

PROBLEM SUMMARY

Sample Rating Trend

ISO

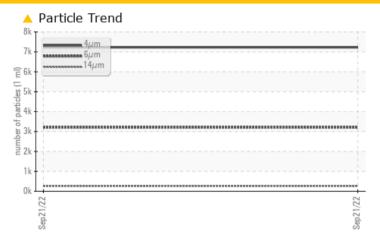
KAESER 7553149

Component

Compressor

KAESER SIGMA (OEM) M-460 (--- GAL)

COMPONENT CONDITION SUMMARY



RECOMMENDATION

Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

PROBLEMATIC TEST	T RESULTS			
Sample Status			ABNORMAL	
Particles >6µm	ASTM D7647	>1300	△ 3206	
Particles >14µm	ASTM D7647	>80	258	
Particles >21µm	ASTM D7647	>20	△ 37	
Oil Cleanliness	ISO 4406 (c)	>/17/13	20/19/15	

Customer Id: COSSANCAL Sample No.: KCP44150 Lab Number: 05648957 Test Package: IND 2



To manage this report scan the QR code

To discuss the diagnosis or test data: Jonathan Hester +1 919-379-4092 x4092 jhester@wearcheckusa.com

To change component or sample information: Customer Service +1 1-800-237-1369 customerservice@wearcheck.com

RECOMMENDED	ACTIONS			
Action	Status	Date	Done By	Description
Change Fluid			?	Oil and filter change at the time of sampling has been noted.
Change Filter			?	Oil and filter change at the time of sampling has been noted.

HISTORICAL DIAGNOSIS



OIL ANALYSIS REPORT

Sample Rating Trend

ISO

Machine Id

KAESER 7553149

Component

Compressor

KAESER SIGMA (OEM) M-460 (--- GAL)

DIAGNOSIS

Recommendation

Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

There is a high amount of particulates present in the oil.

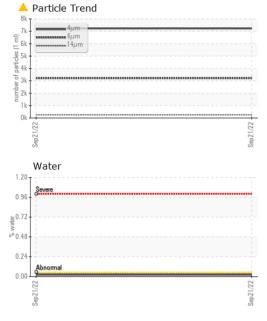
Fluid Condition

The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

SAMPLE INFORMATION method limit/base current history 1 history 2							
Sample Number KCP44150 Sample Date 21 Sep 2022 Machine Age hrs 4759 Oil Age hrs 4000 Oil Changed Changed Sample Status method limil/base current history 1 history 2 Iron ppm ASTM 05185m >50 1 Chromium ppm ASTM 05185m >10 0 Nickel ppm ASTM 05185m >3 0 Silver ppm ASTM 05185m >3 0 Aluminum ppm ASTM 05185m >10 0 Aluminum ppm ASTM 05185m >10 0 Copper ppm ASTM 05185m >10 0							
Sample Date 21 Sep 2022	SAMPLE INFORM	MATION	method	limit/base	current	history 1	history 2
Machine Age hrs	Sample Number				KCP44150		
Oil Age Oil Changed Sample Status hrs 4000 Changed ABNORMAL	Sample Date				21 Sep 2022		
Changed Sample Status method limit/base current history 1 history 2 Iron ppm ASTM D5185m >50 1 Chromium ppm ASTM D5185m >3 0 Nickel ppm ASTM D5185m >3 0 Titanium ppm ASTM D5185m >3 0 Alluminum ppm ASTM D5185m >3 0 Alluminum ppm ASTM D5185m >10 0 Lead ppm ASTM D5185m >10 0 Copper ppm ASTM D5185m >10 0 Vanadium ppm ASTM D5185m 0 0 ADDITIVES method limit/base current history 1 history 2	Machine Age	hrs			4759		
WEAR METALS method limit/base current history 1 history 2 Iron ppm ASTM D5185m >50 1 Chromium ppm ASTM D5185m >10 0 Nickel ppm ASTM D5185m >3 0 Titanium ppm ASTM D5185m >2 0 Silver ppm ASTM D5185m >2 0 Aluminum ppm ASTM D5185m >10 0 Lead ppm ASTM D5185m >50 2 Copper ppm ASTM D5185m >50 2 Vanadium ppm ASTM D5185m 0 0 Cadmium ppm ASTM D5185m 0 0 Barium ppm ASTM D5185m 0 0	Oil Age	hrs			4000		
WEAR METALS method limit/base current history 1 history 2 Iron ppm ASTM D5185m >50 1 Nickel ppm ASTM D5185m >3 0 Nickel ppm ASTM D5185m >3 0 Silver ppm ASTM D5185m >3 0 Aluminum ppm ASTM D5185m >2 0 Lead ppm ASTM D5185m >10 0 Copper ppm ASTM D5185m >10 0 Tin ppm ASTM D5185m >10 0 Cadmium ppm ASTM D5185m 0 0 Boron ppm ASTM D5185m 0 0 Barium ppm ASTM D5185m 0 0	Oil Changed				Changed		
Iron	Sample Status				ABNORMAL		
Chromium ppm ASTM D5185m >10 0 Nickel ppm ASTM D5185m >3 0 Titanium ppm ASTM D5185m >3 0 Silver ppm ASTM D5185m >2 0 Aluminum ppm ASTM D5185m >10 0 Lead ppm ASTM D5185m >10 0 Copper ppm ASTM D5185m >10 0 Vanadium ppm ASTM D5185m 0 0 Vanadium ppm ASTM D5185m 0 0 Vanadium ppm ASTM D5185m 0 0 ABDITIVES method limit/base current history 1 history 2 Boron ppm ASTM D5185m 0 0	WEAR METALS		method	limit/base	current	history 1	history 2
Nickel ppm ASTM D5185m >3 0	Iron	ppm	ASTM D5185m	>50	1		
Titanium	Chromium	ppm	ASTM D5185m	>10	0		
Silver	Nickel	ppm	ASTM D5185m	>3	0		
Silver ppm ASTM D5185m >2 0 Aluminum ppm ASTM D5185m >10 0 Lead ppm ASTM D5185m >10 <1	Titanium	ppm	ASTM D5185m	>3	0		
Aluminum	Silver		ASTM D5185m	>2	0		
Lead ppm ASTM D5185m >10 <1 Copper ppm ASTM D5185m >50 2 Tin ppm ASTM D5185m 10 0 Vanadium ppm ASTM D5185m 0 0 Cadmium ppm ASTM D5185m 0 0 ADDITIVES method limit/base current history 1 history 2 Boron ppm ASTM D5185m 0 0 Barium ppm ASTM D5185m 0 0 Magnesium ppm ASTM D5185m 0 46 Calcium ppm ASTM D5185m 0 98 Zinc ppm ASTM D5185m 0 7 Sulfur ppm ASTM D5185m 25 1	Aluminum		ASTM D5185m	>10	0		
Copper ppm ASTM D5185m >50 2 Tin ppm ASTM D5185m >10 0 Vanadium ppm ASTM D5185m 0 0 ADDITIVES method limit/base current history 1 history 2 Boron ppm ASTM D5185m 0 0 Barium ppm ASTM D5185m 90 0 Molybdenum ppm ASTM D5185m 0 0 Magnesium ppm ASTM D5185m 0 46 Calcium ppm ASTM D5185m 0 46 Phosphorus ppm ASTM D5185m 0 98 Sulfur ppm ASTM D5185m 0 7 Sulfur ppm ASTM D5185m 23500 <td< td=""><td>Lead</td><td></td><td>ASTM D5185m</td><td>>10</td><td><1</td><td></td><td></td></td<>	Lead		ASTM D5185m	>10	<1		
Tin ppm ASTM D5185m >10 0	Copper		ASTM D5185m	>50	2		
Vanadium ppm ASTM D5185m 0 Cadmium ppm ASTM D5185m 0 ADDITIVES method limit/base current history 1 history 2 Boron ppm ASTM D5185m 0 0 Barium ppm ASTM D5185m 0 0 Molybdenum ppm ASTM D5185m 0 0 Magnessum ppm ASTM D5185m 100 46 Calcium ppm ASTM D5185m 0 <1 Phosphorus ppm ASTM D5185m 0 7 Sulfur ppm ASTM D5185m 0 7 Sulfur ppm ASTM D5185m 23500 17373 CONTAMINANTS method limit/base current history 1	• • •				_		
Cadmium ppm ASTM D5185m 0 ADDITIVES method limit/base current history 1 history 2 Boron ppm ASTM D5185m 0 0 Barium ppm ASTM D5185m 90 0 Molybdenum ppm ASTM D5185m 0 0 Manganese ppm ASTM D5185m 0 46 Magnesium ppm ASTM D5185m 100 46 Calcium ppm ASTM D5185m 0 >1 Phosphorus ppm ASTM D5185m 0 98 Zinc ppm ASTM D5185m 0 7 Sulfur ppm ASTM D5185m 0 7 Silicon ppm ASTM D5185m >25 <				7.0	-		
ADDITIVES					-		
Boron ppm ASTM D5185m 0 0 Barium ppm ASTM D5185m 90 0 Molybdenum ppm ASTM D5185m 0 0 Manganese ppm ASTM D5185m 100 46 Magnesium ppm ASTM D5185m 0 <1		ррпп					
Barium ppm ASTM D5185m 90 0 Molybdenum ppm ASTM D5185m 0 0 Magnesium ppm ASTM D5185m 100 46 Calcium ppm ASTM D5185m 0 <1 Phosphorus ppm ASTM D5185m 0 98 Zinc ppm ASTM D5185m 0 7 Sulfur ppm ASTM D5185m 0 7 Sulfur ppm ASTM D5185m 23500 17373 CONTAMINANTS method limit/base current history 1 history 2 Silicon ppm ASTM D5185m >25 1 Sodium ppm ASTM D5185m >20 4 Potassium ppm ASTM D5185m >20 </th <th>ADDITIVES</th> <th></th> <th></th> <th>limit/base</th> <th>current</th> <th>history 1</th> <th>history 2</th>	ADDITIVES			limit/base	current	history 1	history 2
Molybdenum ppm ASTM D5185m 0 0 Manganese ppm ASTM D5185m 0 <1 Magnesium ppm ASTM D5185m 100 46 Calcium ppm ASTM D5185m 0 <1 Phosphorus ppm ASTM D5185m 0 7 Zinc ppm ASTM D5185m 0 7 Sulfur ppm ASTM D5185m 23500 17373 CONTAMINANTS method limit/base current history 1 history 2 Silicon ppm ASTM D5185m >25 1 Sodium ppm ASTM D5185m >20 4 Potassium ppm ASTM D5185m >20 4 Water % ASTM D6185m >20<	Boron	ppm	ASTM D5185m	0	0		
Manganese ppm ASTM D5185m <1 Magnesium ppm ASTM D5185m 100 46 Calcium ppm ASTM D5185m 0 <1		ppm	ASTM D5185m	90	0		
Magnesium ppm ASTM D5185m 100 46 Calcium ppm ASTM D5185m 0 <1	Molybdenum	ppm	ASTM D5185m	0	0		
Calcium ppm ASTM D5185m 0 <1 Phosphorus ppm ASTM D5185m 0 98 Zinc ppm ASTM D5185m 0 7 Sulfur ppm ASTM D5185m 23500 17373 CONTAMINANTS method limit/base current history 1 history 2 Silicon ppm ASTM D5185m >25 1 Sodium ppm ASTM D5185m >20 4 Potassium ppm ASTM D5185m >20 4 Water % ASTM D5185m >20 4 Water % ASTM D6304 >500 226.9 ppm Water ppm ASTM D7647 7225 Particles >4µm ASTM D7647 >80 258 <t< td=""><td>Manganese</td><td>ppm</td><td>ASTM D5185m</td><td></td><td><1</td><td></td><td></td></t<>	Manganese	ppm	ASTM D5185m		<1		
Phosphorus ppm ASTM D5185m 0 98 Zinc ppm ASTM D5185m 0 7 Sulfur ppm ASTM D5185m 23500 17373 CONTAMINANTS method limit/base current history 1 history 2 Silicon ppm ASTM D5185m >25 1 Sodium ppm ASTM D5185m >20 4 Sodium ppm ASTM D5185m >20 4 Potassium ppm ASTM D6185m >20 4 Water % ASTM D6304 >0.05 0.022 ppm Water ppm ASTM D6304 >500 226.9 FLUID CLEANLINESS method limit/base current history 1 history 2 Particles >4µm ASTM D7647	Magnesium	ppm	ASTM D5185m	100	46		
Zinc ppm ASTM D5185m 0 7 Sulfur ppm ASTM D5185m 23500 17373 CONTAMINANTS method limit/base current history 1 history 2 Silicon ppm ASTM D5185m >25 1 Sodium ppm ASTM D5185m >20 4 Potassium ppm ASTM D5185m >20 4 Water % ASTM D6304 >0.05 0.022 Water % ASTM D6304 >500 226.9 FLUID CLEANLINESS method limit/base current history 1 history 2 Particles >4µm ASTM D7647 >1300 3206 Particles >21µm ASTM D7647 >80 258 Particles >71µm ASTM D7647 >4 3	Calcium	ppm	ASTM D5185m	0	<1		
Sulfur ppm ASTM D5185m 23500 17373 CONTAMINANTS method limit/base current history 1 history 2 Silicon ppm ASTM D5185m >25 1 Sodium ppm ASTM D5185m >20 4 Potassium ppm ASTM D5185m >20 4 Water % ASTM D5185m >20 4 Water % ASTM D5185m >20 4 Water % ASTM D6304 >0.05 0.022 ppm Water ppm ASTM D6304 >500 226.9 FLUID CLEANLINESS method limit/base current history 1 history 2 Particles >4µm ASTM D7647 >1300 3206 Particles >21µm ASTM D764	Phosphorus	ppm	ASTM D5185m	0	98		
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Silicon ppm ASTM D5185m >25 1 Sodium ppm ASTM D5185m 20 4 Potassium ppm ASTM D5185m >20 4 Water % ASTM D6304 >0.05 0.022 ppm Water ppm ASTM D6304 >500 226.9 FLUID CLEANLINESS method limit/base current history 1 history 2 Particles >4μm ASTM D7647 >1300 3206 Particles >6μm ASTM D7647 >80 258 Particles >21μm ASTM D7647 >20 37 Particles >38μm ASTM D7647 >3 0 Particles >71μm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >/17/13 20/19/15 <th< td=""><td>Sulfur</td><td>ppm</td><td>ASTM D5185m</td><td>23500</td><td>17373</td><td></td><td></td></th<>	Sulfur	ppm	ASTM D5185m	23500	17373		
Sodium ppm ASTM D5185m 11 Potassium ppm ASTM D5185m >20 4 Water % ASTM D6304 >0.05 0.022 ppm Water ppm ASTM D6304 >500 226.9 FLUID CLEANLINESS method limit/base current history 1 history 2 Particles >4μm ASTM D7647 7225 Particles >6μm ASTM D7647 >80 3206 Particles >14μm ASTM D7647 >80 258 Particles >21μm ASTM D7647 >20 37 Particles >38μm ASTM D7647 >4 3 Particles >71μm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >/17/13 20/19/15 FLUID DEGRA	CONTAMINANTS		method	limit/base	current	history 1	history 2
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Potassium ppm ASTM D5185m >20 4 Water % ASTM D6304 >0.05 0.022 ppm Water ppm ASTM D6304 >500 226.9 FLUID CLEANLINESS method limit/base current history 1 history 2 Particles >4μm ASTM D7647 7225 Particles >6μm ASTM D7647 >1300 3206 Particles >14μm ASTM D7647 >80 258 Particles >21μm ASTM D7647 >20 37 Particles >38μm ASTM D7647 >4 3 Particles >71μm ASTM D7647 3 0 Oil Cleanliness ISO 4406 (c) >/17/13 20/19/15 FLUID DEGRADATION method limit/base current history 1 history 2	Sodium		ASTM D5185m		11		
Water % ASTM D6304 >0.05 0.022 ppm Water ppm ASTM D6304 >500 226.9 FLUID CLEANLINESS method limit/base current history 1 history 2 Particles >4μm ASTM D7647 7225 Particles >6μm ASTM D7647 >1300 3206 Particles >14μm ASTM D7647 >80 258 Particles >21μm ASTM D7647 >20 37 Particles >38μm ASTM D7647 >4 3 Particles >71μm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >/17/13 20/19/15 FLUID DEGRADATION method limit/base current history 1 history 2	Potassium		ASTM D5185m	>20	4		
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Particles >4μm ASTM D7647 7225 Particles >6μm ASTM D7647 >1300 3206 Particles >14μm ASTM D7647 >80 258 Particles >21μm ASTM D7647 >20 37 Particles >38μm ASTM D7647 >4 3 Particles >71μm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >/17/13 20/19/15 FLUID DEGRADATION method limit/base current history 1 history 2	ppm Water						
Particles >6μm ASTM D7647 >1300 3206 Particles >14μm ASTM D7647 >80 258 Particles >21μm ASTM D7647 >20 37 Particles >38μm ASTM D7647 >4 3 Particles >71μm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >/17/13 20/19/15 FLUID DEGRADATION method limit/base current history 1 history 2	FLUID CLEANLIN	IESS	method	limit/base	current	history 1	history 2
Particles >14μm ASTM D7647 >80 258 Particles >21μm ASTM D7647 >20 37 Particles >38μm ASTM D7647 >4 3 Particles >71μm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >/17/13 20/19/15 FLUID DEGRADATION method limit/base current history 1 history 2	Particles >4μm		ASTM D7647		7225		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Particles >6µm		ASTM D7647	>1300	3206		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Particles >14µm		ASTM D7647	>80	258		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Particles >21µm		ASTM D7647	>20	A 37		
Particles >71μm ASTM D7647 >3 0 Oil Cleanliness ISO 4406 (c) >/17/13 ▲ 20/19/15 FLUID DEGRADATION method limit/base current history 1 history 2	Particles >38µm		ASTM D7647	>4	3		
Oil Cleanliness ISO 4406 (c) >/17/13 20/19/15 FLUID DEGRADATION method limit/base current history 1 history 2			ASTM D7647	>3	0		
				>/17/13	<u>^</u> 20/19/15		
	FLUID DEGRADA	TION	method	limit/base	current	history 1	history 2
	Acid Number (AN)	mg KOH/g					



OIL ANALYSIS REPORT



VISUAL		method	limit/base	current	history 1	history 2
Vhite Metal	scalar	*Visual	NONE	NONE		
'ellow Metal	scalar	*Visual	NONE	NONE		
recipitate	scalar	*Visual	NONE	NONE		
Silt	scalar	*Visual	NONE	NONE		
)ebris	scalar	*Visual	NONE	NONE		
and/Dirt	scalar	*Visual	NONE	NONE		
ppearance	scalar	*Visual	NORML	NORML		
Odor	scalar	*Visual	NORML	NORML		
mulsified Water	scalar	*Visual	>0.05	NEG		
ree Water	scalar	*Visual		NEG		
FLUID PROPER	TIES	method	limit/base	current	history 1	history 2
/isc @ 40°C	cSt	ASTM D445	45	44.8		
SAMPLE IMAGE	S	method	limit/base	current	history 1	history 2
Color					no image	no image
Bottom					no image	no image
GRAPHS						
Ferrous Alloys			491,520	Particle Count		т2
iron			122,880			2
•••••••••••• nickel						
			30,720			+2
2			7,680	1		-2
1/2			Sep21/22 (per 1 ml	1:		+1
7ds			S C	1	N.	
Sep21/22	1-		<u>a</u>	1	and the second second	and the second second
Non-ferrous Meta	ls		f barticle		1	1
	ls		Sep21/22 Sep21/22 480 120			11





Laboratory Sample No.

Lab Number

: KCP44150 : 05648957 Unique Number : 10143496

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 22 Sep 2022 Diagnosed

: 26 Sep 2022 Diagnostician : Jonathan Hester **COSTCO WHOLESALE #848**

2376 S EVERGREEN LOOP, SAN JOSE BUSINESS CENTER WHSE SAN JOSE, CA USA 95148

Contact: Service Manager

Test Package: IND 2 (Additional Tests: KF, PrtCount) To discuss this sample report, contact Customer Service at 1-800-237-1369.

* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

Viscosity @ 40°C

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Acid Number

(B) 1.20 (B) 0.96 Ĕ 0.72 은 0.48 0.24 0.00

T:

F: