

Machine Id
YANMAR 500-169

Component
Diesel Engine

Fluid
PETRO CANADA DURON SHP 15W40 (--- GAL)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|--------------------|-------------|-------------|------------|--------------------|-------------|-------------|
| Sample Number | Client Info | | | PCA0089594 | PCA0057419 | LWI-259296 |
| Sample Date | Client Info | | | 07 Aug 2023 | 18 Apr 2022 | 15 Dec 2018 |
| Machine Age | hrs | Client Info | | 6285 | 6000 | 5700 |
| Oil Age | hrs | Client Info | | 450 | 500 | 350 |
| Oil Changed | Client Info | | | Changed | Changed | Changed |
| Sample Status | | | | NORMAL | NORMAL | NORMAL |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---------------|-----------|--------|------------|----------------|----------|----------|
| Fuel | WC Method | >4.0 | | <1.0 | <1.0 | <1.0 |
| Glycol | WC Method | | | NEG | NEG | NEG |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|-------------|-----|-------------|------------|--------------|----------|----------|
| Iron | ppm | ASTM D5185m | >80 | 33 | 22 | 25 |
| Chromium | ppm | ASTM D5185m | >6 | <1 | <1 | 0 |
| Nickel | ppm | ASTM D5185m | >2 | <1 | <1 | 0 |
| Titanium | ppm | ASTM D5185m | >2 | 0 | 0 | 0 |
| Silver | ppm | ASTM D5185m | >2 | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >20 | 4 | 3 | 2 |
| Lead | ppm | ASTM D5185m | >95 | 0 | <1 | 0 |
| Copper | ppm | ASTM D5185m | >85 | <1 | <1 | 0 |
| Tin | ppm | ASTM D5185m | >9 | 0 | <1 | 0 |
| Antimony | ppm | ASTM D5185m | | --- | --- | 0 |
| Vanadium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | 0 | 0 | 0 |

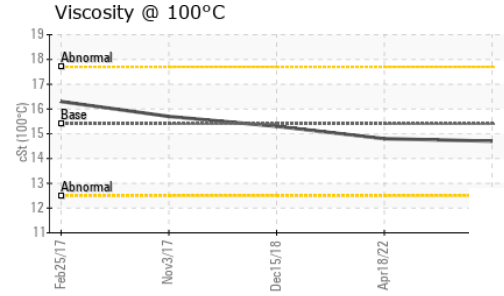
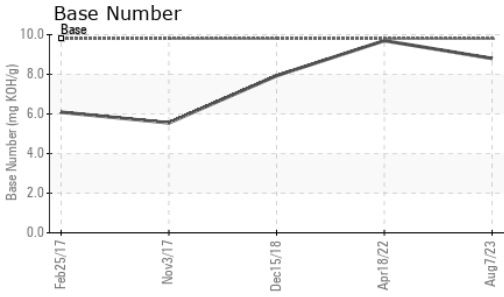
| ADDITIVES | | method | limit/base | current | history1 | history2 |
|------------|-----|-------------|------------|--------------|----------|----------|
| Boron | ppm | ASTM D5185m | 0 | 4 | 5 | 12 |
| Barium | ppm | ASTM D5185m | 0 | 0 | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 60 | 61 | 64 | 64 |
| Manganese | ppm | ASTM D5185m | 0 | <1 | <1 | 0 |
| Magnesium | ppm | ASTM D5185m | 1010 | 935 | 1047 | 989 |
| Calcium | ppm | ASTM D5185m | 1070 | 1209 | 1161 | 1432 |
| Phosphorus | ppm | ASTM D5185m | 1150 | 1050 | 1056 | 1128 |
| Zinc | ppm | ASTM D5185m | 1270 | 1237 | 1281 | 1279 |
| Sulfur | ppm | ASTM D5185m | 2060 | 2869 | 2691 | --- |
| Lithium | ppm | ASTM D5185m | | --- | --- | 0 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|--------------|-----|-------------|------------|----------|----------|----------|
| Silicon | ppm | ASTM D5185m | >25 | 7 | 6 | 6 |
| Sodium | ppm | ASTM D5185m | | 0 | 2 | 3 |
| Potassium | ppm | ASTM D5185m | >20 | 1 | <1 | 1 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|-----------|----------|-------------|------------|-------------|----------|----------|
| Soot % | % | *ASTM D7844 | | 0.6 | 0.5 | --- |
| Nitration | Abs/cm | *ASTM D7624 | >20 | 7.8 | 9.0 | 8 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 18.7 | 19.9 | --- |

| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|-------------------|----------|-------------|------------|-------------|----------|----------|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 14.6 | 16.3 | 12 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | 8.8 | 9.7 | 7.93 |

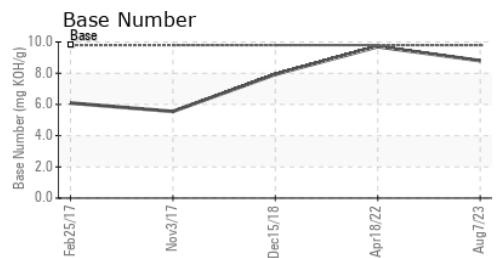
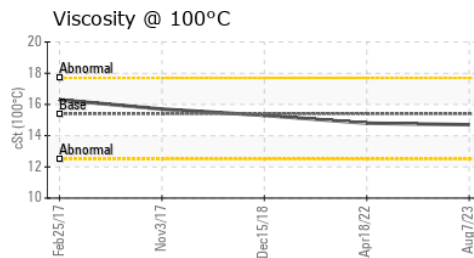
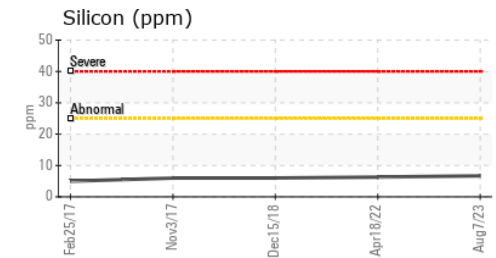
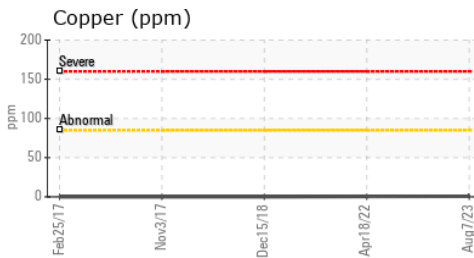
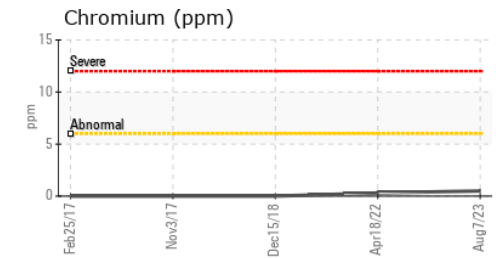
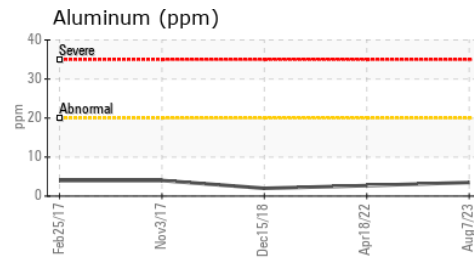
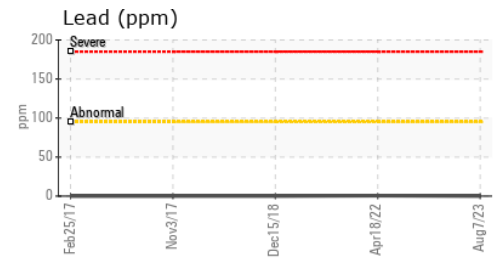
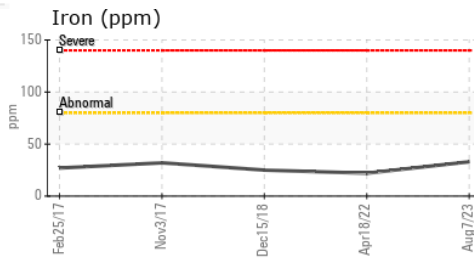
OIL ANALYSIS REPORT



| 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 @ 100°C | cSt | ASTM D445 | 15.4 | 14.7 | 14.8 | 15.3 |

GRAPHS



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : PCA0089594 **Received** : 15 Aug 2023
Lab Number : 05924657 **Diagnosed** : 15 Aug 2023
Unique Number : 10604604 **Diagnostician** : Wes Davis
Test Package : MOB 1 (Additional Tests: TBN)

GE MARSHALL EXCAVATION
 1351 JOLIET RD
 VALPARAISO, IN
 US 46385
 Contact: MARK STEFFEL
 mark.steffel@gemarshall.com

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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F: