OIL
DIAGNOSTICS


## 32 <br> Component <br> Diesel Engine <br> PETRO CANADA DURON SHP 15W40 (-- GAL)



## DIAGNOSIS

## Recommendation

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

## 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 | limitbase | current | history1 | history2 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Sample Number |  | Client Info |  | PCA0053910 | PCA0053883 | PCA0030476 |
| Sample Date |  | Client Info |  | 01 Sep 2023 | 24 Nov 2021 | 06 May 2021 |
| Machine Age | mls | Client Info |  | 560947 | 533555 | 506828 |
| Oil Age | mls | Client Info |  | 20000 | 20000 | 20000 |
| Oil Changed |  | Client Info |  | Changed | Changed | Changed |
| Sample Status |  |  |  | NORMAL | NORMAL | NORMAL |
| CONTAMINATION |  | method | limitbase | current | history 1 | history2 |
| Fuel |  | WC Method | >5 | <1.0 | <1.0 | <1.0 |
| Glycol |  | WC Method |  | NEG | NEG | NEG |
| WEAR METALS |  | method | limitbase | current | history1 | history2 |
| Iron | ppm | ASTM D5185m | >100 | 7 | 4 | 7 |
| Chromium | ppm | ASTM D5185m | >20 | <1 | <1 | <1 |
| Nickel | ppm | ASTM D5185m | >4 | 0 | 1 | 0 |
| Titanium | ppm | ASTM D5185m |  | 0 | <1 | 0 |
| Silver | ppm | ASTM D5185m | >3 | 0 | 0 | <1 |
| Aluminum | ppm | ASTM D5185m | >20 | 4 | 1 | 2 |
| Lead | ppm | ASTM D5185m | >40 | <1 | 1 | <1 |
| Copper | ppm | ASTM D5185m | >330 | 1 | $<1$ | 2 |
| Tin | ppm | ASTM D5185m | >15 | <1 | <1 | <1 |
| Antimony | ppm | ASTM D5185m |  | --- | 0 | 0 |
| Vanadium | ppm | ASTM D5185m |  | 0 | 0 | 0 |
| Cadmium | ppm | ASTM D5185m |  | 0 | 0 | 0 |


| ADDITIVES |  | method | limitbase | current | history1 | history2 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Boron | ppm | ASTM D5185m | 0 | 2 | 2 | 10 |
| Barium | ppm | ASTM D5185m | 0 | 0 | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 60 | 66 | 62 | 54 |
| Manganese | ppm | ASTM D5185m | 0 | <1 | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | 1010 | 974 | 1146 | 859 |
| Calcium | ppm | ASTM D5185m | 1070 | 1087 | 1268 | 1330 |
| Phosphorus | ppm | ASTM D5185m | 1150 | 1026 | 1210 | 1099 |
| Zinc | ppm | ASTM D5185m | 1270 | 1275 | 1361 | 1165 |
| Sulfur | ppm | ASTM D5185m | 2060 | 3588 | 3314 | 2647 |
| CONTAMINANTS |  | method | limit/base | current | history1 | history2 |
| Silicon | ppm | ASTM D5185m | >25 | 10 | 9 | 5 |
| Sodium | ppm | ASTM D5185m |  | 1 | 1 | 0 |
| Potassium | ppm | ASTM D5185m | >20 | 2 | 3 | 1 |
| INFRA-RED |  | method | limitbase | current | history1 | history2 |
| Soot \% | \% | *ASTM D7844 | >3 | 0.2 | 0.2 | 0.2 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | 6.0 | 6 | 9.2 |
| Sulfation | Abs. 1 mm | *ASTM D7415 | >30 | 18.1 | 18.8 | 20.5 |
| FLUID DEGRAD | ATION | method | limitbase | current | history1 | history2 |
| Oxidation | Abs. 1 mm | *ASTM D7414 | >25 | 14.1 | 14.7 | 17.3 |
| Base Number (BN) | $\mathrm{mg} \mathrm{KOH} / \mathrm{g}$ | ASTM D2896 | 9.8 | 5.82 | 8.88 | 9.88 |




| VISUAL |  | method | limitbase | 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 | limitbase | current | history1 | history2 |  |  |



Aluminum (ppm)


Copper (ppm)


Viscosity @ $100^{\circ} \mathrm{C}$


Chromium (ppm)


Silicon (ppm)


Base Number


