

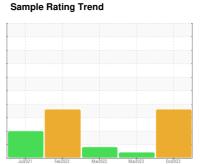
# **PROBLEM SUMMARY**



727065-361316.1

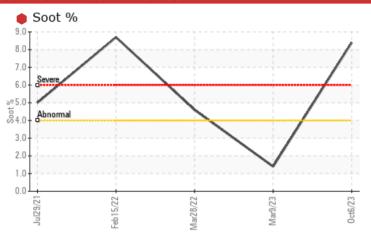
Component **Diesel Engine** 

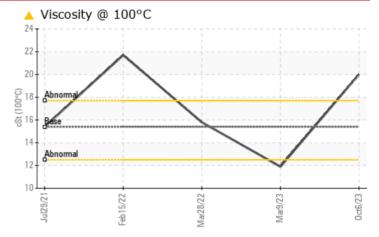
PETRO CANADA DURON SHP 15W40 (--- GAL)





# **COMPONENT CONDITION SUMMARY**





# RECOMMENDATION

We advise that you check for faulty combustion, plugged air filters, or aftercoolers. 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. NOTE: High solids (carbon/soot) in the sample have limited the accuracy of Infra-Red data including Total Base Number (TBN) value.

PROBLEMATIC TEST RESULTS									
Sample Status				SEVERE	ATTENTION	ABNORMAL			
Soot %	%	*ASTM D7844	>4	<b>8.4</b>	1.4	<b>4.6</b>			
Base Number (BN)	mg KOH/g	ASTM D2896	9.8	<b>△</b> 0.0	10.0	7.5			
Visc @ 100°C	cSt	ASTM D445	15.4	<b>20.0</b>	<b>△</b> 11.9	15.8			

Customer Id: GFL829 **Sample No.:** GFL0065462 Lab Number: 05974652 Test Package: FLEET



To manage this report scan the QR code

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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			?	We recommend that you drain the oil and perform a filter service on this component if not already done.	
Change Filter			?	We recommend that you drain the oil and perform a filter service on this component if not already done.	
Resample			?	We recommend an early resample to monitor this condition.	
Alert			?	NOTE: High solids (carbon/soot) in the sample have limited the accuracy of Infra-Red data including Total Base Number (TBN) value.	
Check Combustion			?	We advise that you check for faulty combustion, plugged air filters, or aftercoolers.	

# HISTORICAL DIAGNOSIS

#### 09 Mar 2023 Diag: Jonathan Hester

#### VISCOSITY



Oil and filter change at the time of sampling has been noted. 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 oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.

# view report

### 28 Mar 2022 Diag: Jonathan Hester

#### SOOT



Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor. All component wear rates are normal. There is an abnormal amount of solids and carbon present in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.



# 15 Feb 2022 Diag: Don Baldridge

#### SOOT



We advise that you check for faulty combustion, plugged air filters, or aftercoolers. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition. NOTE: High solids (carbon/soot) in the sample have limited the accuracy of Infra-Red data including Total Base Number (TBN) value. All component wear rates are normal. There is an abnormal amount of solids and carbon present in the oil. The oil viscosity is higher than normal. The BN level is low.





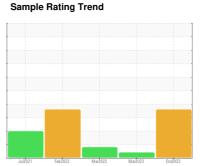
# **OIL ANALYSIS REPORT**



727065-361316.1

Component **Diesel Engine** 

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





# **DIAGNOSIS**

#### Recommendation

We advise that you check for faulty combustion, plugged air filters, or aftercoolers. 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. NOTE: High solids (carbon/soot) in the sample have limited the accuracy of Infra-Red data including Total Base Number (TBN) value.

#### Wear

All component wear rates are normal.

#### Contamination

There is an abnormal amount of solids and carbon present in the oil.

# Fluid Condition

The oil viscosity is higher than normal. The BN level is low. The oil is no longer serviceable due to the presence of contaminants.

Sample Date         Client Info         06 Oct 2023         09 Mar 2023         28 Mar 2022           Machine Age         hrs         Client Info         2821         0         870           Oil Age         hrs         Client Info         150         0         700           Oil Changed         Client Info         Not Changed         Changed         Changed           Sample Status         SEVERE         ATTENTION         ABNORMAL           CONTAMINATION         method         limit/base         current         history1         history2           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >120         58         7         9           Chromium         ppm         ASTM D5185m         >20         2         <1         <1           Nickel         ppm         ASTM D5185m         >20         2         <1         <1           Silver         ppm         ASTM D5185m         >20         3         2         2           Lead         ppm         ASTM D5185m         >20         3         2         2           Copper         <	N SHP 15W40 (	- GAL)	Jul2021	Feb2022	Mar2022 Mar2023	Oct2023	
Sample Date         Client Info         06 Oct 2023         09 Mar 2023         28 Mar 2022           Machine Age         hrs         Client Info         2821         0         870           Oil Age         hrs         Client Info         150         0         700           Oil Changed         Client Info         Not Changed         Changed         Changed           Sample Status         SEVERE         ATTENTION         ABNORMAL           CONTAMINATION         method         Imitivbase         current         history1         history2           Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >20         2         <1	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         2821         0         870           Oil Age         hrs         Client Info         150         0         700           Oil Changed         Client Info         Not Changd         Changed         Changed           Sample Status         SEVERE         ATTENTION         ABNORMAL           CONTAMINATION         method         limit/base         current         history1         history2           Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >120         58         7         9           Ohromium         ppm         ASTM D5185m         >20         2         <1         0         <1           Iritanium         ppm         ASTM D5185m         >20         2         <1         0         <1           Silver         ppm         ASTM D5185m         >20         3         2         2         2           Copper         ppm         ASTM D5185m         >20         3         2         2           Cim	Sample Number		Client Info		GFL0065462	GFL0065557	GFL0036301
Oil Age         hrs         Client Info         150         0         700           Oil Changed Sample Status         Client Info         Not Changed         Changed ABNORMAL         Changed ABNORMAL           CONTAMINATION         method         limit/base         current         history1         history2           Glycol         WE ABRETALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         > 120         58         7         9           Chromium         ppm         ASTM D5185m         > 22         2         -1         -1           Chromium         ppm         ASTM D5185m         >20         2         -1         -1           Chromium         ppm         ASTM D5185m         >20         2         -1         -1         -1           Chromium         ppm         ASTM D5185m         >20         0         0         0           Chromium         ppm         ASTM D5185m         >20         3         2         2           Silver         ppm         ASTM D5185m         >20         3         2         2           Copper         ppm         ASTM D5185m	Sample Date		Client Info		06 Oct 2023	09 Mar 2023	28 Mar 2022
Contact   Client Info   Severe   Changed   Severe   ATTENTION   ABNORMAL	Machine Age	hrs	Client Info		2821	0	870
SEVERE   ATTENTION   ABNORMAL	Oil Age	hrs	Client Info		150	0	700
CONTAMINATION   method   limit/base   current   history1   history2	Oil Changed		Client Info		Not Changd	Changed	Changed
Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >120         58         7         9           Chromium         ppm         ASTM D5185m         >20         2         <1         <1           Nickel         ppm         ASTM D5185m         >5         <1         0         <1           Silver         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Cadad         ppm         ASTM D5185m         >2         0         0         0           Capper         ppm         ASTM D5185m         >20         3         2         2         2           Lead         ppm         ASTM D5185m         >20         3         2         2         2           Lead         ppm         ASTM D5185m         >30         21         2         2           Lead         ppm         ASTM D5185m         0         2         137         2	Sample Status				SEVERE	ATTENTION	ABNORMAL
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >120         58         7         9           Chromium         ppm         ASTM D5185m         >20         2         -1         -1           Nickel         ppm         ASTM D5185m         >20         0         0         0           Tittanium         ppm         ASTM D5185m         >2         0         0         0           Alluminum         ppm         ASTM D5185m         >2         0         0         0           Alluminum         ppm         ASTM D5185m         >2         0         0         0           Alluminum         ppm         ASTM D5185m         >40         6         -1         1           Copper         ppm         ASTM D5185m         >15         1         -1         -1         -1           Copper         ppm         ASTM D5185m         0         -1         0         -1         0           Cadadium         ppm         ASTM D5185m         0         -1         1         -1         -1         -1         -1         -1         -1         <	CONTAMINAT	ION	method	limit/base	current	history1	history2
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         2         <1         <1           Nickel         ppm         ASTM D5185m         >5         <1	WEAR METAL	S	method	limit/base	current	history1	history2
Chromium         ppm         ASTM D5185m         >20         2         <1         <1           Nickel         ppm         ASTM D5185m         >5         <1         0         <1           Titanium         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >20         3         2         2           Lead         ppm         ASTM D5185m         >40         6         <1         1           Copper         ppm         ASTM D5185m         >330         21         28         2           Tin         ppm         ASTM D5185m         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 <td>Iron</td> <td>ppm</td> <td>ASTM D5185m</td> <td>&gt;120</td> <th>58</th> <td>7</td> <td>9</td>	Iron	ppm	ASTM D5185m	>120	58	7	9
Titanium	Chromium		ASTM D5185m	>20	2	<1	<1
Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >20         3         2         2           Lead         ppm         ASTM D5185m         >40         6         <1         1           Copper         ppm         ASTM D5185m         >330         21         28         2           Tin         ppm         ASTM D5185m         0         <1         <1         <1           Vanadium         ppm         ASTM D5185m         0         <1         0         <1         0           Cadmium         ppm         ASTM D5185m         0         2         137         2         2           Boron         ppm         ASTM D5185m         0         2         137         2         2           Barium         ppm         ASTM D5185m         0         0         2         0         0         2         0           Molybdenum         ppm         ASTM D5185m         0         1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1	Nickel	ppm	ASTM D5185m	>5	<1	0	<1
Aluminum         ppm         ASTM D5185m         >20         3         2         2           Lead         ppm         ASTM D5185m         >40         6         <1	Titanium		ASTM D5185m	>2	0	0	0
Lead         ppm         ASTM D5185m         >40         6         <1         1           Copper         ppm         ASTM D5185m         >330         21         28         2           Tin         ppm         ASTM D5185m         >15         1         <1         <1           Vanadium         ppm         ASTM D5185m         0         <1         0           Cadmium         ppm         ASTM D5185m         0         <1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         2         137         2           Barium         ppm         ASTM D5185m         0         0         2         0           Molybdenum         ppm         ASTM D5185m         0         0         2         0           Manganese         ppm         ASTM D5185m         0         1         <1         <1         <1           Calcium         ppm         ASTM D5185m         0         1         <1         <1         <1           Phosphorus         ppm         ASTM D5185m         1070         930         1654	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper         ppm         ASTM D5185m         >330         21         28         2           Tin         ppm         ASTM D5185m         >15         1         <1	Aluminum	ppm	ASTM D5185m	>20	3	2	2
Copper         ppm         ASTM D5185m         >330         21         28         2           Tin         ppm         ASTM D5185m         >15         1         <1	Lead	ppm	ASTM D5185m	>40	6	<1	1
Tin	Copper		ASTM D5185m	>330	21	28	2
Vanadium         ppm         ASTM D5185m         0         <1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         2         137         2           Barium         ppm         ASTM D5185m         0         0         2         0           Molybdenum         ppm         ASTM D5185m         0         51         61         53           Manganese         ppm         ASTM D5185m         0         1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         861         408         935           Calcium         ppm         ASTM D5185m         1070         930         1654         1090           Phosphorus         ppm         ASTM D5185m         1270         1082         1183         1198           Sulfur         ppm         ASTM D5185m         2060         2295         3321         2564           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8 </td <td></td> <td></td> <td>ASTM D5185m</td> <td>&gt;15</td> <th>1</th> <td>&lt;1</td> <td>&lt;1</td>			ASTM D5185m	>15	1	<1	<1
Cadmium         ppm         ASTM D5185m         0         <1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         2         137         2           Barium         ppm         ASTM D5185m         0         0         2         0           Molybdenum         ppm         ASTM D5185m         60         51         61         53           Manganese         ppm         ASTM D5185m         0         1         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         861         408         935           Calcium         ppm         ASTM D5185m         1070         930         1654         1090           Phosphorus         ppm         ASTM D5185m         1150         835         1017         989           Zinc         ppm         ASTM D5185m         1270         1082         1183         1198           Sulfur         ppm         ASTM D5185m         2060         2295         3321         2564           CONTAMINANTS         method         limit/base <t< td=""><td>Vanadium</td><td></td><td>ASTM D5185m</td><td></td><th>0</th><td>&lt;1</td><td>0</td></t<>	Vanadium		ASTM D5185m		0	<1	0
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         2         137         2           Barium         ppm         ASTM D5185m         0         0         2         0           Molybdenum         ppm         ASTM D5185m         60         51         61         53           Manganese         ppm         ASTM D5185m         0         1         <1	Cadmium		ASTM D5185m		0	<1	0
Barium         ppm         ASTM D5185m         0         0         2         0           Molybdenum         ppm         ASTM D5185m         60         51         61         53           Manganese         ppm         ASTM D5185m         0         1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         861         408         935           Calcium         ppm         ASTM D5185m         1070         930         1654         1090           Phosphorus         ppm         ASTM D5185m         1150         835         1017         989           Zinc         ppm         ASTM D5185m         1270         1082         1183         1198           Sulfur         ppm         ASTM D5185m         2060         2295         3321         2564           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         6         2           Sodium         ppm         ASTM D5185m         >20         1         1         0           Fuel         %         ASTM D5185m	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         51         61         53           Manganese         ppm         ASTM D5185m         0         1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         861         408         935           Calcium         ppm         ASTM D5185m         1070         930         1654         1090           Phosphorus         ppm         ASTM D5185m         1150         835         1017         989           Zinc         ppm         ASTM D5185m         1270         1082         1183         1198           Sulfur         ppm         ASTM D5185m         2060         2295         3321         2564           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         6         2           Sodium         ppm         ASTM D5185m         20         1         1         0           Fuel         %         ASTM D5185m         >20         1         1         0           INFRA-RED         method	Boron	maa	ASTM D5185m	0	2	127	2
Manganese         ppm         ASTM D5185m         0         1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         861         408         935           Calcium         ppm         ASTM D5185m         1070         930         1654         1090           Phosphorus         ppm         ASTM D5185m         1150         835         1017         989           Zinc         ppm         ASTM D5185m         1270         1082         1183         1198           Sulfur         ppm         ASTM D5185m         2060         2295         3321         2564           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         6         2           Sodium         ppm         ASTM D5185m         22         3         <1           Potassium         ppm         ASTM D5185m         >20         1         1         0           Fuel         %         ASTM D3524         >3.0         <1.0         0.6         <1.0           INFRA-RED         method         limit/base         4		le le	710 HW D0 100HH	0	_	137	_
Magnesium         ppm         ASTM D5185m         1010         861         408         935           Calcium         ppm         ASTM D5185m         1070         930         1654         1090           Phosphorus         ppm         ASTM D5185m         1150         835         1017         989           Zinc         ppm         ASTM D5185m         1270         1082         1183         1198           Sulfur         ppm         ASTM D5185m         2060         2295         3321         2564           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         6         2           Sodium         ppm         ASTM D5185m         >25         8         6         2           Sodium         ppm         ASTM D5185m         >20         1         1         0           Fuel         %         ASTM D5185m         >20         1         1         0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4	Barium						
Calcium         ppm         ASTM D5185m         1070         930         1654         1090           Phosphorus         ppm         ASTM D5185m         1150         835         1017         989           Zinc         ppm         ASTM D5185m         1270         1082         1183         1198           Sulfur         ppm         ASTM D5185m         2060         2295         3321         2564           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         6         2           Sodium         ppm         ASTM D5185m         2         3         <1		ppm	ASTM D5185m	0	0	2	0
Phosphorus         ppm         ASTM D5185m         1150         835         1017         989           Zinc         ppm         ASTM D5185m         1270         1082         1183         1198           Sulfur         ppm         ASTM D5185m         2060         2295         3321         2564           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         6         2           Sodium         ppm         ASTM D5185m         >20         1         1         0           Fuel         %         ASTM D5185m         >20         1         1         0           Fuel         %         ASTM D3524         >3.0         <1.0	Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m	0 60	0 51	2 61	0 53
Zinc         ppm         ASTM D5185m         1270         1082         1183         1198           Sulfur         ppm         ASTM D5185m         2060         2295         3321         2564           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         6         2           Sodium         ppm         ASTM D5185m         2         3         <1           Potassium         ppm         ASTM D5185m         >20         1         1         0           Fuel         %         ASTM D3524         >3.0         <1.0         0.6         <1.0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         8.4         1.4         4.6           Nitration         Abs/cm         *ASTM D7624         >20         29.5         5.5         10.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         61.6         20.6         26.4           FLUID DEGRADATION         *ASTM D7414         >25	Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0	0 51 1	2 61 <1	0 53 <1
Sulfur         ppm         ASTM D5185m         2060         2295         3321         2564           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         6         2           Sodium         ppm         ASTM D5185m         2         3         <1	Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0 1010	0 51 1 861	2 61 <1 408	0 53 <1 935
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         6         2           Sodium         ppm         ASTM D5185m         2         3         <1	Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0 1010 1070	0 51 1 861 930	2 61 <1 408 1654	0 53 <1 935 1090
Silicon         ppm         ASTM D5185m         >25         8         6         2           Sodium         ppm         ASTM D5185m         2         3         <1           Potassium         ppm         ASTM D5185m         >20         1         1         0           Fuel         %         ASTM D3524         >3.0         <1.0         0.6         <1.0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         8.4         1.4         4.6           Nitration         Abs/cm         *ASTM D7624         >20         29.5         5.5         10.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         61.6         20.6         26.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         87.7         13.4         14.6	Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0 1010 1070 1150	0 51 1 861 930 835	2 61 <1 408 1654 1017	0 53 <1 935 1090 989
Sodium         ppm         ASTM D5185m         2         3         <1           Potassium         ppm         ASTM D5185m         >20         1         1         0           Fuel         %         ASTM D3524         >3.0         <1.0	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0 1010 1070 1150 1270	0 51 1 861 930 835 1082	2 61 <1 408 1654 1017 1183	0 53 <1 935 1090 989 1198
Sodium         ppm         ASTM D5185m         2         3         <1           Potassium         ppm         ASTM D5185m         >20         1         1         0           Fuel         %         ASTM D3524         >3.0         <1.0	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0 1010 1070 1150 1270 2060	0 51 1 861 930 835 1082 2295	2 61 <1 408 1654 1017 1183 3321	0 53 <1 935 1090 989 1198 2564
Potassium         ppm         ASTM D5185m         >20         1         1         0           Fuel         %         ASTM D3524         >3.0         <1.0         0.6         <1.0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         8.4         1.4         △ 4.6           Nitration         Abs/cm         *ASTM D7624         >20         29.5         5.5         10.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         61.6         20.6         26.4           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         87.7         13.4         14.6	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0 1010 1070 1150 1270 2060	0 51 1 861 930 835 1082 2295	2 61 <1 408 1654 1017 1183 3321 history1	0 53 <1 935 1090 989 1198 2564 history2
Fuel         %         ASTM D3524         >3.0         <1.0         0.6         <1.0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         8.4         1.4         ▲ 4.6           Nitration         Abs/cm         *ASTM D7624         >20         29.5         5.5         10.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         61.6         20.6         26.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         87.7         13.4         14.6	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 60 0 1010 1070 1150 1270 2060	0 51 1 861 930 835 1082 2295 current	2 61 <1 408 1654 1017 1183 3321 history1	0 53 <1 935 1090 989 1198 2564 history2
Soot %         %         *ASTM D7844         >4         ■ 8.4         1.4         ▲ 4.6           Nitration         Abs/cm         *ASTM D7624         >20         29.5         5.5         10.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         61.6         20.6         26.4           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         87.7         13.4         14.6	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 60 0 1010 1070 1150 1270 2060 limit/base	0 51 1 861 930 835 1082 2295 current 8	2 61 <1 408 1654 1017 1183 3321 history1 6 3	0 53 <1 935 1090 989 1198 2564 history2 2
Soot %         %         *ASTM D7844         >4         ■ 8.4         1.4         ▲ 4.6           Nitration         Abs/cm         *ASTM D7624         >20         29.5         5.5         10.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         61.6         20.6         26.4           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         87.7         13.4         14.6	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 60 0 1010 1070 1150 1270 2060 limit/base >25	0 51 1 861 930 835 1082 2295 current 8 2	2 61 <1 408 1654 1017 1183 3321 history1 6 3	0 53 <1 935 1090 989 1198 2564 history2 2 <1
Nitration         Abs/cm         *ASTM D7624         >20         29.5         5.5         10.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         61.6         20.6         26.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         87.7         13.4         14.6	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 >3.0	0 51 1 861 930 835 1082 2295 current 8 2 1	2 61 <1 408 1654 1017 1183 3321 history1 6 3 1	0 53 <1 935 1090 989 1198 2564 history2 2 <1 0 <1.0
Sulfation         Abs/.1mm         *ASTM D7415         >30         61.6         20.6         26.4           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         87.7         13.4         14.6	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED	ppm	ASTM D5185m	0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 >3.0	0 51 1 861 930 835 1082 2295  current 8 2 1 <1.0  current	2 61 <1 408 1654 1017 1183 3321 history1 6 3 1 0.6 history1	0 53 <1 935 1090 989 1198 2564 history2 2 <1 0 <1.0 history2
Oxidation Abs/.1mm *ASTM D7414 >25 <b>87.7</b> 13.4 14.6	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED	ppm	ASTM D5185m	0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 >3.0 limit/base	0 51 1 861 930 835 1082 2295  current 8 2 1 <1.0  current  8.4	2 61 <1 408 1654 1017 1183 3321 history1 6 3 1 0.6 history1 1.4	0 53 <1 935 1090 989 1198 2564 history2 2 <1 0 <1.0 history2 ▲ 4.6
Oxidation Abs/.1mm *ASTM D7414 >25 <b>87.7</b> 13.4 14.6	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m  method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D7844 *ASTM D7844	0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 >3.0 limit/base	0 51 1 861 930 835 1082 2295  current 8 2 1 <1.0  current  8.4 29.5	2 61 <1 408 1654 1017 1183 3321 history1 6 3 1 0.6 history1 1.4 5.5	0 53 <1 935 1090 989 1198 2564 history2 2 <1 0 <1.0 history2 ▲ 4.6 10.1
	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D3524  method  *ASTM D7844  *ASTM D7624  *ASTM D76145	0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 >3.0 limit/base >4 >20 >30	0 51 1 861 930 835 1082 2295  current 8 2 1 <1.0  current  8.4 29.5 61.6	2 61 <1 408 1654 1017 1183 3321 history1 6 3 1 0.6 history1 1.4 5.5 20.6	0 53 <1 935 1090 989 1198 2564 history2 2 <1 0 <1.0 history2  4.6 10.1 26.4
	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm	ASTM D5185m  Method  ASTM D5185m ASTM D7624 *ASTM D7624 *ASTM D76185m *ASTM D76185m ASTM D76185m	0 60 0 1010 1070 1150 1270 2060  limit/base >25  >20 >3.0  limit/base >4 >20 >30  limit/base	0 51 1 861 930 835 1082 2295 current 8 2 1 <1.0 current	2 61 <1 408 1654 1017 1183 3321 history1 6 3 1 0.6 history1 1.4 5.5 20.6 history1	0 53 <1 935 1090 989 1198 2564 history2 2 <1 0 <1.0 history2  ▲ 4.6 10.1 26.4 history2



# **OIL ANALYSIS REPORT**







Certificate L2367

Laboratory Sample No. Lab Number **Unique Number** 

: 05974652

: GFL0065462 : 10686602

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : 10 Oct 2023 Received

Diagnosed : 16 Oct 2023 Diagnostician : Jonathan Hester

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 - 829 - Wilco Hauling

5054 Highway HH Hartville, MO US 65667 Contact: James Jones

james.jones@gflenv.com T: (417)349-5006