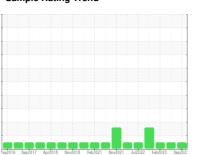


# **OIL ANALYSIS REPORT**

## Sample Rating Trend







# Day in

4498
Component
Front Diesel Engine

PETRO CANADA DURON SHP 15W40 (37 LTR)

## 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**

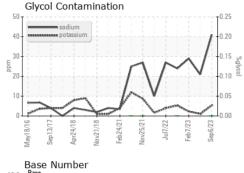
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

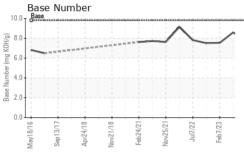
| Client Info  | N 30P 13W4U ( | 3/ LIN)  | Tay2016 Sep2  | 017 Apr2018 Nov2018 | Feb2021 Nov2021 Jul2022 Feb | 023 Sep202; |             |
|--|---------------|----------|---------------|---------------------|-----------------------------|-------------|-------------|
| Client Info  | SAMPLE INFOR  | RMATION  | method        | limit/base          | current                     | history1    | history2    |
| Machine Age   hrs   Client Info   19640   195402   18733   1873   18734   1873   187 | Sample Number |          | Client Info   |                     | GFL0084340                  | GFL0077628  | GFL0063761  |
| Oil Changed  | Sample Date   |          | Client Info   |                     | 06 Sep 2023                 | 11 May 2023 | 07 Feb 2023 |
| Client Info   Changed   NORMAL   NORMAL   NORMAL   NORMAL  | Machine Age   | hrs      | Client Info   |                     | 19640                       | 195402      | 18733       |
| NORMAL   NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2  | Oil Age       | hrs      | Client Info   |                     | 600                         | 195402      | 687         |
| CONTAMINATION  | Oil Changed   |          | Client Info   |                     | Changed                     | N/A         | Changed     |
| WEAR METALS  | Sample Status |          |               |                     | NORMAL                      | NORMAL      | NORMAL      |
|  | CONTAMINAT    | ΓΙΟΝ     | method        | limit/base          | current                     | history1    | history2    |
|  | Fuel          |          | WC Method     | >6.0                | <1.0                        | <1.0        | <1.0        |
| Chromium   | WEAR METAL    | _S       | method        | limit/base          | current                     | history1    | history2    |
| Nickel   | Iron          | ppm      | ASTM D5185(m) | >100                | 45                          | 16          | 34          |
| Silver   | Chromium      | ppm      | ASTM D5185(m) | >20                 | <1                          | <1          | <1          |
| Silver   | Nickel        |          | , ,           |                     | 1                           | <1          | 1           |
| Silver   | Titanium      |          | ASTM D5185(m) |                     | <1                          | <1          | <1          |
| Aluminum   | Silver        |          | ASTM D5185(m) | >2                  | 0                           | 0           | 0           |
| Lead   | Aluminum      |          | ASTM D5185(m) | >25                 | 5                           | 2           | 4           |
| Copper   | Lead          |          | , ,           |                     |                             | <1          | 2           |
| Trin   | Copper        |          | ASTM D5185(m) | >330                | 13                          | 2           | 4           |
| Antimony   | • •           |          | ASTM D5185(m) | >15                 | <1                          | <1          | 1           |
| Vanadium         ppm         ASTM D5185(m)         0         0         0           Beryllium         ppm         ASTM D5185(m)         0         0         0           Cadmium         ppm         ASTM D5185(m)         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         4         2         2           Barium         ppm         ASTM D5185(m)         0         0         0         0           Wolybdenum         ppm         ASTM D5185(m)         60         60         58         60           Manganese         ppm         ASTM D5185(m)         0         <1         <1         <1           Magnesium         ppm         ASTM D5185(m)         1010         959         938         945           Calcium         ppm         ASTM D5185(m)         1070         1067         1081         1114           Phosphorus         ppm         ASTM D5185(m)         1270         1184         1142         1179           Sulfur         ppm         ASTM D5185(m)         2060         2301         2562  | Antimony      |          | . ,           |                     |                             |             | <1          |
| Beryllium  | •             |          | , ,           |                     |                             |             | 0           |
| Cadmium         ppm         ASTM D5185(m)         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         4         2         2           Barium         ppm         ASTM D5185(m)         0         0         0         0           Molybdenum         ppm         ASTM D5185(m)         60         60         58         60           Manganese         ppm         ASTM D5185(m)         0         -1         -1         -1         -1           Magnesium         ppm         ASTM D5185(m)         1010         959         938         945           Calcium         ppm         ASTM D5185(m)         1070         1067         1081         1114           Phosphorus         ppm         ASTM D5185(m)         1270         1184         1142         1179           Sulfur         ppm         ASTM D5185(m)         2060         2301         2562         2433           Lithium         ppm         ASTM D5185(m)         <1  | Beryllium     |          | ASTM D5185(m) |                     | 0                           | 0           | 0           |
| Boron   ppm   ASTM D5185(m)   0   0   0   0   0   0   0   0   0  | •             |          | . ,           |                     |                             | 0           | 0           |
| Barium   | ADDITIVES     |          | method        | limit/base          | current                     | history1    | history2    |
| Molybdenum         ppm         ASTM D5185(m)         60         60         58         60           Manganese         ppm         ASTM D5185(m)         0         <1  | Boron         | ppm      | ASTM D5185(m) | 0                   | 4                           | 2           | 2           |
| Manganese         ppm         ASTM D5185(m)         0         <1         <1         <1           Magnesium         ppm         ASTM D5185(m)         1010         959         938         945           Calcium         ppm         ASTM D5185(m)         1070         1067         1081         1114           Phosphorus         ppm         ASTM D5185(m)         1150         1007         1049         1043           Zinc         ppm         ASTM D5185(m)         1270         1184         1142         1179           Sulfur         ppm         ASTM D5185(m)         2060         2301         2562         2433           Lithium         ppm         ASTM D5185(m)         2060         2301         2562         2433           Lithium         ppm         ASTM D5185(m)         25         12         6         15           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         12         6         15           Sodium         ppm         ASTM D5185(m)         >20         5         1         2           Glycol         %   | Barium        | ppm      | ASTM D5185(m) | 0                   | 0                           | 0           | 0           |
| Magnesium         ppm         ASTM D5185(m)         1010         959         938         945           Calcium         ppm         ASTM D5185(m)         1070         1067         1081         1114           Phosphorus         ppm         ASTM D5185(m)         1150         1007         1049         1043           Zinc         ppm         ASTM D5185(m)         1270         1184         1142         1179           Sulfur         ppm         ASTM D5185(m)         2060         2301         2562         2433           Lithium         ppm         ASTM D5185(m)         2060         2301         2562         2433           Lithium         ppm         ASTM D5185(m)         21         <1  | Molybdenum    | ppm      | ASTM D5185(m) | 60                  | 60                          | 58          | 60          |
| Calcium         ppm         ASTM D5185(m)         1070         1067         1081         1114           Phosphorus         ppm         ASTM D5185(m)         1150         1007         1049         1043           Zinc         ppm         ASTM D5185(m)         1270         1184         1142         1179           Sulfur         ppm         ASTM D5185(m)         2060         2301         2562         2433           Lithium         ppm         ASTM D5185(m)         <1  | Manganese     | ppm      | ASTM D5185(m) | 0                   | <1                          | <1          | <1          |
| Phosphorus   | Magnesium     | ppm      | ASTM D5185(m) | 1010                | 959                         | 938         | 945         |
| Zinc   ppm   ASTM D5185(m)   1270   1184   1142   1179     Sulfur   ppm   ASTM D5185(m)   2060   2301   2562   2433     Lithium   ppm   ASTM D5185(m)   <1   <1   <1     CONTAMINANTS   method   limit/base   current   history1   history2     Silicon   ppm   ASTM D5185(m)   >25   12   6   15     Sodium   ppm   ASTM D5185(m)   41   21   29     Potassium   ppm   ASTM D5185(m)   >20   5   1   2     Glycol   %   ASTM D7922*   0.0   NEG   NEG     INFRA-RED   method   limit/base   current   history1   history2     Soot %   %   ASTM D7844*   >3   0.6   0.1   0.1     Nitration   Abs/cm   ASTM D7624*   >20   8.6   7.9   9.4  | Calcium       | ppm      | ASTM D5185(m) | 1070                | 1067                        | 1081        | 1114        |
| Sulfur         ppm         ASTM D5185(m)         2060         2301         2562         2433           Lithium         ppm         ASTM D5185(m)         2060         2301         2562         2433           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         12         6         15           Sodium         ppm         ASTM D5185(m)         >20         5         1         29           Potassium         ppm         ASTM D5185(m)         >20         5         1         2           Glycol         %         ASTM D7922*         0.0         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0.6         0.1         0.1           Nitration         Abs/cm         ASTM D7624*         >20         8.6         7.9         9.4  | Phosphorus    | ppm      | ASTM D5185(m) | 1150                | 1007                        | 1049        | 1043        |
| Lithium         ppm         ASTM D5185(m)         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         12         6         15           Sodium         ppm         ASTM D5185(m)         41         21         29           Potassium         ppm         ASTM D5185(m)         >20         5         1         2           Glycol         %         ASTM D7922*         0.0         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0.6         0.1         0.1           Nitration         Abs/cm         ASTM D7624*         >20         8.6         7.9         9.4  | Zinc          | ppm      | ASTM D5185(m) | 1270                | 1184                        | 1142        | 1179        |
| CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         12         6         15           Sodium         ppm         ASTM D5185(m)         41         21         29           Potassium         ppm         ASTM D5185(m)         >20         5         1         2           Glycol         %         ASTM D7922*         0.0         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0.6         0.1         0.1           Nitration         Abs/cm         ASTM D7624*         >20         8.6         7.9         9.4   | Sulfur        | ppm      | ASTM D5185(m) | 2060                | 2301                        | 2562        | 2433        |
| Silicon         ppm         ASTM D5185(m)         >25         12         6         15           Sodium         ppm         ASTM D5185(m)         41         21         29           Potassium         ppm         ASTM D5185(m)         >20         5         1         2           Glycol         %         ASTM D7922*         0.0         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0.6         0.1         0.1           Nitration         Abs/cm         ASTM D7624*         >20         8.6         7.9         9.4  | Lithium       | ppm      | ASTM D5185(m) |                     | <1                          | <1          | <1          |
| Sodium         ppm         ASTM D5185(m)         41         21         29           Potassium         ppm         ASTM D5185(m)         >20         5         1         2           Glycol         %         ASTM D7922*         0.0         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0.6         0.1         0.1           Nitration         Abs/cm         ASTM D7624*         >20         8.6         7.9         9.4  | CONTAMINA     | NTS      | method        | limit/base          | current                     | history1    | history2    |
| Sodium         ppm         ASTM D5185(m)         41         21         29           Potassium         ppm         ASTM D5185(m)         >20         5         1         2           Glycol         %         ASTM D7922*         0.0         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0.6         0.1         0.1           Nitration         Abs/cm         ASTM D7624*         >20         8.6         7.9         9.4  | Silicon       | ppm      | ASTM D5185(m) | >25                 | 12                          | 6           | 15          |
| Potassium         ppm         ASTM D5185(m)         >20         5         1         2           Glycol         %         ASTM D7922*         0.0         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0.6         0.1         0.1           Nitration         Abs/cm         ASTM D7624*         >20         8.6         7.9         9.4  | Sodium        | ppm      | ASTM D5185(m) |                     | 41                          | 21          | 29          |
| Glycol         %         ASTM D7922*         0.0         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0.6         0.1         0.1           Nitration         Abs/cm         ASTM D7624*         >20         8.6         7.9         9.4  | Potassium     |          | . ,           | >20                 |                             |             |             |
| Soot %         %         ASTM D7844*         >3 <b>0.6</b> 0.1         0.1           Nitration         Abs/cm         ASTM D7624*         >20 <b>8.6</b> 7.9         9.4   | Glycol        |          | ASTM D7922*   |                     | 0.0                         | NEG         | NEG         |
| Nitration         Abs/cm         ASTM D7624*         >20         8.6         7.9         9.4   | INFRA-RED     |          | method        | limit/base          | current                     | history1    | history2    |
| Nitration         Abs/cm         ASTM D7624*         >20         8.6         7.9         9.4   | Soot %        | %        | ASTM D7844*   | >3                  | 0.6                         | 0.1         | 0.1         |
|  |               | Abs/cm   | ASTM D7624*   | >20                 |                             | 7.9         | 9.4         |
|  | Sulfation     | Abs/.1mm | ASTM D7415*   | >30                 | 21.5                        | 19.0        | 22.2        |

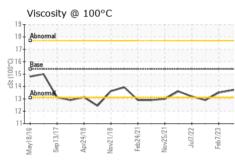


## **OIL ANALYSIS REPORT**

**GRAPHS** 

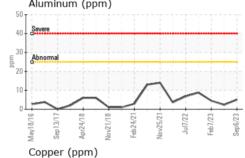




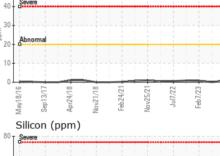


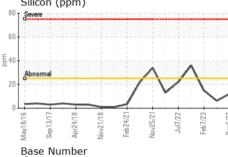
| FLUID DEGRAI     | NOITAC   | method        |            |         |          | history2 |
|------------------|----------|---------------|------------|---------|----------|----------|
| Oxidation        | Abs/.1mm | ASTM D7414*   | >25        | 16.7    | 15.4     | 17.5     |
| Base Number (BN) | mg KOH/g | ASTM D2896*   | 9.8        | 7.67    | 8.59     | 7.54     |
| VISUAL           |          | method        | limit/base | current | history1 | history2 |
| Emulsified Water | scalar   | Visual*       | >0.2       | NEG     | NEG      | NEG      |
| Free Water       | scalar   | Visual*       |            | NEG     | NEG      | NEG      |
| FLUID PROPE      | RTIES    | method        | limit/base | current | history1 | history2 |
| Visc @ 100°C     | cSt      | ASTM D7279(m) | 15.4       | 13.8    | 13.7     | 13.5     |

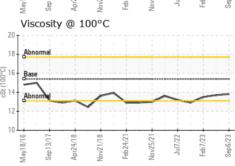
| Iron (ppm)   | Lead (ppm)   |
|--|--|
| 200 Severe   | 80 Severe  |
| 150  | € 60   |
| 100 Abnormal   | 40 - Abnormal  |
| 50   | 20   |
| Sep 13/17 - Apr24/18 - Apr24/18 - Apr24/21 - | Sep13/17 - Sep13/17 - Apr24/18 - Feb24/21 - Indi/22 - Jul7/22 - Feb7/23 - Feb7/24 - Fe |
| Aluminum (ppm)   | Chromium (ppm)   |
| LU.  | rn   |

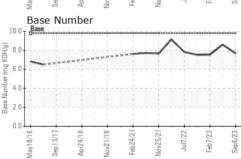














CALA ISO 17025:2017 Accredited Laboratory

Laboratory Sample No. Lab Number **Unique Number** Test Package : MOB 2 ( Additional Tests: Glycol )

: 02581704

: 5642769

300 E 200

100

: WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 GFL Environmental - 550 - Rocky View County : GFL0084340

Received Diagnosed

: 12 Sep 2023 : 14 Sep 2023

: Wes Davis Diagnostician

220 Carmek Blvd Rocky View County, AB **CA T1X 1X1** 

Submitted By: GFL Calgary

Contact: GFL Calgary calgarymaintenance@gflenv.com T:

To discuss this sample report, contact Customer Service at 1-800-268-2131. Test denoted (\*) outside scope of accreditation, (m) method modified, (e) tested at external lab. Validity of results and interpretation are based on the sample and information as supplied.

F: (403)369-6163