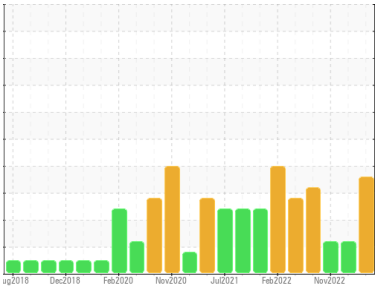
# OIL ANALYSIS REPORT

Sample Rating Trend



**FUEL**

Area
## GUAY SON [CONHER]
Machine Id
## IBACO BM ISMAR 6
Component
**Diesel Engine**
Fluid
**Diesel Engine Oil (--- LTR)**

## DIAGNOSIS

**Recommendation**
We advise that you check the fuel injection system. Resample at the next service interval to monitor.

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

**Contamination**
There is a high amount of particulates present in the oil. There is a moderate amount of fuel present in the oil.

**Fluid Condition**
Fuel is present in the oil and is lowering the viscosity. The BN result indicates that there is suitable alkalinity remaining in the oil.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **KL0011411** | KL0010247 | KL0011220 |
| Sample Date | | Client Info | | **30 Mar 2023** | 24 Feb 2023 | 12 Nov 2022 |
| Machine Age | hrs | Client Info | | **13732** | 13361 | 12137 |
| Oil Age | hrs | Client Info | | **1595** | 1224 | 862 |
| Oil Changed | | Client Info | | **Not Changd** | Not Changd | Not Changd |
| Sample Status | | | | **ABNORMAL** | ABNORMAL | ABNORMAL |

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

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >100 | **17** | 16 | 31 |
| Chromium | ppm | ASTM D5185m | >20 | **<1** | <1 | 2 |
| Nickel | ppm | ASTM D5185m | >2 | **0** | <1 | <1 |
| Titanium | ppm | ASTM D5185m | >2 | **0** | 0 | <1 |
| Silver | ppm | ASTM D5185m | >2 | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >25 | **<1** | 2 | 3 |
| Lead | ppm | ASTM D5185m | >40 | **1** | <1 | 2 |
| Copper | ppm | ASTM D5185m | >330 | **171** | 171 | 86 |
| Tin | ppm | ASTM D5185m | >15 | **<1** | <1 | 1 |
| Vanadium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

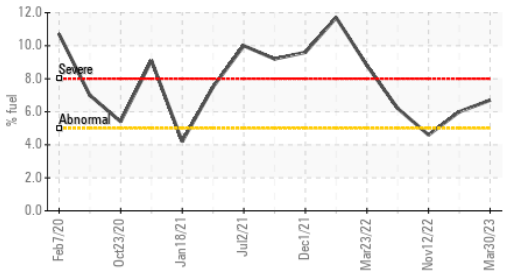
| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | | **2** | 9 | 230 |
| Barium | ppm | ASTM D5185m | | **0** | <1 | 0 |
| Molybdenum | ppm | ASTM D5185m | | **4** | 4 | 111 |
| Manganese | ppm | ASTM D5185m | | **<1** | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | | **18** | 18 | 463 |
| Calcium | ppm | ASTM D5185m | | **2934** | 2864 | 1603 |
| Phosphorus | ppm | ASTM D5185m | | **860** | 1107 | 822 |
| Zinc | ppm | ASTM D5185m | | **1081** | 1309 | 1010 |
| Sulfur | ppm | ASTM D5185m | | **3596** | 4276 | 3932 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **7** | 8 | 19 |
| Sodium | ppm | ASTM D5185m | | **1** | 2 | 4 |
| Potassium | ppm | ASTM D5185m | >20 | **2** | 2 | <1 |
| Fuel | % | ASTM D3524 | >5 | ▲ **6.7** | ▲ 6.0 | ▲ 4.6 |

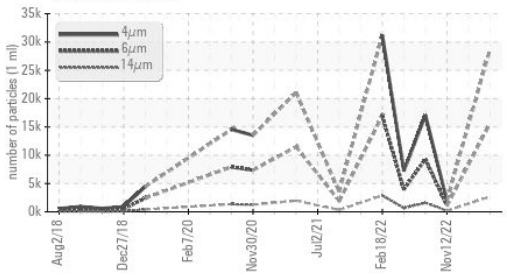
| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >3 | **0.3** | 0.4 | 0.5 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **8.3** | 8.0 | 9.8 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **18.0** | 17.5 | 23.0 |

# OIL ANALYSIS REPORT

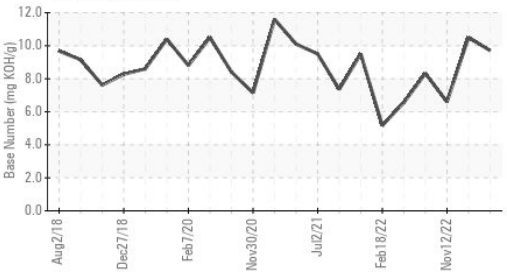
Fuel Dilution



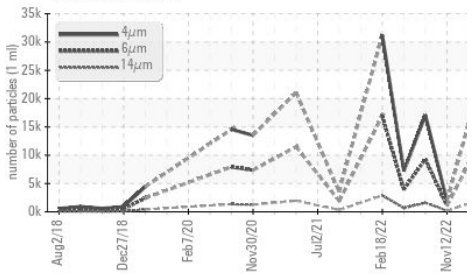

Particle Trend



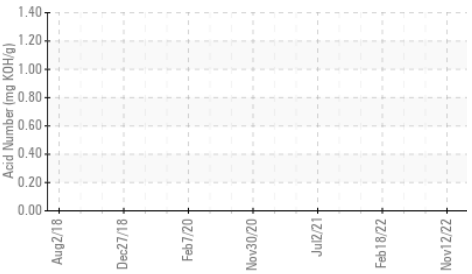

Base Number




Particle Trend




Acid Number




| FLUID CLEANLINESS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Particles >4µm | | ASTM D7647 | | **28770** | --- | 1968 |
| Particles >6µm | | ASTM D7647 | >5000 | ▲ **15673** | --- | 1072 |
| Particles >14µm | | ASTM D7647 | >640 | ▲ **2667** | --- | 182 |
| Particles >21µm | | ASTM D7647 | >160 | ▲ **898** | --- | 61 |
| Particles >38µm | | ASTM D7647 | >40 | ▲ **139** | --- | 9 |
| Particles >71µm | | ASTM D7647 | >10 | ▲ **14** | --- | 1 |
| Oil Cleanliness | | ISO 4406 (c) | >19/16 | ▲ **21/19** | --- | 17/15 |

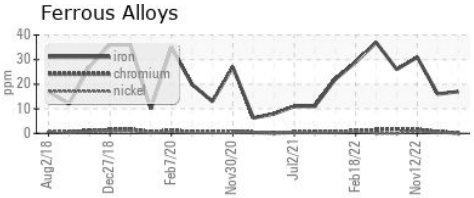
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **10.5** | 9.1 | 19.3 |
| Acid Number (AN) | mg KOH/g | ASTM D8045 | | **1.25** | --- | --- |
| Base Number (BN) | mg KOH/g | ASTM D2896 | | **9.71** | 10.5 | 6.60 |

| 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 |

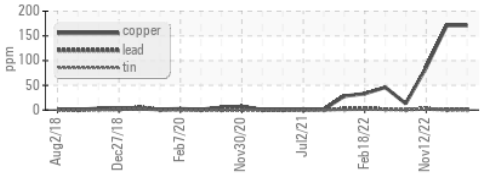
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | | ▲ **11.0** | ▲ 11.1 | ▲ 12.4 |

## GRAPHS

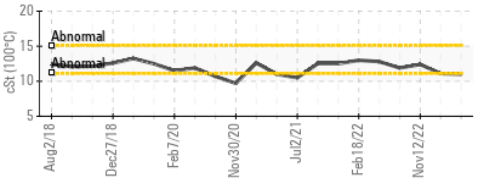
Ferrous Alloys



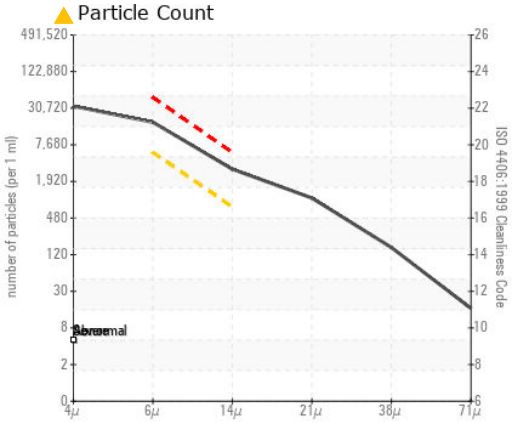

Non-ferrous Metals



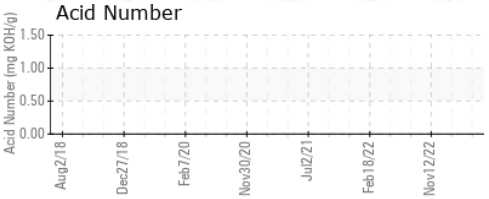

Viscosity @ 100°C




Particle Count




Acid Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : KL0011411 **Received** : 14 Apr 2023
**Lab Number** : 05821119 **Diagnosed** : 19 Apr 2023
**Unique Number** : 10429202 **Diagnostician** : Jonathan Hester
**Test Package** : MOB 2 ( Additional Tests: PercentFuel, PrtCount )

*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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