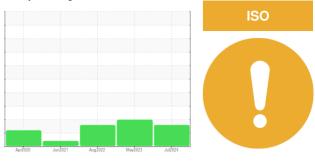


OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id

4171302 (S/N 1007) Compressor

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

Recommendation

Oil and filter change at the time of sampling has been noted. No corrective action is recommended at this time. Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

There is a moderate 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.

| Oil Age F Oil Changed F Sample Status F WEAR METALS F Iron F Chromium F Nickel F Titanium F Silver F Aluminum F Lead F Copper F Tin F Antimony F Vanadium F Boron F Barium F Malybdenum F Magnesium F Calcium F Phosphorus F | hrs hrs ppm ppm ppm ppm ppm ppm ppm ppm ppm pp | Client Info Client Info Client Info Client Info Client Info Astm D5185m ASTM D5185m | >2 >10 >10 | KCPA020760 03 Jul 2024 32699 1041 Changed ATTENTION 0 0 0 3 1 0 0 3 1 0 0 3 1 1 1 0 0 0 3 1 1 1 0 0 1 1 1 0 0 1 1 1 1 | KCPA001627 26 May 2023 31161 0 N/A ABNORMAL 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | KCP44106 10 Aug 2022 30187 0 Changed ABNORMAL history2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 |
|--|---|--|---|---|---|---|
| Machine Age A Oil Age A Oil Changed Sample Status WEAR METALS Iron A Chromium A Nickel A Titanium A Silver A Aluminum A Lead A Copper A Tin A Antimony A Vanadium A Cadmium A Cadmium A ADDITIVES Boron A Barium A Molybdenum A Manganese A Magnesium A Manganese A Magnesium A Calcium A Phosphorus A | hrs ppm ppm ppm ppm ppm ppm ppm ppm ppm pp | Client Info Client Info Client Info Astm D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | >50 >10 >3 >3 >2 >10 >10 >50 | 32699 1041 Changed ATTENTION 0 0 <1 0 0 <1 0 <1 <1 <1 <1 10 0 | 31161 0 N/A ABNORMAL 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 30187 0 Changed ABNORMAL history2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 |
| Oil Age I Oil Changed Sample Status WEAR METALS Iron I Chromium I Nickel I Titanium I Silver I Aluminum I Lead I Copper I Tin I Antimony I Vanadium I Boron I Barium I Malganese I Magnesium I Phosphorus I | hrs ppm ppm ppm ppm ppm ppm ppm ppm ppm pp | Client Info Client Info ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | >50 >10 >3 >3 >2 >10 >10 >50 | 1041 Changed ATTENTION Current 0 0 <1 0 0 <1 <1 <1 10 0 0 | 0 N/A ABNORMAL 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 0 1 1 0 | 0 Changed ABNORMAL 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 |
| Oil Changed Sample Status WEAR METALS Iron Iron Chromium Nickel Titanium Silver Aluminum Lead Copper Tin Antimony Vanadium Cadmium Boron Barium Molybdenum Magnesium Phosphorus Zinc | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | Client Info method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | >50 >10 >3 >3 >2 >10 >10 >50 | Changed ATTENTION 0 0 <1 0 0 0 <1 <1 <1 1 10 0 | N/A ABNORMAL 0 0 0 0 0 0 0 0 0 0 1 1 0 1 1 0 | Changed ABNORMAL history2 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 1 0 0 1 0 |
| WEAR METALS Iron p Chromium p Nickel p Titanium p Silver p Aluminum p Lead p Copper p Tin p Antimony p Vanadium p Cadmium p Boron p Barium p Molybdenum p Magnesium p Calcium p Phosphorus p | ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m | >50 >10 >3 >3 >2 >10 >10 >50 | ATTENTION Current 0 0 <1 0 0 <1 <1 <1 10 0 0 | ABNORMAL history1 0 0 0 0 0 0 0 1 1 0 11 0 | ABNORMAL history2 0 0 0 0 0 0 0 0 <1 0 <1 |
| Iron p Chromium p Nickel p Titanium p Silver p Aluminum p Lead p Copper p Tin p Antimony p Cadmium p Cadmium p Barium p Molybdenum p Manganese p Magnesium p Calcium p Phosphorus p | ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | >50 >10 >3 >3 >2 >10 >10 >50 | Current 0 0 <1 0 0 0 <1 <1 <1 10 0 | history1 0 0 0 0 0 0 0 0 1 1 0 11 0 | history2 0 0 0 0 0 0 <1 0 <1 |
| Iron p Chromium p Nickel p Titanium p Silver p Aluminum p Lead p Copper p Tin p Antimony p Cadmium p Cadmium p Barium p Molybdenum p Manganese p Magnesium p Calcium p Phosphorus p | ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | >50 >10 >3 >3 >2 >10 >10 >50 | 0 0 <1 0 0 <1 <1 10 0 | 0 0 0 0 0 <1 0 11 0 | 0 0 0 0 <1 0 <1 |
| Chromium p Nickel p Titanium p Silver p Aluminum p Lead p Copper p Tin p Antimony p Vanadium p Cadmium p Boron p Barium p Molybdenum p Manganese p Magnesium p Calcium p Phosphorus p | ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | >10 >3 >3 >2 >10 >10 >50 | 0 <1 0 <1 <1 <1 10 0 | 0 0 0 <1 0 11 0 | 0 0 0 <1 0 <1 |
| Nickel p Titanium p Silver p Aluminum p Lead p Copper p Tin p Antimony p Vanadium p Cadmium p ADDITIVES Boron p Barium p Molybdenum p Manganese p Magnesium p Calcium p Phosphorus p | ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | >3 >3 >2 >10 >10 >50 | <1 0 <1 <1 10 0 | 0 0 <1 0 11 0 | 0 0 <1 0 <1 |
| Titanium p Silver p Aluminum p Lead p Copper p Tin p Antimony p Vanadium p Cadmium p ADDITIVES Boron p Barium p Molybdenum p Manganese p Magnesium p Calcium p Phosphorus p | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | >3 >2 >10 >10 >50 | 0 0 <1 <1 10 0 | 0 0 <1 0 11 0 | 0 0 <1 0 <1 |
| Silver p Aluminum p Lead p Copper p Tin p Antimony p Vanadium p Cadmium p ADDITIVES Boron p Barium p Molybdenum p Manganese p Magnesium p Calcium p Phosphorus p | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | >2 >10 >10 >50 | 0 <1 <1 10 0 | 0 <1 0 11 0 | 0 <1 0 <1 |
| Aluminum p Lead p Copper p Tin p Antimony p Vanadium p Cadmium p Cadmium p Barium p Molybdenum p Manganese p Magnesium p Calcium p Phosphorus p | ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | >10 >10 >50 | <1 <1 10 0 | <1 0 11 0 | <1 0 <1 |
| Lead production of the second | ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | >10 >50 | <1 10 0 | 0 11 0 | 0 <1 |
| Lead p Copper p Tin p Antimony p Vanadium p Cadmium p ADDITIVES Boron p Barium p Molybdenum p Manganese p Magnesium p Calcium p Phosphorus p | ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | >50 | 10 0 | 11 0 | <1 |
| Copper prime | ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | | 0 | 0 | |
| Tin p Antimony p Vanadium p Cadmium p ADDITIVES Boron p Barium p Molybdenum p Manganese p Magnesium p Calcium p Phosphorus p | ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | | 0 | 0 | |
| Antimony p Vanadium p Cadmium p ADDITIVES Boron p Barium p Molybdenum p Manganese p Magnesium p Calcium p Phosphorus p | ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m | | | | |
| Vanadium p Cadmium p ADDITIVES Boron p Barium p Molybdenum p Manganese p Magnesium p Calcium p Phosphorus p Zinc p | ppm ppm ppm | ASTM D5185m ASTM D5185m | | | | |
| Cadmium p ADDITIVES Boron p Barium p Molybdenum p Manganese p Magnesium p Calcium p Phosphorus p Zinc p | ppm ppm | ASTM D5185m | | 0 | 0 | 0 |
| Boron p Barium p Molybdenum p Manganese p Magnesium p Calcium p Phosphorus p Zinc p | | method | | 0 | 0 | 0 |
| Barium p Molybdenum p Manganese p Magnesium p Calcium p Phosphorus p Zinc p | | | limit/base | current | history1 | history2 |
| Molybdenum p Manganese p Magnesium p Calcium p Phosphorus p Zinc p | | ASTM D5185m | 0 | 0 | 0 | 0 |
| Manganese p Magnesium p Calcium p Phosphorus p Zinc p | ppm | ASTM D5185m | 90 | 0 | 49 | 0 |
| Manganese p Magnesium p Calcium p Phosphorus p Zinc p | ppm | ASTM D5185m | 0 | 0 | 0 | 0 |
| Calcium p Phosphorus p Zinc p | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Phosphorus p Zinc p | ppm | ASTM D5185m | 100 | 32 | 57 | 0 |
| Zinc p | ppm | ASTM D5185m | 0 | 0 | <1 | 0 |
| | ppm | ASTM D5185m | 0 | 0 | <1 | 4 |
| - ··· | ppm | ASTM D5185m | 0 | 15 | 12 | 5 |
| | ppm | ASTM D5185m | 23500 | 23519 | 19677 | 91 |
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
| Silicon ß | ppm | ASTM D5185m | >25 | <1 | 0 | 0 |
| | ppm | ASTM D5185m | | 7 | 24 | 3 |
| Potassium p | ppm | ASTM D5185m | >20 | 2 | 8 | 0 |
| | % | ASTM D6304 | >0.05 | 0.012 | 0.014 | 0.004 |
| ppm Water p | ppm | ASTM D6304 | >500 | 129 | 148.5 | 41.9 |
| FLUID CLEANLINE | ESS | method | limit/base | current | history1 | history2 |
| Particles >4µm | | ASTM D7647 | | 4443 | 6031 | 20566 |
| Particles >6µm | | ASTM D7647 | >1300 | <mark> </mark> 1324 | A 2331 | ▲ 5349 |
| Particles >14µm | | ASTM D7647 | >80 | <mark> </mark> 115 | <mark>▲</mark> 322 | 🔺 287 |
| Particles >21µm | | ASTM D7647 | >20 | <mark>e</mark> 25 | <u>∧</u> 77 | <mark>▲</mark> 52 |
| Particles >38µm | | ASTM D7647 | >4 | 0 | <mark>▲</mark> 5 | 1 |
| Particles >71µm | | ASTM D7647 | >3 | 0 | 0 | 0 |
| Oil Cleanliness | | ISO 4406 (c) | >/17/13 | — 19/18/14 | ▲ 20/18/16 | ▲ 22/20/15 |
| FLUID DEGRADAT | | method | limit/base | current | history1 | history2 |
| Acid Number (AN) | NON | ASTM D8045 | 1.0 | 0.36 | 0.39 | 0.36 |

Report Id: COLDENCOL [WUSCAR] 06238380 (Generated: 07/18/2024 12:35:03) Rev: 1

Contact/Location: Service Manager - COLDENCOL



Built for a lifetime

Ê 20

) salpitud jo 1 10k

10000 8000

6000 Water 4000 2000 0.

۱ 12000

1 1 20 (B/O.90 KOH/d) E0.72 Ê 0.48 Poid 0.2

0.00

10000

600

4000

200

60

55

() 5(

3 45 B

4(

35

S

nr20/020

muu

Water (

Water (KF)

Abnormal

Viscosity @ 40°C



| Particle T | Frond | | | | | | | |
|-----------------|----------|-------------------------|--|-----------|------------------|--------|--|--|
| 25k T | irenu | | | | VISUAL | | | |
| 4μ 20k - 6μ | ιm ιm | | | | White Metal | scalar | | |
| | µm | | | | Yellow Metal | scalar | | |
| 5k- | 14 M | | | | Precipitate | scalar | | |
| Ok - **** | | | | | Silt | scalar | | |
| 5k - | | and in Managements in a | | | Debris | scalar | | |
| Ok | | | and the balance of th | | Sand/Dirt | scalar | | |
| Apr30/20 | Jun4/21 | Aug10/22 | May26/23 | Jul3/24 | Appearance | scalar | | |
| Apr | ηr | Aug | May | JL | Odor | scalar | | |
| Water (K | (F) | | Emulsified Water | scalar | | | | |
| ⁰⁰ T | | | | | Free Water | scalar | | |
| 00 - G | | | | | FLUID PROPERTIES | | | |
| DO | | | 1 | | Visc @ 40°C | cSt | | |
| 00 | | | | | SAMPLE IMAGE | S | | |
| Abnormal | | | | | | | | |
| Apr30/20 | Jun4/21. | Aug10/22 - | May26/23 - | Jul3/24 - | Color | | | |
| Apr | Γ | Aug | May | <u>ت</u> | | | | |
| Acid Nun | nber | | | | | | | |
| Basermal | | | | | Bottom | | | |
| | | | | | | | | |



LIGHT

NONE

NONE

NONE

LIGHT

NONE

NORML

NORML

NEG

NEG

NONE

NONE

NONE

NONE

VLITE

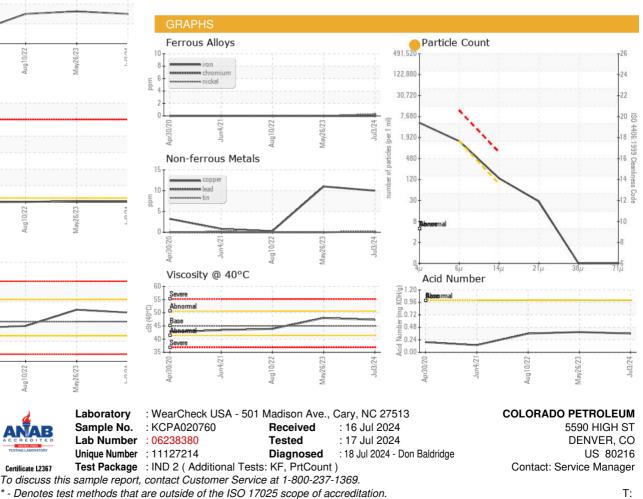
NONE

NORML

NORML

NEG

NEG



NONE

NONE

NONE

NONE

NONE

NONE

NORML

NORML

>0.05

*Visual

ASTM D445

NONE

NONE

NONE

NONE

LIGHT

NONE

NORML

NORML

NEG

NEG

Aug 10/22

10/02

Contact/Location: Service Manager - COLDENCOL Page 2 of 2