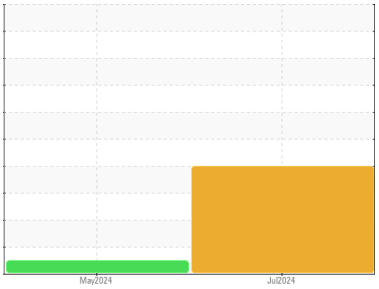
# PROBLEM SUMMARY

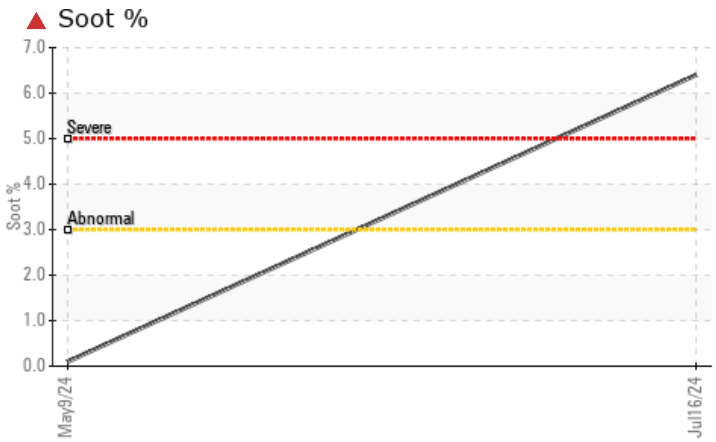
Sample Rating Trend

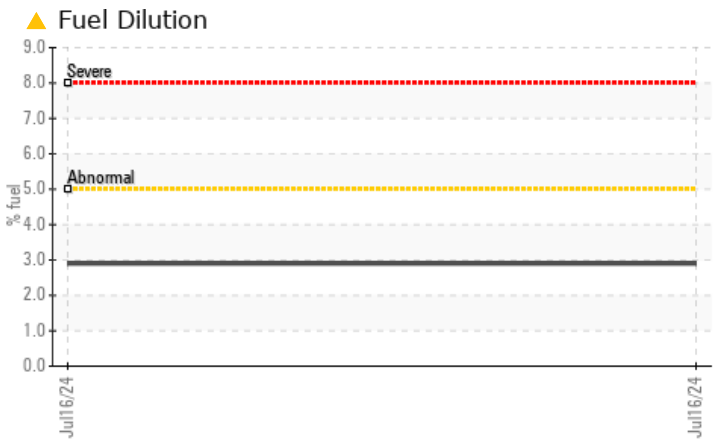



**SOOT**

Machine Id
**915**
Component
**Diesel Engine**
Fluid
**SHELL ROTELLA T 15W40 (--- GAL)**

## COMPONENT CONDITION SUMMARY




## RECOMMENDATION

We advise that you check for faulty combustion, plugged air filters, or aftercoolers. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition. NOTE: High solids (carbon/soot) in the sample have limited the accuracy of Infra-Red data including Total Base Number (TBN) value.

## PROBLEMATIC TEST RESULTS

| Sample Status | | | | SEVERE | NORMAL | --- |
|---|---|---|---|---|---|---|
| Fuel | % | ASTM D3524 | >5 | ▲ 2.9 | <1.0 | --- |
| Soot % | % | *ASTM D7844 | >3 | ▲ 6.4 | 0.1 | --- |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 10.1 | ▲ 0.0 | 8.6 | --- |

**Customer Id:** JERGIL
**Sample No.:** WC0958850
**Lab Number:** 06238737
**Test Package:** FLEET

*To manage this report scan the QR code*

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sfelton@wearcheckusa.com

*To change component or sample information:*
Customer Service +1 1-800-237-1369
customerservice@wearcheck.com

## RECOMMENDED ACTIONS

| Action | Status | Date | Done By | Description |
|---|---|---|---|---|
| Change Fluid | --- | --- | ? | Oil and filter change at the time of sampling has been noted. |
| Change Filter | --- | --- | ? | Oil and filter change at the time of sampling has been noted. |
| Resample | --- | --- | ? | We recommend an early resample to monitor this condition. |
| Alert | --- | --- | ? | NOTE: High solids (carbon/soot) in the sample have limited the accuracy of Infra-Red data including Total Base Number (TBN) value. |
| Check Combustion | --- | --- | ? | We advise that you check for faulty combustion, plugged air filters, or aftercoolers. |

## HISTORICAL DIAGNOSIS

NORMAL

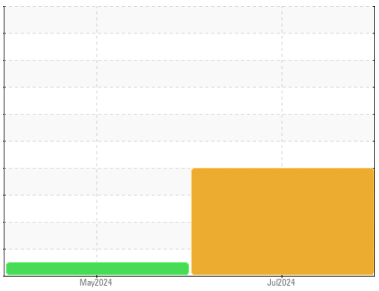
**09 May 2024 Diag: Angela Borella**

Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

**view report**

# OIL ANALYSIS REPORT

Sample Rating Trend




SOOT

Machine Id
**915**
Component
**Diesel Engine**
Fluid
**SHELL ROTELLA T 15W40 (--- GAL)**

## DIAGNOSIS

**Recommendation**
We advise that you check for faulty combustion, plugged air filters, or aftercoolers. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition. NOTE: High solids (carbon/soot) in the sample have limited the accuracy of Infra-Red data including Total Base Number (TBN) value.

**Wear**
All component wear rates are normal.

**Contamination**
There is an abnormal amount of solids and carbon present in the oil. Light fuel dilution occurring.

**Fluid Condition**
The oil is no longer serviceable due to the presence of contaminants.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **WC0958850** | WC0934099 | --- |
| Sample Date | | Client Info | | **16 Jul 2024** | 09 May 2024 | --- |
| Machine Age | mls | Client Info | | **31350** | 980000 | --- |
| Oil Age | mls | Client Info | | **11000** | 11375 | --- |
| Oil Changed | | Client Info | | **Changed** | Changed | --- |
| Sample Status | | | | **SEVERE** | NORMAL | --- |

| 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 | **20** | 2 | --- |
| Chromium | ppm | ASTM D5185m | >20 | **2** | <1 | --- |
| Nickel | ppm | ASTM D5185m | >4 | **<1** | 0 | --- |
| Titanium | ppm | ASTM D5185m | | **<1** | <1 | --- |
| Silver | ppm | ASTM D5185m | >3 | **<1** | 0 | --- |
| Aluminum | ppm | ASTM D5185m | >20 | **2** | 2 | --- |
| Lead | ppm | ASTM D5185m | >40 | **<1** | 0 | --- |
| Copper | ppm | ASTM D5185m | >330 | **<1** | <1 | --- |
| Tin | ppm | ASTM D5185m | >15 | **<1** | <1 | --- |
| Vanadium | ppm | ASTM D5185m | | **<1** | <1 | --- |
| Cadmium | ppm | ASTM D5185m | | **<1** | <1 | --- |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 316 | **60** | 0 | --- |
| Barium | ppm | ASTM D5185m | 0.0 | **0** | 0 | --- |
| Molybdenum | ppm | ASTM D5185m | 1.2 | **27** | 55 | --- |
| Manganese | ppm | ASTM D5185m | | **<1** | 0 | --- |
| Magnesium | ppm | ASTM D5185m | 24 | **281** | 898 | --- |
| Calcium | ppm | ASTM D5185m | 2292 | **1809** | 1084 | --- |
| Phosphorus | ppm | ASTM D5185m | 1064 | **1010** | 1063 | --- |
| Zinc | ppm | ASTM D5185m | 1160 | **1180** | 1180 | --- |
| Sulfur | ppm | ASTM D5185m | 4996 | **3079** | 3417 | --- |

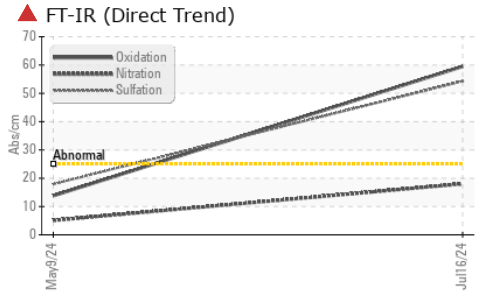
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **6** | 4 | --- |
| Sodium | ppm | ASTM D5185m | | **1** | 2 | --- |
| Potassium | ppm | ASTM D5185m | >20 | **5** | 2 | --- |
| Fuel | % | ASTM D3524 | >5 | ▲ **2.9** | <1.0 | --- |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >3 | ▲ **6.4** | 0.1 | --- |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **18.0** | 5.1 | --- |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **54.3** | 17.9 | --- |

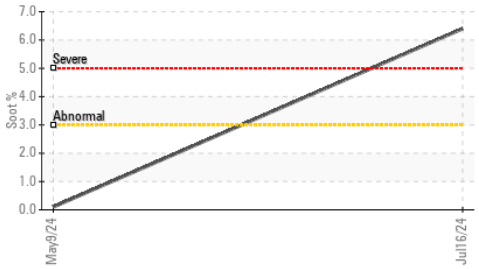
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **59.5** | 13.8 | --- |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 10.1 | ▲ **0.0** | 8.6 | --- |

# OIL ANALYSIS REPORT

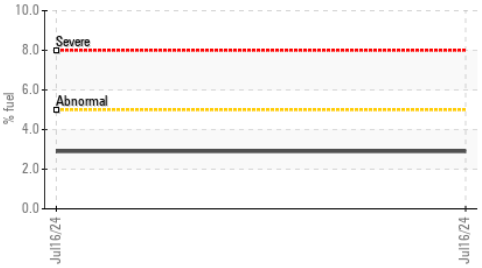
FT-IR (Direct Trend)



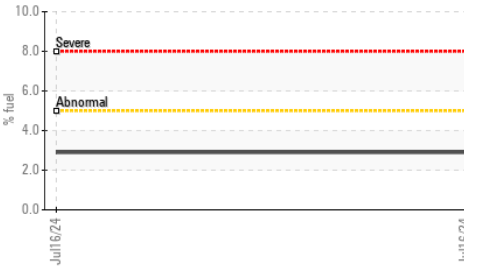

Soot %



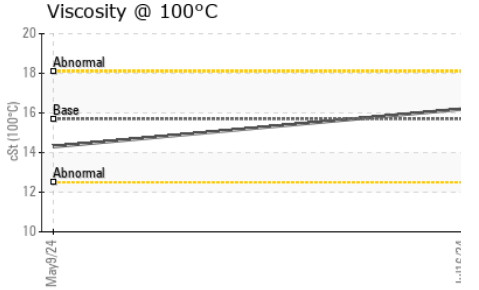

Fuel Dilution




Fuel Dilution




Viscosity @ 100°C

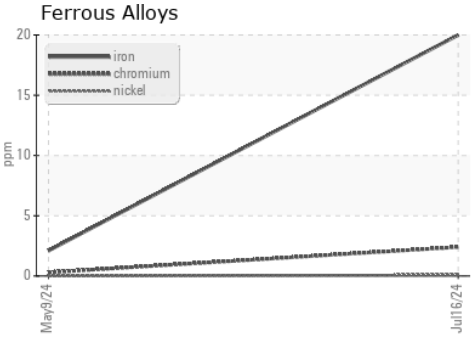



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | --- |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | --- |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | --- |
| Silt | scalar | *Visual | NONE | **NONE** | NONE | --- |
| Debris | scalar | *Visual | NONE | **NONE** | NONE | --- |
| Sand/Dirt | scalar | *Visual | NONE | **NONE** | NONE | --- |
| Appearance | scalar | *Visual | NORML | **NORML** | NORML | --- |
| Odor | scalar | *Visual | NORML | **NORML** | NORML | --- |
| Emulsified Water | scalar | *Visual | >0.2 | **NEG** | NEG | --- |
| Free Water | scalar | *Visual | | **NEG** | NEG | --- |

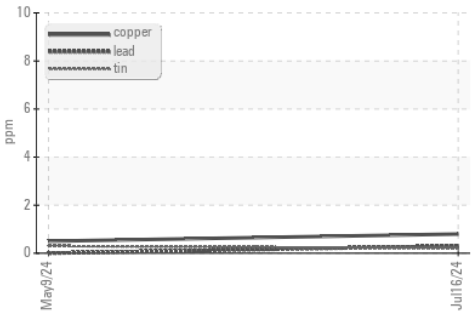
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.7 | **16.2** | 14.3 | --- |

## GRAPHS

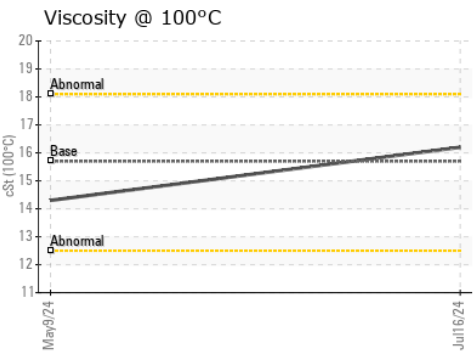
Ferrous Alloys



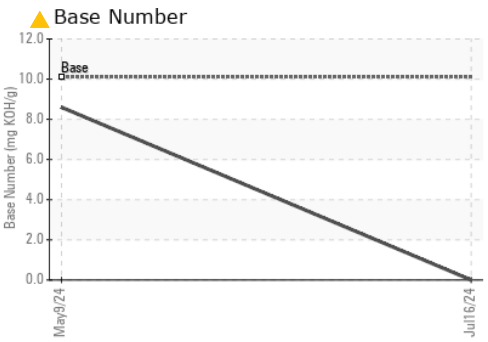

Non-ferrous Metals




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : WC0958850 **Received** : 16 Jul 2024
**Lab Number** : 06238737 **Tested** : 18 Jul 2024
**Unique Number** : 11127571 **Diagnosed** : 18 Jul 2024 - Sean Felton
**Test Package** : FLEET ( Additional Tests: FuelDilution, PercentFuel )

*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)*

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