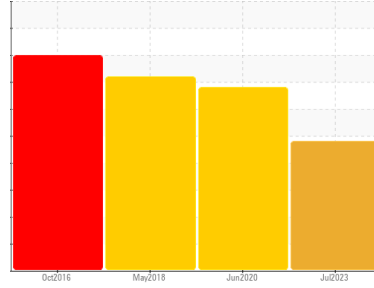
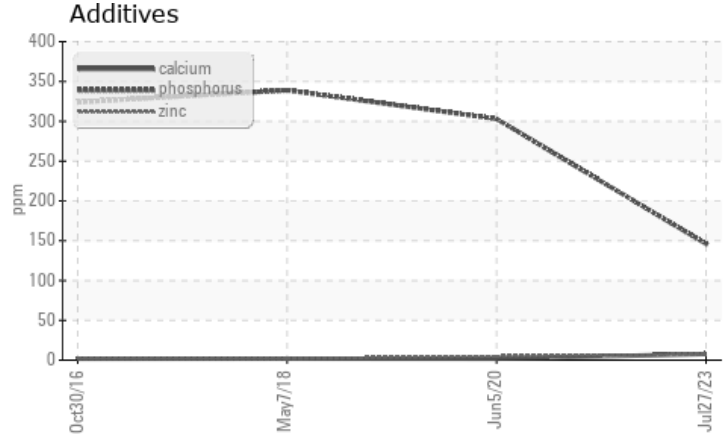
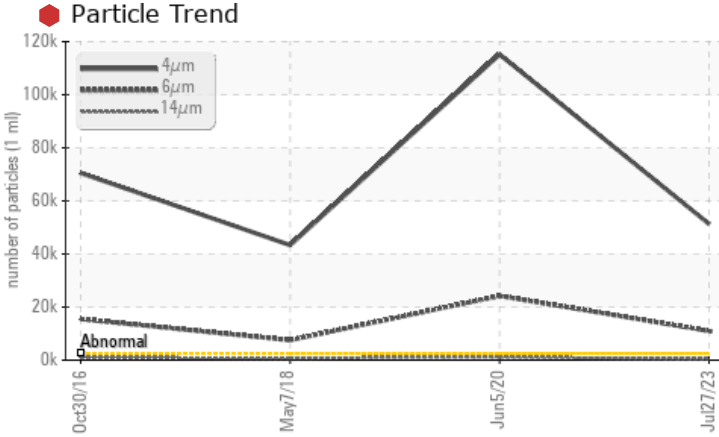


Area
Fwd Machinery Space
Machine Id
Thruster Fwd Fore - Steering Tube Seal (S/N Sample Tag CL-06005-S5)
Component
Steering
Fluid
CASTROL ALPHA SP150 (35 LTR)



COMPONENT CONDITION SUMMARY



RECOMMENDATION

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. Confirm the source of the lubricant being utilized for top-up/fill. Resample in 30-45 days to monitor this situation.

PROBLEMATIC TEST RESULTS

Sample Status	ASTM D7647	SEVERE	SEVERE	SEVERE
Particles >4µm	>2500	51313	115199	43335
Particles >6µm	>640	10988	24190	7497
Particles >14µm	>80	392	1113	729
Particles >21µm	>20	94	317	231
Particles >38µm	>4	9	6	7
Oil Cleanliness	ISO 4406 (c) >18/16/13	23/21/16	24/22/17	23/20/17

Customer Id: TERHAM
Sample No.: PC
Lab Number: 02576272
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 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 Fluid Source	---	---	?	Confirm the source of the lubricant being utilized for top-up/fill.
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

05 Jun 2020 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. Particles >14µm are severely high. Particles >21µm are severely high. Particles >6µm are severely high. Particles >4µm are severely high. The water content is negligible. The AN level is acceptable for this fluid. The condition of the fluid is suitable for further service.

view report



07 May 2018 Diag: Wes Davis

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. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample. All component wear rates are normal. Particles >14µm are severely high. Particles >21µm are severely high. Particles >6µm are severely high. Particles >4µm are severely high. Particles >38µm are notably high. The AN level is acceptable for this fluid. The condition of the fluid is suitable for further service.

view report



30 Oct 2016 Diag: Wes Davis

ISO

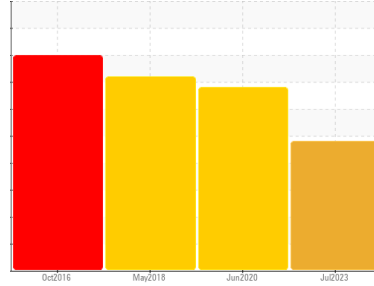


We advise that you check all areas where contaminants can enter the system. We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. Resample in 30-45 days to monitor this situation. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample. All component wear rates are normal. Particles >14µm are severely high. Particles >21µm are severely high. Particles >6µm are severely high. Particles >4µm are severely high. Oil Cleanliness is severe. Particles >38µm are abnormally high. The AN level is acceptable for this fluid. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.

view report



Area
Fwd Machinery Space
Machine Id
Thruster Fwd Fore - Steering Tube Seal (S/N Sample Tag CL-06005-S5)
Component
Steering
Fluid
CASTROL ALPHA SP150 (35 LTR)



DIAGNOSIS

Recommendation
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. Confirm the source of the lubricant being utilized for top-up/fill. 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. The water content is negligible.

Fluid Condition
Additive levels indicate the addition of a different brand, or type of 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.

SAMPLE INFORMATION

method	limit/base	current	history1	history2
Sample Number	Client Info	PC	PC	PC
Sample Date	Client Info	27 Jul 2023	05 Jun 2020	07 May 2018
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) >50	5	29	14
Chromium	ppm ASTM D5185(m) >15	<1	<1	<1
Nickel	ppm ASTM D5185(m) >5	<1	<1	<1
Titanium	ppm ASTM D5185(m)	0	0	0
Silver	ppm ASTM D5185(m)	<1	<1	0
Aluminum	ppm ASTM D5185(m) >5	<1	0	0
Lead	ppm ASTM D5185(m) >10	0	0	0
Copper	ppm ASTM D5185(m) >50	<1	<1	0
Tin	ppm ASTM D5185(m) >5	0	0	0
Antimony	ppm ASTM D5185(m)	0	<1	<1
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)	6	4	3
Barium	ppm ASTM D5185(m) 4	0	<1	0
Molybdenum	ppm ASTM D5185(m)	<1	0	0
Manganese	ppm ASTM D5185(m)	0	<1	0
Magnesium	ppm ASTM D5185(m) 4	<1	<1	<1
Calcium	ppm ASTM D5185(m) 4	8	2	2
Phosphorus	ppm ASTM D5185(m) 330	146	303	339
Zinc	ppm ASTM D5185(m) 4	7	5	2
Sulfur	ppm ASTM D5185(m)	15922	8360	10533
Lithium	ppm ASTM D5185(m)	2	<1	1

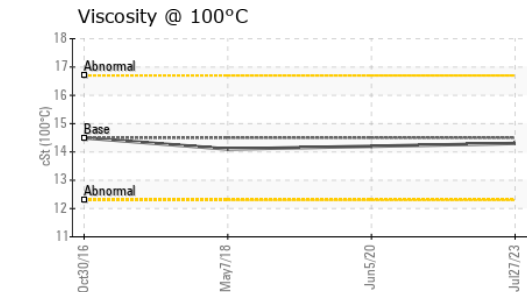
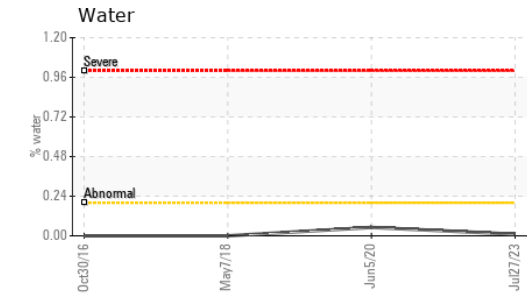
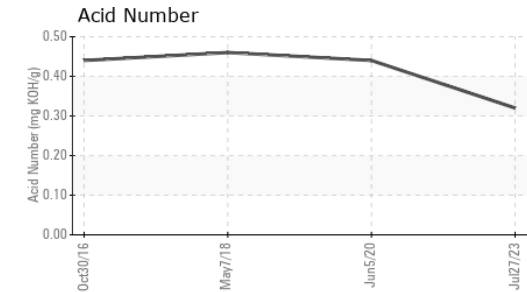
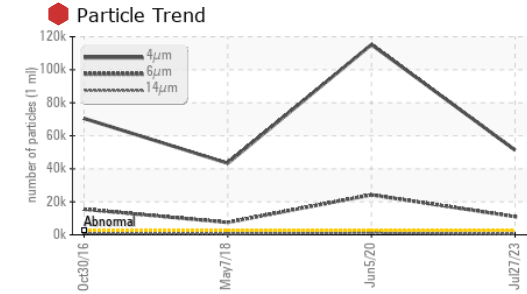
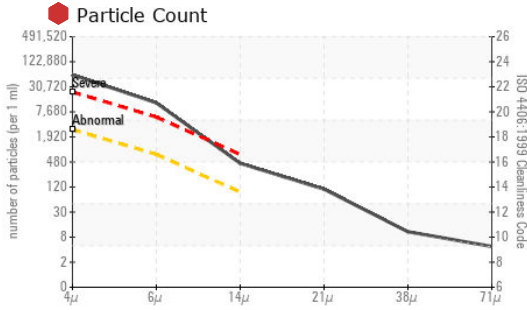
CONTAMINANTS

method	limit/base	current	history1	history2
Silicon	ppm ASTM D5185(m) >15	3	<1	3
Sodium	ppm ASTM D5185(m)	<1	1	1
Potassium	ppm ASTM D5185(m) >20	<1	<1	<1
Water	% ASTM D6304* >0.2	0.010	0.051	---
ppm Water	ppm ASTM D6304* >2000	104.5	512.8	---

FLUID CLEANLINESS

method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647 >2500	51313	115199	43335
Particles >6µm	ASTM D7647 >640	10988	24190	7497
Particles >14µm	ASTM D7647 >80	392	1113	729
Particles >21µm	ASTM D7647 >20	94	317	231
Particles >38µm	ASTM D7647 >4	9	6	7
Particles >71µm	ASTM D7647 >3	4	0	0
Oil Cleanliness	ISO 4406 (c) >18/16/13	23/21/16	24/22/17	23/20/17

OIL ANALYSIS REPORT



FLUID DEGRADATION

method	limit/base	current	history1	history2
Acid Number (AN) mg KOH/g	ASTM D974*	0.32	0.44	0.46

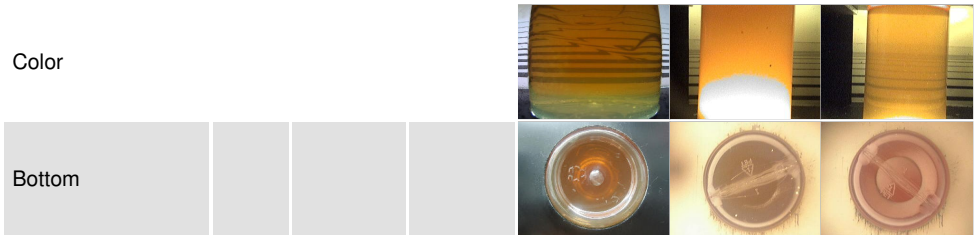
VISUAL

method	limit/base	current	history1	history2
White Metal	scalar Visual*	NONE	NONE	NONE
Yellow Metal	scalar Visual*	NONE	NONE	NONE
Precipitate	scalar Visual*	NONE	NONE	NONE
Silt	scalar Visual*	NONE	NONE	NONE
Debris	scalar Visual*	NONE	NONE	NONE
Sand/Dirt	scalar Visual*	NONE	NONE	NONE
Appearance	scalar Visual*	NORML	NORML	NORML
Odor	scalar Visual*	NORML	NORML	NORML
Emulsified Water	scalar Visual*	>0.2	.2%	NEG
Free Water	scalar Visual*		NEG	NEG

FLUID PROPERTIES

method	limit/base	current	history1	history2	
Visc @ 40°C	cSt ASTM D7279(m)	150.0	146	148	143
Visc @ 100°C	cSt ASTM D7279(m)	14.5	14.3	14.2	14.1
Viscosity Index (VI)	Scale ASTM D2270*	95	95	92	95

SAMPLE IMAGES



Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : PC
Lab Number : **02576272** **Received** : 16 Aug 2023
Unique Number : 5629332 **Diagnosed** : 17 Aug 2023
Test Package : MAR 2 (Additional Tests: KF, KV100, PQ, PrtCount, VI) **Diagnostician** : 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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