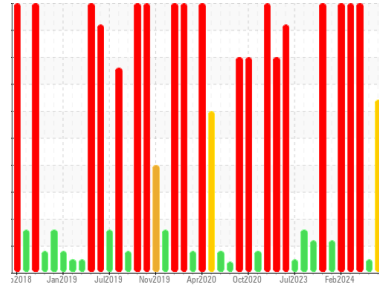


PROBLEM SUMMARY

Area
Aft Machinery Space
Machine Id
Thruster Aft Starboard - Seal Oil System (S/N Sample Tag CL-06003-S3)
Component
Sealing System
Fluid
PETRO CANADA ENERGOL GR-XP ISO 150 (65 LTR)

Sample Rating Trend

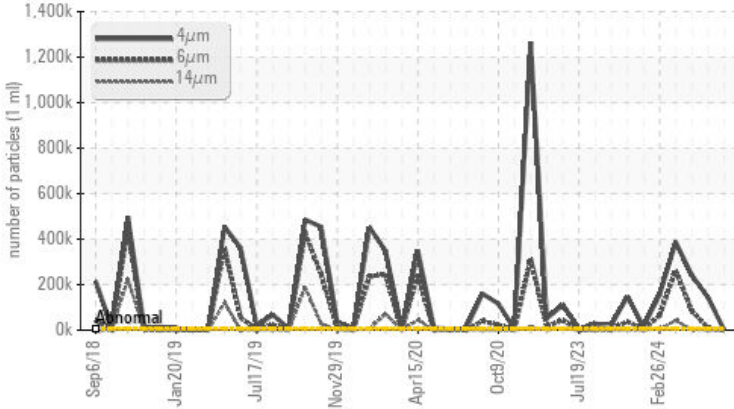


WATER

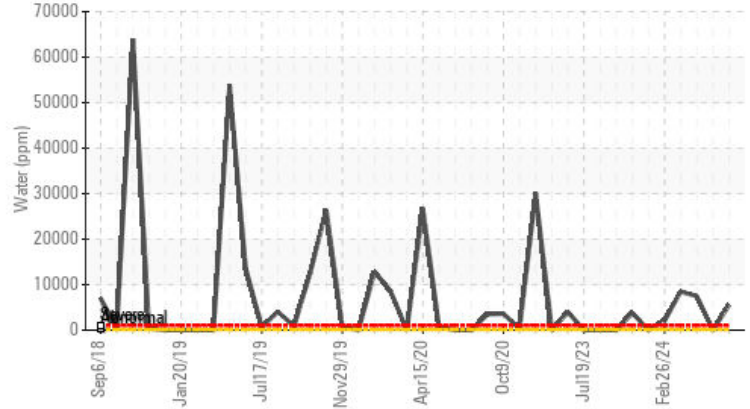


COMPONENT CONDITION SUMMARY

▲ Particle Trend



▲ Water (KF)



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 follow the water drain-off procedure for this component. We recommend you service the filters on this component. Resample in 30-45 days to monitor this situation.

PROBLEMATIC TEST RESULTS

Sample Status			SEVERE	NORMAL	SEVERE
Water	%	ASTM D6304*	▲ 0.552	---	▲ 0.746
ppm Water	ppm	ASTM D6304*	▲ 5526	---	▲ 7461
Particles >4µm		ASTM D7647 >5000	▲ 144606	2107	▲ 241773
Particles >6µm		ASTM D7647 >1300	▲ 8744	366	▲ 86675
Oil Cleanliness		ISO 4406 (c) >19/17/14	▲ 24/20/15	18/16/11	▲ 25/24/19
Appearance	scalar	Visual* NORML	▲ LAYRD	NORML	▲ WGOIL
Emulsified Water	scalar	Visual*	▲ 1%	NEG	▲ .5%
Free Water	scalar	Visual*	▲ >10%	NEG	▲ >10%

Customer Id: TERHAM
Sample No.: PC0080164
Lab Number: 02645049
Test Package: MAR 2



To manage this report scan the QR code

To discuss the diagnosis or test data:
Kevin Marson +1 (289)291-4644 x4644
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.
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

NORMAL



19 Jun 2024 Diag: Kevin Marson

Resample at the next service interval to monitor. All component wear rates are normal. 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 fluid is suitable for further service.

view report



ISO



21 Apr 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 perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid. We recommend that you change the oil. Resample in 30-45 days to monitor this situation. Chromium ppm levels are abnormal. 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 white residue present in the sample is fluid additive precipitate. The AN level is acceptable for this fluid. The fluid is no longer serviceable as a result of the abnormal and/or severe wear.

view report



ISO

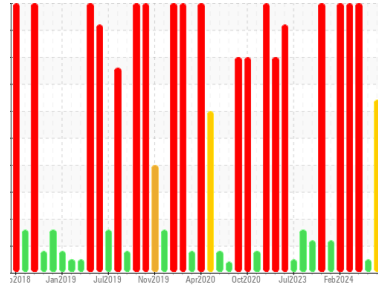


30 Mar 2024 Diag: Kevin Marson

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 perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid. We recommend that you change the oil. Resample in 30-45 days to monitor this situation. Chromium ppm levels are abnormal. 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 white residue present in the sample is fluid additive precipitate. The AN level is acceptable for this fluid. The fluid is no longer serviceable as a result of the abnormal and/or severe wear.

view report





Area

Aft Machinery Space

Machine Id
Thruster Aft Starboard - Seal Oil System (S/N Sample Tag CL-06003-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 advise that you follow the water drain-off procedure for this component. 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.

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		PC0080164	PC0080170	PC
Sample Date	Client Info		19 Jun 2024	19 Jun 2024	21 Apr 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	NORMAL	SEVERE

WEAR METALS

	method	limit/base	current	history1	history2
PQ	ASTM D8184*		0	0	0
Iron	ppm	ASTM D5185(m) >100	6	<1	24
Chromium	ppm	ASTM D5185(m) >3	1	0	▲ 4
Nickel	ppm	ASTM D5185(m) >8	<1	<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	0
Lead	ppm	ASTM D5185(m)	0	0	0
Copper	ppm	ASTM D5185(m) >3	<1	0	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)	2	14	3
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)	4	<1	5
Calcium	ppm	ASTM D5185(m)	2	<1	5
Phosphorus	ppm	ASTM D5185(m)	110	156	120
Zinc	ppm	ASTM D5185(m)	5	3	9
Sulfur	ppm	ASTM D5185(m)	7848	7768	8115
Lithium	ppm	ASTM D5185(m)	<1	<1	<1

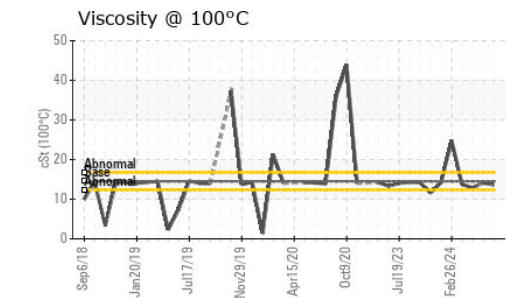
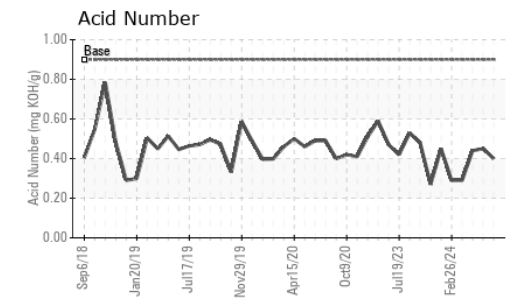
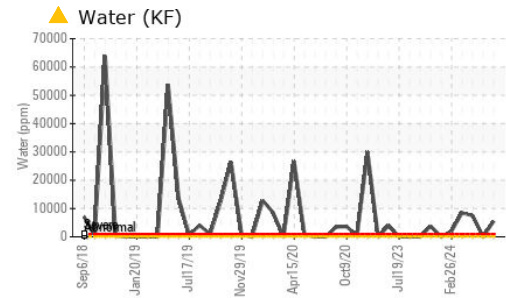
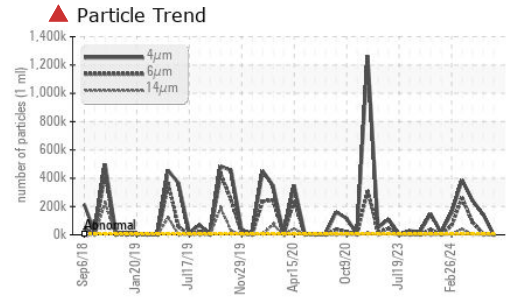
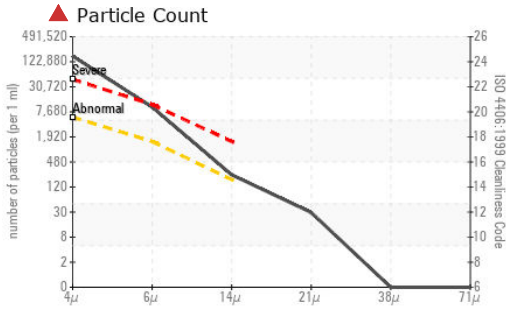
CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185(m) >25	2	2	5
Sodium	ppm	ASTM D5185(m)	20	<1	31
Potassium	ppm	ASTM D5185(m) >20	<1	0	2
Water	%	ASTM D6304*	▲ 0.552	---	▲ 0.746
ppm Water	ppm	ASTM D6304*	▲ 5526	---	▲ 7461

FLUID CLEANLINESS

	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647	>5000	▲ 144606	2107	▲ 241773
Particles >6µm	ASTM D7647	>1300	▲ 8744	366	▲ 86675
Particles >14µm	ASTM D7647	>160	● 208	12	▲ 3172
Particles >21µm	ASTM D7647	>40	26	4	▲ 350
Particles >38µm	ASTM D7647	>10	0	1	2
Particles >71µm	ASTM D7647	>3	0	1	1
Oil Cleanliness	ISO 4406 (c)	>19/17/14	▲ 24/20/15	18/16/11	▲ 25/24/19

OIL ANALYSIS REPORT



Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : PC0080164
Lab Number : 02645049
Unique Number : 5802588
Test Package : MAR 2 (Additional Tests: 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

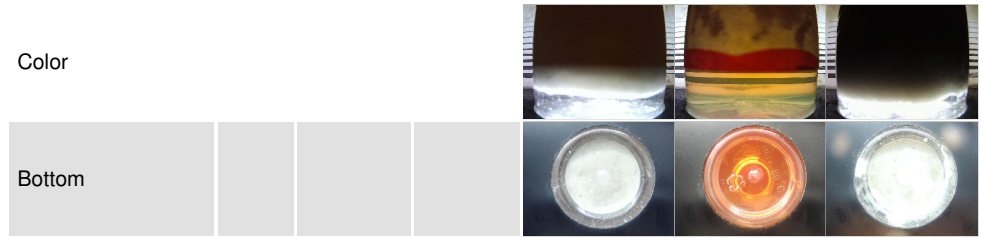
To discuss this sample report, contact Customer Service at 1-800-268-2131.
 Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab.
 Validity of results and interpretation are based on the sample and information as supplied.

FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D974*	0.9	0.40	0.45	0.44

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

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D7279(m)	149	144	144	145
Visc @ 100°C	cSt	ASTM D7279(m)	14.5	13.6	14.1	12.9
Viscosity Index (VI)	Scale	ASTM D2270*		88	94	77

SAMPLE IMAGES		method	limit/base	current	history1	history2
---------------	--	--------	------------	---------	----------	----------



Color

Bottom