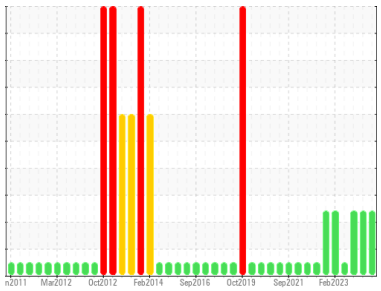
# OIL ANALYSIS REPORT

OIL DIAGNOSTICS

Area
**KEMP QUARRIES / MUSKOGEE SAND [67335]**
Machine Id
**WL039**
Component
**Diesel Engine**
Fluid
**PETRO CANADA DURON SHP 15W40 (--- GAL)**

Sample Rating Trend




**GLYCOL**

## DIAGNOSIS

**Recommendation**
We advise that you check for the source of the coolant leak. Check for low coolant level. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition. ( Customer Sample Comment: PM-2 changed fluid and filters )

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

**Contamination**
Sodium and/or potassium levels are high.

**Fluid Condition**
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 | | **PCA0070658** | PCA0086423 | PCA0087121 |
| Sample Date | | Client Info | | **05 Dec 2023** | 12 Sep 2023 | 15 Jun 2023 |
| Machine Age | hrs | Client Info | | **60261** | 59740 | 59240 |
| Oil Age | hrs | Client Info | | **60261** | 59740 | 500 |
| Oil Changed | | Client Info | | **Changed** | Changed | Changed |
| Sample Status | | | | **ABNORMAL** | ABNORMAL | ABNORMAL |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Fuel | | WC Method | >5 | **<1.0** | <1.0 | <1.0 |
| Water | | WC Method | >0.2 | **NEG** | NEG | NEG |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >100 | **39** | 38 | 27 |
| Chromium | ppm | ASTM D5185m | >20 | **4** | <1 | <1 |
| Nickel | ppm | ASTM D5185m | >2 | **2** | 0 | <1 |
| Titanium | ppm | ASTM D5185m | >2 | **0** | 0 | <1 |
| Silver | ppm | ASTM D5185m | >2 | **0** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >25 | **4** | 1 | 1 |
| Lead | ppm | ASTM D5185m | >40 | **11** | 20 | 20 |
| Copper | ppm | ASTM D5185m | >330 | **105** | 64 | 15 |
| Tin | ppm | ASTM D5185m | >15 | **<1** | 0 | <1 |
| Vanadium | ppm | ASTM D5185m | | **<1** | 0 | <1 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 0 | **10** | 24 | 6 |
| Barium | ppm | ASTM D5185m | 0 | **0** | 12 | 0 |
| Molybdenum | ppm | ASTM D5185m | 60 | **344** | 211 | 89 |
| Manganese | ppm | ASTM D5185m | 0 | **<1** | 0 | <1 |
| Magnesium | ppm | ASTM D5185m | 1010 | **965** | 946 | 1029 |
| Calcium | ppm | ASTM D5185m | 1070 | **1036** | 1111 | 1203 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **1071** | 1033 | 1084 |
| Zinc | ppm | ASTM D5185m | 1270 | **1316** | 1216 | 1357 |
| Sulfur | ppm | ASTM D5185m | 2060 | **3245** | 3464 | 4005 |

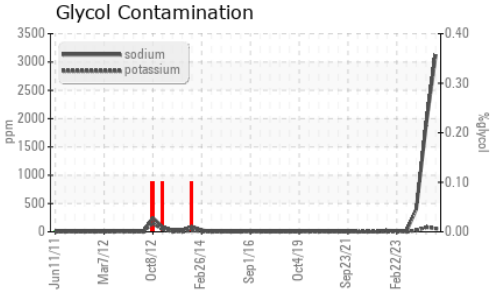
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **23** | 21 | 10 |
| Sodium | ppm | ASTM D5185m | | ▲ **3127** | ▲ 1877 | ▲ 402 |
| Potassium | ppm | ASTM D5185m | >20 | ▲ **56** | ▲ 80 | ▲ 23 |
| Glycol | % | *ASTM D2982 | | **NEG** | NEG | NEG |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >3 | **0.4** | 0.3 | 0.2 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **14.9** | 11.7 | 8.7 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **21.5** | 20.3 | 19.4 |

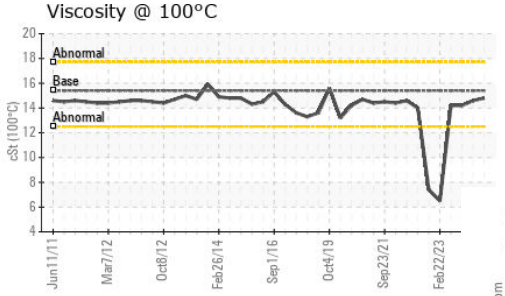
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **17.9** | 16.2 | 15.5 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 9.8 | **25.0** | 17.3 | 10.2 |

# OIL ANALYSIS REPORT

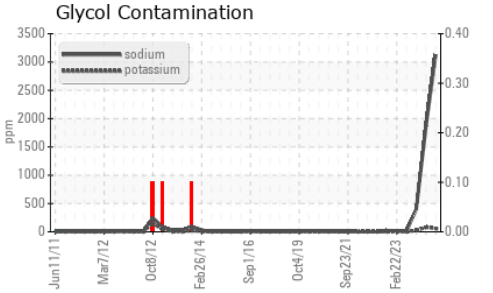
Glycol Contamination




Viscosity @ 100°C




Glycol Contamination

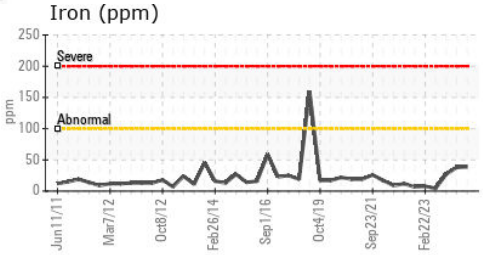



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

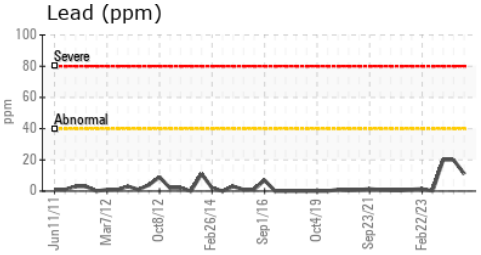
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.4 | **14.8** | 14.6 | 14.2 |

## GRAPHS

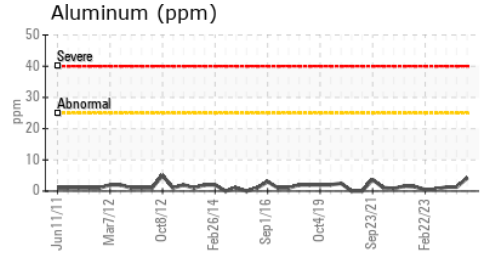
Iron (ppm)



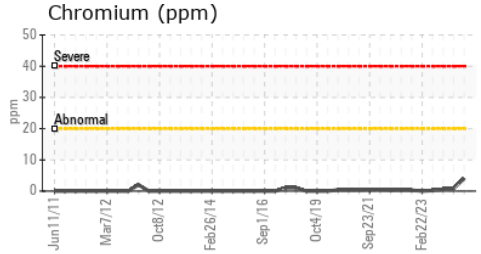

Lead (ppm)



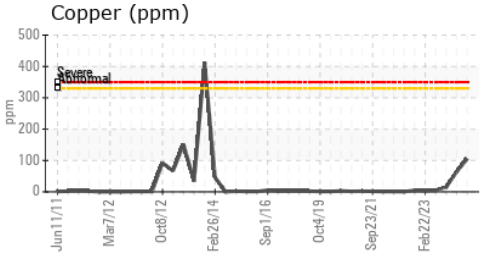

Aluminum (ppm)



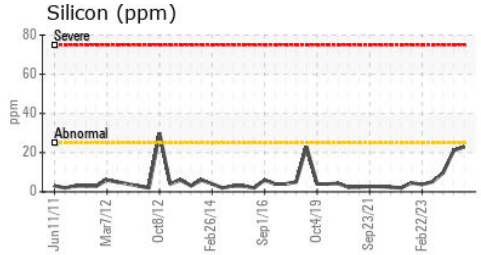

Chromium (ppm)



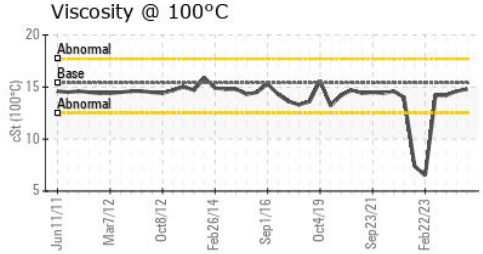

Copper (ppm)



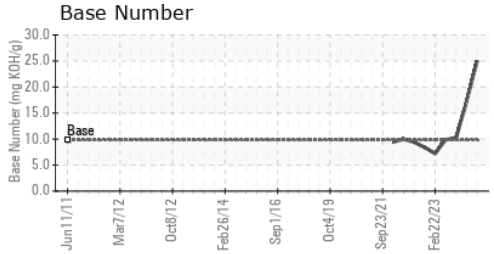

Silicon (ppm)




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : PCA0070658 **Recieved** : 13 Dec 2023
**Lab Number** : 06033994 **Diagnosed** : 18 Dec 2023
**Unique Number** : 10789223 **Diagnostician** : Jonathan Hester
**Test Package** : MOB 1 ( Additional Tests: Glycol, 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)*

**Kemp Quarries - Muskogee Sand**
3395 W 50th St N
Porter, OK
US 74454
Contact:
muskogee@muskogeesand.com
T:
F:

Report Id: KEMPOR [WUSCAR] 06033994 (Generated: 12/18/2023 13:34:44) Rev: 1

Submitted By: