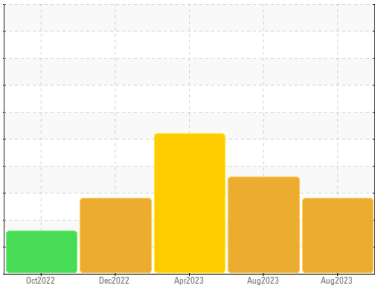
# PROBLEM SUMMARY

Sample Rating Trend

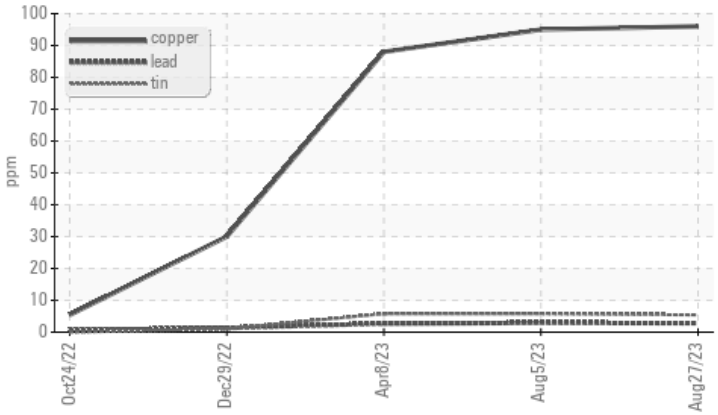



**WEAR**

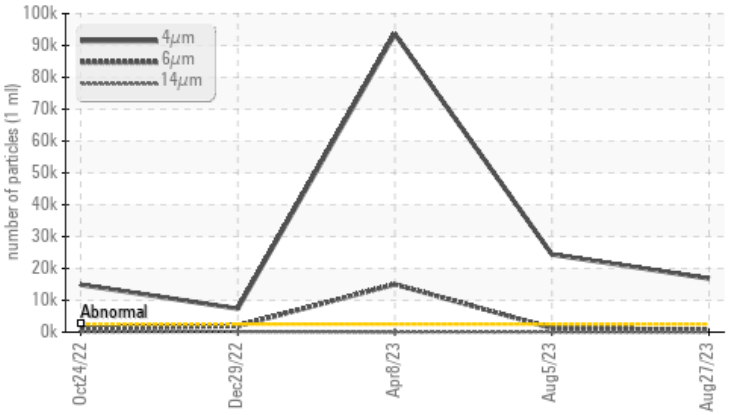
Area
## Steering Gears
Machine Id
## Steering Gear Port
Component
**Rear Left Steering**
Fluid
**PETRO CANADA HYDREX XV ALL SEASON HYDRAULIC OIL (--- GAL)**

## COMPONENT CONDITION SUMMARY

### Non-ferrous Metals




### Particle Trend




## RECOMMENDATION

We recommend you service the filters on this component. We recommend an early resample to monitor this condition.

## PROBLEMATIC TEST RESULTS

| Sample Status | | | | **ABNORMAL** | SEVERE | SEVERE |
|---|---|---|---|---|---|---|
| Copper | ppm | ASTM D5185(m) | >50 | ▲ **96** | ▲ 95 | ▲ 88 |
| Tin | ppm | ASTM D5185(m) | >5 | ▲ **5** | ▲ 6 | ▲ 6 |
| Particles >4µm | | ASTM D7647 | >2500 | ▲ **16833** | ⬢ 24383 | ⬢ 93616 |
| Particles >6µm | | ASTM D7647 | >640 | ▲ **682** | ▲ 1255 | ⬢ 15010 |
| Oil Cleanliness | | ISO 4406 (c) | >18/16/13 | ▲ **21/17/11** | ⬢ 22/17/12 | ⬢ 24/21/12 |


**Customer Id:** VMASSEY
**Sample No.:** WC0810845
**Lab Number:** 02579214
**Test Package:** MAR 2

*To manage this report scan the QR code*

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## RECOMMENDED ACTIONS

| Action | Status | Date | Done By | Description |
|---|---|---|---|---|
| Change Filter | --- | --- | ? | We recommend you service the filters on this component. |
| Resample | --- | --- | ? | We recommend an early resample to monitor this condition. |

## HISTORICAL DIAGNOSIS

**05 Aug 2023 Diag: Kevin Marson**

WEAR

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. The filter change at the time of sampling has been noted. Resample in 30-45 days to monitor this situation.Copper and tin ppm levels are abnormal. There is a high amount of silt (particulates < 14 microns in size) present in the 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.

view report

**08 Apr 2023 Diag: Kevin Marson**

ISO

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. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.Copper and tin ppm levels are abnormal. There is a high amount of silt (particulates < 14 microns in size) present in the 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.

view report

**29 Dec 2022 Diag: Kevin Marson**

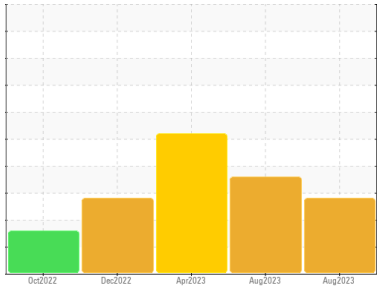
WEAR

The filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.Copper ppm levels are noted. All other component wear rates are normal. Oil Cleanliness are abnormally high. Particles >14µm are abnormally high. Particles >4µm are abnormally high. Particles >6µm are abnormally high. Particles >21µm are notably high. 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

# OIL ANALYSIS REPORT

Sample Rating Trend




**WEAR**

Area
## Steering Gears
Machine Id
## Steering Gear Port
Component
### Rear Left Steering
Fluid
**PETRO CANADA HYDREX XV ALL SEASON HYDRAULIC OIL (--- GAL)**

## DIAGNOSIS

**Recommendation**
We recommend you service the filters on this component. We recommend an early resample to monitor this condition.

**Wear**
Copper and tin ppm levels are abnormal.

**Contamination**
There is a moderate amount of silt (particulates < 14 microns in size) present in the fluid.

**Fluid Condition**
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 | | **WC0810845** | WC0810850 | WC0763478 |
| Sample Date | | Client Info | | **27 Aug 2023** | 05 Aug 2023 | 08 Apr 2023 |
| Machine Age | hrs | Client Info | | **59188** | 0 | 0 |
| Oil Age | hrs | Client Info | | **0** | 0 | 0 |
| Oil Changed | | Client Info | | **Not Changd** | Oil Added | N/A |
| Sample Status | | | | **ABNORMAL** | SEVERE | SEVERE |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185(m) | >50 | **2** | 2 | 3 |
| Chromium | ppm | ASTM D5185(m) | >15 | **0** | 0 | 0 |
| Nickel | ppm | ASTM D5185(m) | >5 | **0** | 0 | <1 |
| Titanium | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Silver | ppm | ASTM D5185(m) | | **0** | <1 | 0 |
| Aluminum | ppm | ASTM D5185(m) | >5 | **<1** | <1 | <1 |
| Lead | ppm | ASTM D5185(m) | >10 | **3** | 3 | 3 |
| Copper | ppm | ASTM D5185(m) | >50 | ▲ **96** | ▲ 95 | ▲ 88 |
| Tin | ppm | ASTM D5185(m) | >5 | ▲ **5** | ▲ 6 | ▲ 6 |
| Antimony | ppm | ASTM D5185(m) | | **0** | 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 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185(m) | 0 | **0** | <1 | <1 |
| Barium | ppm | ASTM D5185(m) | 0 | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185(m) | 0 | **0** | 0 | 0 |
| Manganese | ppm | ASTM D5185(m) | 1 | **0** | 0 | 0 |
| Magnesium | ppm | ASTM D5185(m) | 0 | **1** | <1 | <1 |
| Calcium | ppm | ASTM D5185(m) | 100 | **97** | 96 | 100 |
| Phosphorus | ppm | ASTM D5185(m) | 670 | **699** | 704 | 719 |
| Zinc | ppm | ASTM D5185(m) | 850 | **846** | 850 | 843 |
| Sulfur | ppm | ASTM D5185(m) | 1600 | **1606** | 1631 | 1695 |
| Lithium | ppm | ASTM D5185(m) | | **<1** | <1 | <1 |

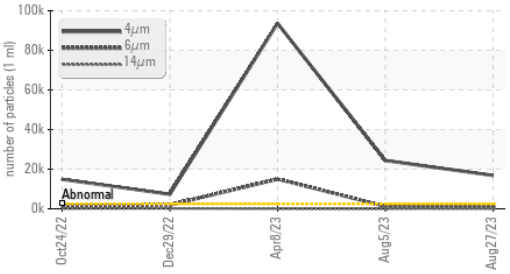
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185(m) | >15 | **2** | <1 | <1 |
| Sodium | ppm | ASTM D5185(m) | | **<1** | <1 | <1 |
| Potassium | ppm | ASTM D5185(m) | >20 | **<1** | <1 | 0 |

| FLUID CLEANLINESS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Particles >4µm | | ASTM D7647 | >2500 | ▲ **16833** | ⬢ 24383 | ⬢ 93616 |
| Particles >6µm | | ASTM D7647 | >640 | ▲ **682** | ▲ 1255 | ⬢ 15010 |
| Particles >14µm | | ASTM D7647 | >80 | **16** | 23 | 21 |
| Particles >21µm | | ASTM D7647 | >20 | **4** | 4 | 4 |
| Particles >38µm | | ASTM D7647 | >4 | **0** | 0 | 0 |
| Particles >71µm | | ASTM D7647 | >3 | **0** | 0 | 0 |
| Oil Cleanliness | | ISO 4406 (c) | >18/16/13 | ▲ **21/17/11** | ⬢ 22/17/12 | ⬢ 24/21/12 |

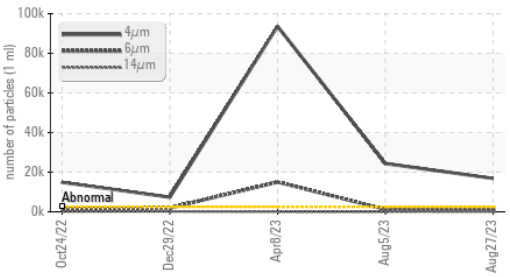
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Acid Number (AN) | mg KOH/g | ASTM D974* | 0.60 | **0.69** | 0.71 | 0.74 |

# OIL ANALYSIS REPORT

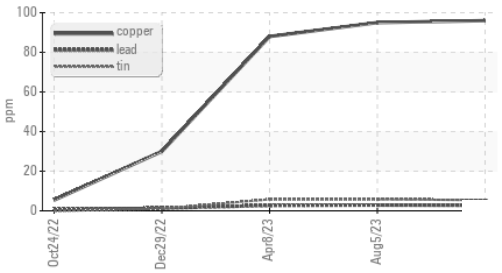
Particle Trend



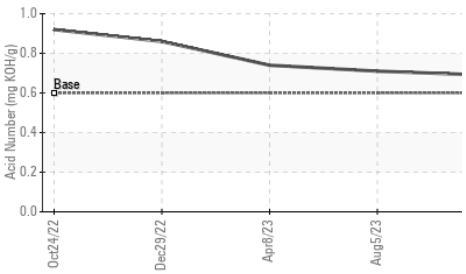

Particle Trend



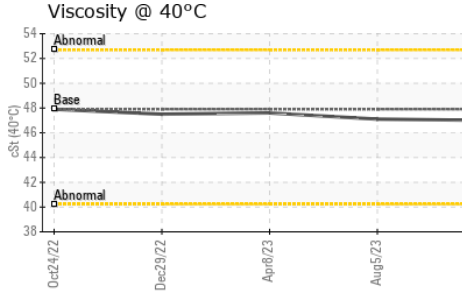

Non-ferrous Metals




Acid Number



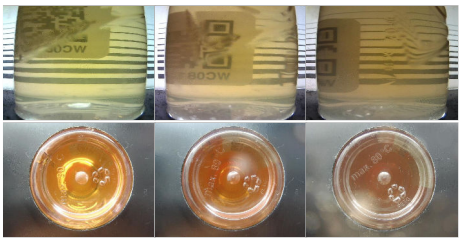

Viscosity @ 40°C




| 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** | NONE | NONE |
| Sand/Dirt | scalar | Visual* | NONE | **NONE** | NONE | NONE |
| Appearance | scalar | Visual* | NORML | **NORML** | NORML | NORML |
| Odor | scalar | Visual* | NORML | **NORML** | NORML | NORML |
| Emulsified Water | scalar | Visual* | >0.2 | **NEG** | NEG | NEG |
| Free Water | scalar | Visual* | | **NEG** | NEG | NEG |

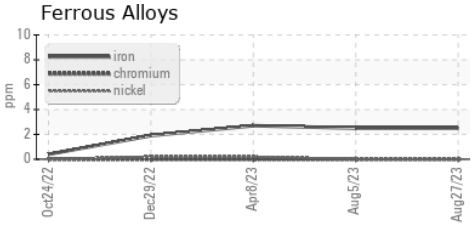
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 40°C | cSt | ASTM D7279(m) | 47.9 | **47.0** | 47.1 | 47.6 |

| SAMPLE IMAGES | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|
| Color | | | | | |
| Bottom | | | | | |

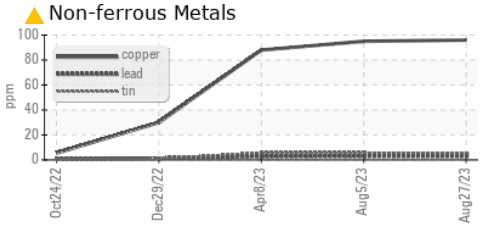


## GRAPHS

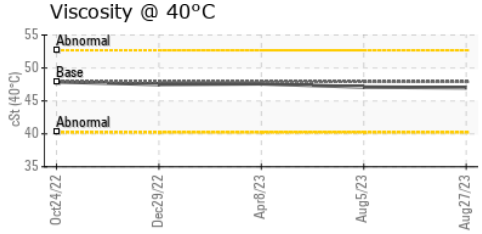
Ferrous Alloys



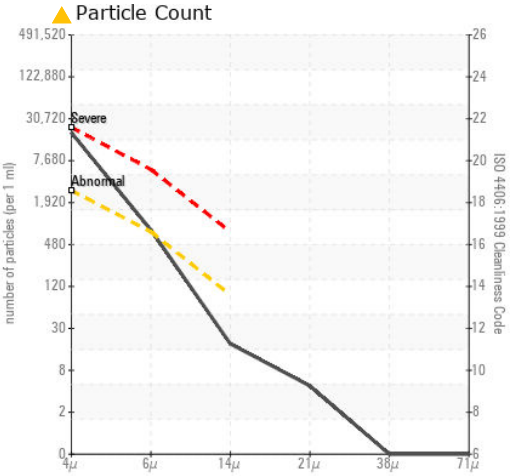

Non-ferrous Metals



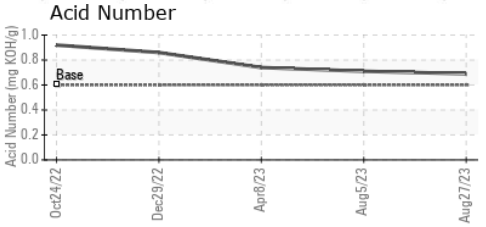

Viscosity @ 40°C




Particle Count




Acid Number




ISO 17025:2017 Accredited Laboratory

**Laboratory** : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
**Sample No.** : WC0810845 **Received** : 29 Aug 2023
**Lab Number** : 02579214 **Diagnosed** : 30 Aug 2023
**Unique Number** : 5632274 **Diagnostician** : Kevin Marson
**Test Package** : MAR 2 ( Additional Tests: PrtCount )

*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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