

# **OIL ANALYSIS REPORT**

### Sample Rating Trend





Component **Diesel Engine** 

PETRO CANADA DURON SHP 10W30 (9 QTS)

# 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.

| 1313 REPU   |            |   |                     |  |  | ORIMAL   |
|---|------------|---|---------------------|--|--|--|
| ats)  |            | -2017 Jan   | 019 May2221 0.02021 | Jaz2022 Nov2022 Fe22023                    |  |  |
| SAMPLE INFOR  | MATION     | method  | limit/base          | current                                    | history1   | history2   |
| Sample Number<br>Sample Date<br>Machine Age<br>Oil Age<br>Oil Changed | hrs<br>hrs | Client Info<br>Client Info<br>Client Info<br>Client Info<br>Client Info |                     | PCA0104867<br>07 Nov 2023<br>0<br>0<br>N/A | PCA0102039<br>30 Jul 2023<br>11276<br>11276<br>N/A | PCA0100717<br>22 Jun 2023<br>11276<br>11276<br>N/A |
| Sample Status   |            |   |                     | NORMAL                                     | NORMAL   | NORMAL   |
| CONTAMINAT  | ION        | method  | limit/base          | current                                    | history1   | history2   |
| Fuel<br>Glycol  |            | WC Method<br>WC Method  | >5                  | <1.0<br>NEG                                | <1.0<br>NEG  | <1.0<br>NEG  |
| WEAR METAL  | .S         | method  | limit/base          | current                                    | history1   | history2   |
| Iron  | ppm        | ASTM D5185m   | >100                | 4  | 6  | 6  |
| Chromium<br>Nickel  | ppm<br>ppm | ASTM D5185m<br>ASTM D5185m  | >20                 | <1<br>0                                    | <1<br>0  | <1<br><1   |
| Titanium  | ppm        | ASTM D5185m   | 24                  | 0  | 0  | 0  |
| Silver  | ppm        | ASTM D5185m   | >3                  | 0  | 0  | 0  |
| Aluminum  | ppm        | ASTM D5185m   |                     | 2  | 1  | 6  |
| Lead  | ppm        | ASTM D5185m   | >40                 | 0  | 0  | 5  |
| Copper  | ppm        | ASTM D5185m   | >330                | 0  | <1   | 6  |
| Tin   | ppm        | ASTM D5185m   | >15                 | 0  | 0  | 2  |
| Vanadium  | ppm        | ASTM D5185m   |                     | 0  | <1   | 0  |
| Cadmium   | ppm        | ASTM D5185m   |                     | 0  | 0  | 0  |
| ADDITIVES   |            | method  | limit/base          | current                                    | history1   | history2   |
| Boron   | ppm        | ASTM D5185m   | 2                   | 5  | <1   | 5  |
| Barium  | ppm        | ASTM D5185m   | 0                   | 0  | 0  | 0  |
| Molybdenum  | ppm        | ASTM D5185m   | 50                  | 58   | 58   | 57   |
| Manganese   | ppm        | ASTM D5185m   | 0                   | 0  | <1   | 2  |
| Magnesium   | ppm        | ASTM D5185m   | 950                 | 891  | 966  | 1053   |
| Calcium   | ppm        | ASTM D5185m   | 1050                | 1011                                       | 1078   | 1107   |
| Phosphorus  | ppm        | ASTM D5185m   | 995                 | 970  | 1031   | 1176   |
| Zinc  | ppm        | ASTM D5185m   | 1180                | 1224                                       | 1234   | 1432   |
| Sulfur  | ppm        | ASTM D5185m   | 2600                | 3051                                       | 3531   | 4231   |

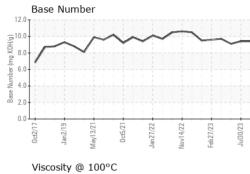
| CONTAMINAN | ITS | method      | limit/base | current | history1 | history2 |
|------------|-----|-------------|------------|---------|----------|----------|
| Silicon    | ppm | ASTM D5185m | >25        | 3       | 3        | 4        |
| Sodium     | ppm | ASTM D5185m |            | <1      | 1        | <1       |
| Potassium  | ppm | ASTM D5185m | >20        | 0       | 0        | 7        |

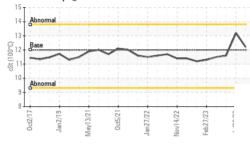
| INFRA-RED        |          | method      | limit/base | current | history1 | history2 |
|------------------|----------|-------------|------------|---------|----------|----------|
| Soot %           | %        | *ASTM D7844 | >3         | 0.4     | 0.4      | 0.3      |
| Nitration        | Abs/cm   | *ASTM D7624 | >20        | 5.4     | 5.4      | 5.5      |
| Sulfation        | Abs/.1mm | *ASTM D7415 | >30        | 17.5    | 17.4     | 17.9     |
| FLUID DEGRA      | DATION   | method      | limit/base | current | history1 | history2 |
| Oxidation        | Abs/.1mm | *ASTM D7414 | >25        | 12.7    | 12.7     | 14.2     |
| Base Number (BN) | mg KOH/g | ASTM D2896  |            | 9.4     | 9.4      | 9.1      |



# **OIL ANALYSIS REPORT**

VISUAL





| $\sim \sim \sim$          | White Metal  | aaalar   |  |   |   |  |   |
|---------------------------|--|--|--|---|---|--|---|
|                           |  | 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  |
|                           |  |  |  |   |   |  | NONE  |
|                           |  |  |  |   |   |  | NONE  |
| 723                       |  |  |  |   |   |  | NORML   |
| vovi 1<br>Feb 27<br>Jul30 |  |  |  |   |   |  | NORML   |
|                           |  |  |  |   |   |  | NEG   |
|                           |  |  |  | >0.2  |   |  |   |
|                           | Free water   | scalar   | visuai   |   | NEG   | NEG  | NEG   |
| $\wedge$                  |  |  | method   | limit/base  | current   | history1   | history2  |
|                           |  | cSt  | ASTM D445  | 12.00   | 12.2  | 13.2   | 11.6  |
|                           |  |  |  |   |   |  |   |
|                           |  |  |  |   |   |  |   |
|                           | 50 - chromium<br>40 - nickel<br>20 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 -   |  | 422  | 123   |   |  |   |
|                           | ≥<br>Non-ferrous Metal   | 5  | Nov1<br>Feb2   | Uul   |   |  |   |
|                           | Jan 2/13<br>May 13/21<br>May 13/ |  | Nov14/22   | 1010013   |   |  |   |
|                           | Viscosity @ 100°C  |  |  |   | Base Number   |  |   |
|                           | 14 - Abnormal  |  |  | 12.0-   |   |  |   |
|                           | 13-<br>13-<br>10-<br>10-<br>10-<br>10-<br>10-<br>10-<br>10-<br>10  | $\vee$   |  | 10.0-<br>(B)HOX 8.0-<br>But und KOHN<br>Base Mumper<br>4.0-   |   | ~~~  | ~~~   |
|                           | 9  |  |  | 2.0-  |   |  |   |
|                           | 8  |  |  | 0.0-  |   |  |   |
|                           | ct2/17<br>m2/19<br>/13/21  | 27/22  | 27/23  | 130/23  | ct2/17<br>m2/19<br>/13/21   | let5/21  | Feb27/23<br>Jul30/23  |
| Laboratory<br>Sample No.  | : WearCheck USA - 5<br>: PCA0104867  | 5  | son Ave., Ca<br>1 : 08 N   | ry, NC 27513<br>Nov 2023  | Ma L  |  |   |
|                           |  | Debris<br>Sand/Dirt<br>Appearance<br>Odor<br>Emulsified Water<br>Free Water<br>FLUID PROPE<br>Visc @ 100°C<br>GRAPHS<br>Ferrous Alloys<br>On-ferrous Metal | Debris scalar<br>Sand/Dirt scalar<br>Appearance scalar<br>Emulsified Water scalar<br>Free Water scalar<br>Free Water scalar<br>Free Water scalar<br>Free Water scalar<br>Full D PROPERTIES<br>Visc @ 100°C cSt<br>GRAPHS<br>Ferrous Alloys<br>On-ferrous Metals<br>Viscosity @ 100°C | Debris scalar *Visual<br>Sand/Dirt scalar *Visual<br>Appearance scalar *Visual<br>Odor scalar *Visual<br>Emulsified Water scalar *Visual<br>Free Water scalar *Visual *Vi | Debris scalar *Visual NONE<br>Sand/Dirt scalar *Visual NORML<br>Appearance scalar *Visual NORML<br>Emulsified Water scalar *Visual NORML<br>Emulsified Water scalar *Visual OC<br>Free Water scalar *Visual OC<br>Visc @ 100°C cst ASTM D445 12.00<br>CRAPHS<br>Ferrous Alloys<br>On-ferrous Metals<br>Of Communication<br>Conferrous Metals<br>Of 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| Debris scalar 'Visual NONE NONE<br>Sand/Dirt scalar 'Visual NONE NONE<br>Appearance scalar 'Visual NORML NORML<br>Emulsified Water scalar 'Visual SO.2 NEG<br>Free Water scalar 'Visual SO.2 NEG<br>Solar 'Visual SO.2 NEG | Debris scalar Visual NONE NONE NONE NONE<br>Appearance scalar Visual NORML NORML NORML NORML<br>NORML NORML NORML NORML NORML NORML<br>NORML NORML NORML NORML NORML<br>NORML NORML NORML<br>NORML NORML NORML<br>NORML NORML<br>NORML NORML<br>NORML NORML<br>NORML NORML<br>NORML NORML<br>NORML 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