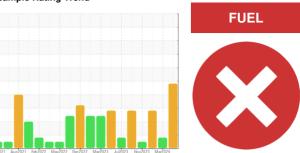


# **PROBLEM SUMMARY**

Sample Rating Trend



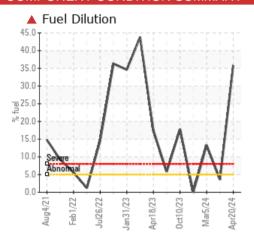
Machine Id

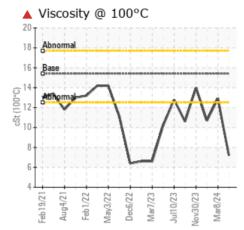
827036-1040

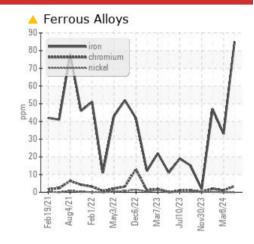
**Diesel Engine** 

PETRO CANADA DURON SHP 15W40 (22 QTS)

# **COMPONENT CONDITION SUMMARY**







# RECOMMENDATION

We advise that you check the fuel injection system. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

PROBLEMATIC TEST RESULTS									
Sample Status				SEVERE	MARGINAL	SEVERE			
Iron	ppm	ASTM D5185m	>80	<u>^</u> 85	33	47			
Fuel	%	ASTM D3524	>5	<b>▲</b> 35.8	<b>▲</b> 3.6	<b>13.3</b>			
Oxidation	Abs/.1mm	*ASTM D7414	>25	<b>27.9</b>	22.3	16.9			
Visc @ 100°C	cSt	ASTM D445	15.4	<b>7.2</b>	12.9	<b>1</b> 0.7			

Customer Id: GFL622 Sample No.: GFL0110312 Lab Number: 06158377 Test Package: FLEET



To manage this report scan the QR code

To discuss the diagnosis or test data: Sean Felton +1 919-379-4092 sfelton@wearcheckusa.com

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

RECOMMENDED ACTIONS						
Action	Status	Date	Done By	Description		
Change Fluid			?	Oil and filter change at the time of sampling has been noted.		
Change Filter			?	Oil and filter change at the time of sampling has been noted.		
Resample			?	We recommend an early resample to monitor this condition.		
Check Fuel/injector System			?	We advise that you check the fuel injection system.		

# HISTORICAL DIAGNOSIS

### 08 Mar 2024 Diag: Jonathan Hester

FUEL



No corrective action is recommended at this time. Resample at the next service interval to monitor. All component wear rates are normal. Light fuel dilution occurring. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.







**05 Mar 2024 Diag: Jonathan Hester**We advise that you check the fuel injection system. We recommend that you drain the oil and perform a filter service on this component if not already done. We recommend an early resample to monitor this condition.All component wear rates are normal. There is a high amount of fuel present in the oil. Fuel is present in the oil and is lowering the viscosity. 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.



#### NORMAL





30 Nov 2023 Diag: Jonathan Hester

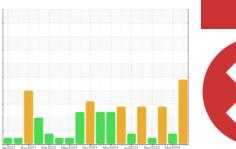
Resample at the next service interval to monitor. All component wear rates are normal. Fuel content negligible. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.





# **OIL ANALYSIS REPORT**

Sample Rating Trend



**FUEL** 

Machine Id

827036-1040

**Diesel Engine** 

PETRO CANADA DURON SHP 15W40 (22 QTS)

# **DIAGNOSIS**

### ▲ Recommendation

We advise that you check the fuel injection system. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

### Wear

All component wear rates are normal.

# Contamination

There is a high amount of fuel present in the oil.

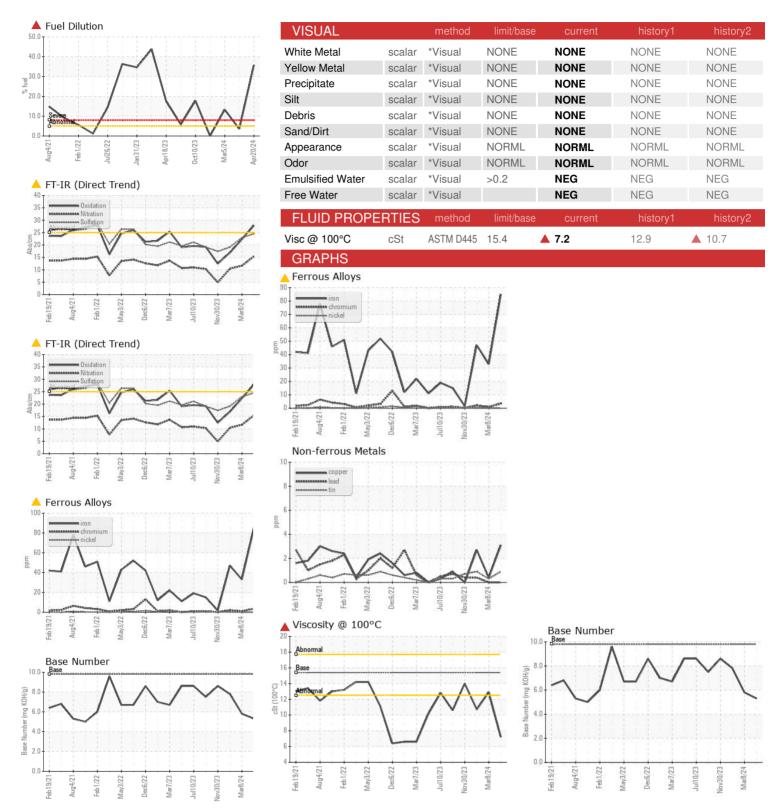
### ▲ Fluid Condition

Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.

Sample Number         Client Info         GFL0110312         GFL0110312         GFL0110314         GFL0110310         GRL0110312         GFL0110314         GFL0110310         GRL0110312         GFL0110341         GFL0110341         GFL0110340         GRL0110341         GFL0110340         DRM ar 2024         Mar 2024         Mar 2024         DRM ar 2024         Mar 20	QTS)		eb2021 Aug20	021 Feb2022 May2022 De	c2022 Mar2023 Jul2023 Nov2023	Mar2024	
Sample Date         Client Info         20 Apr 2024         08 Mar 2024         05 Mar 2024         14437	SAMPLE INFOR	RMATION	method	limit/base	current	history1	history2
Sample Date         Client Info         20 Apr 2024         08 Mar 2024         05 Mar 2024         14437         1	Sample Number		Client Info		GFL0110312	GFL0110341	GFL0110305
Machine Age         hrs         Client Info         14773         14227         14437           Oil Age         hrs         Client Info         590         370         241           Oil Changed         Client Info         Changed         Not Changed         Not Changed           Sample Status         Contact         SEVERE         MARGINAL         SEVERE           CONTAMINATION         method         Immitbles         current         history1         history2           Water         WC Method         >0.2         NEG         NEG         NEG           WEAR METALS         method         limitbles         current         history1         history2           Iron         ppm         ASTM D5185m         >0.2         NEG         NEG         NEG           WEAR METALS         method         limitbles         current         history1         history2           Iron         ppm         ASTM D5185m         >5         4         1         2           Nickel         ppm         ASTM D5185m         >2         0         0         <1	· ·		Client Info		20 Apr 2024	08 Mar 2024	05 Mar 2024
Oil Changed Sample Status         Client Info         Changed SEVERE         Not Changed MARGINAL         Not Changed SEVERE           CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         NEG         NEG         NEG           Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >80         & 85         33         47           Chromium         ppm         ASTM D5185m         >5         4         1         2           Nickel         ppm         ASTM D5185m         >0         0         0         <1           Aluminum         ppm         ASTM D5185m         >30         0         0         <1           Lead         ppm         ASTM D5185m         >30         0         0         <1         <1           Copper         ppm         ASTM D5185m         >30         0         0         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1	•	hrs	Client Info		•	14227	14437
Several   Sev	Oil Age	hrs	Client Info		590	370	241
Several   Sev	Oil Changed		Client Info		Changed	Not Changd	Not Changd
Water Glycol         WC Method WC Method         >0.2         NEG NEG         NEG NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >80         A \$5         33         47           Chromium         ppm         ASTM D5185m         >5         4         1         2           Nickel         ppm         ASTM D5185m         >2         0         0         <1					_		_
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >80         A \$5         33         47           Chromium         ppm         ASTM D5185m         >5         4         1         2           Nickel         ppm         ASTM D5185m         >2         0         0         <1	CONTAMINAT	TION	method	limit/base	current	history1	history2
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >5         4         1         2           Nickel         ppm         ASTM D5185m         >2         0         0         <1           Titanium         ppm         ASTM D5185m         >2         0         0         <1           Silver         ppm         ASTM D5185m         >3         0         0         0         0           Aluminum         ppm         ASTM D5185m         >30         0         0         <1         0         0         <1         0         0         <1         0         0         <1         0         0         <1         1         0         0         <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	WEAR METAL	_S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>80	<b>4</b> 85	33	47
Titanium	Chromium	ppm	ASTM D5185m	>5	4	1	2
Silver	Nickel	ppm	ASTM D5185m	>2	0	0	<1
Aluminum ppm ASTM D5185m >30 2 2 3 3  Lead ppm ASTM D5185m >30 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Titanium	ppm	ASTM D5185m		0	0	<1
Lead         ppm         ASTM D5185m         >30         0         0         <1           Copper         ppm         ASTM D5185m         >150         3         <1         3           Tin         ppm         ASTM D5185m         >5         <1         <1         <1           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         1         0         3           Barium         ppm         ASTM D5185m         0         0         0         <1         0         3           Barium         ppm         ASTM D5185m         0         0         0         <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 <td>Silver</td> <td>ppm</td> <td>ASTM D5185m</td> <td>&gt;3</td> <th>0</th> <td>0</td> <td>0</td>	Silver	ppm	ASTM D5185m	>3	0	0	0
Copper         ppm         ASTM D5185m         >150         3         <1         3           Tin         ppm         ASTM D5185m         >5         <1	Aluminum	ppm	ASTM D5185m	>30	2	2	3
Tin	Lead	ppm	ASTM D5185m	>30	0	0	<1
Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         1         0         3           Barium         ppm         ASTM D5185m         0         0         0         <1           Molybdenum         ppm         ASTM D5185m         0         1         <1         <1           Manganese         ppm         ASTM D5185m         0         1         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         542         903         732           Calcium         ppm         ASTM D5185m         1070         648         1078         894           Phosphorus         ppm         ASTM D5185m         1150         572         1020         788           Zinc         ppm         ASTM D5185m         2060         1769         3055         2396           CONTAMINANTS         method         limit/base         current         history	Copper	ppm	ASTM D5185m	>150	3	<1	3
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         1         0         3           Barium         ppm         ASTM D5185m         0         0         0         <1	Tin	ppm	ASTM D5185m	>5	<1	<1	<1
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         1         0         3           Barium         ppm         ASTM D5185m         0         0         0         <1	Vanadium	ppm	ASTM D5185m		0	0	0
Boron ppm ASTM D5185m 0 1 0 3 Barium ppm ASTM D5185m 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         0         0         0         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         37         62         49           Manganese         ppm         ASTM D5185m         0         1         <1	Boron	ppm	ASTM D5185m	0	1	0	3
Manganese         ppm         ASTM D5185m         0         1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         542         903         732           Calcium         ppm         ASTM D5185m         1070         648         1078         894           Phosphorus         ppm         ASTM D5185m         1150         572         1020         788           Zinc         ppm         ASTM D5185m         1270         713         1220         998           Sulfur         ppm         ASTM D5185m         2060         1769         3055         2396           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         14         3         15           Sodium         ppm         ASTM D5185m         >20         0         <1         2           Fuel         %         ASTM D5185m         >20         0         <1         2           Fuel         %         ASTM D5185m         >20         0         <1         2           Fuel         %         ASTM D5185m         >20	Barium	ppm	ASTM D5185m	0	0	0	<1
Magnesium         ppm         ASTM D5185m         1010         542         903         732           Calcium         ppm         ASTM D5185m         1070         648         1078         894           Phosphorus         ppm         ASTM D5185m         1150         572         1020         788           Zinc         ppm         ASTM D5185m         1270         713         1220         998           Sulfur         ppm         ASTM D5185m         2060         1769         3055         2396           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         14         3         15           Sodium         ppm         ASTM D5185m         >20         0         <1         2           Fuel         %         ASTM D584m         >3         1.2	Molybdenum	ppm	ASTM D5185m	60	37	62	49
Calcium         ppm         ASTM D5185m         1070         648         1078         894           Phosphorus         ppm         ASTM D5185m         1150         572         1020         788           Zinc         ppm         ASTM D5185m         1270         713         1220         998           Sulfur         ppm         ASTM D5185m         2060         1769         3055         2396           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         14         3         15           Sodium         ppm         ASTM D5185m         >20         0         <1	Manganese	ppm	ASTM D5185m	0	1	<1	<1
Phosphorus         ppm         ASTM D5185m         1150         572         1020         788           Zinc         ppm         ASTM D5185m         1270         713         1220         998           Sulfur         ppm         ASTM D5185m         2060         1769         3055         2396           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         14         3         15           Sodium         ppm         ASTM D5185m         >20         0         <1	Magnesium	ppm	ASTM D5185m	1010	542	903	732
Zinc         ppm         ASTM D5185m         1270         713         1220         998           Sulfur         ppm         ASTM D5185m         2060         1769         3055         2396           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         14         3         15           Sodium         ppm         ASTM D5185m         6         8         6           Potassium         ppm         ASTM D5185m         >20         0         <1	Calcium	ppm	ASTM D5185m	1070	648	1078	894
Sulfur         ppm         ASTM D5185m         2060         1769         3055         2396           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         14         3         15           Sodium         ppm         ASTM D5185m         6         8         6           Potassium         ppm         ASTM D5185m         >20         0         <1	Phosphorus	ppm	ASTM D5185m	1150	572	1020	788
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         14         3         15           Sodium         ppm         ASTM D5185m         6         8         6           Potassium         ppm         ASTM D5185m         >20         0         <1	Zinc	ppm	ASTM D5185m	1270	713	1220	998
Silicon       ppm       ASTM D5185m       >20       14       3       15         Sodium       ppm       ASTM D5185m       6       8       6         Potassium       ppm       ASTM D5185m       >20       0       <1       2         Fuel       %       ASTM D3524       >5       ▲ 35.8       ▲ 3.6       ▲ 13.3         INFRA-RED       method       limit/base       current       history1       history2         Soot %       %       *ASTM D7844       >3       1.2       0.7       0.7         Nitration       Abs/cm       *ASTM D7624       >20       15.4       11.6       10.4         Sulfation       Abs/.1mm       *ASTM D7415       >30       24.5       22.9       19.1         FLUID DEGRADATION method       limit/base       current       history1       history2         Oxidation       Abs/.1mm       *ASTM D7414       >25       27.9       22.3       16.9	Sulfur	ppm	ASTM D5185m	2060	1769	3055	2396
Sodium         ppm         ASTM D5185m         6         8         6           Potassium         ppm         ASTM D5185m         >20         0         <1         2           Fuel         %         ASTM D3524         >5         ▲ 35.8         ▲ 3.6         ▲ 13.3           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         1.2         0.7         0.7           Nitration         Abs/cm         *ASTM D7624         >20         15.4         11.6         10.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         24.5         22.9         19.1           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         ▲ 27.9         22.3         16.9	CONTAMINAN	NTS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         0         <1         2           Fuel         %         ASTM D3524         >5         ▲ 35.8         ▲ 3.6         ▲ 13.3           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         1.2         0.7         0.7           Nitration         Abs/cm         *ASTM D7624         >20         15.4         11.6         10.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         24.5         22.9         19.1           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         27.9         22.3         16.9	Silicon	ppm	ASTM D5185m	>20	14	3	15
Fuel % ASTM D3524 >5 ▲ 35.8 ▲ 3.6 ▲ 13.3  INFRA-RED method limit/base current history1 history2  Soot % *ASTM D7844 >3 1.2 0.7 0.7  Nitration Abs/cm *ASTM D7624 >20 15.4 11.6 10.4  Sulfation Abs/.1mm *ASTM D7415 >30 24.5 22.9 19.1  FLUID DEGRADATION method limit/base current history1 history2  Oxidation Abs/.1mm *ASTM D7414 >25 ▲ 27.9 22.3 16.9	Sodium	ppm	ASTM D5185m		6	8	6
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         1.2         0.7         0.7           Nitration         Abs/cm         *ASTM D7624         >20         15.4         11.6         10.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         24.5         22.9         19.1           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         27.9         22.3         16.9	Potassium	ppm	ASTM D5185m	>20	0	<1	2
Soot %         %         *ASTM D7844         >3         1.2         0.7         0.7           Nitration         Abs/cm         *ASTM D7624         >20         15.4         11.6         10.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         24.5         22.9         19.1           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         27.9         22.3         16.9	Fuel	%	ASTM D3524	>5	<b>▲</b> 35.8	▲ 3.6	<b>▲</b> 13.3
Nitration         Abs/cm         *ASTM D7624         >20         15.4         11.6         10.4           Sulfation         Abs/.1mm         *ASTM D7615         >30         24.5         22.9         19.1           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         27.9         22.3         16.9	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         24.5         22.9         19.1           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         27.9         22.3         16.9	Soot %	%	*ASTM D7844	>3	1.2	0.7	0.7
Sulfation         Abs/.1mm         *ASTM D7415         >30         24.5         22.9         19.1           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         27.9         22.3         16.9	Nitration	Abs/cm	*ASTM D7624	>20	15.4	11.6	10.4
Oxidation Abs/.1mm *ASTM D7414 >25 <b>27.9</b> 22.3 16.9	Sulfation	Abs/.1mm	*ASTM D7415	>30		22.9	19.1
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
Base Number (BN)   mg KOH/g   ASTM D2896   9.8   5.3   5.8   7.8	Oxidation	Abs/.1mm	*ASTM D7414	>25	<b>27.9</b>	22.3	16.9
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	5.3	5.8	7.8



# OIL ANALYSIS REPORT







Certificate 12367

Report Id: GFL622 [WUSCAR] 06158377 (Generated: 04/25/2024 17:37:57) Rev: 1

Laboratory Sample No.

Lab Number : 06158377 Unique Number : 10993800

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0110312

Received **Tested** 

: 23 Apr 2024 : 25 Apr 2024 Diagnosed Test Package : FLEET ( Additional Tests: FuelDilution, PercentFuel )

: 25 Apr 2024 - Sean Felton

GFL Environmental - 622 - Traverse City Hauling 160 Hughes Dr

Traverse City, MI US 49686

Contact: GARY BREWER

To discuss this sample report, contact Customer Service at 1-800-237-1369.

 $^st$  - 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)

Submitted By: TECHNICIAN ACCOUNT

T:

F: