

# LABORATORY ANALYSIS



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**COPELAND (MHDS)**  
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Department **REYLAM-PRESS**  
Equipment No. **MANSC02 DEREELEER (SCROLL LINE 2) (00071)**  
System **Hydraulic System**  
Oil Type **ENGINEERED LUBRICANTS ENLUBE 30-AW (--- GAL)**

## Diagnosis

All component wear rates are normal. There is a moderate amount of silt (particulates < 14 microns in size) present in the oil. The system cleanliness is above the acceptable limit for the target ISO 4406 cleanliness code. The oil viscosity is lower than typical, possibly indicating the addition of lighter grade oil. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.

## Sample Information

| Lab Number          | New       | 2404-00884         | 2401-00764  | 2310-00804  |
|---------------------|-----------|--------------------|-------------|-------------|
| Date of Sample      | (Typical) | <b>05 Apr 2024</b> | 19 Jan 2024 | 10 Oct 2023 |
| Oil Added           |           | <b>UNK</b>         | UNK         | UNK         |
| Last Drain Date     |           | --                 | --          | --          |
| Months on Sample    |           | <b>270.5</b>       | 268.0       | 264.8       |
| Last Filter Service |           | --                 | --          | --          |
| Sample Point        |           | ---                | ---         | ---         |
| Sample Status       |           | <b>NORMAL</b>      | ABNORMAL    | NORMAL      |

## VISCOSITY @ 100F or 40C (ASTM D-445)

| SSU Vis. @ 100F | SSU | 314.2 | 313.6        | 349.0 |
|-----------------|-----|-------|--------------|-------|
| cSt Vis. @ 40C  | cSt | 68.0  | <b>60.67</b> | 60.56 |
|                 |     |       | 67.27        |       |

## COLOR (BASED ON ASTM D1500 STANDARDS)

| Color | Scale 0-8 | 1.0 | 0.5 | 0.5 |
|-------|-----------|-----|-----|-----|
|       |           |     |     |     |

## PARTICLE COUNT (PER 1ML)

| ISO CODE           | ISO 4406(c)  | >19/18/14 | 21/18/13      | 21/18/14 | 19/17/13 |
|--------------------|--------------|-----------|---------------|----------|----------|
| 4 Micron & Larger  | particles/ml | >5000     | <b>13,313</b> | 15,507   | 2,825    |
| 6 Micron & Larger  | particles/ml | >2500     | <b>1,867</b>  | 2,315    | 680      |
| 14 Micron & Larger | particles/ml | >160      | <b>75</b>     | 121      | 56       |
| 21 Micron & Larger | particles/ml | >40       | <b>15</b>     | 34       | 14       |
| 38 Micron & Larger | particles/ml | >10       | <b>0</b>      | 1        | 1        |
| 70 Micron & Larger | particles/ml | >3        | <b>0</b>      | 0        | 0        |

## ICP - OILS (REPORTED IN PARTS PER MILLION)

|                |     |            |              |       |
|----------------|-----|------------|--------------|-------|
| Aluminum (Al)  | ppm | <5         | <5           | <5    |
| Antimony (Sb)  | ppm | <5         | <5           | <5    |
| Cadmium (Cd)   | ppm | <5         | <5           | <5    |
| Chromium (Cr)  | ppm | <5         | <5           | <5    |
| Cobalt (Co)    | ppm | <5         | <5           | <5    |
| Copper (Cu)    | ppm | <5         | <5           | <5    |
| Iron (Fe)      | ppm | <5         | <5           | <5    |
| Lead (Pb)      | ppm | <5         | <5           | <5    |
| Manganese (Mn) | ppm | <5         | <5           | <5    |
| Molybdenum(Mo) | ppm | <5         | <5           | <5    |
| Nickel (Ni)    | ppm | <5         | <5           | <5    |
| Silver (Ag)    | ppm | <5         | <5           | <5    |
| Tin (Sn)       | ppm | <5         | <5           | <5    |
| Titanium (Ti)  | ppm | <5         | <5           | <5    |
| Vanadium (V)   | ppm | <5         | <5           | <5    |
| Barium (Ba)    | ppm | <5         | <5           | <5    |
| Boron (B)      | ppm | <5         | <5           | <5    |
| Calcium (Ca)   | ppm | <b>92</b>  | 96           | 60    |
| Magnesium (Mg) | ppm | <5         | <5           | <5    |
| Phosphorus(P)  | ppm | <b>521</b> | 540          | 498   |
| Silicon (Si)   | ppm | <5         | <5           | <5    |
| Zinc (Zn)      | ppm | 668        | <b>617</b>   | 644   |
| Sulfur (S)     | ppm |            | <b>1,370</b> | 1,550 |
|                |     |            |              | 1,420 |

Customer Id: MOTMCA  
Sample No.: EN24040884  
Lab Number: 24040884  
Test Package: TEST

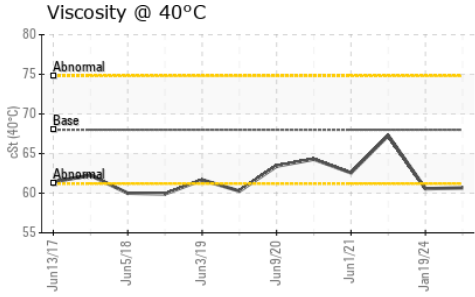


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# OIL ANALYSIS REPORT



## DR FERROGRAPHY READINGS

|     |         |        |        |       |
|-----|---------|--------|--------|-------|
| L   |         | ■ 17.4 | ■ 14.8 | ■ 1.6 |
| S   |         | ■ 7.3  | ■ 0.4  | ■ 1.2 |
| WPC | DL + DS | ■ 24.7 | ■ 15.2 | ■ 2.8 |

## Contamination

|       |       |            |     |     |
|-------|-------|------------|-----|-----|
| Water | >0.05 | <b>NEG</b> | NEG | NEG |
|-------|-------|------------|-----|-----|