

# **PROBLEM SUMMARY**

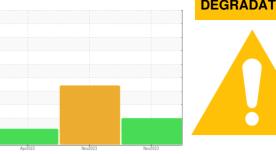
# Sample Rating Trend

# **DEGRADATION**

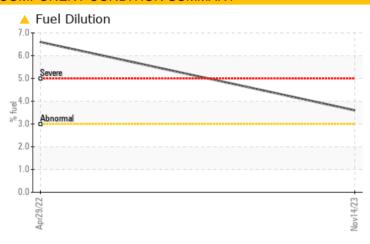


Machine Id 346M Component **Diesel Engine** 

PETRO CANADA DURON SHP 15W40 (--- GAL)



# **COMPONENT CONDITION SUMMARY**



### RECOMMENDATION

We advise that you check the fuel injection system. The oil is near the end of it's useful service life, recommend schedule an oil change.

PROBLEMATION	TEST	RESULT	S			
Sample Status				ABNORMAL	SEVERE	ABNORMAL
Fuel	%	ASTM D3524	>3.0	<b>△</b> 3.6	<1.0	<b>△</b> 6.6
Base Number (BN)	mg KOH/g	ASTM D2896	9.8	<b>2.9</b>	0.2	5.8

Customer Id: GFL410 Sample No.: GFL0059241 Lab Number: 06010564 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

# Action Status Date Done By Description Service/change Fluid --- ? The oil is near the end of it's useful service life, recommend schedule an oil change. Check Fuel/injector System --- ? We advise that you check the fuel injection system.

### HISTORICAL DIAGNOSIS

13 Nov 2023 Diag:

### **DEGRADATION**





### 29 Apr 2022 Diag: Don Baldridge

### FUEL



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. 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.





# **OIL ANALYSIS REPORT**

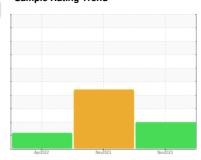
# Sample Rating Trend

# **DEGRADATION**



Machine Id 346M Component **Diesel Engine** 

PETRO CANADA DURON SHP 15W40 (--- GAL)





### **DIAGNOSIS**

### Recommendation

We advise that you check the fuel injection system. The oil is near the end of it's useful service life, recommend schedule an oil change.

All component wear rates are normal.

### Contamination

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

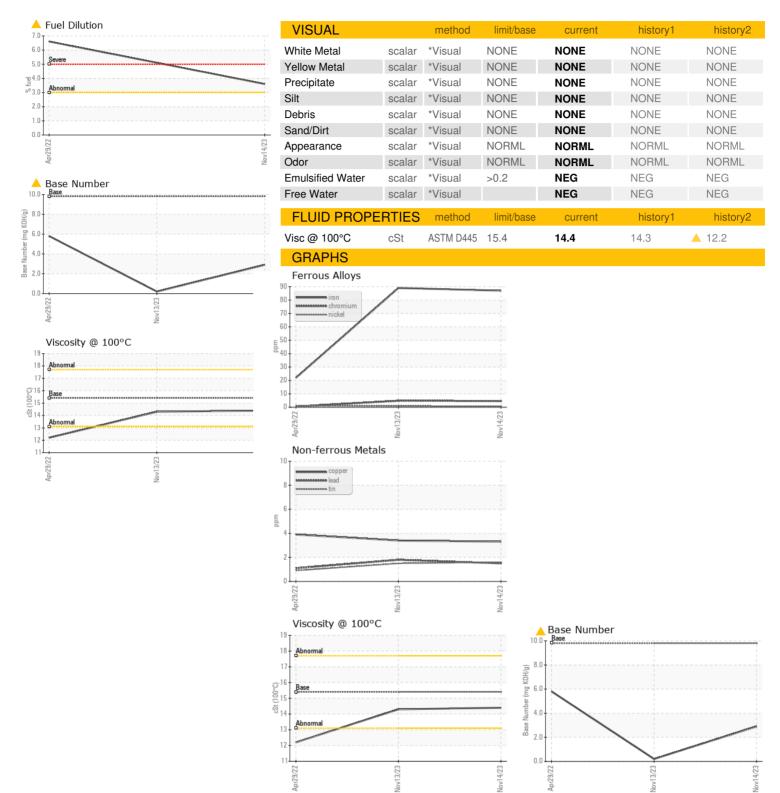
# Fluid Condition

The BN level is low.

Sample Date         Client Info         14 Nov 2023         13 Nov 2023         29 Apr 2022           Machine Age         hrs         Client Info         22721         22721         22938           Oil Age         hrs         Client Info         22721         22721         600           Oil Changed         Client Info         Not Changd         Not Changd         Changed           Sample Status         ABNORMAL         SEVERE         ABNORMAL           CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         >0.2         NEG         NEG         NEG	N SHP 15W40 (	- GAL)	Ap	72022	Nov2023 Nov20	23	
Sample Date   Client Info   14 Nov 2023   13 Nov 2023   29 Apr 2022	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         22721         22721         22721         22938           Dil Age         hrs         Client Info         22721         22721         600           Dil Changed         Client Info         Not Changd         Not Changd         Changed         Changed           ABNORMAL         SEVERE         ABNORMAL         SEVERE         ABNORMAL           CONTAMINATION         method         limit/base         current         history1         history2           WEAR         WC Method         >0.2         NEG         NEG         NEG           NEG         NEG         NEG         NEG         NEG           Mactin         ppm         ASTM D5185m         >20         5         5         <1	Sample Number		Client Info		GFL0059241	GFL0059244	GFL0049296
Dil Age	Sample Date		Client Info		14 Nov 2023	13 Nov 2023	29 Apr 2022
Contamped   Client Info   Not Changed   ABNORMAL   SeVERE   ABNORMAL   SeVERE   ABNORMAL	•	hrs	Client Info		22721	22721	
ABNORMAL   SEVERE   ABNORMAL   CONTAMINATION   method   imil/base   current   history1   history2	Oil Age	hrs	Client Info		22721	22721	600
CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         Vo.2         NEG         NEG         NEG           Silycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           ron         ppm         ASTM D5185m         >120         87         89         22           Chromium         ppm         ASTM D5185m         >20         5         5         <1	Oil Changed		Client Info		Not Changd	Not Changd	Changed
Water         WC Method         >0.2         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >120         87         89         22           Chromium         ppm         ASTM D5185m         >20         5         5         <1           Vickel         ppm         ASTM D5185m         >2         0         <1         1         1           Titanium         ppm         ASTM D5185m         >2         0         <1         <1         0           Silver         ppm         ASTM D5185m         >2         <1         <1         0           Silver         ppm         ASTM D5185m         >20         8         9         7           Lead         ppm         ASTM D5185m         >40         2         2         2         1           Copper         ppm         ASTM D5185m         >330         3         3         4           Tin         ppm         ASTM D5185m         0         0         0         0           Caddium         ppm         ASTM D5185m         0 <t< td=""><td>-</td><td></td><td></td><td></td><td>ABNORMAL</td><td>SEVERE</td><td>ABNORMAL</td></t<>	-				ABNORMAL	SEVERE	ABNORMAL
WEAR METALS	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >120         87         89         22           Chromium         ppm         ASTM D5185m         >20         5         5         <1	Water		WC Method	>0.2	NEG	NEG	NEG
Concording   Co	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         5         5         <1           Nickel         ppm         ASTM D5185m         >5         <1	WEAR METAL	S	method	limit/base	current	history1	history2
Silver	ron	ppm	ASTM D5185m	>120	87	89	22
Description	Chromium	ppm	ASTM D5185m	>20	5	5	<1
Silver	Nickel	ppm	ASTM D5185m	>5	<1	<1	1
Aluminum ppm ASTM D5185m >20 8 9 7  Lead ppm ASTM D5185m >40 2 2 1  Copper ppm ASTM D5185m >330 3 3 4  Fin ppm ASTM D5185m >15 2 2 2 1  ASTM D5185m >15 2 2 2 1  ASTM D5185m O 0 0 0  Cadmium ppm ASTM D5185m O 0 0 0  Cadmium ppm ASTM D5185m O 0 0 0  ADDITIVES method limit/base current history1 history2  Boron ppm ASTM D5185m O 0 0 0  ADDITIVES method limit/base current history1 history2  Boron ppm ASTM D5185m O 0 0 0  ASTM D5185m O 0 0 0 0  Molybdenum ppm ASTM D5185m O 0 0 0  Molybdenum ppm ASTM D5185m O 1 1 1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	Titanium	ppm	ASTM D5185m	>2	0	<1	0
Lead         ppm         ASTM D5185m         >40         2         2         1           Copper         ppm         ASTM D5185m         >330         3         3         4           Fin         ppm         ASTM D5185m         >15         2         2         <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         4         4         4           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         1         1         <1         <1           Magnesium         ppm         ASTM D5185m         0         1         1         <1         <1           Calcium         ppm         ASTM D5185m         1070         1103         1120         1025           Phosphorus         ppm         ASTM D5185m         1270	Silver	ppm	ASTM D5185m	>2	<1	<1	0
Copper	Aluminum	ppm	ASTM D5185m	>20	8	9	7
Princ	_ead	ppm	ASTM D5185m	>40	2	2	1
Fin	Copper	ppm	ASTM D5185m	>330	3	3	4
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         4         4         4           Barium         ppm         ASTM D5185m         0         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         1         1         <1         <1           Manganesium         ppm         ASTM D5185m         0         1         1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         955         979         846           Calcicium         ppm         ASTM D5185m         1070         1103         1120         1025           Phosphorus         ppm         ASTM D5185m         1270         1306         1338         1081           Sulfur         ppm         ASTM D5185m         2060         2612         2684         2139           CONTAMINANTS         method         limit/base <td>Γin</td> <td></td> <td></td> <td></td> <td>2</td> <td>2</td> <td>&lt;1</td>	Γin				2	2	<1
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         4         4         4           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         63         65         52           Manganese         ppm         ASTM D5185m         0         1         1         <1	/anadium		ASTM D5185m		0	0	0
Boron	Cadmium		ASTM D5185m			0	0
Sarium	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         63         65         52           Manganese         ppm         ASTM D5185m         0         1         1         <1	Boron	ppm	ASTM D5185m	0	4	4	4
Manganese         ppm         ASTM D5185m         0         1         1         <1           Magnesium         ppm         ASTM D5185m         1010         955         979         846           Calcium         ppm         ASTM D5185m         1070         1103         1120         1025           Phosphorus         ppm         ASTM D5185m         1150         1045         1083         912           Zinc         ppm         ASTM D5185m         1270         1306         1338         1081           Sulfur         ppm         ASTM D5185m         2060         2612         2684         2139           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         14         15         4           Bodium         ppm         ASTM D5185m         >20         <1         <1         9           Fuel         %         ASTM D5185m         >20         <1         <1         9           Fuel         %         ASTM D5185m         >20         <1         <1         9           Fuel         %         ASTM D5185m         >20	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium         ppm         ASTM D5185m         1010         955         979         846           Calcium         ppm         ASTM D5185m         1070         1103         1120         1025           Phosphorus         ppm         ASTM D5185m         1150         1045         1083         912           Zinc         ppm         ASTM D5185m         1270         1306         1338         1081           Sulfur         ppm         ASTM D5185m         2060         2612         2684         2139           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         14         15         4           Sodium         ppm         ASTM D5185m         >20         <1	Molybdenum	ppm	ASTM D5185m	60	63	65	52
Calcium         ppm         ASTM D5185m         1070         1103         1120         1025           Phosphorus         ppm         ASTM D5185m         1150         1045         1083         912           Zinc         ppm         ASTM D5185m         1270         1306         1338         1081           Sulfur         ppm         ASTM D5185m         2060         2612         2684         2139           CONTAMINANTS         method         limit/base         current         history1         history2           Gilicon         ppm         ASTM D5185m         >25         14         15         4           Godium         ppm         ASTM D5185m         >20         <1	Manganese	ppm	ASTM D5185m	0	1	1	<1
Phosphorus         ppm         ASTM D5185m         1150         1045         1083         912           Zinc         ppm         ASTM D5185m         1270         1306         1338         1081           Sulfur         ppm         ASTM D5185m         2060         2612         2684         2139           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         14         15         4           Sodium         ppm         ASTM D5185m         >20         <1	Magnesium	ppm	ASTM D5185m	1010	955	979	846
Zinc         ppm         ASTM D5185m         1270         1306         1338         1081           Sulfur         ppm         ASTM D5185m         2060         2612         2684         2139           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         14         15         4           Sodium         ppm         ASTM D5185m         >20         <1	Calcium	ppm	ASTM D5185m	1070	1103	1120	1025
Gulfur         ppm         ASTM D5185m         2060         2612         2684         2139           CONTAMINANTS         method         limit/base         current         history1         history2           Gilicon         ppm         ASTM D5185m         >25         14         15         4           Bodium         ppm         ASTM D5185m         >20         <1         <1         9           Godium         ppm         ASTM D5185m         >20         <1         <1         9           Fuel         %         ASTM D3524         >3.0         <3.6         <1.0         <6.6           INFRA-RED         method         limit/base         current         history1         history2           Solf Miration         Abs/.1mm         *ASTM D7624         >20         16.8	Phosphorus	ppm	ASTM D5185m	1150	1045	1083	912
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         14         15         4           Sodium         ppm         ASTM D5185m         11         11         6           Potassium         ppm         ASTM D5185m         >20         <1	Zinc	ppm	ASTM D5185m	1270	1306	1338	1081
Soliticon   ppm   ASTM D5185m   >25   14   15   4	Sulfur	ppm	ASTM D5185m	2060	2612	2684	2139
Sodium         ppm         ASTM D5185m         11         11         6           Potassium         ppm         ASTM D5185m         >20         <1         <1         9           Fuel         %         ASTM D3524         >3.0         ▲ 3.6         <1.0         ▲ 6.6           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         1.6         1.5         0.9           Nitration         Abs/cm         *ASTM D7624         >20         16.8         13.4         11.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         30.0         24.8         25.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         31.4         25.0         21.6	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         <1         <1         9           Fuel         %         ASTM D3524         >3.0         ▲ 3.6         <1.0         ▲ 6.6           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         1.6         1.5         0.9           Nitration         Abs/cm         *ASTM D7624         >20         16.8         13.4         11.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         30.0         24.8         25.3           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         31.4         25.0         21.6	Silicon	ppm	ASTM D5185m	>25	14	15	4
Fuel	Sodium	ppm	ASTM D5185m		11	11	6
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         1.6         1.5         0.9           Nitration         Abs/cm         *ASTM D7624         >20         16.8         13.4         11.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         30.0         24.8         25.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         31.4         25.0         21.6	Potassium	ppm	ASTM D5185m	>20	<1	<1	9
Soot %         %         *ASTM D7844	Fuel	%	ASTM D3524	>3.0	△ 3.6	<1.0	<b>△</b> 6.6
Nitration         Abs/cm         *ASTM D7624         >20         16.8         13.4         11.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         30.0         24.8         25.3           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         31.4         ≥5.0         21.6	INFRA-RED		method	limit/base	current	history1	history2
Nitration         Abs/cm         *ASTM D7624         >20         16.8         13.4         11.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         30.0         24.8         25.3           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         31.4         ≥5.0         21.6	Soot %	%	*ASTM D7844	>4	1.6	1.5	0.9
Sulfation         Abs/.1mm         *ASTM D7415         >30         30.0         24.8         25.3           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         31.4         ▲ 25.0         21.6	Vitration	Abs/cm	*ASTM D7624	>20			11.9
Oxidation							
	Sulfation	AUS/.1111111					
				limit/base		history1	history2
	FLUID DEGRA	OATION	method		current		



# **OIL ANALYSIS REPORT**







Certificate L2367

Laboratory Sample No. **Unique Number** 

Lab Number

: 06010564 : 10749708

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 17 Nov 2023 : GFL0059241 Diagnosed : 20 Nov 2023 Diagnostician : Sean Felton

Test Package : FLEET ( Additional Tests: FuelDilution, PercentFuel ) 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)

GFL Environmental - 410 - Michigan West

39000 Van Born Rd Wayne, MI US 48184 Contact: Belal Dgheish

bdgheish@gflenv.com T: (734)714-2340

Report Id: GFL410 [WUSCAR] 06010564 (Generated: 11/20/2023 16:26:34) Rev: 1