

# **PROBLEM SUMMARY**

Sample Rating Trend

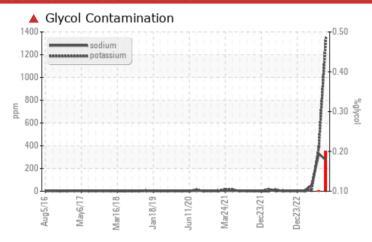
GLYCOL

(YA122797) 020 Nachfine Id 10580

Diesel Engine

PETRO CANADA DURON SHP 15W40 (34 QTS)

# **COMPONENT CONDITION SUMMARY**



## RECOMMENDATION

We advise that you check for the source of the coolant leak. The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

| PROBLEMATIC TEST RESULTS |     |             |     |             |               |        |  |  |
|--------------------------|-----|-------------|-----|-------------|---------------|--------|--|--|
| Sample Status            |     |             |     | SEVERE      | SEVERE        | NORMAL |  |  |
| Potassium                | ppm | ASTM D5185m | >20 | <b>1356</b> | ▲ 382         | 14     |  |  |
| Glycol                   | %   | *ASTM D2982 |     | <b>0.20</b> | <b>▲</b> 0.10 | NEG    |  |  |

Customer Id: GFL020 Sample No.: GFL0126044 Lab Number: 06237597 Test Package: FLEET



To manage this report scan the QR code

To discuss the diagnosis or test data: Wes Davis +1 905-569-8600 x223 wesd@wearcheck.ca

To change component or sample information: Customer Service +1 1-800-237-1369 customerservice@wearcheck.com

| RECOMMENDED ACTIONS |        |      |         |  |  |  |
|---------------------|--------|------|---------|--|--|--|
| Action              | Status | Date | Done By | Description  |  |  |
| Resample            |        |      | ?       | We recommend an early resample to monitor this condition.    |  |  |
| Check Glycol Access |        |      | ?       | We advise that you check for the source of the coolant leak. |  |  |

## HISTORICAL DIAGNOSIS

# 14 Sep 2023 Diag: Jonathan Hester

**GLYCOL** 

We advise that you check for the source of the coolant leak. Check for low coolant level. We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition.All component wear rates are normal. Sodium and/or potassium levels are high. Test for glycol is positive. The BN result indicates that there is suitable alkalinity remaining in the oil. The oil is no longer serviceable due to the presence of contaminants.





30 Jun 2023 Diag: Wes Davis Resample at the next service interval to monitor. All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.





### 01 Mar 2023 Diag: Wes Davis



Resample at the next service interval to monitor. All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.



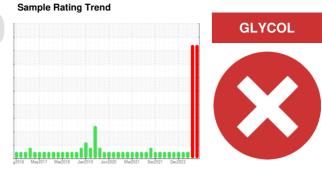


# **OIL ANALYSIS REPORT**

(YA122797) 020 10580

**Diesel Engine** 

PETRO CANADA DURON SHP 15W40 (34 QTS)



## **DIAGNOSIS**

### Recommendation

We advise that you check for the source of the coolant leak. The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

All component wear rates are normal.

## Contamination

Test for glycol is positive. There is a high concentration of glycol present in the oil.

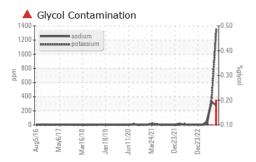
### Fluid Condition

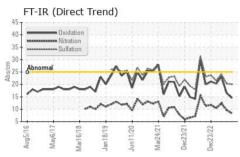
The BN result indicates that there is suitable alkalinity remaining in the oil. The oil is no longer serviceable due to the presence of contaminants.

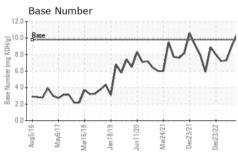
| Sample Number         Client Info         GFL0126044         GFL0091173         GFL0076970           Sample Date         Client Info         12 Jul 2024         14 Sep 2023         30 Jun 2023           Machine Age         hrs         Client Info         15911         0         14674           Oil Age         hrs         Client Info         815         600         600           Oil Changed         Client Info         Changed         Not Changd         Not Changd           Sample Status         WC Method         3.0         <1.0         <1.0         <1.0           Fuel         WC Method         >0.0         <1.0         <1.0         <1.0         <1.0           Water         WC Method         >0.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0   | SAMPLE INFORM  | IATION  | method  | limit/base  | current  | history1   | history2  |
|---|--|---|---|---|--|--|---|
| Sample Date   |  |   |   |   |  | •  | •   |
| Machine Age         hrs         Client Info         15911         0         14674           Oil Age         hrs         Client Info         815         600         600         600           Oil Changed         Client Info         Changed         Not Changed         Not Changed         Not Changed           Sample Status         SEVERE         SEVERE         SEVERE         NEG         NCI Changed           Fuel         WC Method         3.0         <1.0         <1.0         <1.0         <1.0           WEAR METALS         method         Imit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >5         1         <1         1           Nickel         ppm         ASTM D5185m         >5         1         <1         1           Nickel         ppm         ASTM D5185m         >2         0         0         <1           Alluminum         ppm         ASTM D5185m         >2         0         0         <1           Lead         ppm         ASTM D5185m         >2         0         0         <1         <1           Copper         ppm         ASTM D5185m         >100         <   |  |   |   |   |  |  |   |
| Oil Age         hrs         Client Info         815         600         600           Oil Changed Sample Status         Client Info         Changed SEVERE         Not Changd Not Changd Not Changd Not Changd Not Changd Not Changd NorMAL         NorMAL         Not Changd NorMAL         Not Changd NorMAL         Not Changd NorMAL         Not Changd NorMAL         N  |  | hrs   |   |   |  |  |   |
| Client Info   |  |   |   |   |  |  |   |
| Sample Status   | -  |   | Client Info   |   |  | Not Changd   | Not Changd  |
| Fuel   WC Method   S3.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   Water   WC Method   >0.2   NEG   Neg |  |   |   |   |  | Ü  | Ü   |
| Weter         WC Method         >0.2         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >75         25         15         23           Chromium         ppm         ASTM D5185m         >5         1         <1         1           Nickel         ppm         ASTM D5185m         >4         0         0         <1           Silver         ppm         ASTM D5185m         >2         <1         <1         0           Aluminum         ppm         ASTM D5185m         >2         <1         <1         0           Aluminum         ppm         ASTM D5185m         >2         0         0         <1           Lead         ppm         ASTM D5185m         >25         0         0         <1         2           Lead         ppm         ASTM D5185m         >4         0         <1         <2         1           Lead         ppm         ASTM D5185m         >4         0         <1         <1         <1         <1         <1         <1         <1         <1         <1  | CONTAMINATIO   | NC  | method  | limit/base  | current  | history1   | history2  |
| WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >75         25         15         23           Chromium         ppm         ASTM D5185m         >5         1         <1  | Fuel   |   | WC Method   | >3.0  | <1.0   | <1.0   | <1.0  |
| Iron  | Water  |   | WC Method   | >0.2  | NEG  | NEG  | NEG   |
| Chromium         ppm         ASTM D5185m         >5         1         <1         1           Nickel         ppm         ASTM D5185m         >4         0         0         <1   | WEAR METALS  | ;   | method  | limit/base  | current  | history1   | history2  |
| Nickel         ppm         ASTM D5185m         >4         0         0         <1           Titanium         ppm         ASTM D5185m         >2         <1   | Iron   | ppm   | ASTM D5185m   | >75   | 25   | 15   | 23  |
| Titanium         ppm         ASTM D5185m         >2         <1         <1         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >15         3         2         1           Lead         ppm         ASTM D5185m         >25         0         0         <1           Copper         ppm         ASTM D5185m         >100         4         <1         2           Tin         ppm         ASTM D5185m         0         0         <1         <1           Vanadium         ppm         ASTM D5185m         0         0         <1         <1           Vanadium         ppm         ASTM D5185m         0         0         <1         <1            Vanadium         ppm         ASTM D5185m         0         11         7         7            Vanadium         ppm         ASTM D5185m         0         11         7         7            ADDITIVES         method         limit/base         current         history1         history2           Barium         ppm         ASTM D5185m         0   | Chromium   | ppm   | ASTM D5185m   | >5  | 1  | <1   | 1   |
| Silver  | Nickel   | ppm   | ASTM D5185m   | >4  | 0  | 0  | <1  |
| Aluminum         ppm         ASTM D5185m         >15         3         2         1           Lead         ppm         ASTM D5185m         >25         0         0         <1  | Titanium   | ppm   | ASTM D5185m   | >2  | <1   | <1   | 0   |
| Lead         ppm         ASTM D5185m         >25         0         0         <1           Copper         ppm         ASTM D5185m         >100         4         <1         2           Tin         ppm         ASTM D5185m         >4         0         <1         <1           Vanadium         ppm         ASTM D5185m         0         <1         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0         0         0           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         <1         <1           Magnesium         ppm         ASTM D5185m         0         0         <1         <1         <1           Calcium         ppm         ASTM D5185m         1010         916         1107         1008           Calcium         ppm         ASTM D5185m         1270         1206         1428 </td <td>Silver</td> <td>ppm</td> <td>ASTM D5185m</td> <td>&gt;2</td> <td>0</td> <td>0</td> <td>0</td>   | Silver   | ppm   | ASTM D5185m   | >2  | 0  | 0  | 0   |
| Copper         ppm         ASTM D5185m         >100         4         <1         2           Tin         ppm         ASTM D5185m         >4         0         <1  |  | • •   | ASTM D5185m   | >15   | 3  | 2  | 1   |
| Copper         ppm         ASTM D5185m         >100         4         <1         2           Tin         ppm         ASTM D5185m         >4         0         <1  |  |   | ASTM D5185m   | >25   | 0  | 0  | <1  |
| Tin   |  |   | ASTM D5185m   | >100  | 4  | <1   | 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         0         11         7         7           Barium         ppm         ASTM D5185m         0         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         0         0         0           Manganese         ppm         ASTM D5185m         0         0         <1         <1           Magnesium         ppm         ASTM D5185m         1010         916         1107         1008           Calcium         ppm         ASTM D5185m         1070         1090         1288         1142           Phosphorus         ppm         ASTM D5185m         1270         1206         1428         1349           Sulfur         ppm         ASTM D5185m         2060         2774         4058         3654           CONTAMINANTS         method         limit/base         current  | ` ` `  |   | ASTM D5185m   | >4  | 0  | <1   | <1  |
| Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         11         7         7           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         69         72         66           Manganese         ppm         ASTM D5185m         0         0         <1   |  | • •   | ASTM D5185m   |   | 0  | <1   |   |
| Boron   |  |   | ASTM D5185m   |   | 0  | 0  | 0   |
| Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         69         72         66           Manganese         ppm         ASTM D5185m         0         0         <1  | ADDITIVEC  |   |   |   |  |  |   |
| Molybdenum         ppm         ASTM D5185m         60         69         72         66           Manganese         ppm         ASTM D5185m         0         0         <1         <1           Magnesium         ppm         ASTM D5185m         1010         916         1107         1008           Calcium         ppm         ASTM D5185m         1070         1090         1288         1142           Phosphorus         ppm         ASTM D5185m         1150         900         1134         1072           Zinc         ppm         ASTM D5185m         1270         1206         1428         1349           Sulfur         ppm         ASTM D5185m         2060         2774         4058         3654           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         16         10         7           Sodium         ppm         ASTM D5185m         >20         1356         382         14           Glycol         %         *ASTM D2882         0.20         0.10         NEG           INFRA-RED         method         limit/base <t< td=""><td>ADDITIVES</td><td></td><td>method</td><td>limit/base</td><td>current</td><td>history1</td><td>history2</td></t<>   | ADDITIVES  |   | method  | limit/base  | current  | history1   | history2  |
| Manganese         ppm         ASTM D5185m         0         0         <1         <1           Magnesium         ppm         ASTM D5185m         1010         916         1107         1008           Calcium         ppm         ASTM D5185m         1070         1090         1288         1142           Phosphorus         ppm         ASTM D5185m         1150         900         1134         1072           Zinc         ppm         ASTM D5185m         1270         1206         1428         1349           Sulfur         ppm         ASTM D5185m         2060         2774         4058         3654           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         225         16         10         7           Sodium         ppm         ASTM D5185m         225         16         10         7           Sodium         ppm         ASTM D5185m         220         1356         382         14           Glycol         *ASTM D5185m         20         1356         382         14           Glycol         *ASTM D5185m         20         0.3 <td>_</td> <td>ppm</td> <td></td> <td></td> <td></td> <td></td> <td></td>   | _  | ppm   |   |   |  |  |   |
| Magnesium         ppm         ASTM D5185m         1010         916         1107         1008           Calcium         ppm         ASTM D5185m         1070         1090         1288         1142           Phosphorus         ppm         ASTM D5185m         1150         900         1134         1072           Zinc         ppm         ASTM D5185m         1270         1206         1428         1349           Sulfur         ppm         ASTM D5185m         2060         2774         4058         3654           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         16         10         7           Sodium         ppm         ASTM D5185m         >25         16         10         7           Sodium         ppm         ASTM D5185m         >20         1356         382         14           Glycol         %         *ASTM D585m         >20         1356         382         14           Glycol         %         *ASTM D7844         >6         0.3         0.3         0.5           INFRA-RED         method         limit/base<   | Boron  |   | ASTM D5185m   | 0   | 11   | 7  | 7   |
| Calcium         ppm         ASTM D5185m         1070         1090         1288         1142           Phosphorus         ppm         ASTM D5185m         1150         900         1134         1072           Zinc         ppm         ASTM D5185m         1270         1206         1428         1349           Sulfur         ppm         ASTM D5185m         2060         2774         4058         3654           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         16         10         7           Sodium         ppm         ASTM D5185m         >25         16         10         7           Sodium         ppm         ASTM D5185m         >20         ▲ 1356         ▲ 382         14           Glycol         %         *ASTM D5185m         >20         ▲ 1356         ▲ 382         14           Glycol         %         *ASTM D2982         ▲ 0.20         ▲ 0.10         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624  | Boron<br>Barium  | ppm   | ASTM D5185m<br>ASTM D5185m  | 0   | 11<br>0  | 7  | 7   |
| Phosphorus         ppm         ASTM D5185m         1150         900         1134         1072           Zinc         ppm         ASTM D5185m         1270         1206         1428         1349           Sulfur         ppm         ASTM D5185m         2060         2774         4058         3654           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         16         10         7           Sodium         ppm         ASTM D5185m         >25         16         10         7           Sodium         ppm         ASTM D5185m         >20         ▲ 1356         ▲ 382         14           Glycol         %         *ASTM D5185m         >20         ▲ 1356         ▲ 382         14           Glycol         %         *ASTM D2982         ▲ 0.20         ▲ 0.10         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         8.3         9.6         12.3           Sulfation         Abs/.1mm         *ASTM D7415  | Boron<br>Barium<br>Molybdenum  | ppm<br>ppm                                    | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 0<br>0<br>60  | 11<br>0<br>69  | 7<br>0<br>72   | 7<br>0<br>66  |
| Zinc         ppm         ASTM D5185m         1270         1206         1428         1349           Sulfur         ppm         ASTM D5185m         2060         2774         4058         3654           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         16         10         7           Sodium         ppm         ASTM D5185m         >25         16         10         7           Sodium         ppm         ASTM D5185m         >20         1356         382         14           Glycol         %         *ASTM D2982         ▲ 0.20         ▲ 0.10         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.3         0.3         0.5           Nitration         Abs/cm         *ASTM D7624         >20         8.3         9.6         12.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.0         20.3         24.1           FLUID DEGRADATION         method         limit/ba   | Boron<br>Barium<br>Molybdenum<br>Manganese   | ppm<br>ppm                                    | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 0<br>0<br>60<br>0   | 11<br>0<br>69<br>0   | 7<br>0<br>72<br><1   | 7<br>0<br>66<br><1  |
| Sulfur         ppm         ASTM D5185m         2060         2774         4058         3654           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         16         10         7           Sodium         ppm         ASTM D5185m         >25         16         10         7           Sodium         ppm         ASTM D5185m         >20         1356         329         50           Potassium         ppm         ASTM D5185m         >20         1356         382         14           Glycol         %         *ASTM D2982         ▲ 0.20         ▲ 0.10         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.3         0.3         0.5           Nitration         Abs/cm         *ASTM D7415         >30         20.0         20.3         24.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 <td< td=""><td>Boron<br/>Barium<br/>Molybdenum<br/>Manganese<br/>Magnesium</td><td>ppm<br/>ppm<br/>ppm</td><td>ASTM D5185m<br/>ASTM D5185m<br/>ASTM D5185m<br/>ASTM D5185m<br/>ASTM D5185m</td><td>0<br/>0<br/>60<br/>0<br/>1010</td><td>11<br/>0<br/>69<br/>0<br/>916</td><td>7<br/>0<br/>72<br/>&lt;1<br/>1107</td><td>7<br/>0<br/>66<br/>&lt;1<br/>1008</td></td<>   | Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium  | ppm<br>ppm<br>ppm                             | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 0<br>0<br>60<br>0<br>1010   | 11<br>0<br>69<br>0<br>916  | 7<br>0<br>72<br><1<br>1107   | 7<br>0<br>66<br><1<br>1008  |
| Sulfur         ppm         ASTM D5185m         2060         2774         4058         3654           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         16         10         7           Sodium         ppm         ASTM D5185m         >25         16         10         7           Sodium         ppm         ASTM D5185m         >20         1356         329         50           Potassium         ppm         ASTM D5185m         >20         1356         382         14           Glycol         %         *ASTM D2982          0.20         0.10         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.3         0.3         0.5           Nitration         Abs/.1mm         *ASTM D7415         >30         20.0         20.3         24.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414<   | Boron Barium Molybdenum Manganese Magnesium Calcium  | ppm<br>ppm<br>ppm<br>ppm                      | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 0<br>0<br>60<br>0<br>1010<br>1070   | 11<br>0<br>69<br>0<br>916<br>1090  | 7<br>0<br>72<br><1<br>1107<br>1288   | 7<br>0<br>66<br><1<br>1008  |
| Silicon       ppm       ASTM D5185m       >25       16       10       7         Sodium       ppm       ASTM D5185m       272       329       50         Potassium       ppm       ASTM D5185m       >20       1356       382       14         Glycol       %       *ASTM D2982       0.20       0.10       NEG         INFRA-RED       method       limit/base       current       history1       history2         Soot %       %       *ASTM D7844       >6       0.3       0.3       0.5         Nitration       Abs/cm       *ASTM D7624       >20       8.3       9.6       12.3         Sulfation       Abs/.1mm       *ASTM D7415       >30       20.0       20.3       24.1         FLUID DEGRADATION method       limit/base       current       history1       history2         Oxidation       Abs/.1mm       *ASTM D7414       >25       14.5       16.5       23.2  | Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus   | ppm<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  | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150   | 11<br>0<br>69<br>0<br>916<br>1090<br>900   | 7<br>0<br>72<br><1<br>1107<br>1288<br>1134   | 7<br>0<br>66<br><1<br>1008<br>1142<br>1072  |
| Sodium         ppm         ASTM D5185m         272         329         50           Potassium         ppm         ASTM D5185m         >20         1356         382         14           Glycol         %         *ASTM D2982         ▲ 0.20         ▲ 0.10         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.3         0.3         0.5           Nitration         Abs/cm         *ASTM D7624         >20         8.3         9.6         12.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.0         20.3         24.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.5         16.5         23.2  | Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc  | ppm<br>ppm<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<br>ASTM D5185m   | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270                                     | 11<br>0<br>69<br>0<br>916<br>1090<br>900<br>1206   | 7<br>0<br>72<br><1<br>1107<br>1288<br>1134<br>1428   | 7<br>0<br>66<br><1<br>1008<br>1142<br>1072<br>1349                                      |
| Potassium         ppm         ASTM D5185m         >20         ▲ 1356         ▲ 382         14           Glycol         %         *ASTM D2982         ▲ 0.20         ▲ 0.10         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.3         0.3         0.5           Nitration         Abs/cm         *ASTM D7624         >20         8.3         9.6         12.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.0         20.3         24.1           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.5         16.5         23.2  | Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur   | ppm<br>ppm<br>ppm<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<br>ASTM D5185m<br>ASTM D5185m  | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270<br>2060                             | 11<br>0<br>69<br>0<br>916<br>1090<br>900<br>1206<br>2774   | 7<br>0<br>72<br><1<br>1107<br>1288<br>1134<br>1428<br>4058                                       | 7<br>0<br>66<br><1<br>1008<br>1142<br>1072<br>1349<br>3654                              |
| Glycol         %         *ASTM D2982         ▲ 0.20         ▲ 0.10         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.3         0.3         0.5           Nitration         Abs/cm         *ASTM D7624         >20         8.3         9.6         12.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.0         20.3         24.1           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.5         16.5         23.2  | Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT   | ppm       | ASTM D5185m   | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270<br>2060                             | 11<br>0<br>69<br>0<br>916<br>1090<br>900<br>1206<br>2774   | 7<br>0<br>72<br><1<br>1107<br>1288<br>1134<br>1428<br>4058<br>history1                           | 7<br>0<br>66<br><1<br>1008<br>1142<br>1072<br>1349<br>3654<br>history2                  |
| INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.3         0.3         0.5           Nitration         Abs/cm         *ASTM D7624         >20         8.3         9.6         12.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.0         20.3         24.1           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.5         16.5         23.2   | Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon   | ppm       | ASTM D5185m   | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270<br>2060                             | 11<br>0<br>69<br>0<br>916<br>1090<br>900<br>1206<br>2774<br>current  | 7<br>0<br>72<br><1<br>1107<br>1288<br>1134<br>1428<br>4058<br>history1                           | 7<br>0<br>66<br><1<br>1008<br>1142<br>1072<br>1349<br>3654<br>history2                  |
| Soot %         %         *ASTM D7844 >6         0.3         0.3         0.5           Nitration         Abs/cm         *ASTM D7624 >20         8.3         9.6         12.3           Sulfation         Abs/.1mm         *ASTM D7415 >30         20.0         20.3         24.1           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         14.5         16.5         23.2   | Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium  | ppm       | ASTM D5185m   | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br>limit/base               | 11<br>0<br>69<br>0<br>916<br>1090<br>900<br>1206<br>2774<br>current<br>16<br>272   | 7<br>0<br>72<br><1<br>1107<br>1288<br>1134<br>1428<br>4058<br>history1<br>10<br>△ 329            | 7 0 66 <1 1008 1142 1072 1349 3654 history2 7 50  |
| Nitration         Abs/cm         *ASTM D7624         >20         8.3         9.6         12.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.0         20.3         24.1           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.5         16.5         23.2   | Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium  | ppm       | ASTM D5185m   | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br>limit/base               | 11 0 69 0 916 1090 900 1206 2774  current 16 272 1356  | 7 0 72 <1 1107 1288 1134 1428 4058 history1 10 △ 329 △ 382                                       | 7 0 66 <1 1008 1142 1072 1349 3654 history2 7 50 14                                     |
| Sulfation         Abs/.1mm         *ASTM D7415         >30         20.0         20.3         24.1           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.5         16.5         23.2   | Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium Glycol   | ppm       | ASTM D5185m   | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br>limit/base<br>>25<br>>20 | 11 0 69 0 916 1090 900 1206 2774  current 16 272 1356 0.20   | 7 0 72 <1 1107 1288 1134 1428 4058 history1 10  329 382 0.10                                     | 7 0 66 <1 1008 1142 1072 1349 3654 history2 7 50 14 NEG                                 |
| Sulfation         Abs/.1mm         *ASTM D7415         >30         20.0         20.3         24.1           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.5         16.5         23.2   | Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium Glycol INFRA-RED   | ppm       | ASTM D5185m ASTM D2982                                | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br>limit/base<br>>25<br>>20 | 11<br>0<br>69<br>0<br>916<br>1090<br>900<br>1206<br>2774<br>current<br>16<br>272<br>▲ 1356<br>▲ 0.20<br>current                                  | 7 0 72 <1 1107 1288 1134 1428 4058 history1 10 △ 329 △ 382 △ 0.10 history1                       | 7 0 66 <1 1008 1142 1072 1349 3654 history2 7 50 14 NEG history2                        |
| Oxidation         Abs/.1mm         *ASTM D7414         >25         14.5         16.5         23.2   | Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium Glycol INFRA-RED Soot %                                  | ppm       | ASTM D5185m *ASTM D7844   | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br>limit/base<br>>25<br>>20 | 11<br>0<br>69<br>0<br>916<br>1090<br>900<br>1206<br>2774<br>current<br>16<br>272<br>▲ 1356<br>▲ 0.20<br>current<br>0.3                           | 7 0 72 <1 1107 1288 1134 1428 4058 history1 10 △ 329 △ 382 △ 0.10 history1 0.3                   | 7 0 66 <1 1008 1142 1072 1349 3654 history2 7 50 14 NEG history2 0.5                    |
|   | Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration                        | ppm       | ASTM D5185m  *ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D7844 *ASTM D7844 *ASTM D7844                                     | 0<br>0<br>60<br>0<br>1010<br>1070<br>1150<br>1270<br>2060<br>limit/base<br>>25<br>>20 | 11<br>0<br>69<br>0<br>916<br>1090<br>900<br>1206<br>2774<br>current<br>16<br>272<br>▲ 1356<br>▲ 0.20<br>current<br>0.3<br>8.3                    | 7 0 72 <1 1107 1288 1134 1428 4058 history1 10 △ 329 △ 382 △ 0.10 history1 0.3 9.6               | 7 0 66 <1 1008 1142 1072 1349 3654 history2 7 50 14 NEG history2 0.5 12.3               |
|   | Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation              | ppm       | ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D7844 *ASTM D7624 *ASTM D76145 | 0<br>0<br>60<br>0<br>1010<br>1150<br>1270<br>2060<br>limit/base<br>>25<br>>20         | 11<br>0<br>69<br>0<br>916<br>1090<br>900<br>1206<br>2774<br>current<br>16<br>272<br>▲ 1356<br>▲ 0.20<br>current<br>0.3<br>8.3<br>20.0            | 7 0 72 <1 1107 1288 1134 1428 4058 history1 10 △ 329 △ 382 △ 0.10 history1 0.3 9.6 20.3          | 7 0 66 <1 1008 1142 1072 1349 3654 history2 7 50 14 NEG history2 0.5 12.3 24.1          |
| <b>Base Number (BN)</b> mg KOH/g ASTM D2896 9.8 <b>10.4</b> 9.0 7.3   | Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation FLUID DEGRAD | ppm       | ASTM D5185m *ASTM D7844 *ASTM D7624 *ASTM D7415 *Method   | 0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >6 >20 >30 limit/base    | 11<br>0<br>69<br>0<br>916<br>1090<br>900<br>1206<br>2774<br>current<br>16<br>272<br>△ 1356<br>△ 0.20<br>current<br>0.3<br>8.3<br>20.0<br>current | 7 0 72 <1 1107 1288 1134 1428 4058 history1 10 △ 329 △ 382 △ 0.10 history1 0.3 9.6 20.3 history1 | 7 0 66 <1 1008 1142 1072 1349 3654 history2 7 50 14 NEG history2 0.5 12.3 24.1 history2 |

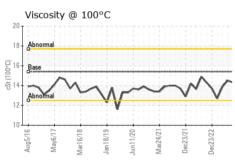


# **OIL ANALYSIS REPORT**





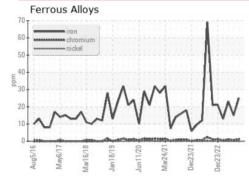


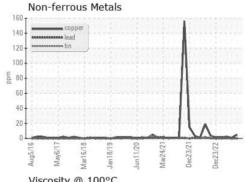


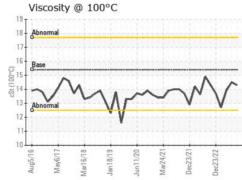
| VISUAL                  |        | method  | limit/base | current | history1 | history2 |
|-------------------------|--------|---------|------------|---------|----------|----------|
| White Metal             | scalar | *Visual | NONE       | NONE    | NONE     | NONE     |
| Yellow Metal            | 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    |
| <b>Emulsified Water</b> | scalar | *Visual | >0.2       | NEG     | NEG      | NEG      |
| Free Water              | scalar | *Visual |            | NEG     | NEG      | NEG      |

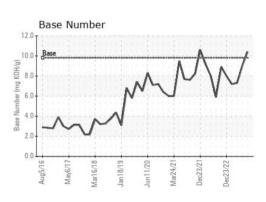
| FLUID PROPE  | RTIES | method    | limit/base | current | history1 | history2 |
|--------------|-------|-----------|------------|---------|----------|----------|
| Visc @ 100°C | cSt   | ASTM D445 | 15.4       | 14.3    | 14.5     | 13.9     |

## **GRAPHS**













Certificate 12367

Laboratory Sample No.

: GFL0126044 Lab Number : 06237597 Unique Number : 11126431

Test Package : FLEET

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 16 Jul 2024 **Tested** : 17 Jul 2024

Diagnosed : 17 Jul 2024 - Wes Davis

GFL Environmental - 020 - Alamance

703 East Gilbreath St Graham, NC

US 27253 Contact: richard.belcher@gflenv.com

T: (800)207-6618

F: (336)229-0526

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)