

Area

Water Injection

Machine Id

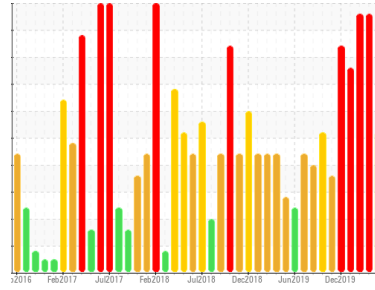
Pump - Glycol Circulation (B) (S/N Sample Tag PA-38002B)

Component

Pump

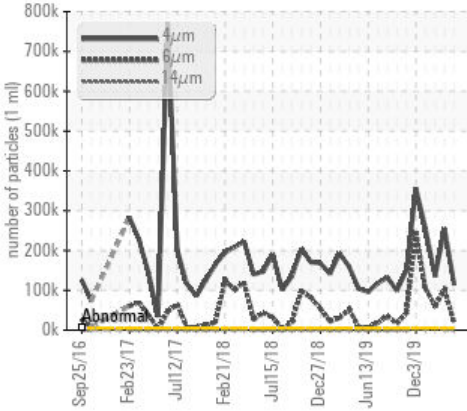
Fluid

PETRO CANADA DURON HP 15W40 (7 LTR)

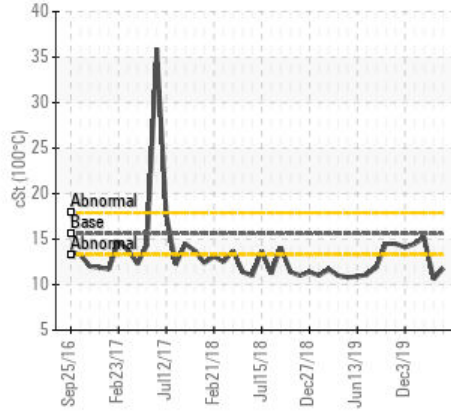


COMPONENT CONDITION SUMMARY

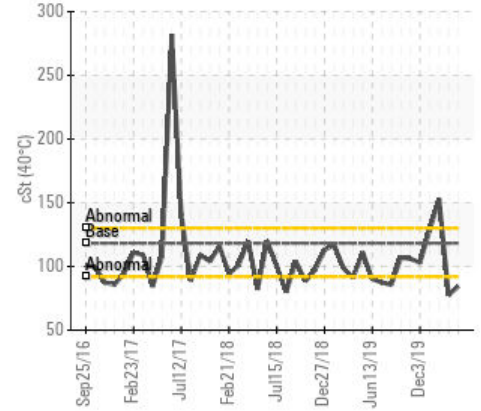
▲ Particle Trend



▲ Viscosity @ 100°C



▲ Viscosity @ 40°C



RECOMMENDATION

Check seals and/or filters for points of contaminant entry. 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. We recommend you service the filters on this component. Resample in 30-45 days to monitor this situation.

PROBLEMATIC TEST RESULTS

| Sample Status | | | SEVERE | SEVERE | SEVERE | |
|-----------------|--------------|---------------|------------|------------|------------|------|
| Particles >4µm | ASTM D7647 | >5000 | ▲ 114109 | ▲ 254999 | ▲ 135416 | |
| Particles >6µm | ASTM D7647 | >1300 | ▲ 20164 | ▲ 101822 | ▲ 61155 | |
| Particles >14µm | ASTM D7647 | >40 | ▲ 163 | ▲ 1136 | ▲ 5063 | |
| Oil Cleanliness | ISO 4406 (c) | >19/17/12 | ▲ 24/22/15 | ▲ 25/24/17 | ▲ 24/23/20 | |
| Visc @ 40°C | cSt | ASTM D7279(m) | 118.2 | ▲ 84.5 | ▲ 77.4 | 153 |
| Visc @ 100°C | cSt | ASTM D7279(m) | 15.6 | ▲ 11.8 | ▲ 10.6 | 15.2 |

Customer Id: TERHAM
Sample No.: PC
Lab Number: 02631666
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 Filter | --- | --- | ? | We recommend you service the filters on this component. |
| 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 Seals | --- | --- | ? | Check seals and/or filters for points of contaminant entry. |


HISTORICAL DIAGNOSIS

ISO




13 Mar 2024 Diag: Kevin Marson
 We advise that you check all areas where contaminants can enter the system. We recommend that you drain the oil from the component if this has not already been done. We recommend you service the filters on this component. Resample in 30-45 days to monitor this situation. Copper ppm levels are abnormal. There is a high amount of particulates (2 to 100 microns in size) present in the oil. The system cleanliness code is much higher than the acceptable limit for the target ISO 4406 cleanliness code. Viscosity of sample indicates oil is within SAE 10W30 range, advise investigate. The AN level is acceptable for this fluid. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

view report




ISO



27 Jan 2020 Diag: Bill Quesnel
 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 >38µm are severely high. Particles >6µm are severely high. Particles >4µm are severely high. Particles >71µm are abnormally high. The system cleanliness code is much higher than the acceptable limit for the target ISO 4406 cleanliness code. Viscosity of sample indicates oil is within SAE 40 range, advise investigate. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

view report



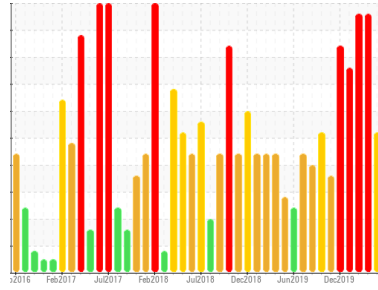
ISO



01 Jan 2020 Diag: Kevin Marson
 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. Particles >38µm are abnormally high. The system cleanliness code is much higher than the acceptable limit for the target ISO 4406 cleanliness code. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

view report





Area
Water Injection
Machine Id
Pump - Glycol Circulation (B) (S/N Sample Tag PA-38002B)
Component
Pump
Fluid
PETRO CANADA DURON HP 15W40 (7 LTR)

DIAGNOSIS

▲ Recommendation
Check seals and/or filters for points of contaminant entry. 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. We recommend you service the filters on this component. Resample in 30-45 days to monitor this situation.

Wear
All component wear rates are normal.

▲ Contamination
There is a high amount of silt (particulates < 14 microns in size) present in the oil. The system cleanliness code is much higher than the acceptable limit for the target ISO 4406 cleanliness code.

▲ Fluid Condition
Viscosity of sample indicates oil is within SAE 10W30 range, advise investigate. 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 INFORMATION | | method | limit/base | current | history1 | history2 |
|--------------------|-----------------|--------|------------|--------------------|-------------|-------------|
| Sample Number | Client Info | | | PC | PC | PC |
| Sample Date | Client Info | | | 07 Apr 2024 | 13 Mar 2024 | 27 Jan 2020 |
| Machine Age | kms Client Info | | | 0 | 0 | 0 |
| Oil Age | kms Client Info | | | 0 | 0 | 0 |
| Oil Changed | Client Info | | | N/A | N/A | N/A |
| Sample Status | | | | SEVERE | SEVERE | SEVERE |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---------------|-----------|--------|------------|------------|----------|----------|
| Water | WC Method | | >.1 | NEG | NEG | NEG |

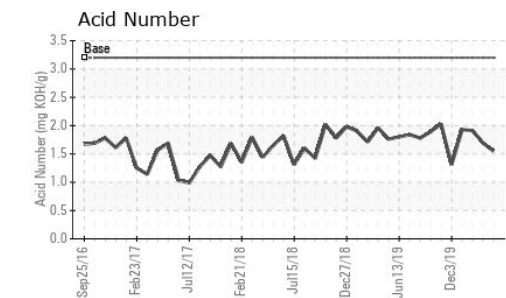
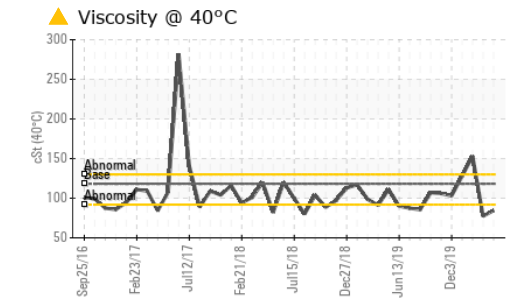
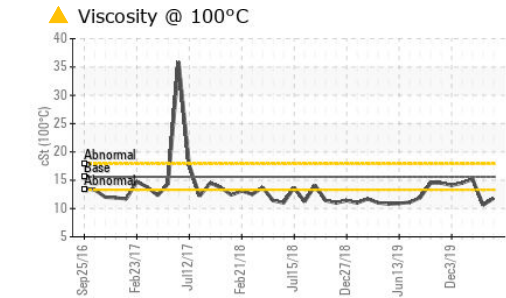
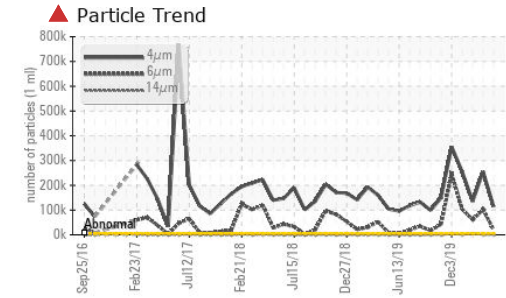
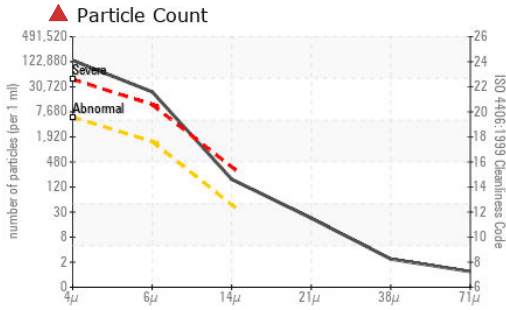
| WEAR METALS | | method | limit/base | current | history1 | history2 |
|-------------|-----|---------------|------------|--------------|-------------|----------|
| Iron | ppm | ASTM D5185(m) | >75 | 6 | 20 | 2 |
| Chromium | ppm | ASTM D5185(m) | >5 | 0 | 0 | <1 |
| Nickel | ppm | ASTM D5185(m) | | 0 | 0 | 0 |
| Titanium | ppm | ASTM D5185(m) | | 0 | <1 | <1 |
| Silver | ppm | ASTM D5185(m) | | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185(m) | >5 | <1 | 2 | <1 |
| Lead | ppm | ASTM D5185(m) | >10 | 0 | 1 | 0 |
| Copper | ppm | ASTM D5185(m) | >15 | 4 | ▲ 30 | <1 |
| Tin | ppm | ASTM D5185(m) | | 0 | <1 | 0 |
| Antimony | ppm | ASTM D5185(m) | | 0 | 0 | <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) | 0 | 1 | 2 | 1 |
| Barium | ppm | ASTM D5185(m) | 0 | 0 | 0 | <1 |
| Molybdenum | ppm | ASTM D5185(m) | 60 | 62 | 65 | 60 |
| Manganese | ppm | ASTM D5185(m) | 0 | 0 | 0 | <1 |
| Magnesium | ppm | ASTM D5185(m) | 1010 | 973 | 1002 | 983 |
| Calcium | ppm | ASTM D5185(m) | 1070 | 1043 | 1184 | 991 |
| Phosphorus | ppm | ASTM D5185(m) | 1150 | 1034 | 1069 | 1012 |
| Zinc | ppm | ASTM D5185(m) | 1270 | 1175 | 1214 | 1177 |
| Sulfur | ppm | ASTM D5185(m) | 2060 | 2657 | 2955 | 2704 |
| Lithium | ppm | ASTM D5185(m) | | <1 | <1 | <1 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|--------------|-----|---------------|------------|--------------|----------|----------|
| Silicon | ppm | ASTM D5185(m) | >20 | 3 | 4 | 5 |
| Sodium | ppm | ASTM D5185(m) | | 2 | 6 | <1 |
| Potassium | ppm | ASTM D5185(m) | >20 | <1 | 1 | <1 |

| FLUID CLEANLINESS | | method | limit/base | current | history1 | history2 |
|-------------------|--------------|-----------|-------------------|------------|------------|----------|
| Particles >4µm | ASTM D7647 | >5000 | ▲ 114109 | ▲ 254999 | ▲ 135416 | |
| Particles >6µm | ASTM D7647 | >1300 | ▲ 20164 | ▲ 101822 | ▲ 61155 | |
| Particles >14µm | ASTM D7647 | >40 | ▲ 163 | ▲ 1136 | ▲ 5063 | |
| Particles >21µm | ASTM D7647 | >10 | ● 19 | ▲ 229 | ▲ 1494 | |
| Particles >38µm | ASTM D7647 | >3 | 2 | ▲ 12 | ▲ 70 | |
| Particles >71µm | ASTM D7647 | >3 | 1 | 1 | ▲ 12 | |
| Oil Cleanliness | ISO 4406 (c) | >19/17/12 | ▲ 24/22/15 | ▲ 25/24/17 | ▲ 24/23/20 | |

OIL ANALYSIS REPORT

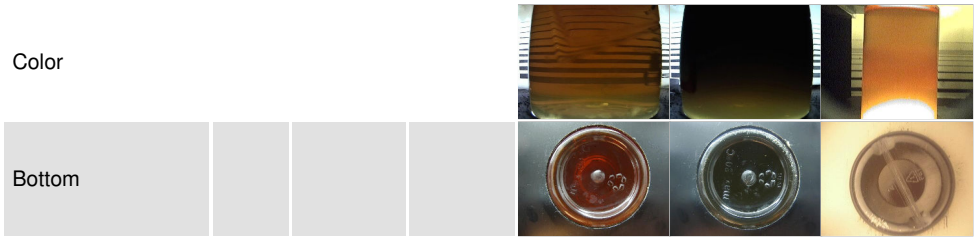


| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|-------------------|----------|------------|------------|-------------|----------|----------|
| Acid Number (AN) | mg KOH/g | ASTM D974* | 3.2 | 1.55 | 1.69 | 1.91 |

| VISUAL | | method | limit/base | current | history1 | history2 |
|------------------|--------|---------|------------|--------------|----------|----------|
| White Metal | scalar | Visual* | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | Visual* | NONE | NONE | NONE | NONE |
| Precipitate | scalar | Visual* | NONE | NONE | NONE | NONE |
| Silt | scalar | Visual* | NONE | NONE | NONE | NONE |
| Debris | scalar | Visual* | NONE | NONE | VLITE | NONE |
| Sand/Dirt | scalar | Visual* | NONE | NONE | VLITE | NONE |
| Appearance | scalar | Visual* | NORML | NORML | NORML | HAZY |
| Odor | scalar | Visual* | NORML | NORML | NORML | NORML |
| Emulsified Water | scalar | Visual* | >.1 | NEG | NEG | NEG |
| Free Water | scalar | Visual* | | NEG | NEG | NEG |

| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|----------------------|-------|---------------|------------|---------------|----------|----------|
| Visc @ 40°C | cSt | ASTM D7279(m) | 118.2 | ▲ 84.5 | ▲ 77.4 | 153 |
| Visc @ 100°C | cSt | ASTM D7279(m) | 15.6 | ▲ 11.8 | ▲ 10.6 | 15.2 |
| Viscosity Index (VI) | Scale | ASTM D2270* | 139 | 132 | 122 | ▲ 99 |

SAMPLE IMAGES



Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : PC
Lab Number : 02631666
Unique Number : 5772819
Test Package : MAR 2 (Additional Tests: KV100, PrtCount, TAN MAN, VI)

Suncor - Terra Nova Projects
 Scotia Centre, 235 Water Strret
 St. John`s, NL
 CA A1C 1B6
 Contact: Josh Hynes
 joshynes@suncor.com
 T: (709)778-3575
 F: (709)724-2835

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.