

## **OIL ANALYSIS REPORT**

#### Sample Rating Trend



### Machine Id 633724

Component Diesel Engine

PETRO CANADA DURON SHP 10W30 (--- QTS)

#### DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor. Please specify the component make and model with your next sample.

#### Wear

Metal levels are typical for a new component breaking in.

#### Contamination

There is no indication of any contamination in the oil.

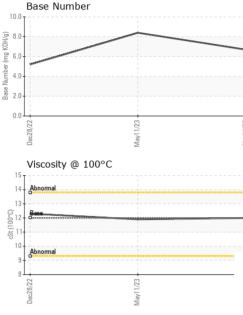
#### Fluid Condition

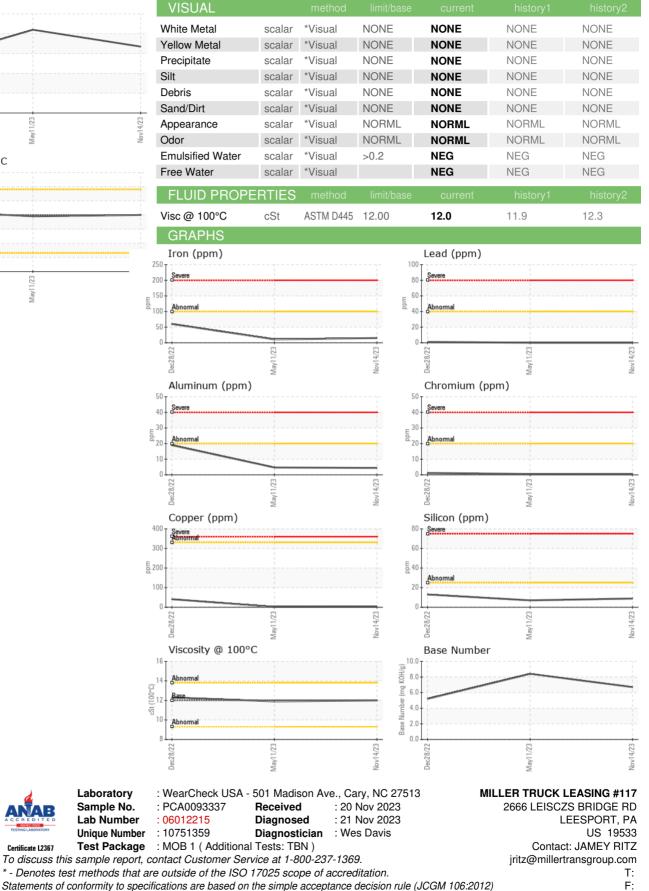
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

| QTS)  |   | Dec   | 2022  | May2023 Nov202   | 23   |  |
|---|---|---|---|--|--|--|
| SAMPLE INFORM   | MATION  | method  | limit/base  | current  | history1   | history2   |
| Sample Number   |   | Client Info   |   | PCA0093337   | PCA0078748   | PCA0078774   |
| Sample Date   |   | Client Info   |   | 14 Nov 2023  | 11 May 2023  | 28 Dec 2022  |
| Machine Age   | mls   | Client Info   |   | 61305  | 37301  | 22356  |
| Oil Age   | mls   | Client Info   |   | 0  | 0  | 0  |
| Oil Changed   |   | Client Info   |   | Not Changd   | Not Changd   | Changed  |
| Sample Status   |   |   |   | NORMAL   | NORMAL   | NORMAL   |
| CONTAMINATI   | ION   | method  | limit/base  | current  | history1   | history2   |
| Fuel  |   | WC Method   | >5  | <1.0   | <1.0   | <1.0   |
| Water   |   | WC Method   | >0.2  | NEG  | NEG  | NEG  |
| Glycol  |   | WC Method   |   | NEG  | NEG  | NEG  |
| WEAR METALS   | S   | method  | limit/base  | current  | history1   | history2   |
| Iron  | ppm   | ASTM D5185m   | >100  | 15   | 11   | 60   |
| Chromium  | ppm   | ASTM D5185m   | >20   | <1   | <1   | 1  |
| Nickel  | ppm   | ASTM D5185m   | >4  | 1  | <1   | <1   |
| Titanium  | ppm   | ASTM D5185m   |   | 6  | 6  | <1   |
| Silver  | ppm   | ASTM D5185m   | >3  | <1   | <1   | <1   |
| Aluminum  | ppm   | ASTM D5185m   | >20   | 4  | 5  | 19   |
| Lead  | ppm   | ASTM D5185m   | >40   | 0  | 0  | 1  |
| Copper  | ppm   | ASTM D5185m   | >330  | 2  | 2  | 41   |
| Tin   | ppm   | ASTM D5185m   | >15   | <1   | <1   | 2  |
| Vanadium  | ppm   | ASTM D5185m   |   | <1   | <1   | 0  |
| Cadmium   | ppm   | ASTM D5185m   |   | 0  | 0  | 0  |
| ADDITIVES   |   | method  | limit/base  | current  | history1   | history2   |
| Boron   | ppm   | ASTM D5185m   | 2   | 11   | 15   | 38   |
| Barium  | ppm   | ASTM D5185m   | 0   | 0  | 0  | 0  |
| Molybdenum  | ppm   | ASTM D5185m   | 50  | 58   | 56   | 27   |
| Manganese   | ppm   | ASTM D5185m   | 0   | <1   | <1   | 2  |
| Magnesium   | ppm   | ACTM DE10Em   |   |  |  |  |
| Calcium   |   | ASTM D5185m   | 950   | 915  | 952  | 689  |
|   | ppm   | ASTM D5185m   | 1050  | 1138   | 1220   | 1516   |
| Phosphorus  | ppm<br>ppm  | ASTM D5185m<br>ASTM D5185m  | 1050<br>995   | 1138<br>1092   | 1220<br>1096   | 1516<br>762  |
| Phosphorus<br>Zinc  |   | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 1050<br>995<br>1180   | 1138<br>1092<br>1336   | 1220<br>1096<br>1366   | 1516<br>762<br>940   |
| Phosphorus<br>Zinc<br>Sulfur  | ppm<br>ppm<br>ppm   | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 1050<br>995<br>1180<br>2600   | 1138<br>1092   | 1220<br>1096<br>1366<br>4103   | 1516<br>762<br>940<br>3040   |
| Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINAN  | ppm<br>ppm<br>ppm<br>TS   | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>method  | 1050<br>995<br>1180<br>2600<br>limit/base   | 1138<br>1092<br>1336<br>3185<br>current  | 1220<br>1096<br>1366<br>4103<br>history1   | 1516<br>762<br>940<br>3040<br>history2   |
| Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINAN<br>Silicon   | ppm<br>ppm<br>ppm<br>TS<br>ppm  | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br><b>method</b><br>ASTM D5185m  | 1050<br>995<br>1180<br>2600   | 1138<br>1092<br>1336<br>3185<br>current<br>9   | 1220<br>1096<br>1366<br>4103<br>history1<br>7  | 1516<br>762<br>940<br>3040<br>history2<br>13   |
| Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINAN<br>Silicon<br>Sodium   | ppm<br>ppm<br>ppm<br>TS<br>ppm<br>ppm                                   | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 1050<br>995<br>1180<br>2600<br>limit/base<br>>25  | 1138<br>1092<br>1336<br>3185<br>current<br>9<br>2  | 1220<br>1096<br>1366<br>4103<br>history1<br>7<br>1   | 1516<br>762<br>940<br>3040<br>history2<br>13<br>7  |
| Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINAN<br>Silicon<br>Sodium<br>Potassium  | ppm<br>ppm<br>ppm<br>TS<br>ppm  | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>Method<br>ASTM D5185m<br>ASTM D5185m  | 1050<br>995<br>1180<br>2600<br><i>limit/base</i><br>>25<br>>20  | 1138<br>1092<br>1336<br>3185<br>current<br>9<br>2<br>8   | 1220<br>1096<br>1366<br>4103<br>history1<br>7<br>1<br>7<br>7   | 1516<br>762<br>940<br>3040<br>history2<br>13<br>7<br>53                                    |
| Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINAN<br>Silicon<br>Sodium<br>Potassium<br>INFRA-RED                                     | ppm<br>ppm<br>TS<br>ppm<br>ppm<br>ppm                                   | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 1050<br>995<br>1180<br>2600<br>limit/base<br>>25<br>>20   | 1138<br>1092<br>1336<br>3185<br>current<br>9<br>2<br>8<br>8<br>current                                 | 1220<br>1096<br>1366<br>4103<br>history1<br>7<br>1<br>7<br>1<br>7<br>history1                        | 1516<br>762<br>940<br>3040<br>history2<br>13<br>7<br>53<br>history2                        |
| Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINAN<br>Silicon<br>Sodium<br>Potassium<br>INFRA-RED<br>Soot %                           | ppm<br>ppm<br>TS<br>ppm<br>ppm<br>ppm<br>ppm                            | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m                              | 1050<br>995<br>1180<br>2600<br>Imit/base<br>>25<br>>20<br>Imit/base<br>>3                               | 1138<br>1092<br>1336<br>3185<br>current<br>9<br>2<br>8<br>8<br>current<br>0.3                          | 1220<br>1096<br>1366<br>4103<br>history1<br>7<br>1<br>7<br>1<br>7<br>1<br>7<br>history1<br>0.2       | 1516<br>762<br>940<br>3040<br>history2<br>13<br>7<br>53<br>history2<br>0.4                 |
| Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINAN<br>Silicon<br>Sodium<br>Potassium<br>INFRA-RED<br>Soot %<br>Nitration              | ppm<br>ppm<br>ppm<br>TS<br>ppm<br>ppm<br>ppm<br>ppm                     | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br><b>method</b><br>*ASTM D7844             | 1050<br>995<br>1180<br>2600<br><i>limit/base</i><br>>25<br>>20<br><i>limit/base</i><br>>3<br>>20        | 1138<br>1092<br>1336<br>3185<br>current<br>9<br>2<br>8<br>current<br>0.3<br>10.1                       | 1220<br>1096<br>1366<br>4103<br><b>history1</b><br>7<br>1<br>1<br>7<br><b>history1</b><br>0.2<br>6.7 | 1516<br>762<br>940<br>3040<br>history2<br>13<br>7<br>53<br>history2<br>0.4<br>11.2         |
| Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINAN<br>Silicon<br>Sodium<br>Potassium<br>INFRA-RED<br>Soot %<br>Nitration<br>Sulfation | ppm<br>ppm<br>ppm<br>TS<br>ppm<br>ppm<br>ppm<br>%<br>Abs/cm<br>Abs/.1mm | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D7844<br>*ASTM D7844<br>*ASTM D7844 | 1050<br>995<br>1180<br>2600<br>imit/base<br>>25<br>>20<br>imit/base<br>>3                               | 1138<br>1092<br>1336<br>3185<br>current<br>9<br>2<br>8<br>8<br>current<br>0.3                          | 1220<br>1096<br>1366<br>4103<br>history1<br>7<br>1<br>7<br>1<br>7<br>history1<br>0.2<br>6.7<br>19.2  | 1516<br>762<br>940<br>3040<br>history2<br>13<br>7<br>53<br>history2<br>0.4<br>11.2<br>25.1 |
| Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINAN<br>Silicon<br>Sodium<br>Potassium<br>INFRA-RED<br>Soot %<br>Nitration              | ppm<br>ppm<br>ppm<br>TS<br>ppm<br>ppm<br>ppm<br>%<br>Abs/cm<br>Abs/.1mm | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D7844<br>*ASTM D7844<br>*ASTM D7844 | 1050<br>995<br>1180<br>2600<br><i>limit/base</i><br>>25<br>>20<br><i>limit/base</i><br>>3<br>>20        | 1138<br>1092<br>1336<br>3185<br><u>current</u><br>9<br>2<br>8<br><u>current</u><br>0.3<br>10.1<br>21.3 | 1220<br>1096<br>1366<br>4103<br><b>history1</b><br>7<br>1<br>1<br>7<br><b>history1</b><br>0.2<br>6.7 | 1516<br>762<br>940<br>3040<br>history2<br>13<br>7<br>53<br>history2<br>0.4<br>11.2         |
| Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINAN<br>Silicon<br>Sodium<br>Potassium<br>INFRA-RED<br>Soot %<br>Nitration<br>Sulfation | ppm<br>ppm<br>ppm<br>TS<br>ppm<br>ppm<br>ppm<br>%<br>Abs/cm<br>Abs/.1mm | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D7844<br>*ASTM D7844<br>*ASTM D7844 | 1050<br>995<br>1180<br>2600<br><b>limit/base</b><br>>25<br>>20<br><b>limit/base</b><br>>3<br>>20<br>>30 | 1138<br>1092<br>1336<br>3185<br><u>current</u><br>9<br>2<br>8<br><u>current</u><br>0.3<br>10.1<br>21.3 | 1220<br>1096<br>1366<br>4103<br>history1<br>7<br>1<br>7<br>1<br>7<br>history1<br>0.2<br>6.7<br>19.2  | 1516<br>762<br>940<br>3040<br>history2<br>13<br>7<br>53<br>history2<br>0.4<br>11.2<br>25.1 |



# **OIL ANALYSIS REPORT**





Certificate L2367