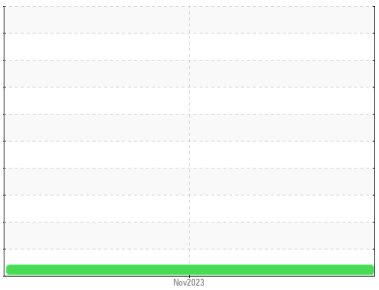
# OIL ANALYSIS REPORT

Sample Rating Trend




**VISCOSITY**

Machine Id
## MACK ANTHEM 5595 (S/N 1376760)
Component
**Diesel Engine**
Fluid
**SHELL ROTELLA T 15W40 (--- GAL)**

## DIAGNOSIS

**Recommendation**

Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

**Wear**

Metal levels are typical for a new component breaking in.

**Contamination**

Fuel content negligible. 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.

**Fluid Condition**

The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **WC0850991** | --- | --- |
| Sample Date | | Client Info | | **17 Nov 2023** | --- | --- |
| Machine Age | mls | Client Info | | **38921** | --- | --- |
| Oil Age | mls | Client Info | | **0** | --- | --- |
| Oil Changed | | Client Info | | **Changed** | --- | --- |
| Sample Status | | | | **ATTENTION** | --- | --- |

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

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >120 | **74** | --- | --- |
| Chromium | ppm | ASTM D5185m | >20 | **2** | --- | --- |
| Nickel | ppm | ASTM D5185m | >5 | **3** | --- | --- |
| Titanium | ppm | ASTM D5185m | >2 | **<1** | --- | --- |
| Silver | ppm | ASTM D5185m | >2 | **0** | --- | --- |
| Aluminum | ppm | ASTM D5185m | >20 | **21** | --- | --- |
| Lead | ppm | ASTM D5185m | >40 | **3** | --- | --- |
| Copper | ppm | ASTM D5185m | >330 | **195** | --- | --- |
| Tin | ppm | ASTM D5185m | >15 | **7** | --- | --- |
| Vanadium | ppm | ASTM D5185m | | **0** | --- | --- |
| Cadmium | ppm | ASTM D5185m | | **0** | --- | --- |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 316 | **18** | --- | --- |
| Barium | ppm | ASTM D5185m | 0.0 | **0** | --- | --- |
| Molybdenum | ppm | ASTM D5185m | 1.2 | **104** | --- | --- |
| Manganese | ppm | ASTM D5185m | | **4** | --- | --- |
| Magnesium | ppm | ASTM D5185m | 24 | **608** | --- | --- |
| Calcium | ppm | ASTM D5185m | 2292 | **1649** | --- | --- |
| Phosphorus | ppm | ASTM D5185m | 1064 | **746** | --- | --- |
| Zinc | ppm | ASTM D5185m | 1160 | **979** | --- | --- |
| Sulfur | ppm | ASTM D5185m | 4996 | **2186** | --- | --- |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **26** | --- | --- |
| Sodium | ppm | ASTM D5185m | | **6** | --- | --- |
| Potassium | ppm | ASTM D5185m | >20 | **62** | --- | --- |
| Fuel | % | ASTM D3524 | >3.0 | **0.9** | --- | --- |

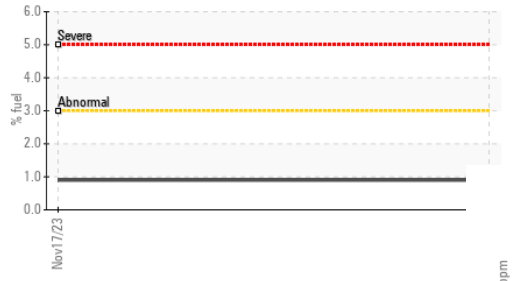
| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >4 | **0.7** | --- | --- |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **13.5** | --- | --- |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **26.6** | --- | --- |

| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **27.9** | --- | --- |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 10.1 | **4.9** | --- | --- |

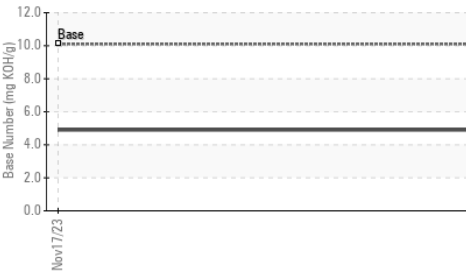
# OIL ANALYSIS REPORT

Fuel Dilution


Fuel Dilution




Base Number

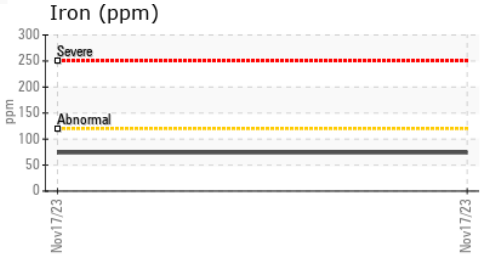



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | --- | --- |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | --- | --- |
| Precipitate | scalar | *Visual | NONE | **NONE** | --- | --- |
| Silt | 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** | --- | --- |

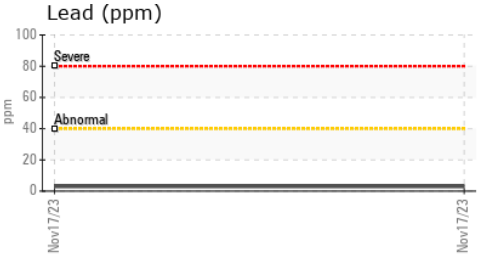
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.7 | ▲ **10.4** | --- | --- |

## GRAPHS

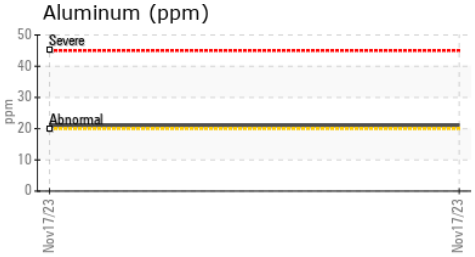
Iron (ppm)



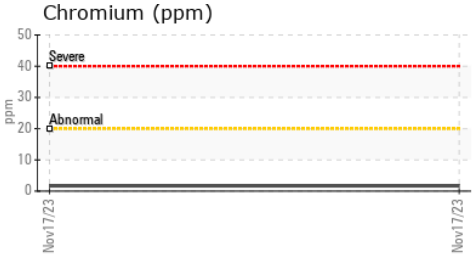

Lead (ppm)



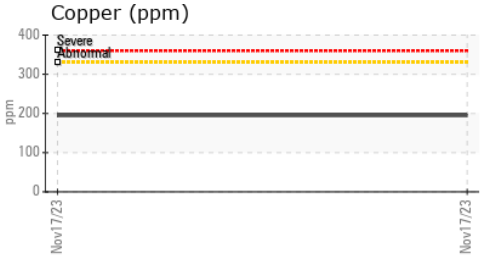

Aluminum (ppm)



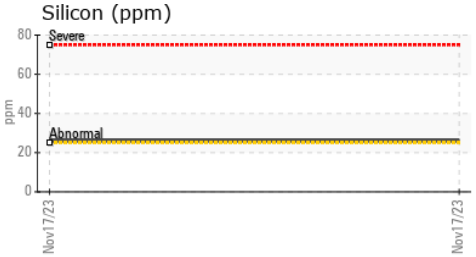

Chromium (ppm)



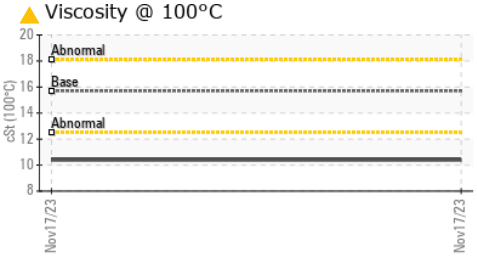

Copper (ppm)



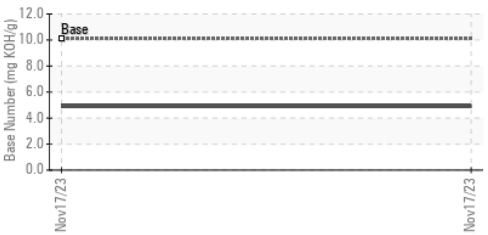

Silicon (ppm)




▲ Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : WC0850991 **Received** : 21 Nov 2023
**Lab Number** : 06014490 **Diagnosed** : 27 Nov 2023
**Unique Number** : 10753634 **Diagnostician** : Jonathan Hester
**Test Package** : MOB 1 ( Additional Tests: FuelDilution, PercentFuel, TBN )

*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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