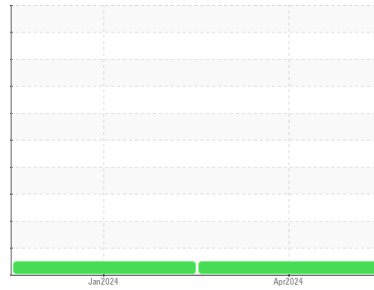


OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id
312
 Component
Diesel Engine
 Fluid
RED GIANT LOCOMOTIVE EO 20W40 (--- GAL)

DIAGNOSIS

Recommendation
 Resample at the next service interval to monitor.

Wear
 All component wear rates are normal.

Contamination
 There is no indication of any contamination in the oil.

Fluid Condition
 The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORMATION

| | method | limit/base | current | history1 | history2 |
|---------------|-------------|-------------|--------------------|-------------|----------|
| Sample Number | Client Info | | PCA0092766 | PCA0092702 | --- |
| Sample Date | Client Info | | 03 Apr 2024 | 08 Jan 2024 | --- |
| Machine Age | hrs | Client Info | 0 | 0 | --- |
| Oil Age | hrs | Client Info | 0 | 0 | --- |
| Oil Changed | Client Info | | N/A | N/A | --- |
| Sample Status | | | NORMAL | NORMAL | --- |

CONTAMINATION

| | method | limit/base | current | history1 | history2 |
|--------|-----------|------------|----------------|----------|----------|
| Fuel | WC Method | >4 | <1.0 | <1.0 | --- |
| Water | WC Method | >0.20 | NEG | NEG | --- |
| Glycol | WC Method | | NEG | NEG | --- |

WEAR METALS

| | method | limit/base | current | history1 | history2 |
|----------|--------|------------------|--------------|----------|----------|
| Iron | ppm | ASTM D5185m >100 | 31 | 24 | --- |
| Chromium | ppm | ASTM D5185m >15 | 0 | 1 | --- |
| Nickel | ppm | ASTM D5185m >5 | 0 | 0 | --- |
| Titanium | ppm | ASTM D5185m | 0 | 0 | --- |
| Silver | ppm | ASTM D5185m >2 | 0 | 0 | --- |
| Aluminum | ppm | ASTM D5185m >10 | <1 | 3 | --- |
| Lead | ppm | ASTM D5185m >75 | 5 | 5 | --- |
| Copper | ppm | ASTM D5185m >90 | 12 | 14 | --- |
| Tin | ppm | ASTM D5185m >30 | <1 | 2 | --- |
| Vanadium | ppm | ASTM D5185m | 0 | 0 | --- |
| Cadmium | ppm | ASTM D5185m | 0 | 0 | --- |

ADDITIVES

| | method | limit/base | current | history1 | history2 |
|------------|--------|------------------|-------------|----------|----------|
| Boron | ppm | ASTM D5185m | 36 | 28 | --- |
| Barium | ppm | ASTM D5185m | 0 | 0 | --- |
| Molybdenum | ppm | ASTM D5185m | 38 | 36 | --- |
| Manganese | ppm | ASTM D5185m | 0 | 1 | --- |
| Magnesium | ppm | ASTM D5185m | 12 | 25 | --- |
| Calcium | ppm | ASTM D5185m | 3561 | 2977 | --- |
| Phosphorus | ppm | ASTM D5185m 0 | 0 | 8 | --- |
| Zinc | ppm | ASTM D5185m 0 | 0 | 18 | --- |
| Sulfur | ppm | ASTM D5185m 1900 | 3919 | 2812 | --- |

CONTAMINANTS

| | method | limit/base | current | history1 | history2 |
|-----------|--------|-----------------|--------------|----------|----------|
| Silicon | ppm | ASTM D5185m >17 | 8 | 8 | --- |
| Sodium | ppm | ASTM D5185m | 36 | 34 | --- |
| Potassium | ppm | ASTM D5185m >20 | <1 | 0 | --- |

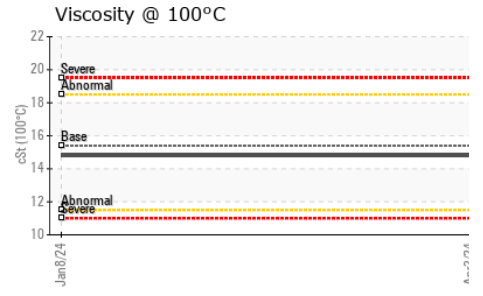
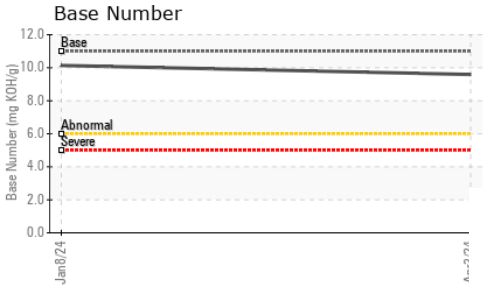
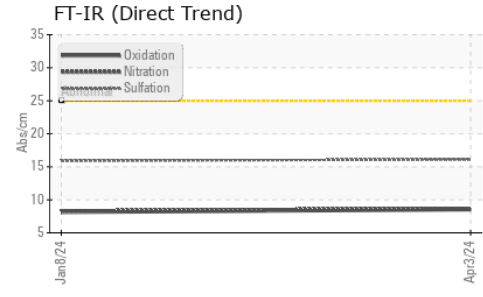
INFRA-RED

| | method | limit/base | current | history1 | history2 |
|-----------|----------|-----------------|-------------|----------|----------|
| Soot % | % | *ASTM D7844 >3 | 0.9 | 0.8 | --- |
| Nitration | Abs/cm | *ASTM D7624 >20 | 8.7 | 8.3 | --- |
| Sulfation | Abs/.1mm | *ASTM D7415 >30 | 16.1 | 15.9 | --- |

FLUID DEGRADATION

| | method | limit/base | current | history1 | history2 |
|------------------|----------|-----------------|-------------|----------|----------|
| Oxidation | Abs/.1mm | *ASTM D7414 >25 | 8.5 | 8.1 | --- |
| Base Number (BN) | mg KOH/g | ASTM D2896 11 | 9.59 | 10.14 | --- |

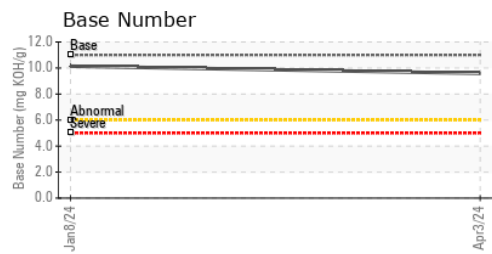
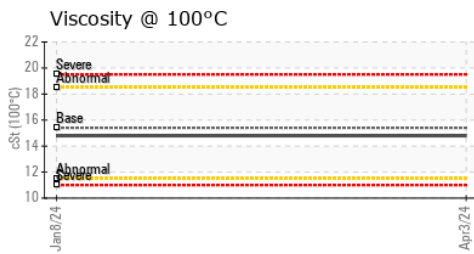
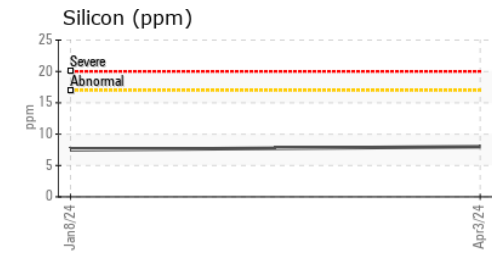
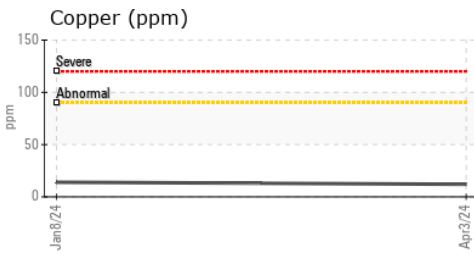
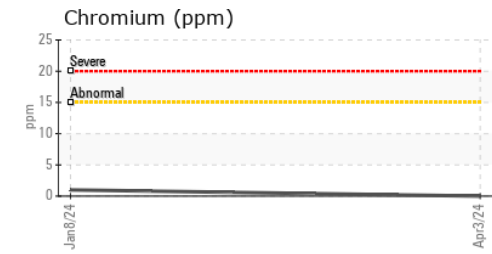
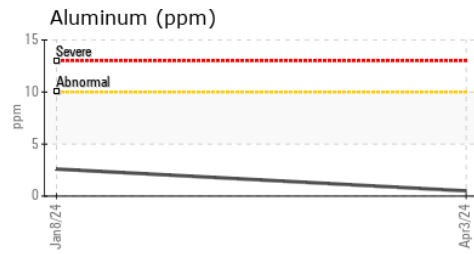
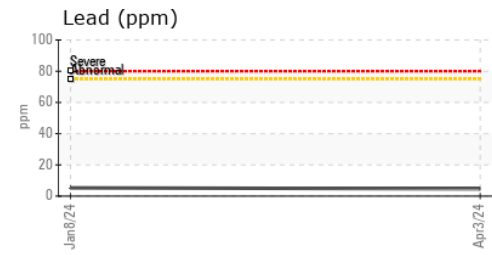
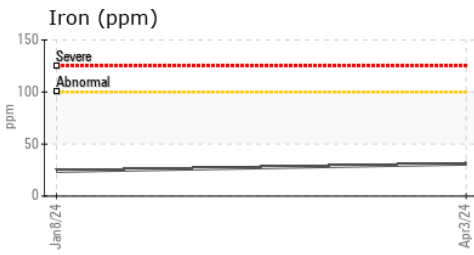
OIL ANALYSIS REPORT



| VISUAL | method | limit/base | current | history1 | history2 |
|------------------|--------|------------|---------|----------|----------|
| White Metal | scalar | *Visual | NONE | NONE | --- |
| Yellow Metal | scalar | *Visual | NONE | NONE | --- |
| Precipitate | scalar | *Visual | NONE | NONE | --- |
| Silt | scalar | *Visual | NONE | NONE | --- |
| Debris | scalar | *Visual | NONE | NONE | --- |
| Sand/Dirt | scalar | *Visual | NONE | NONE | --- |
| Appearance | scalar | *Visual | NORML | NORML | --- |
| Odor | scalar | *Visual | NORML | NORML | --- |
| Emulsified Water | scalar | *Visual | >0.20 | NEG | --- |
| Free Water | scalar | *Visual | | NEG | --- |

| FLUID PROPERTIES | method | limit/base | current | history1 | history2 | |
|------------------|--------|------------|---------|-------------|----------|-----|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | 14.8 | 14.8 | --- |

GRAPHS



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : PCA0092766 **Received** : 11 Apr 2024
Lab Number : **06146765** **Tested** : 12 Apr 2024
Unique Number : 10976843 **Diagnosed** : 12 Apr 2024 - Wes Davis
Test Package : MOB 2

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 CLEWISTON, FL
 US 33440-3032
 Contact: JAMES MCGROGAN
 jmcgrogan@ussugar.com

To discuss this sample report, contact Customer Service at 1-800-237-1369.
 * - Denotes test methods that are outside of the ISO 17025 scope of accreditation.
 Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)