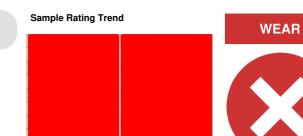


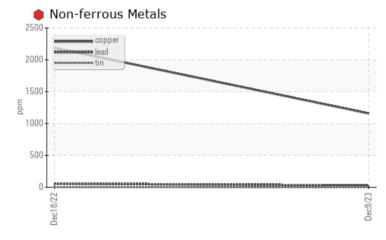
Copper



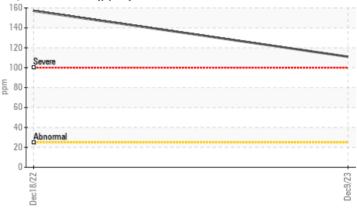
CRANE #1

Component Gearbox Fluid MOBIL MOBILUBE HD 85W140 (--- GAL)

COMPONENT CONDITION SUMMARY



Aluminum (ppm)



RECOMMENDATION

We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.

| PROBLEMATIC TEST RESULTS | | | | | | | |
|--------------------------|-----|---------------|-----|--------|--------|--|--|
| Sample Status | | | | SEVERE | SEVERE | | |
| Aluminum | ppm | ASTM D5185(m) | >25 | • 111 | 157 | | |

1158

2188

ASTM D5185(m) >200

ppm

Customer Id: METREX Sample No.: WC0887210 Lab Number: 02605130 Test Package: IND 1



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 <u>gloria.gonzalez@wearcheck.com</u>

| RECOMMENDED ACTIONS | | | | | |
|----------------------|--------|------|---------|--|--|
| Action | Status | Date | Done By | Description | |
| Change Fluid | | | ? | We recommend that you drain the oil from the component if this has not already been done. | |
| Resample | | | ? | We recommend an early resample to monitor this condition. | |
| Information Required | | | ? | NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample. | |

HISTORICAL DIAGNOSIS



18 Dec 2022 Diag: Kevin Marson

serviceable as a result of the abnormal and/or severe wear.



We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample. Aluminum and copper ppm levels are severe. Thrust washer and/or bearing/bushing wear is indicated. There is no indication of any contamination in the oil. The oil is no longer





OIL ANALYSIS REPORT

Sample Rating Trend

WEAR

CRANE #1

Component Gearbox Fluid MOBIL MOBILUBE HD 85W140 (--- GAL)

DIAGNOSIS

Recommendation

We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.

🛡 Wear

Aluminum and copper ppm levels are severe. Thrust washer and/or bearing/bushing wear is indicated.

Contamination

There is no indication of any contamination in the oil.

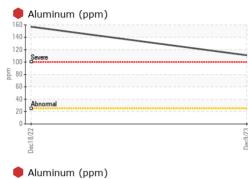
Fluid Condition

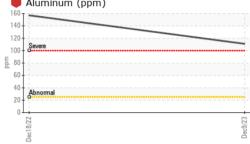
The oil is no longer serviceable as a result of the abnormal and/or severe wear.

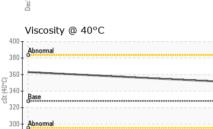
| SAMPLE INFORMATION method limit/base current history1 history2 Sample Number Client Info 09 Dec 2023 18 Dec 2022 Machine Age hrs Client Info 0 0 Oil Age hrs Client Info 0 0 Oil Age hrs Client Info 0 0 Oil Age hrs Client Info 0 0 Sample Status - Imit/base current history1 history2 Water WC Method >0.2 NEG NEG WEAR METALS method limit/base current history1 history2 Vater WC Method >0.2 NEG Nickel ppm ASTM 05/5/5/m 1 2 Nickel ppm ASTM 05/5/5/m 0 0 Silver ppm ASTM 05/5/5/m 0 0 <th></th> <th></th> <th></th> <th>Dec2022</th> <th>Dec2023</th> <th></th> <th></th> | | | | Dec2022 | Dec2023 | | |
|---|---------------|-------|---------------|------------|-------------|-------------|----------|
| Sample Date Client Info 09 Dec 2023 18 Dec 2022 Machine Age hrs Client Info 0 0 Oil Age hrs Client Info 0 0 Oil Changed Client Info N/A N/A Sample Status Imit/base current history1 history2 Water WC Method >0.2 NEG NEG VEAR METALS method limi/base current history1 history2 Iron ppm ASTM DS185(m) >15 0 0 Nickel ppm ASTM DS185(m) >15 0 0 Nickel ppm ASTM DS185(m) >10 28 56 Aluminum ppm ASTM DS185(m) >25 11 157 Aluminum ppm ASTM DS185(m) >26 -1 -1 Autininum ppm AS | SAMPLE INFORM | ATION | method | limit/base | current | history1 | history2 |
| Machine Age hrs Client Info 0 0 Oil Age hrs Client Info N/A N/A Sample Status Client Info N/A N/A Sample Status Client Info N/A N/A CONTAMINATION method imit/base current history1 history2 Water WC Method >0.2 NEG NEG WEAR METALS method imit/base current history1 history2 Iron ppm ASTMD5165(m) >15 0 0 Kear METALS method imit/base current history1 history2 Iron ppm ASTMD5165(m) >15 1 2 Silver ppm ASTMD5165(m) >10 28 5 Copper ppm ASTMD5165(m) >20 111 Vanadium ppm | Sample Number | | Client Info | | WC0887210 | WC0765206 | |
| Oil Age hrs Client Info 0 0 Oil Changed Client Info N/A N/A N/A Sample Status Client Info N/A N/A N/A CONTAMINATION method limit/base current history1 history2 Water WC Method >0.2 NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5165(m) >200 70 102 Nickel ppm ASTM D5165(m) >15 1 2 Aluminum ppm ASTM D5165(m) >0 0 Aluminum ppm ASTM D5165(m) >200 1118 157 Lead ppm ASTM D5165(m) >5 0 0 Vanadium ppm ASTM D5165(m) >5 0 0 | Sample Date | | Client Info | | 09 Dec 2023 | 18 Dec 2022 | |
| Oil Changed Client Info N/A N/A N/A Sample Status Client Info N/A SEVERE SEVERE SEVERE CONTAMINATION method limit/base current history1 history2 Water WC Method >0.2 NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTMD5185(m) >200 70 102 Nickel ppm ASTMD5185(m) >15 1 2 Aluminum ppm ASTMD5185(m) >55 111 157 Lead ppm ASTMD5185(m) >200 1158 2188 Antimony ppm ASTMD5185(m) >55 0 0 0 Vanadium ppm ASTMD5185(m) >55 0 0 Vanadium ppm ASTMD5185(m) 0 0 <th>Machine Age</th> <th>hrs</th> <th>Client Info</th> <th></th> <th>0</th> <th>0</th> <th></th> | Machine Age | hrs | Client Info | | 0 | 0 | |
| Sample Status SEVERE SEVERE SEVERE CONTAMINATION method limit/base current history1 history2 Water WC Method >0.2 NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185(m) >200 70 102 Chromium ppm ASTM D5185(m) >15 1 2 Nickel ppm ASTM D5185(m) >15 1 2 Nickel ppm ASTM D5185(m) >200 0 0 Aluminum ppm ASTM D5185(m) >200 1158 -16 Autinum ppm ASTM D5185(m) >200 1158 Autinum ppm ASTM D5185(m) >20 0 Autinum ppm ASTM D5185(m) >20 0 | Oil Age | hrs | Client Info | | 0 | 0 | |
| CONTAMINATION method limit/base current history1 history2 Water WC Method >0.2 NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185(m) >200 70 102 Chromium ppm ASTM D5185(m) >15 0 0 Nickel ppm ASTM D5185(m) >1 2 Aluminum ppm ASTM D5185(m) 0 0 Aluminum ppm ASTM D5185(m) 28 56 Copper ppm ASTM D5185(m) >20 1158 2188 Tin ppm ASTM D5185(m) >20 0 0 Vanadium ppm ASTM D5185(m) 0 0 Koron ppm ASTM D5185(m) 0 0 <tr< th=""><th>Oil Changed</th><th></th><th>Client Info</th><th></th><th>N/A</th><th>N/A</th><th></th></tr<> | Oil Changed | | Client Info | | N/A | N/A | |
| Water WC Method >0.2 NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185(m) >200 70 102 Chromium ppm ASTM D5185(m) >15 0 0 Nickel ppm ASTM D5185(m) >15 1 2 Silver ppm ASTM D5185(m) >25 111 157 Aluminum ppm ASTM D5185(m) >200 1158 2188 Lead ppm ASTM D5185(m) >200 1158 2188 Copper ppm ASTM D5185(m) >200 0 0 Antimony ppm ASTM D5185(m) >5 0 0 Antimony ppm ASTM D5185(m) >5 0 0 Cadmium ppm ASTM D5185(m) 0 <th>Sample Status</th> <th></th> <th></th> <th></th> <th>SEVERE</th> <th>SEVERE</th> <th></th> | Sample Status | | | | SEVERE | SEVERE | |
| WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185(m) >200 70 102 Chromium ppm ASTM D5185(m) >15 0 0 Nickel ppm ASTM D5185(m) >15 0 0 Silver ppm ASTM D5185(m) >0 0 Aluminum ppm ASTM D5185(m) >25 111 157 Lead ppm ASTM D5185(m) >200 1158 2188 Copper ppm ASTM D5185(m) >200 1158 2188 Antimony ppm ASTM D5185(m) >5 0 0 Vanadium ppm ASTM D5185(m) >5 0 0 Cadmium ppm ASTM D5185(m) 0 0 Boron ppm ASTM D5185(m)< | CONTAMINATIO | N | method | limit/base | current | history1 | history2 |
| Ion ppm ASTM D5185(m) >200 70 102 Chromium ppm ASTM D5185(m) >15 0 0 Nickel ppm ASTM D5185(m) >15 1 2 Titanium ppm ASTM D5185(m) 0 0 Aluminum ppm ASTM D5185(m) >25 111 157 Lead ppm ASTM D5185(m) >200 1158 2188 Copper ppm ASTM D5185(m) >20 1158 2188 Antimony ppm ASTM D5185(m) >25 <1 <1 Vanadium ppm ASTM D5185(m) >5 0 0 Cadmium ppm ASTM D5185(m) >5 0 0 | Water | | WC Method | >0.2 | NEG | NEG | |
| Chromium ppm ASTM D5185(m) >15 0 0 Nickel ppm ASTM D5185(m) >15 1 2 Titanium ppm ASTM D5185(m) 0 0 Silver ppm ASTM D5185(m) 225 111 157 Aluminum ppm ASTM D5185(m) >220 1158 56 Copper ppm ASTM D5185(m) >200 1158 2188 Antimony ppm ASTM D5185(m) >25 <1 <1 Antimony ppm ASTM D5185(m) >5 0 0 Vanadium pm ASTM D5185(m) 0 0 Cadmium ppm ASTM D5185(m) 0 0 Boron ppm ASTM D5185(m) 0 0 Magnaese ppm ASTM D5185(m) 0 0 | WEAR METALS | | method | limit/base | current | history1 | history2 |
| Nickel ppm ASTM D5185(m) >15 1 2 Titanium ppm ASTM D5185(m) 0 0 Silver ppm ASTM D5185(m) 0 0 Aluminum ppm ASTM D5185(m) >25 111 157 Lead ppm ASTM D5185(m) >200 1158 2188 Copper ppm ASTM D5185(m) >200 1158 2188 Antimony ppm ASTM D5185(m) >25 <1 | Iron | ppm | ASTM D5185(m) | >200 | 70 | 102 | |
| Titanium ppm ASTM D5185(m) 0 0 0 | Chromium | ppm | ASTM D5185(m) | >15 | 0 | 0 | |
| Silver ppm ASTM D5188(m) 0 | Nickel | ppm | ASTM D5185(m) | >15 | 1 | 2 | |
| Aluminum ppm ASTM D5165(m) >25 111 157 Lead ppm ASTM D5165(m) >200 1158 \$2188 Copper ppm ASTM D5165(m) >200 1158 \$2188 Tin ppm ASTM D5165(m) >25 <1 <1 Antimony ppm ASTM D5165(m) >5 0 0 Vanadium ppm ASTM D5165(m) >5 0 0 Seryllium ppm ASTM D5165(m) 0 0 Cadmium ppm ASTM D5165(m) 0 0 Boron ppm ASTM D5165(m) 138 108 Molybdenum ppm ASTM D5165(m) 0 0 Magnesium ppm ASTM D5165(m) 21 0 Magnesium ppm ASTM D5165(m) 910 14 | Titanium | ppm | ASTM D5185(m) | | 0 | 0 | |
| Lead ppm ASTM D5185(m) >100 28 56 Copper ppm ASTM D5185(m) >200 1158 2188 Tin ppm ASTM D5185(m) >25 <1 <1 Antimony ppm ASTM D5185(m) >5 0 0 Vanadium ppm ASTM D5185(m) >5 0 0 Beryllium ppm ASTM D5185(m) 0 0 Cadmium ppm ASTM D5185(m) 0 0 Cadmium ppm ASTM D5185(m) 0 0 ADDITIVES method limit/base current historyl historyl Barium ppm ASTM D5185(m) 0 0 | Silver | ppm | ASTM D5185(m) | | 0 | 0 | |
| Copper ppm ASTM D5185(m) >200 1158 2188 Tin ppm ASTM D5185(m) >25 <1 <1 Antimony ppm ASTM D5185(m) >5 0 0 Vanadium ppm ASTM D5185(m) 0 0 Beryllium ppm ASTM D5185(m) 0 0 Cadmium ppm ASTM D5185(m) 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 138 108 Barium ppm ASTM D5185(m) 0 0 Magnaese ppm ASTM D5185(m) 2 3 Magnesium ppm ASTM D5185(m) 4 8 Calcium ppm ASTM D5185(m) 996 939 Z | Aluminum | ppm | ASTM D5185(m) | >25 | • 111 | 157 | |
| Tin ppm ASTM D5185(m) >25 <1 | Lead | ppm | ASTM D5185(m) | >100 | 28 | 56 | |
| Antimony ppm ASTM D5185(m) >5 0 0 Vanadium ppm ASTM D5185(m) 0 0 Beryllium ppm ASTM D5185(m) 0 0 Cadmium ppm ASTM D5185(m) 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 138 108 Barium ppm ASTM D5185(m) 0 0 Molybdenum ppm ASTM D5185(m) 0 0 Manganese ppm ASTM D5185(m) 2 3 Magnesium ppm ASTM D5185(m) <1 0 Calcium ppm ASTM D5185(m) <1 0 Sulfur ppm ASTM D5185(m) 10 14 Sulfur ppm ASTM D5185(m) <11 <1 | Copper | ppm | ASTM D5185(m) | >200 | 🛑 1158 | 2188 | |
| Vanadium ppm ASTM D5185(m) 0 0 Beryllium ppm ASTM D5185(m) 0 0 Cadmium ppm ASTM D5185(m) 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 138 108 Barium ppm ASTM D5185(m) 0 0 Molybdenum ppm ASTM D5185(m) 0 0 Manganese ppm ASTM D5185(m) 2 3 Magnesium ppm ASTM D5185(m) <4 8 Calcium ppm ASTM D5185(m) <4 8 Sulfur ppm ASTM D5185(m) 10 14 Sulfur ppm ASTM D5185(m) 21573 20166 Sulfur ppm ASTM D5185(m) <1 <1 | Tin | ppm | ASTM D5185(m) | >25 | <1 | <1 | |
| Beryllium ppm ASTM D5185(m) 0 0 Cadmium ppm ASTM D5185(m) 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 138 108 Barium ppm ASTM D5185(m) 0 0 Molybdenum ppm ASTM D5185(m) 0 0 Manganese ppm ASTM D5185(m) 2 3 Magnesium ppm ASTM D5185(m) <1 | Antimony | ppm | ASTM D5185(m) | >5 | 0 | 0 | |
| Cadmium ppm ASTM D5185(m) 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 138 108 Barium ppm ASTM D5185(m) 0 0 Molybdenum ppm ASTM D5185(m) 0 0 Maganese ppm ASTM D5185(m) 2 3 Magnesium ppm ASTM D5185(m) <<1 | Vanadium | ppm | ASTM D5185(m) | | 0 | 0 | |
| ADDITIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185(m)138108BariumppmASTM D5185(m)00MolybdenumppmASTM D5185(m)00ManganeseppmASTM D5185(m)23MagnesiumppmASTM D5185(m)<10CalciumppmASTM D5185(m)<10CalciumppmASTM D5185(m)996939ZincppmASTM D5185(m)1014SulfurppmASTM D5185(m)2157320166LithiumppmASTM D5185(m)<1<1CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185(m) >50814SodiumppmASTM D5185(m)0<1 | Beryllium | ppm | ASTM D5185(m) | | 0 | 0 | |
| Boron ppm ASTM D5185(m) 138 108 Barium ppm ASTM D5185(m) 0 0 Molybdenum ppm ASTM D5185(m) 0 0 Manganese ppm ASTM D5185(m) 0 0 Magnesium ppm ASTM D5185(m) 2 3 Calcium ppm ASTM D5185(m) <1 0 Calcium ppm ASTM D5185(m) 4 8 Phosphorus ppm ASTM D5185(m) 996 939 Zinc ppm ASTM D5185(m) 10 14 Sulfur ppm ASTM D5185(m) 21573 20166 Lithium ppm ASTM D5185(m) <1 <1 Solicon ppm ASTM D5185(m) <50 8 14 Sodium ppm ASTM D5185(m) >50 8 | Cadmium | ppm | ASTM D5185(m) | | 0 | 0 | |
| Barium ppm ASTM D5185(m) 0 0 Molybdenum ppm ASTM D5185(m) 0 0 Manganese ppm ASTM D5185(m) 2 3 Magnesium ppm ASTM D5185(m) <1 0 Calcium ppm ASTM D5185(m) <1 0 Calcium ppm ASTM D5185(m) <1 0 Calcium ppm ASTM D5185(m) 996 939 Zinc ppm ASTM D5185(m) 996 939 Sulfur ppm ASTM D5185(m) 21573 20166 Lithium ppm ASTM D5185(m) <1 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >50 8 14 Sodium ppm ASTM D5185(m) 0 <1 <th>ADDITIVES</th> <th></th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th> | ADDITIVES | | method | limit/base | current | history1 | history2 |
| Molybdenum ppm ASTM D5185(m) 0 0 Manganese ppm ASTM D5185(m) 2 3 Magnesium ppm ASTM D5185(m) <1 | Boron | ppm | ASTM D5185(m) | | 138 | 108 | |
| Manganese ppm ASTM D5185(m) 2 3 Magnesium ppm ASTM D5185(m) <1 0 Calcium ppm ASTM D5185(m) <4 8 Calcium ppm ASTM D5185(m) 996 939 Phosphorus ppm ASTM D5185(m) 996 939 Zinc ppm ASTM D5185(m) 10 14 Sulfur ppm ASTM D5185(m) 21573 20166 Lithium ppm ASTM D5185(m) <1 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >50 8 14 Sodium ppm ASTM D5185(m) 0 <1 | Barium | ppm | ASTM D5185(m) | | 0 | 0 | |
| Magnesium ppm ASTM D5185(m) <1 | Molybdenum | ppm | ASTM D5185(m) | | 0 | 0 | |
| Calcium ppm ASTM D5185(m) 4 8 Phosphorus ppm ASTM D5185(m) 996 939 Zinc ppm ASTM D5185(m) 10 14 Sulfur ppm ASTM D5185(m) 21573 20166 Lithium ppm ASTM D5185(m) <1 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >50 8 14 Sodium ppm ASTM D5185(m) 0 <1 | Manganese | ppm | ASTM D5185(m) | | 2 | 3 | |
| Phosphorus ppm ASTM D5185(m) 996 939 Zinc ppm ASTM D5185(m) 10 14 Sulfur ppm ASTM D5185(m) 21573 20166 Lithium ppm ASTM D5185(m) <1 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >50 8 14 Sodium ppm ASTM D5185(m) 0 <1 | Magnesium | ppm | ASTM D5185(m) | | <1 | 0 | |
| Zinc ppm ASTM D5185(m) 10 14 Sulfur ppm ASTM D5185(m) 21573 20166 Lithium ppm ASTM D5185(m) <1 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >50 8 14 Sodium ppm ASTM D5185(m) >50 8 14 | Calcium | ppm | ASTM D5185(m) | | 4 | 8 | |
| Sulfur ppm ASTM D5185(m) 21573 20166 Lithium ppm ASTM D5185(m) <1 | Phosphorus | ppm | ASTM D5185(m) | | 996 | 939 | |
| Lithium ppm ASTM D5185(m) <1 | Zinc | ppm | ASTM D5185(m) | | 10 | 14 | |
| CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185(m)>50814SodiumppmASTM D5185(m)0<1 | Sulfur | ppm | ASTM D5185(m) | | 21573 | 20166 | |
| Silicon ppm ASTM D5185(m) >50 8 14 Sodium ppm ASTM D5185(m) 0 <1 | Lithium | ppm | ASTM D5185(m) | | <1 | <1 | |
| Sodium ppm ASTM D5185(m) 0 <1 | CONTAMINANTS | ; | method | limit/base | current | history1 | history2 |
| Sodium ppm ASTM D5185(m) 0 <1 | Silicon | ppm | ASTM D5185(m) | >50 | 8 | 14 | |
| | Sodium | | () | | - | <1 | |
| | | | () | >20 | - | | |
| | Potassium | ppm | ASTM D5185(m) | >20 | <1 | 0 | |



OIL ANALYSIS REPORT



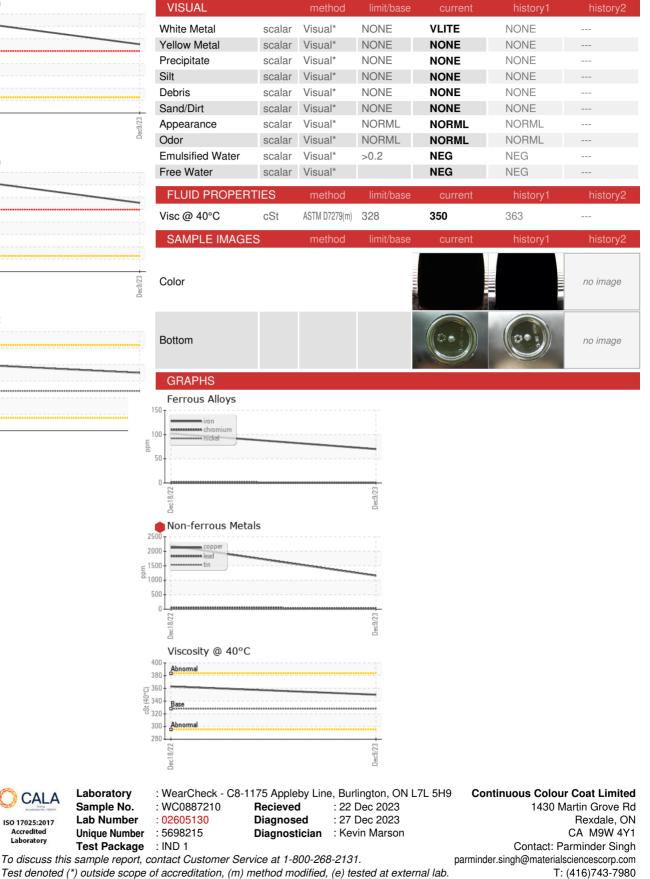




ŝ

280

Dec18/22



CALA

ISO 17025:2017 Accredited

Laboratory

Laboratory

Sample No.

Lab Number

Validity of results and interpretation are based on the sample and information as supplied.

F: (416)743-7138