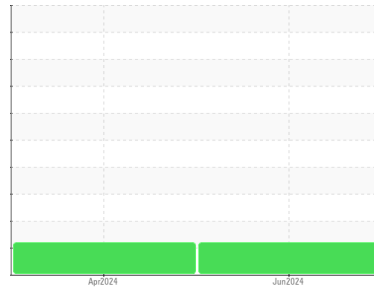




OIL ANALYSIS REPORT

Area
MINING
Machine Id
ME-117 CATERPILLAR 980M KRS00356
Component
Diesel Engine
Fluid
SHELL RIMULA SUPER SAE 15W40 (--- GAL)

Sample Rating Trend



FUEL



DIAGNOSIS

Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

Light fuel dilution occurring. No other contaminants were detected 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 | | WC0919979 | WC0920007 | --- |
| Sample Date | Client Info | | 03 Jun 2024 | 01 Apr 2024 | --- |
| Machine Age | hrs | Client Info | 11913 | 11592 | --- |
| Oil Age | hrs | Client Info | 250 | 500 | --- |
| Oil Changed | Client Info | | N/A | Changed | --- |
| Sample Status | | | ABNORMAL | ABNORMAL | --- |

CONTAMINATION

| | method | limit/base | current | history1 | history2 |
|--------|-----------|------------|------------|----------|----------|
| Water | WC Method | >0.2 | NEG | NEG | --- |
| Glycol | WC Method | | NEG | NEG | --- |

WEAR METALS

| | method | limit/base | current | history1 | history2 |
|----------|--------|------------------|--------------|----------|----------|
| Iron | ppm | ASTM D5185m >100 | 9 | 5 | --- |
| Chromium | ppm | ASTM D5185m >20 | 0 | 0 | --- |
| Nickel | ppm | ASTM D5185m >2 | 0 | <1 | --- |
| Titanium | ppm | ASTM D5185m >2 | 0 | 0 | --- |
| Silver | ppm | ASTM D5185m >2 | 0 | 0 | --- |
| Aluminum | ppm | ASTM D5185m >25 | 1 | 2 | --- |
| Lead | ppm | ASTM D5185m >40 | <1 | 2 | --- |
| Copper | ppm | ASTM D5185m >330 | 2 | 2 | --- |
| Tin | ppm | ASTM D5185m >15 | <1 | <1 | --- |
| Vanadium | ppm | ASTM D5185m | 0 | 0 | --- |
| Cadmium | ppm | ASTM D5185m | 0 | 0 | --- |

ADDITIVES

| | method | limit/base | current | history1 | history2 |
|------------|--------|------------------|--------------|----------|----------|
| Boron | ppm | ASTM D5185m | 40 | 37 | --- |
| Barium | ppm | ASTM D5185m | <1 | 0 | --- |
| Molybdenum | ppm | ASTM D5185m | 36 | 36 | --- |
| Manganese | ppm | ASTM D5185m | <1 | <1 | --- |
| Magnesium | ppm | ASTM D5185m | 451 | 476 | --- |
| Calcium | ppm | ASTM D5185m 2840 | 1454 | 1598 | --- |
| Phosphorus | ppm | ASTM D5185m 1150 | 869 | 906 | --- |
| Zinc | ppm | ASTM D5185m 1270 | 983 | 1075 | --- |
| Sulfur | ppm | ASTM D5185m 2829 | 2994 | 3288 | --- |

CONTAMINANTS

| | method | limit/base | current | history1 | history2 |
|-----------|--------|-----------------|--------------|----------|----------|
| Silicon | ppm | ASTM D5185m >25 | 5 | 3 | --- |
| Sodium | ppm | ASTM D5185m | 3 | 4 | --- |
| Potassium | ppm | ASTM D5185m >20 | <1 | <1 | --- |
| Fuel | % | ASTM D3524 >5 | ▲ 4.2 | ▲ 5.1 | --- |

INFRA-RED

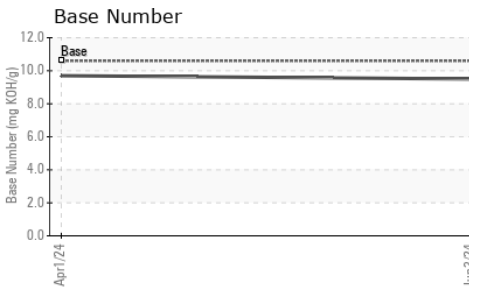
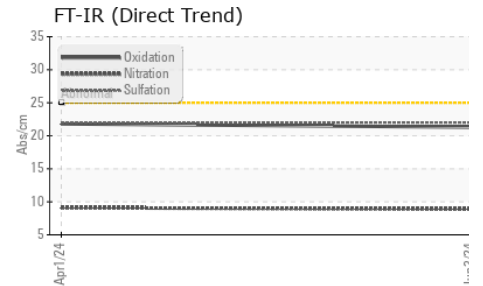
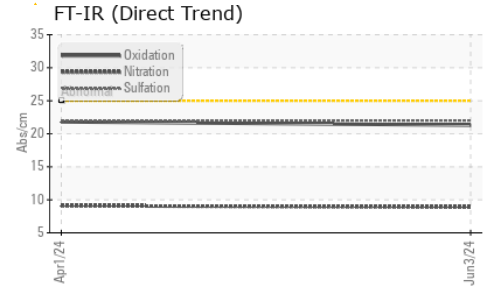
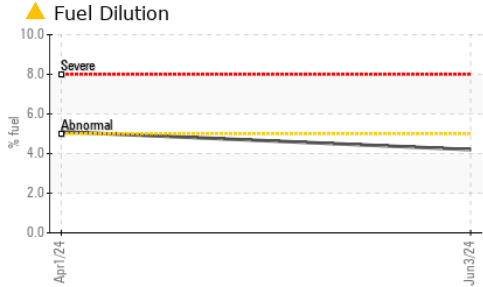
| | method | limit/base | current | history1 | history2 |
|-----------|----------|-----------------|-------------|----------|----------|
| Soot % | % | *ASTM D7844 >3 | 0.2 | 0.2 | --- |
| Nitration | Abs/cm | *ASTM D7624 >20 | 8.9 | 9.1 | --- |
| Sulfation | Abs/.1mm | *ASTM D7415 >30 | 22.0 | 22.0 | --- |

FLUID DEGRADATION

| | method | limit/base | current | history1 | history2 |
|------------------|----------|-----------------|-------------|----------|----------|
| Oxidation | Abs/.1mm | *ASTM D7414 >25 | 21.3 | 21.8 | --- |
| Base Number (BN) | mg KOH/g | ASTM D2896 10.6 | 9.5 | 9.7 | --- |



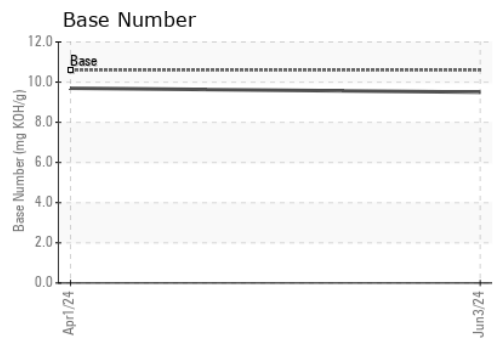
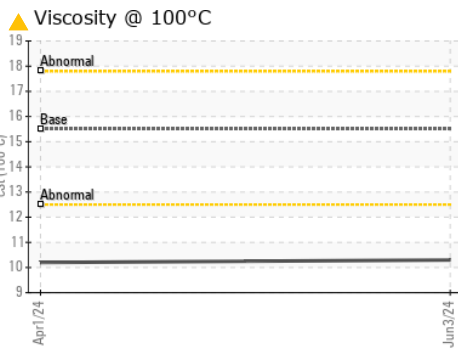
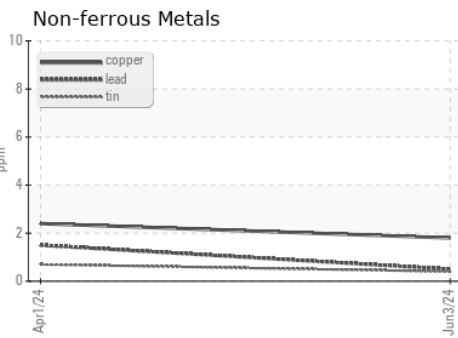
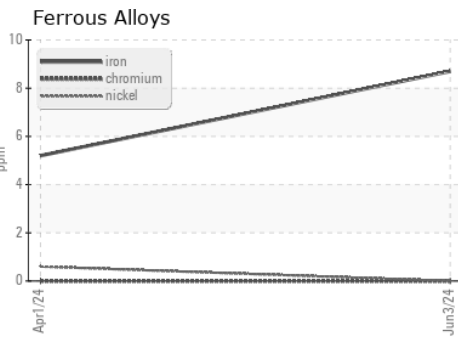
OIL ANALYSIS REPORT



| 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 | >0.2 | NEG | --- |
| Free Water | scalar | *Visual | | NEG | --- |

| FLUID PROPERTIES | method | limit/base | current | history1 | history2 |
|------------------|--------|------------|---------|----------|----------|
| Visc @ 100°C | cSt | ASTM D445 | 15.5 | ▲ 10.3 | ▲ 10.2 |

GRAPHS



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0919979 **Received** : 06 Jun 2024
Lab Number : 06201196 **Tested** : 10 Jun 2024
Unique Number : 11063319 **Diagnosed** : 10 Jun 2024 - Wes Davis
Test Package : CONST (Additional Tests: PercentFuel, TBN)

COVIA - MENOMONIE - 852
 N5628 580TH STREET
 MENOMONIE, WI
 US 54751
 Contact: Jeremy Wagner
 jeremy.wagner@coviacorp.com
 T: (715)235-0942
 F:

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)