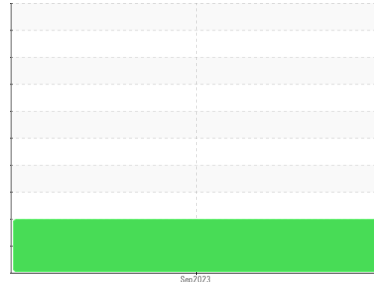




PROBLEM SUMMARY

Sample Rating Trend



ISO



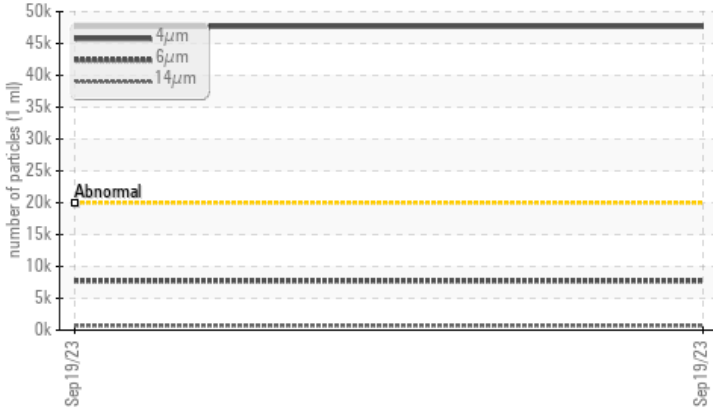
Machine Id
141701

Component
Hydraulic System

Fluid
LIEBHERR HYDRAULIC 37 (--- GAL)

COMPONENT CONDITION SUMMARY

▲ Particle Trend



RECOMMENDATION

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

PROBLEMATIC TEST RESULTS

| Sample Status | | | ABNORMAL | --- | --- |
|-----------------|--------------|-----------|-------------------|-----|-----|
| Particles >4µm | ASTM D7647 | >20000 | ▲ 47671 | --- | --- |
| Particles >6µm | ASTM D7647 | >5000 | ▲ 7739 | --- | --- |
| Particles >14µm | ASTM D7647 | >640 | ▲ 706 | --- | --- |
| Particles >21µm | ASTM D7647 | >160 | ▲ 262 | --- | --- |
| Oil Cleanliness | ISO 4406 (c) | >21/19/16 | ▲ 23/20/17 | --- | --- |

Customer Id: LIEHIA
Sample No.: LM05962538
Lab Number: 05962538
Test Package: CONST



To manage this report scan the QR code

To discuss the diagnosis or test data:
Jonathan Hester +1 919-379-4092 x4092
jhester@wearcheckusa.com

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

RECOMMENDED ACTIONS

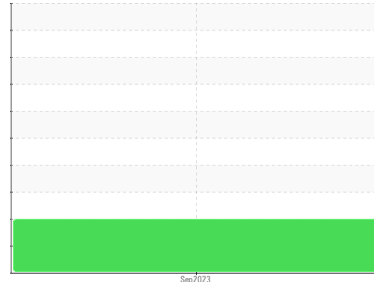
There are no recommended actions for this sample.

HISTORICAL DIAGNOSIS



OIL ANALYSIS REPORT

Sample Rating Trend



ISO

Machine Id
141701

Component
Hydraulic System

Fluid
LIEBHERR HYDRAULIC 37 (--- GAL)

DIAGNOSIS

▲ Recommendation

The filter change at the time of sampling has been noted. 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.

Fluid Condition

The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

SAMPLE INFORMATION

| method | limit/base | current | history1 | history2 |
|---------------|-----------------|--------------------|----------|----------|
| Sample Number | Client Info | LM05962538 | --- | --- |
| Sample Date | Client Info | 19 Sep 2023 | --- | --- |
| Machine Age | hrs Client Info | 9916 | --- | --- |
| Oil Age | hrs Client Info | 0 | --- | --- |
| Oil Changed | Client Info | Not Changed | --- | --- |
| Sample Status | | ABNORMAL | --- | --- |

WEAR METALS

| method | limit/base | current | history1 | history2 |
|--------------------------|------------|--------------|----------|----------|
| Iron ppm ASTM D5185m | >20 | 3 | --- | --- |
| Chromium ppm ASTM D5185m | >10 | 0 | --- | --- |
| Nickel ppm ASTM D5185m | >10 | <1 | --- | --- |
| Titanium ppm ASTM D5185m | | 0 | --- | --- |
| Silver ppm ASTM D5185m | | 0 | --- | --- |
| Aluminum ppm ASTM D5185m | >10 | 0 | --- | --- |
| Lead ppm ASTM D5185m | >10 | <1 | --- | --- |
| Copper ppm ASTM D5185m | >75 | 7 | --- | --- |
| Tin ppm ASTM D5185m | >10 | <1 | --- | --- |
| Vanadium ppm ASTM D5185m | | 0 | --- | --- |
| Cadmium ppm ASTM D5185m | | 0 | --- | --- |

ADDITIVES

| method | limit/base | current | history1 | history2 |
|----------------------------|------------|--------------|----------|----------|
| Boron ppm ASTM D5185m | | 0 | --- | --- |
| Barium ppm ASTM D5185m | | 0 | --- | --- |
| Molybdenum ppm ASTM D5185m | | 0 | --- | --- |
| Manganese ppm ASTM D5185m | | 0 | --- | --- |
| Magnesium ppm ASTM D5185m | | <1 | --- | --- |
| Calcium ppm ASTM D5185m | | 56 | --- | --- |
| Phosphorus ppm ASTM D5185m | | 274 | --- | --- |
| Zinc ppm ASTM D5185m | | 337 | --- | --- |
| Sulfur ppm ASTM D5185m | | 1247 | --- | --- |

CONTAMINANTS

| method | limit/base | current | history1 | history2 |
|---------------------------|------------|--------------|----------|----------|
| Silicon ppm ASTM D5185m | >20 | <1 | --- | --- |
| Sodium ppm ASTM D5185m | | 0 | --- | --- |
| Potassium ppm ASTM D5185m | >20 | <1 | --- | --- |

FLUID CLEANLINESS

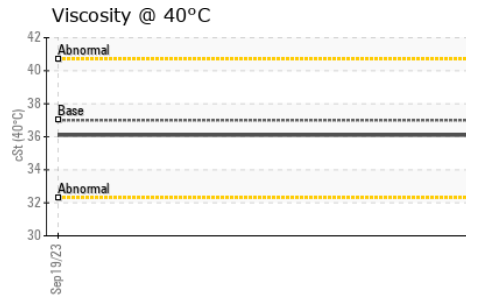
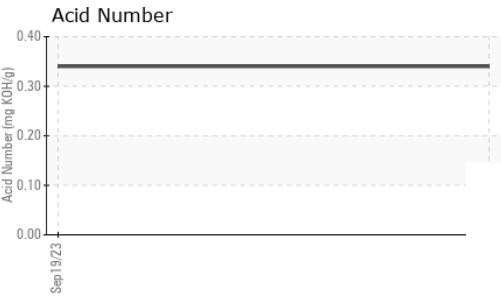
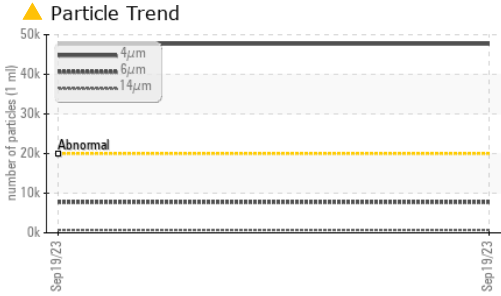
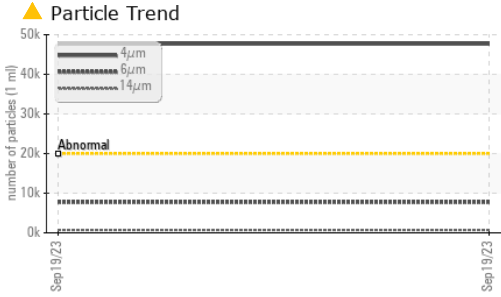
| method | limit/base | current | history1 | history2 |
|------------------------------|------------|-------------------|----------|----------|
| Particles >4µm ASTM D7647 | >20000 | ▲ 47671 | --- | --- |
| Particles >6µm ASTM D7647 | >5000 | ▲ 7739 | --- | --- |
| Particles >14µm ASTM D7647 | >640 | ▲ 706 | --- | --- |
| Particles >21µm ASTM D7647 | >160 | ▲ 262 | --- | --- |
| Particles >38µm ASTM D7647 | >40 | 7 | --- | --- |
| Particles >71µm ASTM D7647 | >10 | 1 | --- | --- |
| Oil Cleanliness ISO 4406 (c) | >21/19/16 | ▲ 23/20/17 | --- | --- |

FLUID DEGRADATION

| method | limit/base | current | history1 | history2 |
|--------------------------------------|------------|-------------|----------|----------|
| Acid Number (AN) mg KOH/g ASTM D8045 | | 0.34 | --- | --- |



OIL ANALYSIS REPORT

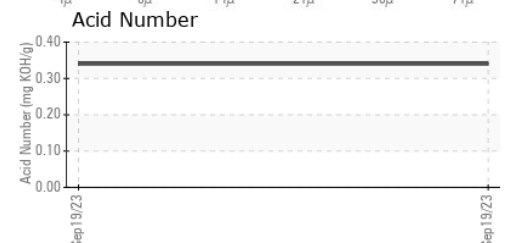
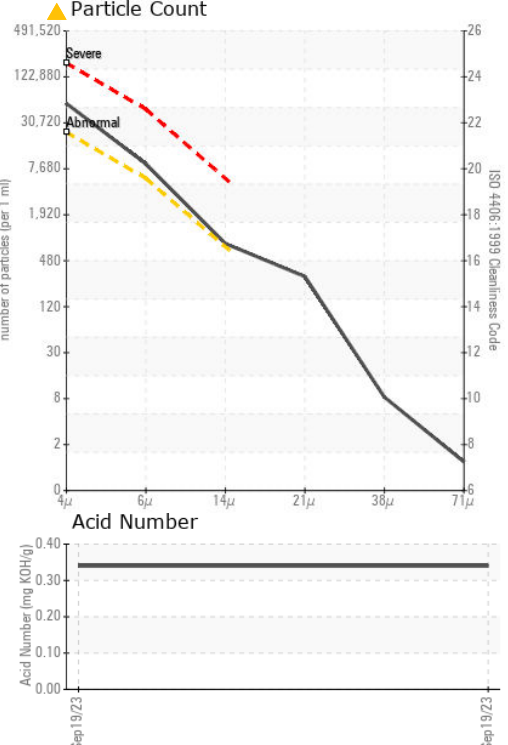
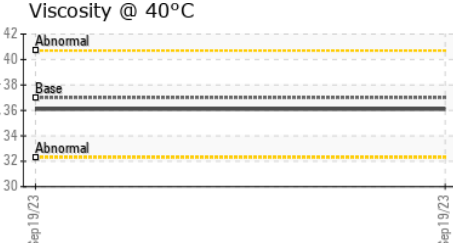
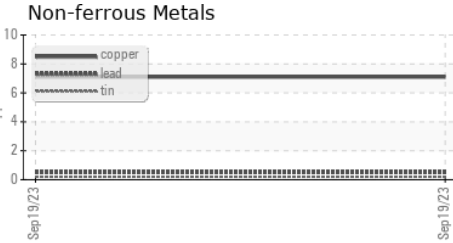
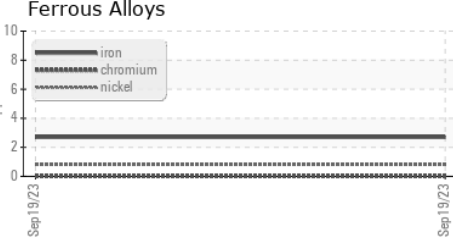


| VISUAL | method | limit/base | current | history1 | history2 |
|------------------|--------|------------|---------|----------|----------|
| White Metal | scalar | *Visual | NONE | NONE | --- |
| Yellow Metal | scalar | *Visual | NONE | NONE | --- |
| Precipitate | scalar | *Visual | NONE | NONE | --- |
| 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 | >0.1 | NEG | --- |
| Free Water | scalar | *Visual | | NEG | --- |

| FLUID PROPERTIES | method | limit/base | current | history1 | history2 |
|------------------|--------|------------|---------|----------|----------|
| Visc @ 40°C | cSt | ASTM D445 | 37 | 36.1 | --- |

| SAMPLE IMAGES | method | limit/base | current | history1 | history2 |
|---------------|--------|------------|---------|----------|----------|
| Color | | | | no image | no image |
| Bottom | | | | no image | no image |

GRAPHS



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : LM05962538 **Received** : 27 Sep 2023
Lab Number : 05962538 **Diagnosed** : 03 Oct 2023
Unique Number : 10669089 **Diagnostician** : Jonathan Hester
Test Package : CONST

LIEBHERR USA CO - Maritime Cranes
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 HIALEAH GARDENS, FL
 US 33018
 Contact: RONNY FUNK
 ronny.funk@liebherr.com
 T: (305)817-7566
 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)