



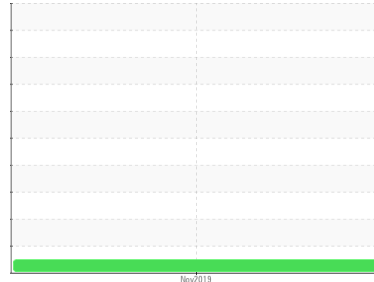
# OIL ANALYSIS REPORT

Sample Rating Trend

**NORMAL**



Area  
**CLEMENT HYDRALITECH [02324190]**  
 Machine Id  
**CATERPILLAR C5563-A R19**  
 Component  
**Hydraulic System**  
 Fluid  
**PANOLIN HLP SYNTH 46 (80 LTR)**



## DIAGNOSIS

### Recommendation

Échantillonner de nouveau l'équipement au prochain intervalle de vidange afin d'en surveiller la condition.

### Wear

Les taux d'usure de tous les composants sont normaux.

### Contamination

Il y a une faible concentration (4.9%) d'huile minérale présente dans le fluide. La propreté du système est acceptable pour votre objectif de propreté ISO 4406. La propreté du système et du fluide est acceptable.

### Fluid Condition

Le AN est acceptable pour ce fluide. L'état de l'huile permet d'en prolonger l'utilisation.

## SAMPLE INFORMATION

|               | method      | limit/base  | current            | history1 | history2 |
|---------------|-------------|-------------|--------------------|----------|----------|
| Sample Number | Client Info |             | <b>WC</b>          | ---      | ---      |
| Sample Date   | Client Info |             | <b>23 Nov 2019</b> | ---      | ---      |
| Machine Age   | hrs         | Client Info | <b>0</b>           | ---      | ---      |
| Oil Age       | hrs         | Client Info | <b>0</b>           | ---      | ---      |
| Oil Changed   | Client Info |             | <b>N/A</b>         | ---      | ---      |
| Sample Status |             |             | <b>NORMAL</b>      | ---      | ---      |

## WEAR METALS

|           | method | limit/base        | current      | history1 | history2 |
|-----------|--------|-------------------|--------------|----------|----------|
| Iron      | ppm    | ASTM D5185(m) >20 | <b>0</b>     | ---      | ---      |
| Chromium  | ppm    | ASTM D5185(m) >10 | <b>0</b>     | ---      | ---      |
| Nickel    | ppm    | ASTM D5185(m)     | <b>&lt;1</b> | ---      | ---      |
| Titanium  | ppm    | ASTM D5185(m)     | <b>&lt;1</b> | ---      | ---      |
| Silver    | ppm    | ASTM D5185(m)     | <b>&lt;1</b> | ---      | ---      |
| Aluminum  | ppm    | ASTM D5185(m) >10 | <b>0</b>     | ---      | ---      |
| Lead      | ppm    | ASTM D5185(m) >10 | <b>0</b>     | ---      | ---      |
| Copper    | ppm    | ASTM D5185(m) >75 | <b>&lt;1</b> | ---      | ---      |
| Tin       | ppm    | ASTM D5185(m) >10 | <b>0</b>     | ---      | ---      |
| Antimony  | ppm    | ASTM D5185(m)     | <b>&lt;1</b> | ---      | ---      |
| Vanadium  | ppm    | ASTM D5185(m)     | <b>0</b>     | ---      | ---      |
| Beryllium | ppm    | ASTM D5185(m)     | <b>0</b>     | ---      | ---      |
| Cadmium   | ppm    | ASTM D5185(m)     | <b>0</b>     | ---      | ---      |

## ADDITIVES

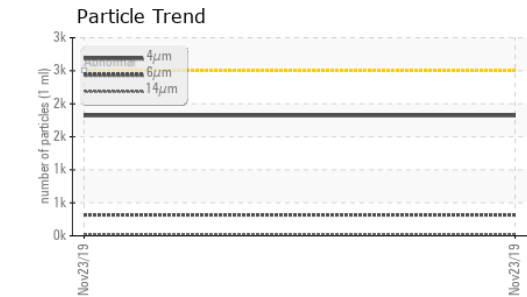
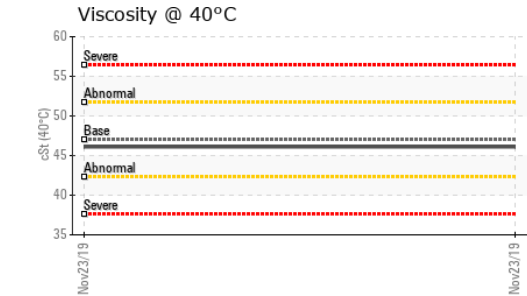
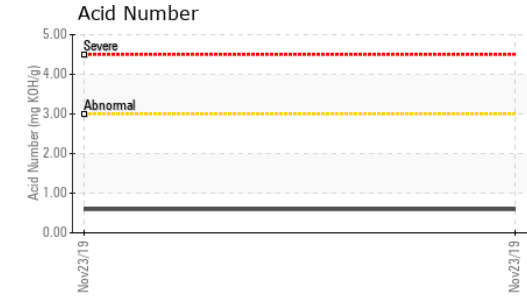
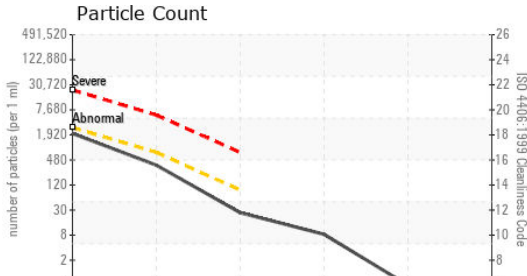
|            | method | limit/base         | current      | history1 | history2 |
|------------|--------|--------------------|--------------|----------|----------|
| Boron      | ppm    | ASTM D5185(m) 0    | <b>&lt;1</b> | ---      | ---      |
| Barium     | ppm    | ASTM D5185(m) 0    | <b>0</b>     | ---      | ---      |
| Molybdenum | ppm    | ASTM D5185(m) 0    | <b>0</b>     | ---      | ---      |
| Manganese  | ppm    | ASTM D5185(m) 0    | <b>0</b>     | ---      | ---      |
| Magnesium  | ppm    | ASTM D5185(m) 0    | <b>1</b>     | ---      | ---      |
| Calcium    | ppm    | ASTM D5185(m) 0    | <b>21</b>    | ---      | ---      |
| Phosphorus | ppm    | ASTM D5185(m) 1700 | <b>1526</b>  | ---      | ---      |
| Zinc       | ppm    | ASTM D5185(m) 0    | <b>6</b>     | ---      | ---      |
| Sulfur     | ppm    | ASTM D5185(m) 1350 | <b>1411</b>  | ---      | ---      |
| Lithium    | ppm    | ASTM D5185(m)      | <b>&lt;1</b> | ---      | ---      |

## CONTAMINANTS

|           | method | limit/base        | current      | history1 | history2 |
|-----------|--------|-------------------|--------------|----------|----------|
| Silicon   | ppm    | ASTM D5185(m) >20 | <b>&lt;1</b> | ---      | ---      |
| Sodium    | ppm    | ASTM D5185(m)     | <b>0</b>     | ---      | ---      |
| Potassium | ppm    | ASTM D5185(m) >20 | <b>&lt;1</b> | ---      | ---      |

## INFRA-RED

|                     | method   | limit/base  | current         | history1 | history2 |
|---------------------|----------|-------------|-----------------|----------|----------|
| Soot %              | %        | ASTM D7844* | <b>0</b>        | ---      | ---      |
| Nitration           | Abs/cm   | ASTM D7624* | <b>2.2</b>      | ---      | ---      |
| Sulfation           | Abs/.1mm | ASTM D7415* | <b>24.3</b>     | ---      | ---      |
| Mineral Oil Content | %        | ASTM D7418* | <b>&lt;5.0%</b> | ---      | ---      |



| FLUID CLEANLINESS | method       | limit/base | current         | history1 | history2 |
|-------------------|--------------|------------|-----------------|----------|----------|
| Particles >4µm    | ASTM D7647   | >2500      | <b>1821</b>     | ---      | ---      |
| Particles >6µm    | ASTM D7647   | >640       | <b>317</b>      | ---      | ---      |
| Particles >14µm   | ASTM D7647   | >80        | <b>23</b>       | ---      | ---      |
| Particles >21µm   | ASTM D7647   | >20        | <b>7</b>        | ---      | ---      |
| Particles >38µm   | ASTM D7647   | >4         | <b>0</b>        | ---      | ---      |
| Particles >71µm   | ASTM D7647   | >3         | <b>0</b>        | ---      | ---      |
| Oil Cleanliness   | ISO 4406 (c) | >18/16/13  | <b>18/15/12</b> | ---      | ---      |

| FLUID DEGRADATION | method   | limit/base  | current      | history1 | history2 |
|-------------------|----------|-------------|--------------|----------|----------|
| Oxidation         | Abs/.1mm | ASTM D7414* | <b>17.0</b>  | ---      | ---      |
| Acid Number (AN)  | mg KOH/g | ASTM D974*  | <b>0.593</b> | ---      | ---      |

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

| FLUID PROPERTIES | method | limit/base    | current     | history1 | history2 |
|------------------|--------|---------------|-------------|----------|----------|
| Visc @ 40°C      | cSt    | ASTM D2729(m) | <b>46.1</b> | ---      | ---      |

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

|        |  |  |  |          |          |
|--------|--|--|--|----------|----------|
| Color  |  |  |  | no image | no image |
| Bottom |  |  |  | no image | no image |



**Laboratory** : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9  
**Sample No.** : WC  
**Lab Number** : **02324189**  
**Unique Number** : 4967487  
**Test Package** : MOB 2 ( Additional Tests: TAN Man )  
**Received** : 02 Dec 2019  
**Diagnosed** : 06 Dec 2019  
**Diagnostician** : Bill Quesnel

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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# MINERAL OIL CONTENT REPORT

PASS



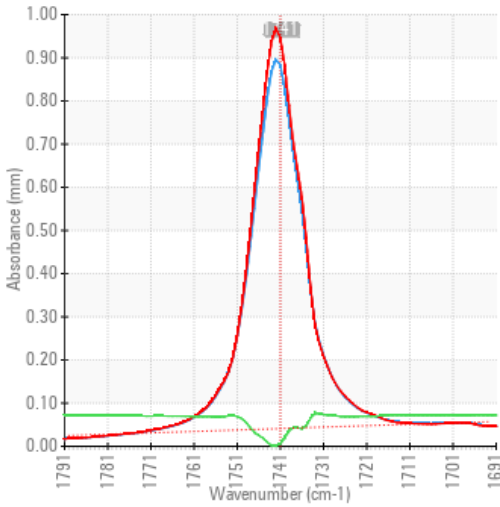
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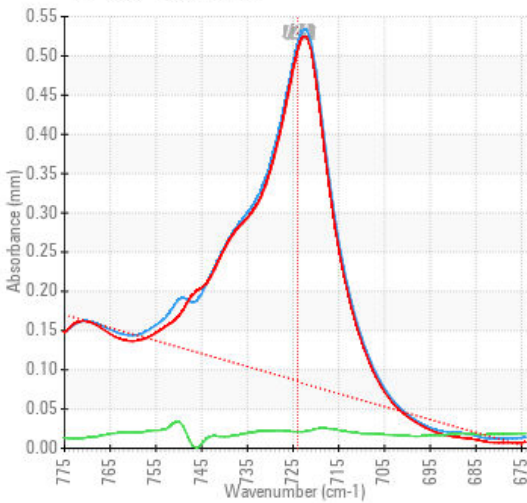
## SPECTRAL ANALYSIS

|                     |     | method        | limit/base | current    | history1 | history2 |
|---------------------|-----|---------------|------------|------------|----------|----------|
| Zinc                | ppm | ASTM D5185(m) | 0          | <b>6</b>   | ---      | ---      |
| Mineral Oil Content | %   | ASTM D7418*   | <5.0%      | <b>4.9</b> | ---      | ---      |

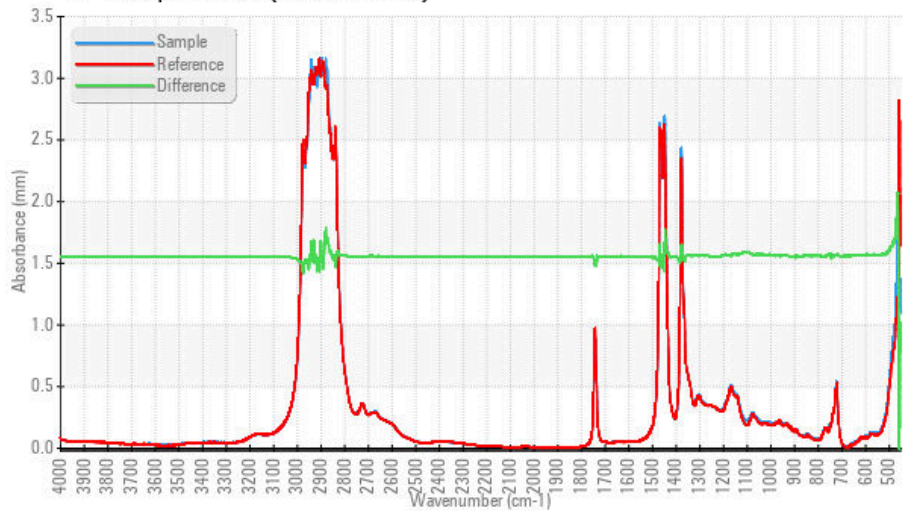
### FT-IR - Esters I



### FT-IR - Esters II



### FT-IR Spectrum (Absorbance)



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