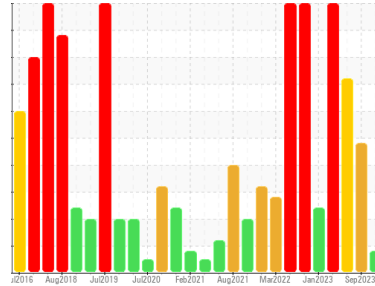


OIL ANALYSIS REPORT



Area
KEMP QUARRIES / RIVER VALLEY ARKOMA
Machine Id
WL108
Component
Diesel Engine
Fluid
PETRO CANADA DURON SHP 15W40 (--- GAL)

Sample Rating Trend



SOOT



DIAGNOSIS

▲ Recommendation

Oil and 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 an abnormal amount of solids and carbon present 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 | | PCA0084174 | PCA0083945 | PCA0084137 |
| Sample Date | Client Info | | 29 Oct 2023 | 08 Sep 2023 | 04 Aug 2023 |
| Machine Age | hrs | Client Info | 47123 | 46766 | 46129 |
| Oil Age | hrs | Client Info | 0 | 46129 | 45601 |
| Oil Changed | Client Info | | Changed | Changed | Changed |
| Sample Status | | | ABNORMAL | SEVERE | SEVERE |

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 | 25 | 37 | 37 |
| Chromium | ppm | ASTM D5185m >20 | <1 | <1 | <1 |
| Nickel | ppm | ASTM D5185m >2 | <1 | <1 | <1 |
| Titanium | ppm | ASTM D5185m >2 | 0 | <1 | <1 |
| Silver | ppm | ASTM D5185m >2 | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m >25 | 2 | 1 | 2 |
| Lead | ppm | ASTM D5185m >40 | 0 | 5 | 1 |
| Copper | ppm | ASTM D5185m >330 | 114 | ▲ 524 | ▲ 545 |
| Tin | ppm | ASTM D5185m >15 | 0 | <1 | <1 |
| Vanadium | ppm | ASTM D5185m | 0 | <1 | <1 |
| Cadmium | ppm | ASTM D5185m | 0 | 0 | 0 |

ADDITIVES

| | method | limit/base | current | history1 | history2 |
|------------|--------|------------------|-------------|----------|----------|
| Boron | ppm | ASTM D5185m 0 | 0 | 2 | 0 |
| Barium | ppm | ASTM D5185m 0 | 0 | 0 | 1 |
| Molybdenum | ppm | ASTM D5185m 60 | 66 | 63 | 91 |
| Manganese | ppm | ASTM D5185m 0 | 0 | <1 | <1 |
| Magnesium | ppm | ASTM D5185m 1010 | 871 | 946 | 905 |
| Calcium | ppm | ASTM D5185m 1070 | 969 | 1091 | 1010 |
| Phosphorus | ppm | ASTM D5185m 1150 | 866 | 958 | 944 |
| Zinc | ppm | ASTM D5185m 1270 | 1162 | 1244 | 1164 |
| Sulfur | ppm | ASTM D5185m 2060 | 2890 | 3181 | 2763 |

CONTAMINANTS

| | method | limit/base | current | history1 | history2 |
|-----------|--------|-----------------|----------------|----------|----------|
| Silicon | ppm | ASTM D5185m >25 | 4 | 4 | 5 |
| Sodium | ppm | ASTM D5185m | 68 | 53 | ▲ 222 |
| Potassium | ppm | ASTM D5185m >20 | 29 | 17 | ▲ 64 |
| Fuel | % | ASTM D3524 >5 | <1.0 | ▲ 4.6 | ▲ 3.9 |

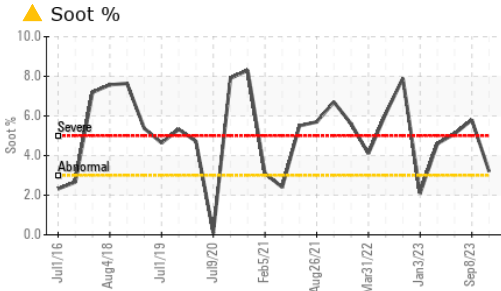
INFRA-RED

| | method | limit/base | current | history1 | history2 |
|-----------|----------|-----------------|--------------|----------|----------|
| Soot % | % | *ASTM D7844 >3 | ▲ 3.2 | ● 5.8 | ● 5.1 |
| Nitration | Abs/cm | *ASTM D7624 >20 | 9.0 | 13.6 | 13.6 |
| Sulfation | Abs/.1mm | *ASTM D7415 >30 | 24.3 | 30.6 | 28.9 |

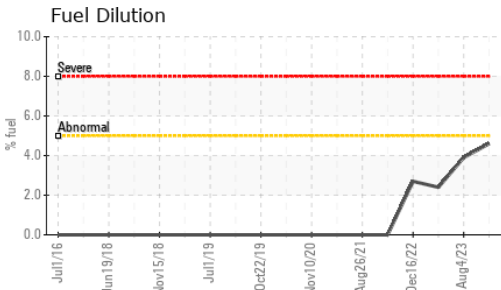
FLUID DEGRADATION

| | method | limit/base | current | history1 | history2 |
|------------------|----------|-----------------|-------------|----------|----------|
| Oxidation | Abs/.1mm | *ASTM D7414 >25 | 14.5 | 20.4 | 18.8 |
| Base Number (BN) | mg KOH/g | ASTM D2896 9.8 | 7.6 | ▲ 0.0 | ▲ 0.0 |

OIL ANALYSIS REPORT



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



| FLUID PROPERTIES | method | limit/base | current | history1 | history2 | |
|------------------|--------|------------|---------|-------------|----------|------|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | 14.1 | 15.2 | 15.1 |

