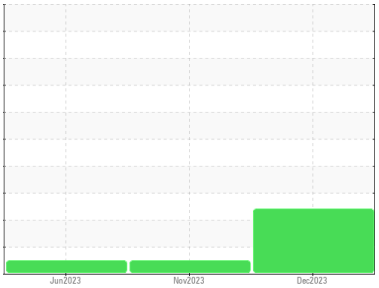
# PROBLEM SUMMARY

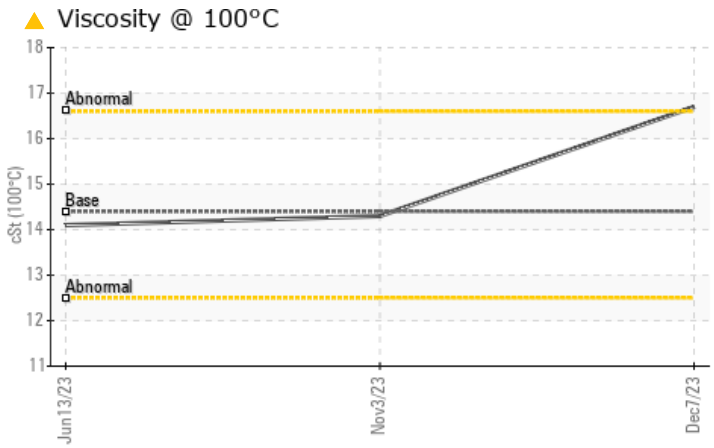
Area
**{UNASSIGNED}**
Machine Id
**2445**
Component
**Diesel Engine**
Fluid
**DIESEL ENGINE OIL SAE 40 (60 QTS)**

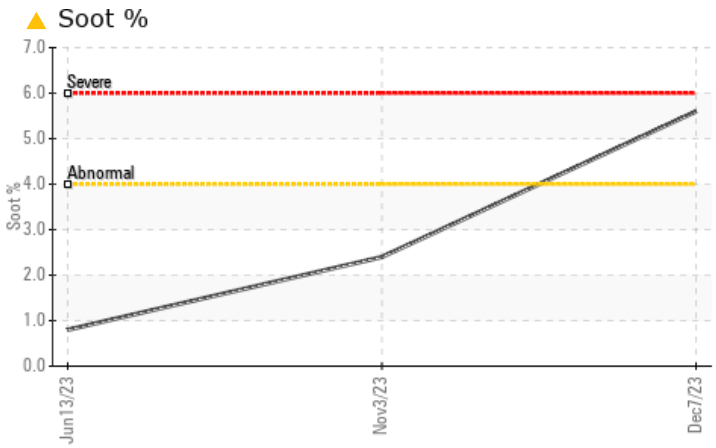
**Sample Rating Trend**




**DEGRADATION**

## 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. Resample at the next service interval to monitor. 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 | | | | **ABNORMAL** | NORMAL | NORMAL |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >4 | ▲ **5.6** | 2.4 | 0.8 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 8.5 | ▲ **0.0** | 8.1 | 7.7 |
| Visc @ 100°C | cSt | ASTM D445 | 14.4 | ▲ **16.7** | 14.3 | 14.1 |

**Customer Id:** GFL005
**Sample No.:** GFL0092678
**Lab Number:** 06032161
**Test Package:** FLEET

*To manage this report scan the QR code*

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jhester@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. |
| 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

**03 Nov 2023 Diag: Wes Davis**

NORMAL

Resample at the next service interval to monitor. Please specify the brand, type, and viscosity of the oil on your next sample.Metal levels are typical for a new component breaking in. Elevated aluminum (Al) and/or lead (Pb) and potassium (K) levels in your metals analysis are likely a result of solder flux release into the lubricant and is common on new equipment/components. 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 suitable for further service.

**view report**

**13 Jun 2023 Diag: Don Baldridge**

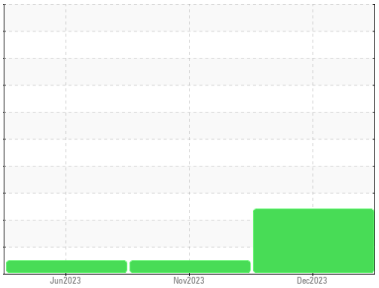
NORMAL

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 suitable for further service.

**view report**

# OIL ANALYSIS REPORT

Sample Rating Trend




**DEGRADATION**

Area
**{UNASSIGNED}**
Machine Id
**2445**
Component
**Diesel Engine**
Fluid
**DIESEL ENGINE OIL SAE 40 (60 QTS)**

## 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. Resample at the next service interval to monitor. 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.

**Fluid Condition**

The oil viscosity is higher than normal. The BN level is low.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **GFL0092678** | GFL0092712 | GFL0072396 |
| Sample Date | | Client Info | | **07 Dec 2023** | 03 Nov 2023 | 13 Jun 2023 |
| Machine Age | hrs | Client Info | | **32603** | 332 | 32603 |
| Oil Age | hrs | Client Info | | **721** | 332 | 686 |
| Oil Changed | | Client Info | | **Changed** | Not Changd | Changed |
| Sample Status | | | | **ABNORMAL** | NORMAL | NORMAL |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Fuel | | WC Method | >3.0 | **<1.0** | <1.0 | <1.0 |
| Water | | WC Method | >0.2 | **NEG** | NEG | NEG |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >120 | **63** | 33 | 6 |
| Chromium | ppm | ASTM D5185m | >20 | **2** | 1 | <1 |
| Nickel | ppm | ASTM D5185m | >5 | **<1** | <1 | <1 |
| Titanium | ppm | ASTM D5185m | >2 | **0** | 0 | 0 |
| Silver | ppm | ASTM D5185m | >2 | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >20 | **4** | 5 | 4 |
| Lead | ppm | ASTM D5185m | >40 | **6** | 2 | 1 |
| Copper | ppm | ASTM D5185m | >330 | **24** | 11 | 11 |
| Tin | ppm | ASTM D5185m | >15 | **2** | 1 | 2 |
| Vanadium | ppm | ASTM D5185m | | **0** | 0 | <1 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 250 | **8** | 10 | 116 |
| Barium | ppm | ASTM D5185m | 10 | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 100 | **63** | 64 | 78 |
| Manganese | ppm | ASTM D5185m | | **1** | <1 | 1 |
| Magnesium | ppm | ASTM D5185m | 450 | **864** | 924 | 209 |
| Calcium | ppm | ASTM D5185m | 3000 | **1259** | 1219 | 2006 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **1011** | 1055 | 1065 |
| Zinc | ppm | ASTM D5185m | 1350 | **1289** | 1332 | 1298 |
| Sulfur | ppm | ASTM D5185m | 4250 | **2854** | 3136 | 4684 |

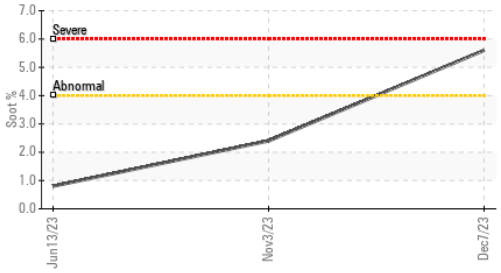
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **7** | 6 | 7 |
| Sodium | ppm | ASTM D5185m | >216 | **20** | 6 | 14 |
| Potassium | ppm | ASTM D5185m | >20 | **24** | 12 | 18 |
| Glycol | % | *ASTM D2982 | | **NEG** | NEG | NEG |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >4 | **5.6** | 2.4 | 0.8 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **13.5** | 9.2 | 7.0 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **30.6** | 22.7 | 19.4 |

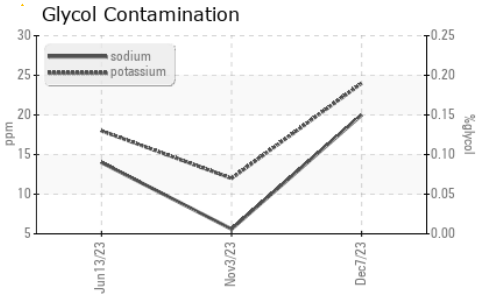
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **18.3** | 14.8 | 14.4 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 8.5 | **0.0** | 8.1 | 7.7 |

# OIL ANALYSIS REPORT

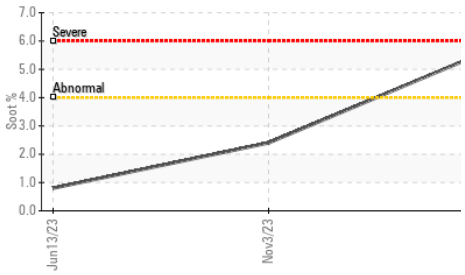
Soot %



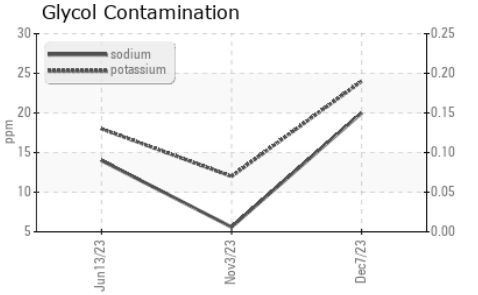

Glycol Contamination




Soot %




Glycol Contamination

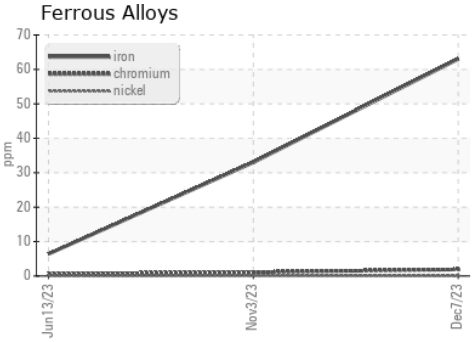



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

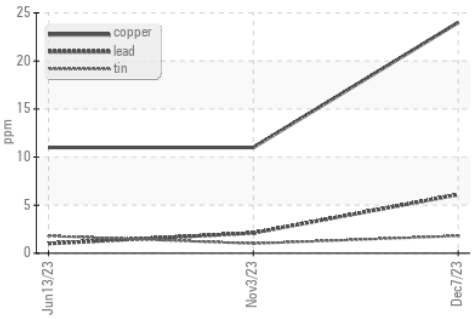
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 14.4 | ▲ **16.7** | 14.3 | 14.1 |

## GRAPHS

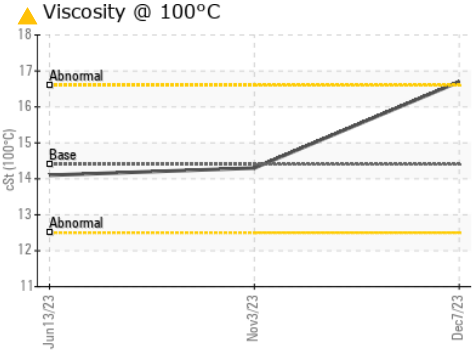
Ferrous Alloys



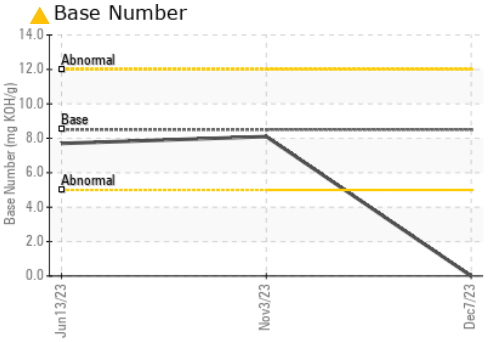

Non-ferrous Metals




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : GFL0092678 **Received** : 12 Dec 2023
**Lab Number** : 06032161 **Diagnosed** : 14 Dec 2023
**Unique Number** : 10781952 **Diagnostician** : Jonathan Hester
**Test Package** : FLEET ( Additional Tests: Glycol )

*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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