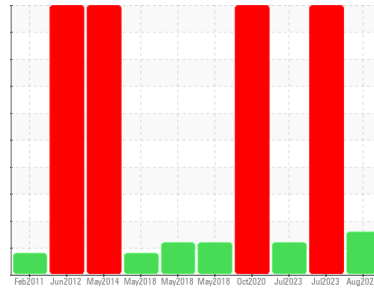


# PROBLEM SUMMARY

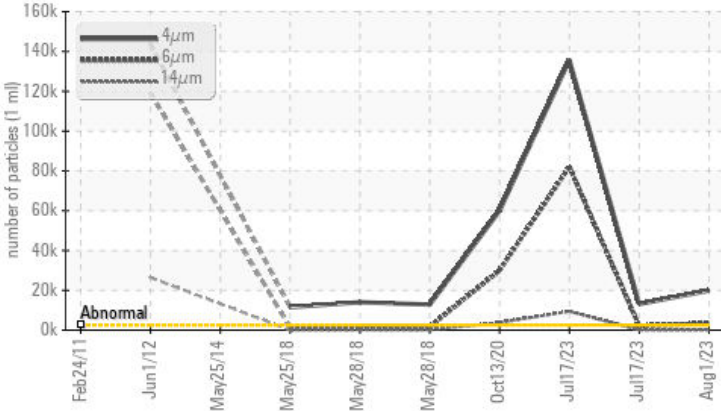
Area  
**Fwd Machinery Space [450164930]**  
 Machine Id  
**Thruster Aft Center - Steering Tube Seal (S/N Sample Tag CL-06001-S5)**  
 Component  
**Steering**  
 Fluid  
**CASTROL ALPHA SP150 (35 LTR)**

Sample Rating Trend



## COMPONENT CONDITION SUMMARY

▲ Particle Trend



## RECOMMENDATION

We recommend you service the filters on this component. We recommend an early resample to monitor this condition.

## PROBLEMATIC TEST RESULTS

Sample Status			<b>ABNORMAL</b>	SEVERE	ABNORMAL
Particles >4µm	ASTM D7647	>2500	▲ <b>19886</b>	● 135697	▲ 13177
Particles >6µm	ASTM D7647	>640	▲ <b>3368</b>	● 82068	▲ 2174
Particles >14µm	ASTM D7647	>80	▲ <b>91</b>	● 9511	▲ 75
Oil Cleanliness	ISO 4406 (c)	>18/16/13	▲ <b>21/19/14</b>	● 24/24/20	▲ 21/18/13

Customer Id: TERHAM  
 Sample No.: PC  
 Lab Number: 02573836  
 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](mailto:Kevin.Marson@wearcheck.com)

To change component or sample information:  
 Gloria Gonzalez +1 (289)291-4643 x4643  
[gloria.gonzalez@wearcheck.com](mailto:gloria.gonzalez@wearcheck.com)

## RECOMMENDED ACTIONS

Action	Status	Date	Done By	Description
Change Filter	---	---	?	We recommend you service the filters on this component.
Resample	---	---	?	We recommend an early resample to monitor this condition.

## HISTORICAL DIAGNOSIS

ISO



### 17 Jul 2023 Diag: Kevin Marson

We advise that you check all areas where contaminants can enter the system. We recommend that you drain the fluid from the component if this has not already been done. 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. Confirm the source of the lubricant being utilized for top-up/fill. Resample in 30-45 days to monitor this situation. Iron and nickel ppm levels are abnormal. Lithium (Li) level abnormal at 8ppm., indicates possible grease contamination. There is a high amount of particulates (2 to 100 microns in size) present in the fluid. Additive levels indicate the addition of a different brand, or type of fluid. 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



### 17 Jul 2023 Diag: Kevin Marson

We recommend you service the filters on this component. We recommend an early resample to monitor this condition. All component wear rates are normal. There is a moderate amount of silt (particulates < 14 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



WATER



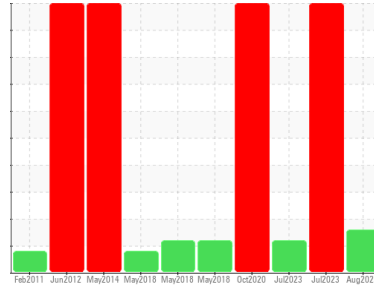
### 13 Oct 2020 Diag: Kevin Marson

Check seals and/or filters for points of contaminant entry. We advise that you check all areas where contaminants can enter the system. We recommend that you drain the fluid from the component if this has not already been done. 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. Confirm the source of the lubricant being utilized for top-up/fill. Resample in 30-45 days to monitor this situation. Please note that the fluid was too thick to perform some of the normal laboratory tests. PQ levels are abnormal. Iron ppm levels are abnormal. Water Water and ppm water contamination levels are severe. Particles >14µm are severely high. Particles >21µm are severely high. Particles >38µm are severely high. Particles >6µm are severely high. Particles >4µm are severely high. Particles >71µm are abnormally high. Lithium (Li) level severe at 66ppm., indicates possible grease contamination. There is a high concentration of water present in the fluid. Additive levels indicate the addition of a different brand, or type of oil. The AN level is acceptable for this fluid. The fluid is no longer serviceable due to the presence of contaminants.

view report



Sample Rating Trend



Area  
**Fwd Machinery Space [450164930]**  
Machine Id  
**Thruster Aft Center - Steering Tube Seal (S/N Sample Tag CL-06001-S5)**  
Component  
**Steering**  
Fluid  
**CASTROL ALPHA SP150 (35 LTR)**

**DIAGNOSIS**

**Recommendation**  
We recommend you service the filters on this component. We recommend an early resample to monitor this condition.

**Wear**  
All component wear rates are normal.

**Contamination**  
There is a moderate amount of silt (particulates < 14 microns in size) 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	<b>PC</b>	PC	PC
Sample Date	Client Info	<b>01 Aug 2023</b>	17 Jul 2023	17 Jul 2023
Machine Age	days	<b>0</b>	0	0
Oil Age	days	<b>0</b>	0	0
Oil Changed	Client Info	<b>N/A</b>	N/A	N/A
Sample Status		<b>ABNORMAL</b>	SEVERE	ABNORMAL

**WEAR METALS**

method	limit/base	current	history1	history2
PQ	ASTM D8184*	<b>17</b>	11	8
Iron	ppm ASTM D5185(m) >50	<b>6</b>	▲ 63	5
Chromium	ppm ASTM D5185(m) >15	<b>0</b>	9	0
Nickel	ppm ASTM D5185(m) >5	<b>0</b>	▲ 6	0
Titanium	ppm ASTM D5185(m)	<b>0</b>	0	0
Silver	ppm ASTM D5185(m)	<b>0</b>	0	0
Aluminum	ppm ASTM D5185(m) >5	<b>&lt;1</b>	<1	0
Lead	ppm ASTM D5185(m) >10	<b>0</b>	0	0
Copper	ppm ASTM D5185(m) >50	<b>&lt;1</b>	<1	<1
Tin	ppm ASTM D5185(m) >5	<b>0</b>	0	0
Antimony	ppm ASTM D5185(m)	<b>0</b>	<1	0
Vanadium	ppm ASTM D5185(m)	<b>0</b>	0	0
Beryllium	ppm ASTM D5185(m)	<b>0</b>	0	0
Cadmium	ppm ASTM D5185(m)	<b>0</b>	0	0

**ADDITIVES**

method	limit/base	current	history1	history2
Boron	ppm ASTM D5185(m)	<b>4</b>	2	4
Barium	ppm ASTM D5185(m) 4	<b>0</b>	0	0
Molybdenum	ppm ASTM D5185(m)	<b>0</b>	3	0
Manganese	ppm ASTM D5185(m)	<b>0</b>	1	0
Magnesium	ppm ASTM D5185(m) 4	<b>&lt;1</b>	2	<1
Calcium	ppm ASTM D5185(m) 4	<b>1</b>	▲ 50	1
Phosphorus	ppm ASTM D5185(m) 330	<b>330</b>	247	334
Zinc	ppm ASTM D5185(m) 4	<b>4</b>	▲ 29	4
Sulfur	ppm ASTM D5185(m)	<b>7551</b>	8156	7584
Lithium	ppm ASTM D5185(m)	<b>&lt;1</b>	▲ 8	<1

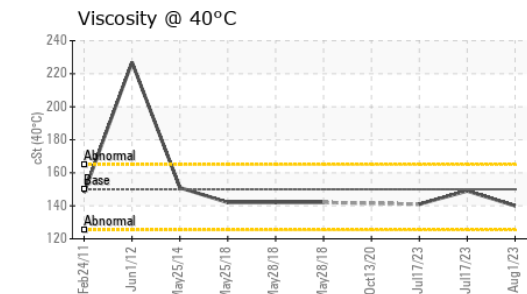
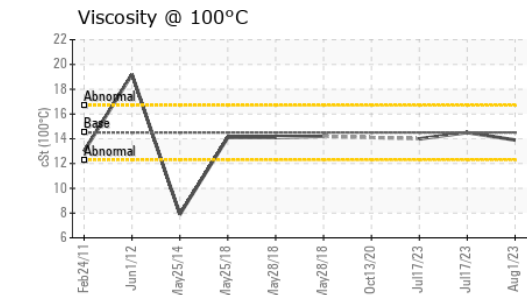
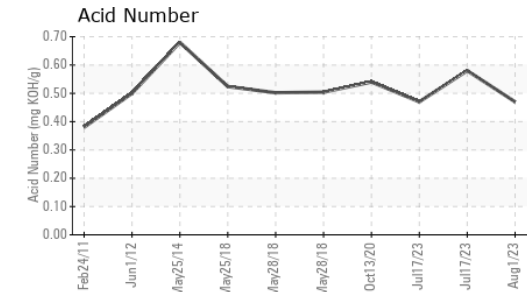
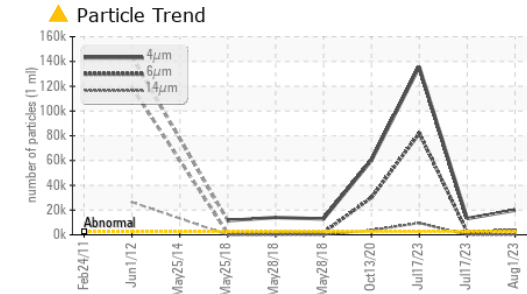
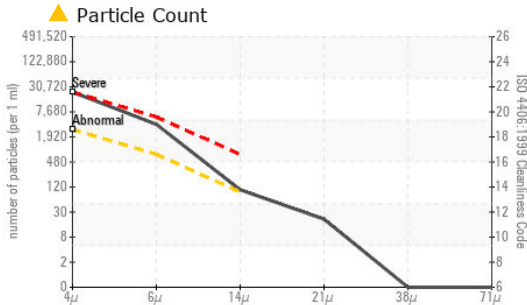
**CONTAMINANTS**

method	limit/base	current	history1	history2
Silicon	ppm ASTM D5185(m) >15	<b>2</b>	10	2
Sodium	ppm ASTM D5185(m)	<b>&lt;1</b>	6	<1
Potassium	ppm ASTM D5185(m) >20	<b>&lt;1</b>	<1	<1

**FLUID CLEANLINESS**

method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647 >2500	▲ <b>19886</b>	135697	▲ 13177
Particles >6µm	ASTM D7647 >640	▲ <b>3368</b>	82068	▲ 2174
Particles >14µm	ASTM D7647 >80	▲ <b>91</b>	9511	75
Particles >21µm	ASTM D7647 >20	<b>18</b>	2539	14
Particles >38µm	ASTM D7647 >4	<b>0</b>	56	1
Particles >71µm	ASTM D7647 >3	<b>0</b>	4	0
Oil Cleanliness	ISO 4406 (c) >18/16/13	▲ <b>21/19/14</b>	24/24/20	▲ 21/18/13

# OIL ANALYSIS REPORT



ISO 17025:2017  
Accredited  
Laboratory

**Laboratory** : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9  
**Sample No.** : PC  
**Lab Number** : 02573836  
**Unique Number** : 5618887  
**Test Package** : MAR 2 ( Additional Tests: KV100, PQ, PrtCount, VI )

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*		<b>0.47</b>	0.58	0.47

VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	Visual*	NONE	<b>NONE</b>	VLITE	NONE
Yellow Metal	scalar	Visual*	NONE	<b>NONE</b>	NONE	NONE
Precipitate	scalar	Visual*	NONE	<b>NONE</b>	NONE	NONE
Silt	scalar	Visual*	NONE	<b>NONE</b>	NONE	NONE
Debris	scalar	Visual*	NONE	<b>NONE</b>	NONE	NONE
Sand/Dirt	scalar	Visual*	NONE	<b>NONE</b>	VLITE	NONE
Appearance	scalar	Visual*	NORML	<b>NORML</b>	NORML	NORML
Odor	scalar	Visual*	NORML	<b>NORML</b>	NORML	NORML
Emulsified Water	scalar	Visual*	>0.2	<b>NEG</b>	NEG	NEG
Free Water	scalar	Visual*		<b>NEG</b>	NEG	NEG

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D7279(m)	150.0	<b>140</b>	149	141
Visc @ 100°C	cSt	ASTM D7279(m)	14.5	<b>13.9</b>	14.5	14.0
Viscosity Index (VI)	Scale	ASTM D2270*	95	<b>95</b>	95	95

## SAMPLE IMAGES

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

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