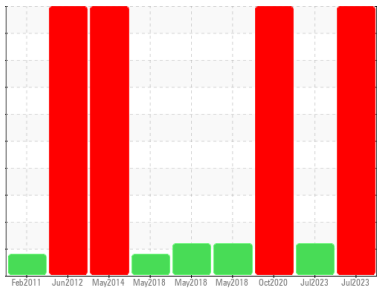
PROBLEM SUMMARY

Sample Rating Trend

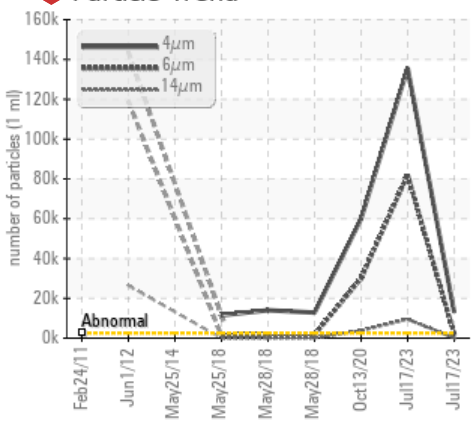


ISO

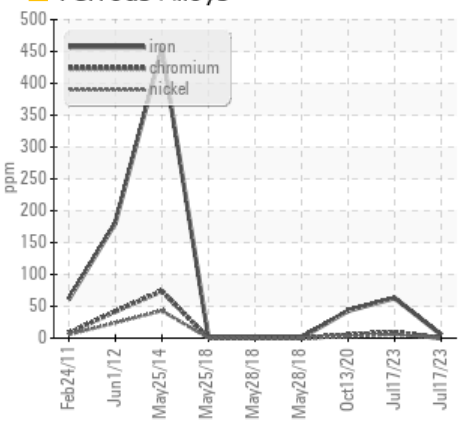
Area
Fwd Machinery Space [450164930]
Machine Id
Thruster Aft Center - Steering Tube Seal (S/N Sample Tag CL-06001-S5)
Component
Steering
Fluid
CASTROL ALPHA SP150 (35 LTR)

COMPONENT CONDITION SUMMARY

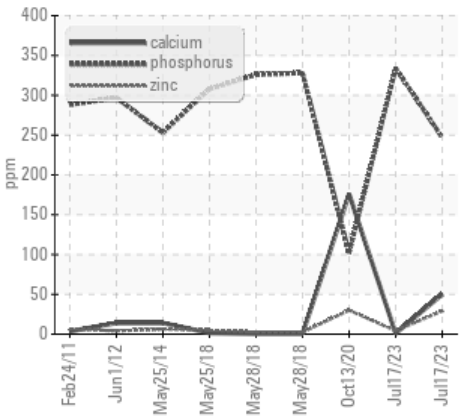
Particle Trend



Ferrous Alloys



Additives



RECOMMENDATION

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.

PROBLEMATIC TEST RESULTS

Sample Status				SEVERE	ABNORMAL	SEVERE
Iron	ppm	ASTM D5185(m)	>50	▲ **63**	5	▲ 43
Nickel	ppm	ASTM D5185(m)	>5	▲ **6**	0	2
Calcium	ppm	ASTM D5185(m)	4	▲ **50**	1	176
Zinc	ppm	ASTM D5185(m)	4	▲ **29**	4	30
Lithium	ppm	ASTM D5185(m)		▲ **8**	<1	⬢ 66
Particles >4µm		ASTM D7647	>2500	⬢ **135697**	▲ 13177	⬢ 60000
Particles >6µm		ASTM D7647	>640	⬢ **82068**	▲ 2174	⬢ 30000
Particles >14µm		ASTM D7647	>80	⬢ **9511**	75	⬢ 3750
Particles >21µm		ASTM D7647	>20	⬢ **2539**	14	⬢ 480
Particles >38µm		ASTM D7647	>4	⬢ **56**	1	⬢ 60
Oil Cleanliness		ISO 4406 (c)	>18/16/13	⬢ **24/24/20**	▲ 21/18/13	⬢ 23/22/19

Customer Id: TERHAM
Sample No.: PC
Lab Number: 02573838
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 Fluid	---	---	?	We recommend that you drain the fluid from the component if this has not already been done.
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.

HISTORICAL DIAGNOSIS

17 Jul 2023 Diag: Kevin Marson

ISO

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

13 Oct 2020 Diag: Kevin Marson

WATER

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

28 May 2018 Diag: Wes Davis

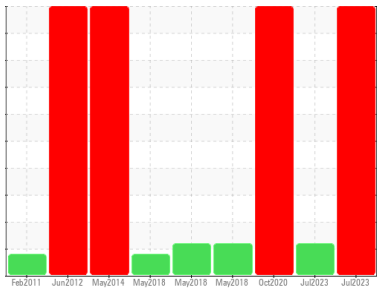
ISO

We recommend you service the filters on this component. We recommend an early resample to monitor this condition. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.All component wear rates are normal. Particles >4µm are abnormally high. Particles >6µm are abnormally high. Particles >14µm are notably 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

OIL ANALYSIS REPORT

Sample Rating Trend



ISO

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 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.

Wear

Iron and nickel ppm levels are abnormal.

Contamination

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.

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 no longer serviceable as a result of the abnormal and/or severe wear.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**PC**	PC	PC
Sample Date		Client Info		**17 Jul 2023**	17 Jul 2023	13 Oct 2020
Machine Age	days	Client Info		**0**	0	0
Oil Age	days	Client Info		**0**	0	0
Oil Changed		Client Info		**N/A**	N/A	N/A
Sample Status				**SEVERE**	ABNORMAL	SEVERE

WEAR METALS		method	limit/base	current	history1	history2
PQ		ASTM D8184*		**11**	8	▲ 200
Iron	ppm	ASTM D5185(m)	>50	▲ **63**	5	▲ 43
Chromium	ppm	ASTM D5185(m)	>15	**9**	0	5
Nickel	ppm	ASTM D5185(m)	>5	▲ **6**	0	2
Titanium	ppm	ASTM D5185(m)		**0**	0	0
Silver	ppm	ASTM D5185(m)		**0**	0	<1
Aluminum	ppm	ASTM D5185(m)	>5	**<1**	0	3
Lead	ppm	ASTM D5185(m)	>10	**0**	0	1
Copper	ppm	ASTM D5185(m)	>50	**<1**	<1	1
Tin	ppm	ASTM D5185(m)	>5	**0**	0	0
Antimony	ppm	ASTM D5185(m)		**<1**	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	<1

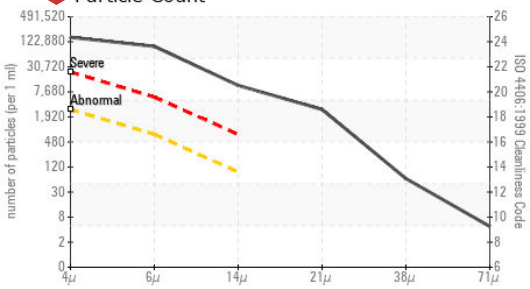
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185(m)		**2**	4	3
Barium	ppm	ASTM D5185(m)	4	**0**	0	0
Molybdenum	ppm	ASTM D5185(m)		**3**	0	▲ 544
Manganese	ppm	ASTM D5185(m)		**1**	0	<1
Magnesium	ppm	ASTM D5185(m)	4	**2**	<1	16
Calcium	ppm	ASTM D5185(m)	4	▲ **50**	1	176
Phosphorus	ppm	ASTM D5185(m)	330	**247**	334	▲ 102
Zinc	ppm	ASTM D5185(m)	4	▲ **29**	4	30
Sulfur	ppm	ASTM D5185(m)		**8156**	7584	▲ 1664
Lithium	ppm	ASTM D5185(m)		▲ **8**	<1	⬢ 66

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185(m)	>15	**10**	2	5
Sodium	ppm	ASTM D5185(m)		**6**	<1	146
Potassium	ppm	ASTM D5185(m)	>20	**<1**	<1	4

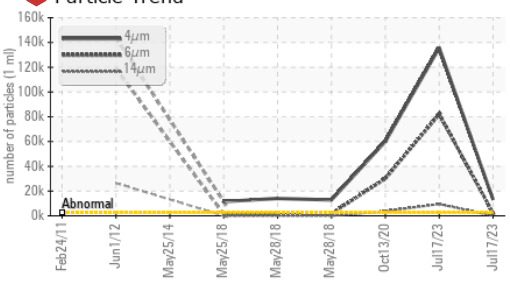
FLUID CLEANLINESS	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647	>2500	⬢ **135697**	▲ 13177	⬢ 60000
Particles >6µm	ASTM D7647	>640	⬢ **82068**	▲ 2174	⬢ 30000
Particles >14µm	ASTM D7647	>80	⬢ **9511**	75	⬢ 3750
Particles >21µm	ASTM D7647	>20	⬢ **2539**	14	⬢ 480
Particles >38µm	ASTM D7647	>4	⬢ **56**	1	⬢ 60
Particles >71µm	ASTM D7647	>3	**4**	0	▲ 7
Oil Cleanliness	ISO 4406 (c)	>18/16/13	⬢ **24/24/20**	▲ 21/18/13	⬢ 23/22/19

OIL ANALYSIS REPORT

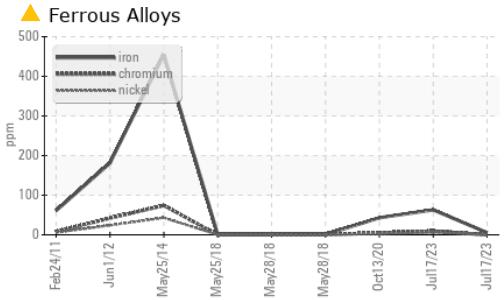
Particle Count



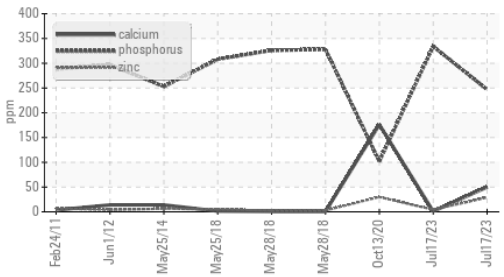
Particle Trend



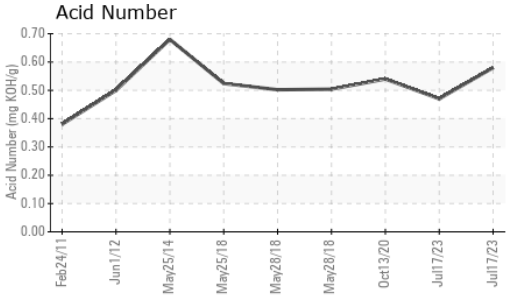
Ferrous Alloys



Additives



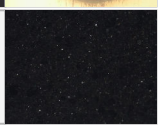
Acid Number



FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D974*		**0.58**	0.47	0.54

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

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

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

ISO 17025:2017 Accredited Laboratory

Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : PC **Received** : 02 Aug 2023
Lab Number : 02573838 **Diagnosed** : 03 Aug 2023
Unique Number : 5618889 **Diagnostician** : Kevin Marson
Test Package : MAR 2 (Additional Tests: KV100, PQ, PrtCount, TAN Man, 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.

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