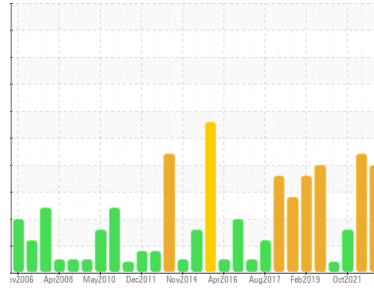


# PROBLEM SUMMARY



Area  
**1311**  
Machine Id  
**ROCK BREAKER HYDRAULIC POWER UNIT**  
Component  
**Hydraulic Power Pack**  
Fluid  
**PETRO CANADA HYDREX XV ALL SEASON HYDRAULIC OIL (200 LTR)**

Sample Rating Trend

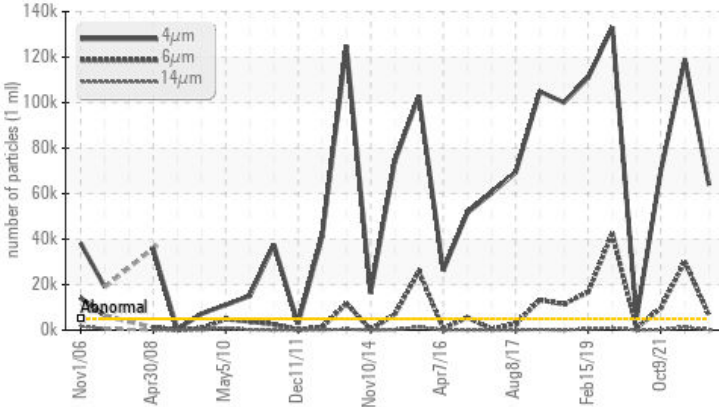


**VISUAL METAL**



## COMPONENT CONDITION SUMMARY

Particle Trend



## RECOMMENDATION

Check seals and/or filters for points of contaminant entry. We advise that you check all areas where contaminants can enter the system. 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 advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid. Resample in 30-45 days to monitor this situation. We suspect that the abnormal contaminant(s) is the result of incorrect sampling technique. **DISCLAIMER:** Interpretation of results is based on the sample as received from the customer. The condition of the sample and the method of sampling cannot be verified.

## PROBLEMATIC TEST RESULTS

| Sample Status   |        |              |           | SEVERE          | SEVERE          | SEVERE          |
|-----------------|--------|--------------|-----------|-----------------|-----------------|-----------------|
| Particles >4µm  |        | ASTM D7647   | >5000     | SEVERE 63837    | SEVERE 119043   | SEVERE 69627    |
| Particles >6µm  |        | ASTM D7647   | >1300     | SEVERE 6548     | SEVERE 30130    | SEVERE 9567     |
| Particles >14µm |        | ASTM D7647   | >160      | SEVERE 218      | SEVERE 1290     | SEVERE 181      |
| Oil Cleanliness |        | ISO 4406 (c) | >19/17/14 | SEVERE 23/20/15 | SEVERE 24/22/17 | SEVERE 23/20/15 |
| White Metal     | scalar | Visual*      | NONE      | SEVERE VLITE    | NONE            | NONE            |
| Debris          | scalar | Visual*      | NONE      | SEVERE LIGHT    | NONE            | VLITE           |
| PrtFilter       |        |              |           |                 | no image        | no image        |

Customer Id: CUSANY  
Sample No.: WC1234567  
Lab Number: 01234567  
Test Package: IND 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](mailto:Kevin.Marson@wearcheck.com)

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Gloria Gonzalez +1 (289)291-4643 x4643  
[gloria.gonzalez@wearcheck.com](mailto:gloria.gonzalez@wearcheck.com)

## RECOMMENDED ACTIONS

| Action            | Status | Date        | Done By | Description  |
|-------------------|--------|-------------|---------|--|
| Change Filter     | MISSED | Jun 06 2023 | ?       | We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid.   |
| Resample          | MISSED | Jun 06 2023 | ?       | Resample in 30-45 days to monitor this situation.  |
| Alert             | MISSED | Jun 06 2023 | ?       | We suspect that the abnormal contaminant(s) is the result of incorrect sampling technique. DISCLAIMER: Interpretation of results is based on the sample as received from the customer. The condition of the sample and the method of sampling cannot be verified. 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 Breathers   | MISSED | Jun 06 2023 | ?       | 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 | MISSED | Jun 06 2023 | ?       | We advise that you check all areas where contaminants can enter the system.  |
| Check Seals       | MISSED | Jun 06 2023 | ?       | Check seals and/or filters for points of contaminant entry.  |
| Filter Fluid      | MISSED | Jun 06 2023 | ?       | We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid.   |

## HISTORICAL DIAGNOSIS

|   |  |  |
|---|--|--|
| <p>ISO</p>    | <p><b>12 Jul 2022 Diag: Wes Davis</b></p> <p>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 &gt;6µm are severely high. Particles &gt;4µm are severely high. Oil Cleanliness are severely high. Particles &gt;14µm are abnormally high. Particles &gt;21µm are abnormally high. The AN level is acceptable for this fluid. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.</p> | <p>view report</p>    |
| <p>ISO</p>  | <p><b>09 Oct 2021 Diag: Wes Davis</b></p> <p>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. All component wear rates are normal. Particles &gt;4µm are severely high. Particles &gt;6µm are abnormally high. Particles &gt;14µm are notably high. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.</p>   | <p>view report</p>  |
| <p>ISO</p>  | <p><b>03 Feb 2021 Diag: Wes Davis</b></p> <p>We recommend you service the filters on this component. Resample at the next service interval to monitor. All component wear rates are normal. There is a light amount of silt (particulates &lt; 14 microns in size) present in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.</p>  | <p>view report</p>  |

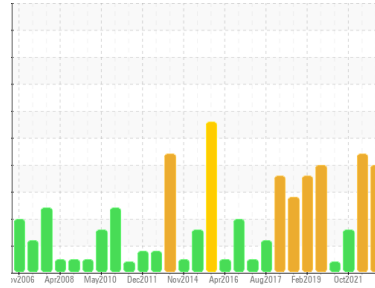
# OIL ANALYSIS REPORT

Sample Rating Trend

**VISUAL METAL**



Area  
**1311**  
Machine Id  
**ROCK BREAKER HYDRAULIC POWER UNIT**  
Component  
**Hydraulic Power Pack**  
Fluid  
**PETRO CANADA HYDREX XV ALL SEASON HYDRAULIC OIL (200 LTR)**



## DIAGNOSIS

### Recommendation

Check seals and/or filters for points of contaminant entry. We advise that you check all areas where contaminants can enter the system. 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 advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid. Resample in 30-45 days to monitor this situation. We suspect that the abnormal contaminant(s) is the result of incorrect sampling technique. **DISCLAIMER:** Interpretation of results is based on the sample as received from the customer. The condition of the sample and the method of sampling cannot be verified.

### Wear

Light concentration of visible metal present.

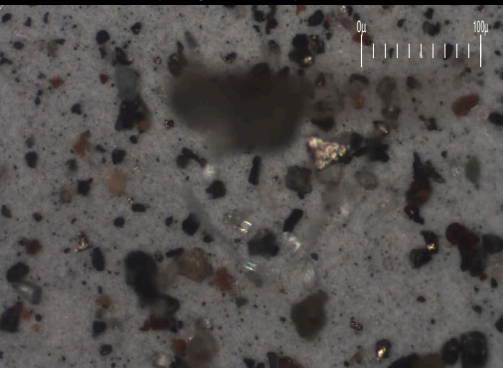
### Contamination

Oil Cleanliness are severely high. Particles >4µm are severely high. Particles >6µm are abnormally high. Particles >6µm are abnormally high.. Particles >14µm are notably high. Light concentration of visible dirt/debris present in the oil.

### Fluid Condition

The AN level is acceptable for this fluid.

Particle Filter (Magn: 200 x)



## SAMPLE INFORMATION

|               | method      | limit/base  | current            | history1    | history2    |
|---------------|-------------|-------------|--------------------|-------------|-------------|
| Sample Number | Client Info |             | <b>PC0040345</b>   | PC0040227   | PC0006177   |
| Sample Date   | Client Info |             | <b>08 Feb 2023</b> | 12 Jul 2022 | 09 Oct 2021 |
| Machine Age   | yrs         | Client Info | <b>0</b>           | 0           | 0           |
| Oil Age       | yrs         | Client Info | <b>0</b>           | 0           | 0           |
| Oil Changed   | Client Info |             | <b>N/A</b>         | N/A         | N/A         |
| Sample Status |             |             | <b>SEVERE</b>      | SEVERE      | SEVERE      |

## WEAR METALS

|           | method | limit/base    | current | history1     | history2 |    |
|-----------|--------|---------------|---------|--------------|----------|----|
| Iron      | ppm    | ASTM D5185(m) | >20     | <b>7</b>     | 5        | 2  |
| Chromium  | ppm    | ASTM D5185(m) | >20     | <b>&lt;1</b> | 0        | 0  |
| Nickel    | ppm    | ASTM D5185(m) | >20     | <b>&lt;1</b> | <1       | <1 |
| Titanium  | ppm    | ASTM D5185(m) |         | <b>&lt;1</b> | <1       | 0  |
| Silver    | ppm    | ASTM D5185(m) |         | <b>0</b>     | 0        | <1 |
| Aluminum  | ppm    | ASTM D5185(m) | >20     | <b>1</b>     | <1       | <1 |
| Lead      | ppm    | ASTM D5185(m) | >20     | <b>&lt;1</b> | <1       | 0  |
| Copper    | ppm    | ASTM D5185(m) | >20     | <b>3</b>     | 4        | 2  |
| Tin       | ppm    | ASTM D5185(m) | >20     | <b>0</b>     | 0        | 0  |
| Antimony  | ppm    | ASTM D5185(m) |         | <b>0</b>     | 0        | 0  |
| Vanadium  | ppm    | ASTM D5185(m) |         | <b>0</b>     | 0        | 0  |
| Beryllium | ppm    | ASTM D5185(m) |         | <b>0</b>     | 0        | 0  |
| Cadmium   | ppm    | ASTM D5185(m) |         | <b>0</b>     | 0        | 0  |

## ADDITIVES

|            | method | limit/base    | current | history1     | history2 |      |
|------------|--------|---------------|---------|--------------|----------|------|
| Boron      | ppm    | ASTM D5185(m) | 0       | <b>&lt;1</b> | <1       | <1   |
| Barium     | ppm    | ASTM D5185(m) | 0       | <b>0</b>     | 0        | 0    |
| Molybdenum | ppm    | ASTM D5185(m) | 0       | <b>0</b>     | 0        | 0    |
| Manganese  | ppm    | ASTM D5185(m) | 1       | <b>0</b>     | 0        | 0    |
| Magnesium  | ppm    | ASTM D5185(m) | 0       | <b>&lt;1</b> | 1        | <1   |
| Calcium    | ppm    | ASTM D5185(m) | 100     | <b>102</b>   | 103      | 105  |
| Phosphorus | ppm    | ASTM D5185(m) | 670     | <b>649</b>   | 604      | 654  |
| Zinc       | ppm    | ASTM D5185(m) | 850     | <b>747</b>   | 796      | 807  |
| Sulfur     | ppm    | ASTM D5185(m) | 1600    | <b>1511</b>  | 1528     | 1458 |
| Lithium    | ppm    | ASTM D5185(m) |         | <b>&lt;1</b> | <1       | <1   |

## CONTAMINANTS

|           | method | limit/base    | current | history1     | history2 |    |
|-----------|--------|---------------|---------|--------------|----------|----|
| Silicon   | ppm    | ASTM D5185(m) | >15     | <b>2</b>     | 2        | <1 |
| Sodium    | ppm    | ASTM D5185(m) |         | <b>&lt;1</b> | <1       | <1 |
| Potassium | ppm    | ASTM D5185(m) | >20     | <b>&lt;1</b> | <1       | <1 |

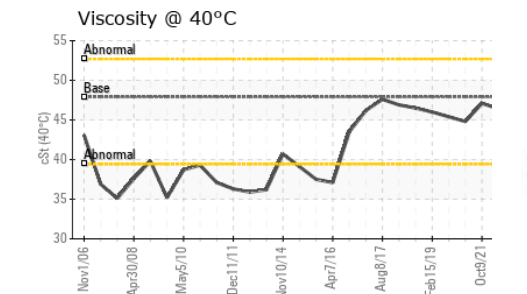
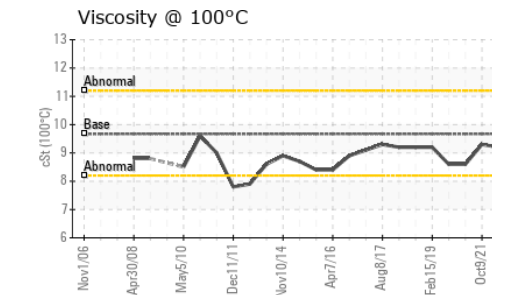
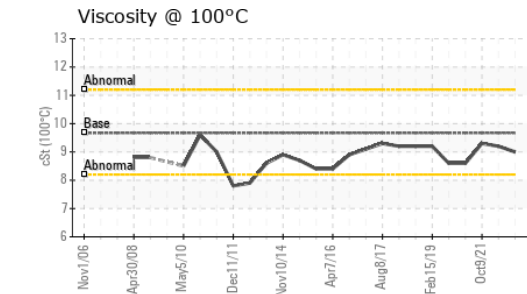
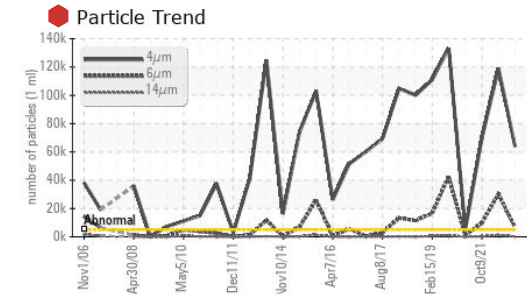
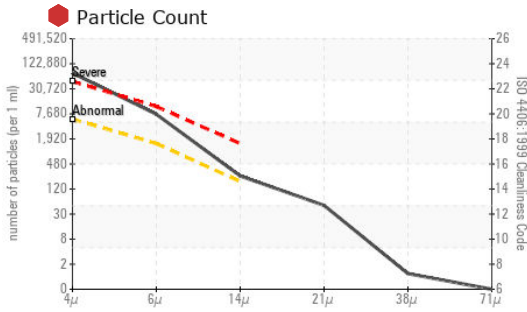
## FLUID CLEANLINESS

|                 | method       | limit/base | current         | history1 | history2 |
|-----------------|--------------|------------|-----------------|----------|----------|
| Particles >4µm  | ASTM D7647   | >5000      | <b>63837</b>    | 119043   | 69627    |
| Particles >6µm  | ASTM D7647   | >1300      | <b>6548</b>     | 30130    | 9567     |
| Particles >14µm | ASTM D7647   | >160       | <b>218</b>      | 1290     | 181      |
| Particles >21µm | ASTM D7647   | >40        | <b>43</b>       | 171      | 20       |
| Particles >38µm | ASTM D7647   | >10        | <b>1</b>        | 3        | 0        |
| Particles >71µm | ASTM D7647   | >3         | <b>0</b>        | 1        | 0        |
| Oil Cleanliness | ISO 4406 (c) | >19/17/14  | <b>23/20/15</b> | 24/22/17 | 23/20/15 |

## FLUID DEGRADATION

|                  | method   | limit/base | current | history1    | history2 |      |
|------------------|----------|------------|---------|-------------|----------|------|
| Acid Number (AN) | mg KOH/g | ASTM D974* | 0.60    | <b>0.61</b> | 0.86     | 0.75 |

# OIL ANALYSIS REPORT

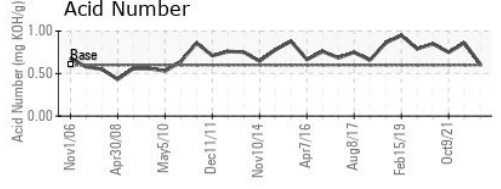
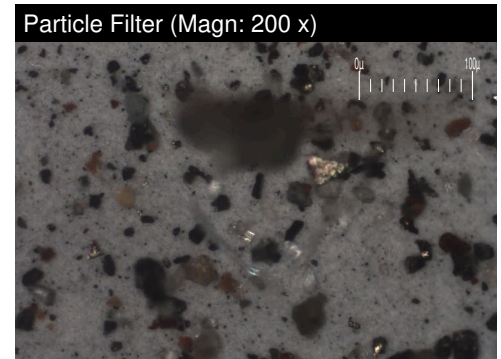
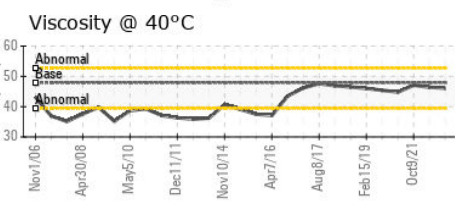
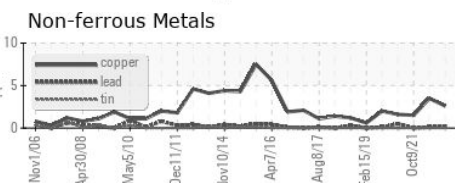
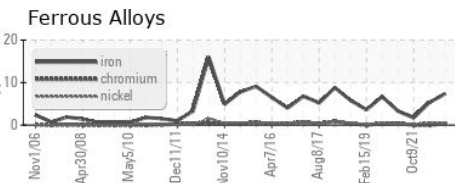


| VISUAL           | method | limit/base | current | history1 | history2 |
|------------------|--------|------------|---------|----------|----------|
| White Metal      | scalar | Visual*    | NONE    | ▲ VLITE  | NONE     |
| Yellow Metal     | scalar | Visual*    | NONE    | NONE     | NONE     |
| Precipitate      | scalar | Visual*    | NONE    | NONE     | NONE     |
| Silt             | scalar | Visual*    | NONE    | NONE     | NONE     |
| Debris           | scalar | Visual*    | NONE    | ▲ LIGHT  | NONE     |
| Sand/Dirt        | scalar | Visual*    | NONE    | NONE     | NONE     |
| Appearance       | scalar | Visual*    | NORML   | NORML    | NORML    |
| Odor             | scalar | Visual*    | NORML   | NORML    | NORML    |
| Emulsified Water | scalar | Visual*    | >0.05   | NEG      | NEG      |
| Free Water       | scalar | Visual*    |         | NEG      | NEG      |

| FLUID PROPERTIES     | method | limit/base    | current | history1 | history2 |
|----------------------|--------|---------------|---------|----------|----------|
| Visc @ 40°C          | cSt    | ASTM D7279(m) | 47.9    | 46.1     | 46.4     |
| Visc @ 100°C         | cSt    | ASTM D7279(m) | 9.67    | 9        | 9.2      |
| Viscosity Index (VI) | Scale  | ASTM D2270*   | 192     | 180      | 185      |

| SAMPLE IMAGES | method | limit/base | current | history1 | history2 |
|---------------|--------|------------|---------|----------|----------|
| Color         |        |            |         |          |          |
| Bottom        |        |            |         |          |          |
| PrtFilter     |        |            |         | no image | no image |

## GRAPHS



**Laboratory** : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9  
**Sample No.** : WC1234567  
**Lab Number** : 01234567  
**Unique Number** : 12345678  
**Test Package** : IND 2 ( Additional Tests: Bottom, BottomAnalysis, FilterPatch, KV100, VI )

**Cusany Logistics Inc.**  
 1212 Industrial Place  
 Centerville, OH  
 USA 75900  
 Contact: Jim Leduc  
 jim.leduc@cusanylogisticsinc.com  
 T: (305)555-1212  
 F: (305)555-1222

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.