Sample Rating Trend



TUMBLER #1

[172522]

Area

PROBLEM SUMMARY



Hydraulic System

PETRO CANADA PURITY FG AW HYDRAULIC 32 (8 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. Resample in 30-45 days to monitor this situation. Please specify the component make and model with your next sample.

PROBLEMATIC TEST RESULTS

| Sample Status | | SEVERE | NORMAL | |
|-----------------|-----------------|--------------------|----------|--|
| Particles >4µm | ASTM D7647 >5 | 000 🔺 103204 | 333 | |
| Particles >6µm | ASTM D7647 >1 | 300 A 28234 | 105 | |
| Particles >14µm | ASTM D7647 >1 | 60 ▲ 3887 | 12 | |
| Particles >21µm | ASTM D7647 >4 | 0 🔺 1071 | 6 | |
| Particles >38µm | ASTM D7647 >1 | 0 🔺 49 | 1 | |
| Oil Cleanliness | ISO 4406 (c) >1 | 9/17/14 🔺 24/22/19 | 16/14/11 | |

Customer Id: GRA685CAM Sample No.: WC0898875 Lab Number: 02641415 Test Package: IND 2



To manage this report scan the QR code

To discuss the diagnosis or test data: Wes Davis +1 905-569-8600 x223 wesd@wearcheck.ca

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. | | |
| Information Required | | | ? | Please specify the component make and model with your next sample. | | |
| 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. | | |
| 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

22 Apr 2024 Diag: Kevin Marson



Resample at the next service interval to monitor. Please specify the component make and model with your next sample. All component wear rates are normal. The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The water content is negligible. The system and fluid cleanliness is acceptable. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.





OIL ANALYSIS REPORT

Sample Rating Trend



[172522] TUMBLER #1

Hydraulic System

Area

PETRO CANADA PURITY FG AW HYDRAULIC 32 (8 LTR)

DIAGNOSIS

A 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. Resample in 30-45 days to monitor this situation. Please specify the component make and model with your next sample.

Wear

All component wear rates are normal.

Contamination

There is a high amount of particulates (2 to 100 microns in size) present in the oil.

Fluid Condition

The AN level is acceptable for this fluid. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.

| Sample Number Client Info WC0898875 WC0929916 Sample Date Client Info 0 0 Machine Age hrs Client Info 0 0 Oil Age hrs Client Info NA N/A Oil Changed Client Info NA N/A CONTAMINATION method Imit/base current history1 history2 Contraming ppm ASTM 05165(m) >20 2 1 Wear WC Method >0.1 NEG Wear WC Method >0.1 NEG Nickel ppm ASTM 05165(m) >10 0 Aluminum ppm ASTM 05165(m) >10 0 Aluminum ppm ASTM 05165(m) >10 0 Aluminum ppm ASTM 05165(m) <t< th=""><th></th><th>IATION</th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></t<> | | IATION | method | limit/base | current | history1 | history2 |
|--|---|---|--|--|---|---|--|
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| Machine Age hrs Client Info 0 0 | Sample Date | | Client Info | | 10 Jun 2024 | 22 Apr 2024 | |
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| Potassium ppm ASTM D5185(m) >20 0 <1 | Boron Barium Molybdenum Manganese Magnesium Calcium Chosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) | limit/base >20 | <1 0 0 <1 0 373 7 541 <1 2 1 | <1 0 0 0 0 0 383 6 539 <1 history1 2 | history2 |
| FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 >5000 ▲ 103204 333 Particles >6µm ASTM D7647 >1300 ▲ 28234 105 Particles >14µm ASTM D7647 >160 ▲ 3887 12 Particles >21µm ASTM D7647 >40 ▲ 1071 6 Particles >38µm ASTM D7647 >10 ▲ 49 1 Particles >71µm ASTM D7647 >3 1 1 Oil Cleanliness ISO 4406 (c) >19/17/14 24/22/19 16/14/11 | Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185(m) ASTM D5185(m) | limit/base >20 | <1 0 0 <1 0 373 7 541 <1 <1 current 1 0 | <1 0 0 0 0 0 383 6 539 <1 history1 2 0 | history2 |
| Particles >4µm ASTM D7647 >5000 ▲ 103204 333 Particles >6µm ASTM D7647 >1300 ▲ 28234 105 Particles >14µm ASTM D7647 >160 ▲ 3887 12 Particles >21µm ASTM D7647 >40 ▲ 1071 6 Particles >38µm ASTM D7647 >10 ▲ 49 1 Particles >71µm ASTM D7647 >3 1 1 Oil Cleanliness ISO 4406 (c) >19/17/14 24/22/19 16/14/11 | Boron Barium Molybdenum Manganese Magnesium Calcium Chosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium | ppm () ppm () | ASTM D5185(m) ASTM D5185(m) | Imit/base >20 | <1 0 0 373 7 541 <1 current 1 0 0 | <1 0 0 0 0 383 6 539 <1 history1 2 0 <1 | history2 |
| Particles >6μm ASTM D7647 >1300 ▲ 28234 105 Particles >14μm ASTM D7647 >160 ▲ 3887 12 Particles >21μm ASTM D7647 >40 ▲ 1071 6 Particles >38μm ASTM D7647 >10 ▲ 49 1 Particles >71μm ASTM D7647 >3 1 1 Oil Cleanliness ISO 4406 (c) >19/17/14 ▲ 24/22/19 16/14/11 | Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLIN | ppm ppm ppm | ASTM D5185(m) ASTM D5185(m) | Imit/base >20 ≥20 Imit/base | <1 0 0 0 1 0 <1 0 373 7 541 <1 | <1 0 0 0 0 0 0 0 0 0 0 383 6 539 <1 history1 2 0 <1 history1 history1 history1 | history2 history2 |
| Particles >14μm ASTM D7647 >160 ▲ 3887 12 Particles >21μm ASTM D7647 >40 ▲ 1071 6 Particles >38μm ASTM D7647 >10 ▲ 49 1 Particles >71μm ASTM D7647 >3 1 1 Oil Cleanliness ISO 4406 (c) >19/17/14 ▲ 24/22/19 16/14/11 | Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLIN Particles >4µm | ppm ppm | ASTM D5185(m) ASTM D5185(m) | Imit/base >20 ≥20 Imit/base >20 S000 | <1 0 0 373 7 541 <1 € 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | <1 0 0 0 0 0 0 0 0 383 6 539 <1 history1 2 0 <1 history1 333 | history2 history2 |
| Particles >21μm ASTM D7647 >40 ▲ 1071 6 Particles >38μm ASTM D7647 >10 ▲ 49 1 Particles >71μm ASTM D7647 >3 1 1 Oil Cleanliness ISO 4406 (c) >19/17/14 ▲ 24/22/19 16/14/11 | Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLIN Particles >4µm Particles >6µm | ppm ppm | ASTM D5185(m) ASTM D5185(m) | Imit/base >20 ≥20 Imit/base >20 S000 >1300 | <1 0 0 0 <1 0 373 7 541 <1 current 1 0 0 0 current ▲ 103204 ▲ 103204 | <1 0 0 0 0 0 0 0 383 6 539 <1 history1 2 0 <1 history1 333 105 | history2 history2 |
| Particles >38μm ASTM D7647 >10 ▲ 49 1 Particles >71μm ASTM D7647 >3 1 1 Oil Cleanliness ISO 4406 (c) >19/17/14 ▲ 24/22/19 16/14/11 | Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLIN Particles >4µm Particles >6µm Particles >14µm | ppm ppm | ASTM D5185(m) ASTM D7647 | Imit/base >20 >20 Imit/base >5000 >1300 >160 | <1 0 0 0 <1 0 373 7 541 <1 current 1 0 0 0 current 1 1 0 0 0 current 1 0 0 0 0 0 0 0 0 0 0 0 0 0 | <1 0 0 0 0 383 6 539 <1 history1 2 0 <1 history1 333 105 12 | history2 history2 |
| Particles >71μm ASTM D7647 >3 1 1 Oil Cleanliness ISO 4406 (c) >19/17/14 ▲ 24/22/19 16/14/11 | Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLIN Particles >4µm Particles >14µm Particles >21µm | ppm ppm | ASTM D5185(m) ASTM D7647 ASTM D7647 ASTM D7647 | Iimit/base >20 >20 Iimit/base >20 >20 >1300 >1300 >160 >40 | <1 0 0 0 <1 0 373 7 541 <1 | <1 0 0 0 0 0 383 6 539 <1 history1 2 0 <1 history1 333 105 12 6 6 6 6 6 6 6 6 6 | history2 history2 |
| Oil Cleanliness ISO 4406 (c) >19/17/14 424/22/19 16/14/11 | Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLIN Particles >4µm Particles >14µm Particles >21µm Particles >38µm | ppm ppm ppm | ASTM D5185(m) ASTM D7647 ASTM D7647 ASTM D7647 ASTM D7647 ASTM D7647 | Iimit/base >20 >20 >20 >20 >20 >1300 >160 >40 >10 | <1 0 0 0 <1 0 373 7 541 <1 <1 0 0 0 0 0 0 0 0 0 0 0 0 0 | <1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | |
| 9:56:13) Rev: 1 Contact/Location: Ryan Shea - GRA685CAM | Boron Barium Molybdenum Maganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Potassium Particles >4µm Particles >14µm Particles >38µm Particles >38µm Particles >71µm | ppm ppm ppm | ASTM D5185(m) ASTM D7647 ASTM D7647 ASTM D7647 ASTM D7647 ASTM D7647 | Imit/base >20 >20 >20 >100 >1300 >160 >40 >10 >3 | <1 0 0 3 (373 7 541 541 3 (1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | <1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | history2 history2 |



OIL ANALYSIS REPORT

| Particle Trend | | | FLUID DEGRAD | ATION | method | limit/base | current | history1 | history2 |
|-------------------------------|--|---|---|-------------------------------------|--|--|--------------------|------------------------------------|---|
| 100k - 4μm Ξ | | | Acid Number (AN) | mg KOH/g | ASTM D974* | 0.26 | 0.17 | 0.16 | |
| 80k | _ | | VISUAL | | method | limit/base | current | history1 | history2 |
| ed 60k | | | White Metal | scalar | Visual* | NONE | NONE | NONE | |
| equint an | | THE REPORT OF A DRIVE TO A DRIVE | Yellow Metal | scalar | Visual* | NONE | NONE | NONE | |
| Abnormel | | | Precipitate | scalar | Visual* | NONE | NONE | NONE | |
| 0K | | - 1/24 | Silt | scalar | Visual* | NONE | NONE | NONE | |
| Apr22 | | Jun 10 | Debris | scalar | Visual* | NONE | NONE | NONE | |
| A = 11 = 1 | | | Sand/Dirt | scalar | Visual* | NONE | NONE | NONE | |
| Particle Trend | | | Appearance | scalar | Visual* | NORML | NORML | NORML | |
| =100k 6/m | | | Odor | scalar | Visual* | NORML | NORML | NORML | |
| 80k - | | | Emulsified Water | scalar | Visual* | >0.1 | NEG | .2% | |
| | | | Free Water | scalar | Visual* | | NEG | NEG | |
| 5 8 40k - | | | FLUID PROPER | TIES | method | limit/base | current | history1 | history2 |
| 20k Abnormal | and that a located trade of the designed | an da a an | Visc @ 40°C | cSt | ASTM D7279(m) | 29.77 | 32.0 | 31.9 | |
| 0k 4 10 | | 0/24 | SAMPLE IMAGE | S | method | limit/base | current | historv1 | historv2 |
| Apr2 | | Jun1 | | | | | | E E | |
| Acid Number | | | Color | | | | | | no image |
| 20.24 | | | | | | | | | |
| 0.12 | | | Bottom | | | | | | no image |
| 2 0.06 | | | GRAPHS | | | | | | |
| 5/24 | | ţ | Ferrous Allovs | | | | Particle Count | | |
| Apr2 | | h an l | ¹⁰ | | | 491,52 | ⁰ | | T ²⁶ |
| Viscosity @ 40 | 000 | | iron chromium | | | 122,88 | 0 | | -24 |
| 38 _T | U°C | | E. 5 - normanickel | | | 20.72 | Severe | | 22 |
| 36 - Abnormal | | | | | | | | | |
| 34- | | | 24 | ************ | ****** | 1,68 12 (jin 7,68 | 0 Abnormal | | -20 8 |
| 0 32 - | | | Apr22/ | | | (0 Lua 1.92 | 0- | | -18 -18 |
| to 30 - Base | ***** | ****** | Non-forrous Mota | lc. | | f saput 48 | 0 | | 999 0 |
| 28 Abnormal | | | ¹⁰ T | | | of pair | | · \ | leanli |
| 26 | | | copper | | | -12 -12 | 0 | | |
| 24 + 62/2 | | VCrt | E. 5 - tin | | | 2 3 | 0- | | -12 ਵ |
| Apr22 | | 11 | | | | | 8 - | | 10 |
| | | | 24 | | | 24 | 2 | | |
| | | | vpr22/ | | | un10/ | | | Y |
| | | | √iccosity @ 40°C | | | 7 | 0 4μ 6μ | 14µ 21µ | 38µ 71µ |
| | | | 40 T | | | | Acid Number | | |
| | | | Abnormal | | | KOH | Base | | |
| | | | 0.05 | | | | 0 | | |
| | | | S 30 Abnormal | | | ^g 0.1 | 0 | | |
| | | | 25 | | | | o L | | |
| | | | 22/24 | | | 10/24 | 22/24 | | 10/24 |
| | | | Apr | | | Jun | Apr | | Jun |
| | ISO 17025:2017 Accredited Laboratory | Laboratory Sample No. Lab Number Unique Number Test Package | : WearCheck - C8-117 : WC0898875 : 02641415 : 5798954 : IND 2 | 5 Appleby Rece Teste Diagr | y Line, Burlir ived : 12 ed : 13 nosed : 13 | ngton, ON L7 2 Jun 2024 3 Jun 2024 3 Jun 2024 - W | L 5H9 Ves Davis | GRAND F 190 VON CAI Conta | RIVER FOODS NDRAU DRIVE MBRIDGE, ON CA N3E 1B8 act: Ryan Shea |
| | To discuss th | is sample report, | contact Customer Serv | vice at 1-8 | 300-268-213 | 1. | | rshea@grand | riverfoods.com |
| | Test denoted | (*) outside scope | e of accreditation, (m) n | nethod ma | odified, (e) te | ested at exter | nal lab. | - Ŭ T: | (519)653-3577 |
| ur. Frankaista 467 | Validity of res | ults and interpret | tation are based on the | sample a | nd informatio | on as supplie | d. | | F: |

Report Id: GRA685CAM [WCAMIS] 02641415 (Generated: 06/13/2024 09:56:13) Rev: 1

Contact/Location: Ryan Shea - GRA685CAM