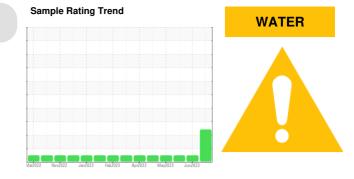


**Natural Gas Engine** 

Machine Id 731115 Component

Eluid

## **PROBLEM SUMMARY**



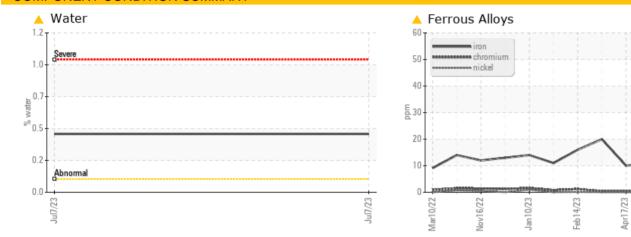
aniana.

May9/23

Jun 14/23

## COMPONENT CONDITION SUMMARY

PETRO CANADA DURON GEO LD 15W40 (--- GAL)



### RECOMMENDATION

No corrective action is recommended at this time. The filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

| PROBLEMATIC TEST RESULTS |     |             |       |                |        |        |  |  |  |
|--------------------------|-----|-------------|-------|----------------|--------|--------|--|--|--|
| Sample Status            |     |             |       | ABNORMAL       | NORMAL | NORMAL |  |  |  |
| Iron                     | ppm | ASTM D5185m | >50   | <u> </u>       | 6      | 11     |  |  |  |
| Water                    | %   | ASTM D6304  | >0.1  | <b>A</b> 0.439 |        |        |  |  |  |
| ppm Water                | maa | ASTM D6304  | >1000 | <b>4390</b>    |        |        |  |  |  |

Customer Id: GFL836 Sample No.: GFL0087237 Lab Number: 05895408 Test Package: FLEET



To manage this report scan the QR code

*To discuss the diagnosis or test data:* Doug Bogart +1 (800)237-1369 x4016 <u>dougb@wearcheckusa.com</u>

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

### **RECOMMENDED ACTIONS**

There are no recommended actions for this sample.

### **HISTORICAL DIAGNOSIS**

### 14 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.

#### 15 May 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.

09 May 2023 Diag: Wes Davis

#### NORMAL



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.



view report







## **OIL ANALYSIS REPORT**





## Machine Id 731115

Component **Natural Gas Engine** 

Fluid PETRO CANADA DURON GEO LD 15W40 (--- GAL)

## 

| No corrective action is recommended at this time;    Orient thin    07 uil 2023    14 Jun 2023    15 May 2025      Machine Age    hrs    Client Info    5214    5071    0      Mear    Simple Date    Client Info    5214    5071    0      Mear    Client Info    5214    5071    0    0      Machine Age    hrs    Client Info    5214    0    0    0      Machine Age    hrs    Client Info    5214    0 <th>DIAGNOSIS</th> <th>SAMPLE INFOR</th> <th>MATION</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>  | DIAGNOSIS  | SAMPLE INFOR     | MATION   | method      | limit/base | current       | history1    | history2    |
|--|--|------------------|----------|-------------|------------|---------------|-------------|-------------|
| No corrective aciton is recommended at this time.    Machine Age    In    In    In    In    In    In    In    In    Name      Meam ple at the next service interval to montlor.    Machine Age    hrs    Client Info    Not    Not    O <td< td=""><td>A Recommendation</td><td>Sample Number</td><td></td><td>Client Info</td><td></td><th>GFL0087237</th><td>GFL0083745</td><td>GFL0070139</td></td<>  | A Recommendation                                       | Sample Number    |          | Client Info |            | GFL0087237    | GFL0083745  | GFL0070139  |
| The filter change at the time of sampling has been nonlow.  Mean  Insertion  Sig14  001  0    Wear  Near  Not Changed  Client Info  Sig14  0  0    Not component wear rates are normal.  Commonion  Not Changed  Not Chan   | No corrective action is recommended at this time.      |                  |          | Client Info |            | 07 Jul 2023   | 14 Jun 2023 | 15 May 2023 |
| Noted. Resample at the next service interval to<br>monitor.    Noted.    Note  | The filter change at the time of sampling has been     |                  | hrs      |             |            |               |             |             |
| Monitor.  Oil Changed  Client Info  Not Changed  Not Changed  N/A    All component wear rates are normal.  Contamination  Immetable  Immetable  Current  Not Changed   | noted. Resample at the next service interval to        | -                |          | Client Info |            |               |             |             |
| Wear    Sample Status    ABNORMAL    NORMAL    NORMAL      All component wear rates are normal.    WEAR METALS    method    imit/base    current    history1    history1      Incent is all gift concentration of water present in the<br>BL result indicates that there is suitable<br>akalinity remaining in the oil. The condition of the<br>all is acceptable for the time in service.    NORMAL    NORMAL    NORMAL    NORMAL      Vickel    ppm    ASTM05156m    >50    60    6    11    -1    0      Ball is acceptable for the time in service.    Normal    Ppm    ASTM05156m    >3    0    0    0    0      Lead    ppm    ASTM05156m    >30    1    <1  | monitor.   | •                |          |             |            | Not Changd    | Not Changd  | N/A         |
| Display="1">MI company: wear rates are normal.  WEAR METALS  method  Imbody  current  history1  history1    There is a light concentration of water present in the ill. Test for glycol is negative.  ppm  ASTM05156m  >  60  6  11    Fuld Condition  ppm  ASTM05156m  >  1  <1   | ▲ Wear   | Ű                |          |             |            | •             | Ű           | NORMAL      |
| Tore is a light concentration of water present in the<br>all. Test of glycol is negative.  Iron  ppm  ASTM D618im  >50  60  6  11    Prote is a light concentration of the<br>alk adminty remaining in the oil. The condition of the<br>alk adminty remaining in the oil. The condition of the<br>alk adminty remaining in the oil. The condition of the<br>alk adminty remaining in the oil. The condition of the<br>alk adminty remaining in the oil. The condition of the<br>alk adminty remaining in the oil. The condition of the<br>alk adminty remaining in the oil. The condition of the<br>alk adminty remaining in the oil. The condition of the<br>alk adminty remaining in the oil. The condition of the<br>alk adminty remaining in the oil. The condition of the<br>alk adminty remaining in the oil. The condition of the<br>alk adminter in service.  ASTM D618im  9  6  -1  -1    Alumnicum  ppm  ASTM D618im  >30  1  -1  -1  -1    Alumnicum  ppm  ASTM D618im  >30  1  -1  -1  -1    Vanadium  ppm  ASTM D618im  >4  1  -1  0  -1  0    Vanadium  ppm  ASTM D618im  50  12  35  15  -1  0    Modedneum  ppm  ASTM D618im  50  710  60  56  57    Barium  ppm | All component wear rates are normal.                   |                  | 0        |             | 11 11 /    |               |             |             |
| Dil. Test for glycol is negative.  Chromium  ppm  ASTM D5185m  >4  1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1  <1   | Contamination  | WEAR METAL       | S        | method      | limit/base | current       | history1    | history2    |
| Fluid Condition    ppm    ASTM Dister    2    1    <1    0      The BV result indicates that there is suitable alkalinity remaining in the 0.1.    Titanium    ppm    ASTM Dister    2    1    <1  | There is a light concentration of water present in the | Iron             | ppm      | ASTM D5185m | >50        | <u> </u>      | 6           | 11          |
| The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the sile acceptable for the time in service.  Titanium  ppm  ASTM D5168n  >3  Q  Q  Q    Silver  ppm  ASTM D5168n  >3  Q  Q  Q  Q    Lead  ppm  ASTM D5168n  >30  1  <1   | oil. Test for glycol is negative.                      | Chromium         | ppm      | ASTM D5185m | >4         | 1             | <1          | <1          |
| alkaliantity remaining in the oil. The condition of the<br>oil is acceptable for the time in service.    Silver    ppm    ASTMD5186m    >3    0    0    0      Aluminum    ppm    ASTMD5186m    >30    1    <1   | Fluid Condition  | Nickel           | ppm      | ASTM D5185m | >2         | 1             | <1          | 0           |
| olivis    ppm    ASTM 05185    S0    1      | The BN result indicates that there is suitable         | Titanium         | ppm      | ASTM D5185m |            | 3             | <1          | <1          |
| Addminum  ppm  ASIM Diffism  >>0  0  <1  | , ,  | Silver           | ppm      | ASTM D5185m | >3         | 0             | 0           | 0           |
| Copper    ppm    ASTM D5185m    >35    17    1    1      Tin    ppm    ASTM D5185m    >4    1    <1  | oil is acceptable for the time in service.             | Aluminum         | ppm      | ASTM D5185m | >9         | 6             | <1          | <1          |
| Copper    ppm    ASTM DS185m    >35    17    1    1      Tin    ppm    ASTM DS185m    >4    1    <1  |  | Lead             | ppm      | ASTM D5185m | >30        | 1             | <1          | 2           |
| Tin  ppm  ASTM D5185m  >4  1  <1  <1  <1    Vanadium  ppm  ASTM D5185m  0  0  <1   |  | Copper           |          | ASTM D5185m | >35        | 17            | 1           | 1           |
| Vanadium    ppm    ASTM D5185m    0    <1    0      Cadmium    ppm    ASTM D5185m    0    <1   |  |                  |          |             |            |               | <1          | <1          |
| Cadmium  ppm  ASTM D5185m  0  <1  0    ADDITIVES  method  ilmit/base  current  history1  history2    Boron  ppm  ASTM D5185m  50  12  35  15    Barium  ppm  ASTM D5185m  50  51  0  0    Molybdenum  ppm  ASTM D5185m  50  50  53  56    Magneseum  ppm  ASTM D5185m  500  70  610  50  510    Calcium  ppm  ASTM D5185m  560  710  609  511  1303    Phosphorus  ppm  ASTM D5185m  780  660  784  753    Zincr  ppm  ASTM D5185m  780  2865  3009  2670    Solitur  ppm  ASTM D5185m  740  2885  3009  2670    Silicon  ppm  ASTM D5185m  5-100  42  4  4    Sodium  ppm  ASTM D5185m  5-20  10  2  10    Plassium  ppm  AST   |  | Vanadium         |          | ASTM D5185m |            |               |             | 0           |
| ADDITIVES  method  limit/base  current  history1  history2    Boron  ppm  ASTM D5185m  50  12  35  15    Barium  ppm  ASTM D5185m  50  50  53  56    Manganese  ppm  ASTM D5185m  50  50  53  56    Mangnesium  ppm  ASTM D5185m  560  710  609  591    Calcium  ppm  ASTM D5185m  1510  1301  1695  1733    Phosphorus  ppm  ASTM D5185m  780  660  784  753    Zinc  ppm  ASTM D5185m  870  931  986  1005    Sulfur  ppm  ASTM D5185m  2040  2885  3009  2670    CONTAMINANTS  method  limit/base  current  history1  history2    Silicon  ppm  ASTM D5185m  50  10  2  1    Yata  ppm  ASTM D5185m  >20  10  2  1    Yata  ppm  ASTM D5185m  |  | Cadmium          |          |             |            | 0             | <1          | 0           |
| Boron  ppm  ASTM D5185m  5.0  12  35.0  15    Barium  ppm  ASTM D5185m  5.0  5.0  5.0  5.0  5.0  5.0    Molybdenum  ppm  ASTM D5185m  5.00  7.1  <.1   |  | ADDITIVES        |          | method      | limit/base | current       | history1    | history2    |
| Barium  ppm  ASTM D518bm  5  <1  0  0    Molybdenum  ppm  ASTM D518bm  50  50  53  56    Manganesse  ppm  ASTM D518bm  0  7  <1  |  |                  | nnm      | ASTM D5185m | 50         | 10            | 35          | 15          |
| Molybdenum  ppm  ASTM D5185m  50  50  53  56    Maganese  ppm  ASTM D5185m  0  7  <1  <1    Magnesium  ppm  ASTM D5185m  560  710  609  551    Calcium  ppm  ASTM D5185m  760  910  1301  1695  1733    Phosphorus  ppm  ASTM D5185m  700  660  784  753    Zinco  ppm  ASTM D5185m  700  931  986  1005    Sulfur  ppm  ASTM D5185m  2040  2885  3009  2670    CONTAMINANTS  method  limit/base  current  history1  history2    Silicon  ppm  ASTM D5185m  >20  10  2  <10    Vater  %  ASTM D5185m  >20  10  2  <1  <1    Sodium  ppm  ASTM D5185m  >20  10  2  <1  <1    INteraction  ppm  ASTM D5185m  >20  10  2  <1  <1  |  |                  |          |             |            |               |             |             |
| Manganese  ppm  ASTM D5185m  0  7  <1  <1    Magnesium  ppm  ASTM D5185m  560  710  609  591    Calcium  ppm  ASTM D5185m  1510  1301  1995  1733    Phosphorus  ppm  ASTM D5185m  700  660  784  753    Zinc  ppm  ASTM D5185m  870  931  986  1005    Sulfur  ppm  ASTM D5185m  870  2885  3009  2670    CONTAMINANT  method  Imit/base  current  history1  history2    Silicon  ppm  ASTM D5185m  >100  42  4  4    Sodium  ppm  ASTM D5185m  >20  10  2  -1    Vater  %  ASTM D5185m  >20  10  2  -1  -1    Water  %  ASTM D5185m  >20  10  2      Ippm Water  pm  ASTM D6304  >1000  4390 <   |  |                  |          |             |            |               |             |             |
| Magnesium  ppm  ASTM D5185m  560  710  609  591    Calcium  ppm  ASTM D5185m  1510  1301  1695  1733    Phosphorus  ppm  ASTM D5185m  780  660  784  753    Zinc  ppm  ASTM D5185m  870  931  986  1005    Sulfur  ppm  ASTM D5185m  2040  2885  3009  2670    CONTAMINAT  ppm  ASTM D5185m  2040  2885  3009  2670    Sulfur  ppm  ASTM D5185m  >+100  42  4  4    Sodium  ppm  ASTM D5185m  >+100  42  4  4    Sodium  ppm  ASTM D5185m  ><0   |  |                  |          |             |            |               |             |             |
| Calcium  ppm  ASTM D5185m  1510  1301  1695  1733    Phosphorus  ppm  ASTM D5185m  780  660  784  753    Zinc  ppm  ASTM D5185m  870  931  986  1005    Sulfur  ppm  ASTM D5185m  2040  2885  3009  2670    CONTAMINANTS  method  limit/base  current  history1  history2    Silicon  ppm  ASTM D5185m  >+100  42  4  4    Sodium  ppm  ASTM D5185m  >+100  42  4  4    Sodium  ppm  ASTM D5185m  >+100  42  4  4    Sodium  ppm  ASTM D5185m  >20  10  2  <10   |  | Ū                |          |             |            |               |             |             |
| Phosphorus  ppm  ASTM D5185m  780  660  784  753    Zinc  ppm  ASTM D5185m  870  931  986  1005    Sulfur  ppm  ASTM D5185m  2040  2885  3009  2670    CONTAMINANTS  method  limit/base  current  history1  history2    Silicon  ppm  ASTM D5185m  >+100  42  4  4    Sodium  ppm  ASTM D5185m  >+100  42  4  4    Sodium  ppm  ASTM D5185m  >20  100  2  21    Potassium  ppm  ASTM D5185m  >20  100  2  21    Water  %  ASTM D5185m  >20  100  2  21    INFRA-RED  method  limit/base  current  history1  history2    Soot %  %  'ASTM D7644  20  11.4  7.8  10.7    Sulfation  Abs/tmm  'ASTM D7745  >30  23.1  19.8  21.7    D100  D100  Abs/tmm   |  | -                |          |             |            |               |             |             |
| Zinc  ppm  ASTM D5185m  870  931  986  1005    Sulfur  ppm  ASTM D5185m  2040  2885  3009  2670    CONTAMINA\TS  method  limit/base  current  history1  history2    Silicon  ppm  ASTM D5185m  >+100  42  4  4    Sodium  ppm  ASTM D5185m  >+100  42  4  4    Sodium  ppm  ASTM D5185m  >+100  42  4  4    Sodium  ppm  ASTM D5185m  >20  100  2  <10  <11    Water  %  ASTM D5185m  >20  100  2  <11  <11  <11    INFRA-RED  method  limit/base  current  history1  history2    Soot %  %  *ASTM D7844  0.1  0.1  0    Nitration  Abs/cm  *ASTM D7624  >20  11.4  7.8  10.7    Sulfation  Abs/lim  *ASTM D7614  >30  23.1  19.8  21.7    FLUID DEGRADATI   |  |                  |          |             |            |               |             |             |
| SulfurppmASTM D5185m2040288530092670CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>+1004244SodiumppmASTM D5185m>201057PotassiumppmASTM D5185m>20102<1  |  |                  |          |             |            |               |             |             |
| CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>+1004244SodiumppmASTM D5185m>20102<1  |  |                  |          |             |            |               |             |             |
| SiliconppmASTM D5185m>+1004244SodiumppmASTM D5185m $>+100$ 657PotassiumppmASTM D5185m>20102<1  |  | Sulfur           | ppm      | ASTM D5185m | 2040       | 2885          | 3009        | 2670        |
| SodiumppmASTM D5185m657PotassiumppmASTM D5185m>20102<1   |  | CONTAMINAN       | ITS      | method      | limit/base | current       | history1    | history2    |
| PotassiumppmASTM D5185m>20102<1Water%ASTM D6304>0.10.439ppm WaterppmASTM D6304>100043900INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D78440.10.100NitrationAbs/cm*ASTM D7624>2011.47.810.7SulfationAbs/lmm*ASTM D7415>3023.119.821.7FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/lmm*ASTM D7414>2519.617.117.8   |  | Silicon          | ppm      | ASTM D5185m | >+100      | 42            | 4           | 4           |
| PotassiumppmASTM D5185m>20102<1Water%ASTM D6304>0.10.439ppm WaterppmASTM D6304>100043900INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D78440.10.100NitrationAbs/cm*ASTM D7624>2011.47.810.7SulfationAbs/lmm*ASTM D7415>3023.119.821.7FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/lmm*ASTM D7414>2519.617.117.8   |  | Sodium           | ppm      | ASTM D5185m |            | 6             | 5           | 7           |
| Water  %  ASTM D6304  >0.1  0.439      ppm Water  ppm  ASTM D6304  >1000  4390       INFRA-RED  method  limit/base  current  history1  history2    Soot %  %  *ASTM D7844  0.1  0.1  0    Nitration  Abs/cm  *ASTM D7624  >20  11.4  7.8  10.7    Sulfation  Abs/.1mm  *ASTM D7415  >30  23.1  19.8  21.7    FLUID DEGRADATION  method  limit/base  current  history1  history2    Oxidation  Abs/.1mm  *ASTM D7414  >25  19.6  17.1  17.8   |  | Potassium        | ppm      | ASTM D5185m | >20        | 10            |             | <1          |
| INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D78440.10.10NitrationAbs/cm*ASTM D7624>2011.47.810.7SulfationAbs/.1mm*ASTM D7415>3023.119.821.7FLUID DEGRADATION methodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2519.617.117.8   |  | Water            |          | ASTM D6304  | >0.1       | <b></b> 0.439 |             |             |
| Soot %  %  *ASTM D7844  0.1  0.1  0    Nitration  Abs/cm  *ASTM D7624  >20  11.4  7.8  10.7    Sulfation  Abs/.1mm  *ASTM D7415  >30  23.1  19.8  21.7    FLUID DEGRADATION  method  limit/base  current  history1  history2    Oxidation  Abs/.1mm  *ASTM D7414  >25  19.6  17.1  17.8  |  | ppm Water        | ppm      | ASTM D6304  | >1000      | <b>4390</b>   |             |             |
| Nitration    Abs/cm    *ASTM D7624    >20    11.4    7.8    10.7      Sulfation    Abs/.1mm    *ASTM D7415    >30    23.1    19.8    21.7      FLUID DEGRADATION    method    limit/base    current    history1    history2      Oxidation    Abs/.1mm    *ASTM D7414    >25    19.6    17.1    17.8   |  | INFRA-RED        |          | method      | limit/base | current       | history1    | history2    |
| SulfationAbs/.1mm*ASTM D7415>3023.119.821.7FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2519.617.117.8   |  | Soot %           | %        | *ASTM D7844 |            | 0.1           | 0.1         | 0           |
| SulfationAbs/.1mm*ASTM D7415>3023.119.821.7FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2519.617.117.8   |  | Nitration        | Abs/cm   | *ASTM D7624 | >20        |               | 7.8         | 10.7        |
| Oxidation    Abs/.1mm    *ASTM D7414    >25    19.6    17.1    17.8  |  |                  |          |             |            |               |             |             |
|  |  | FLUID DEGRAI     |          | method      | limit/base | current       | history1    | history2    |
|  |  | Oxidation        | Abs/.1mm | *ASTM D7414 | >25        | 19.6          | 17.1        | 17.8        |
|  |  | Base Number (BN) | mg KOH/a | ASTM D2896  | 10.2       | 5.1           | 7.2         | 5.5         |



# **OIL ANALYSIS REPORT**

method

limit/base

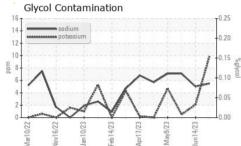
current

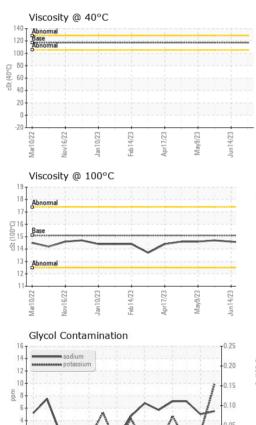
history1

history2

VISUAL







ah 14

Certificate L2367



Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

un14/23

Contact/Location: See also GFL823, 834, 837, 840 - Robert Hart - GFL836

F: