

# **PROBLEM SUMMARY**

Sample Rating Trend

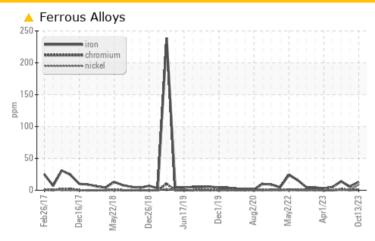
**WEAR** 

Machine Id **10711** Component

**Diesel Engine** 

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

# **COMPONENT CONDITION SUMMARY**



## RECOMMENDATION

No corrective action is recommended at this time. Resample at the next service interval to monitor.

PROBLEMATIC TEST RESULTS									
Sample Status			ABNORMAL	NORMAL	NORMAL				
Nickel	ppm	ASTM D5185m	>4	<u> </u>	0	<1			

Customer Id: GFL073 Sample No.: GFL0097224 Lab Number: 05981116 Test Package: FLEET



To manage this report scan the QR code

To discuss the diagnosis or test data:

Don Baldridge +1 don.b505@comcast.net

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

06 Sep 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.



09 Aug 2023 Diag: Don Baldridge

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.



25 Apr 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.





# **OIL ANALYSIS REPORT**



**WEAR** 



Machine Id 10711 Component **Diesel Engine** 

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

# DIAGNOSIS

#### Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

Valve wear is indicated. All other component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil.

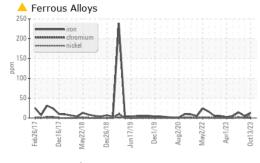
#### **Fluid Condition**

The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Number Client Info GFL0097224 GFL0069199 GFL0069129 GFL0069129 GPL0069129 G	5AL)								
Sample Date	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2		
Machine Age hrs Client Info 1012 905 895   Oil Age hrs Client Info 0 0 0 0   Oil Changed Client Info Not Changed Changed Changed Changed   Sample Status Long Collection Not Changed NoRMAL NORMAL NORMAL   CONTAMINATION method limit/base current history1 history2   Fuel WC Method NEG NEG NEG NEG   WEAR METALS method limit/base current history1 history2   Iron ppm ASTM D5185m >100 13 5 14   Chromium ppm ASTM D5185m >4 9 0 <1	Sample Number		Client Info		GFL0097224	GFL0069199	GFL0069124		
Oil Age hrs Client Info Not Changed Change Changed Change Change	Sample Date		Client Info		13 Oct 2023	06 Sep 2023	09 Aug 2023		
Cilient Info	Machine Age	hrs	Client Info		1012	905	895		
CONTAMINATION	Oil Age	hrs	Client Info		0	0	0		
CONTAMINATION method limit/base current history1 history2   Fuel WC Method >5 <1.0	Oil Changed		Client Info		Not Changd	Changed	Changed		
Fuel	Sample Status				ABNORMAL	NORMAL	NORMAL		
WEAR METALS method limit/base current history1 history2   Iron ppm ASTM D5185m >100 13 5 14   Chromium ppm ASTM D5185m >20 <1	CONTAMINAT	ION	method	limit/base	current	history1	history2		
WEAR METALS method limit/base current history1 history2   Iron ppm ASTM D5185m >100 13 5 14   Chromium ppm ASTM D5185m >20 -1 -1 2   Nickel ppm ASTM D5185m >20 -1 0 -1   Titanium ppm ASTM D5185m >3 0 -1 -1   Aluminum ppm ASTM D5185m >3 0 -1 -1 0   Aluminum ppm ASTM D5185m >20 2 4 13 1 2   Lead ppm ASTM D5185m >20 2 4 13 1 2 1 0 0 -1 1 0 0 -1 1 0 0 -1 1 -1 -1 0 0 -1 1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	Fuel		WC Method	>5	<1.0	<1.0	<1.0		
Iron	Glycol		WC Method		NEG	NEG	NEG		
Chromium ppm ASTM D5185m >20 <1 <1 2   Nickel ppm ASTM D5185m >4 4 9 0 <1   Titanium ppm ASTM D5185m >3 0 <1 <1   Silver ppm ASTM D5185m >20 2 4 13   Lead ppm ASTM D5185m >40 <1 <1 0   Copper ppm ASTM D5185m >40 <1 <1 0   Copper ppm ASTM D5185m >330 3 <1 2   Tin ppm ASTM D5185m 0 0 0 <1 1   Vanadium ppm ASTM D5185m 0 0 0 <1 1 1   Cadmium ppm ASTM D5185m 0 3 6 9   Barium ppm ASTM D5185m 0 10 0 0   Molybdenum ppm ASTM D518	WEAR METAL	S	method	limit/base	current	history1	history2		
Nickel	Iron	ppm	ASTM D5185m	>100	13	5	14		
Titanium	Chromium	ppm	ASTM D5185m	>20	<1	<1	2		
Silver	Nickel	ppm	ASTM D5185m	>4	<u>^</u> 9	0	<1		
Aluminum ppm ASTM D5185m >20 2 4 13   Lead ppm ASTM D5185m >40 <1 <1 0   Copper ppm ASTM D5185m >330 3 <1 2   Tin ppm ASTM D5185m >15 <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	Titanium	ppm	ASTM D5185m		<1	0	<1		
Lead ppm ASTM D5185m >40 <1 <1 0   Copper ppm ASTM D5185m >330 3 <1 2   Tin ppm ASTM D5185m >15 <1 <1 <1 <1   Vanadium 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 <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	Silver	ppm	ASTM D5185m	>3	0	<1	<1		
Copper ppm ASTM D5185m >330 3 <1 2   Tin ppm ASTM D5185m >15 <1	Aluminum	ppm	ASTM D5185m	>20	2	4	13		
Copper ppm ASTM D5185m >330 3 <1 2   Tin ppm ASTM D5185m >15 <1	Lead	ppm	ASTM D5185m	>40	<1	<1	0		
Tin	Copper		ASTM D5185m	>330	3	<1	2		
Vanadium ppm ASTM D5185m 0 0 <1   Cadmium ppm ASTM D5185m <1 0 0   ADDITIVES method limit/base current history1 history2   Boron ppm ASTM D5185m 0 3 6 9   Barium ppm ASTM D5185m 0 10 0 0   Molybdenum ppm ASTM D5185m 0 60 62 58 79   Manganese ppm ASTM D5185m 0 <1 1 <1   Magnesium ppm ASTM D5185m 1010 860 979 1168   Calcium ppm ASTM D5185m 1070 985 1050 1336   Phosphorus ppm ASTM D5185m 1270 1093 1310 1532   Sulfur ppm ASTM D5185m 2060 2427 3947 3944   CONTAMINANTS method limit/base current <th< td=""><td>• •</td><td></td><td></td><td>&gt;15</td><td>&lt;1</td><td>&lt;1</td><td>&lt;1</td></th<>	• •			>15	<1	<1	<1		
Cadmium ppm ASTM D5185m <1 0 0   ADDITIVES method limit/base current history1 history2   Boron ppm ASTM D5185m 0 3 6 9   Barium ppm ASTM D5185m 0 10 0 0   Molybdenum ppm ASTM D5185m 0 41 1 <1	Vanadium								
Boron					<1				
Barium ppm ASTM D5185m 0 10 0 0   Molybdenum ppm ASTM D5185m 60 62 58 79   Manganese ppm ASTM D5185m 0 <1	ADDITIVES		method	limit/base	current	history1	history2		
Molybdenum ppm ASTM D5185m 60 62 58 79   Manganese ppm ASTM D5185m 0 <1 1 <1   Magnesium ppm ASTM D5185m 1010 860 979 1168   Calcium ppm ASTM D5185m 1070 985 1050 1336   Phosphorus ppm ASTM D5185m 1150 930 1043 1266   Zinc ppm ASTM D5185m 1270 1093 1310 1532   Sulfur ppm ASTM D5185m 2060 2427 3947 3944   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >25 4 3 6   Sodium ppm ASTM D5185m 5 2 4   Potassium ppm ASTM D5185m >20 2 8 6   INFRA-RED method limit/base current <td>Boron</td> <td>ppm</td> <td>ASTM D5185m</td> <td>0</td> <td>3</td> <td>6</td> <td>9</td>	Boron	ppm	ASTM D5185m	0	3	6	9		
Manganese ppm ASTM D5185m 0 <1 1 <1   Magnesium ppm ASTM D5185m 1010 860 979 1168   Calcium ppm ASTM D5185m 1070 985 1050 1336   Phosphorus ppm ASTM D5185m 1150 930 1043 1266   Zinc ppm ASTM D5185m 1270 1093 1310 1532   Sulfur ppm ASTM D5185m 2060 2427 3947 3944   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >25 4 3 6   Sodium ppm ASTM D5185m >20 2 8 6   INFRA-RED method limit/base current history1 history2   Soot % % *ASTM D7844 >3 0.8 0.1 0.1   Nitration Abs/cm *ASTM D7815	Barium	ppm	ASTM D5185m	0	10	0	0		
Magnesium ppm ASTM D5185m 1010 860 979 1168   Calcium ppm ASTM D5185m 1070 985 1050 1336   Phosphorus ppm ASTM D5185m 1150 930 1043 1266   Zinc ppm ASTM D5185m 1270 1093 1310 1532   Sulfur ppm ASTM D5185m 2060 2427 3947 3944   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >25 4 3 6   Sodium ppm ASTM D5185m >20 2 8 6   INFRA-RED method limit/base current history1 history2   Soot % % *ASTM D7844 >3 0.8 0.1 0.1   Nitration Abs/:nm *ASTM D7415 >30 19.5 16.8 17.7   FLUID DEGRADATION method	Molybdenum	ppm	ASTM D5185m	60	62	58	79		
Calcium ppm ASTM D5185m 1070 985 1050 1336   Phosphorus ppm ASTM D5185m 1150 930 1043 1266   Zinc ppm ASTM D5185m 1270 1093 1310 1532   Sulfur ppm ASTM D5185m 2060 2427 3947 3944   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >25 4 3 6   Sodium ppm ASTM D5185m 5 2 4   Potassium ppm ASTM D5185m >20 2 8 6   INFRA-RED method limit/base current history1 history2   Soot % % *ASTM D7844 >3 0.8 0.1 0.1   Nitration Abs/cm *ASTM D7624 >20 8.4 4.9 6.4   Sulfation Abs/.1mm *ASTM D7415 <t< td=""><td>Manganese</td><td>ppm</td><td>ASTM D5185m</td><td>0</td><td>&lt;1</td><td>1</td><td>&lt;1</td></t<>	Manganese	ppm	ASTM D5185m	0	<1	1	<1		
Phosphorus ppm ASTM D5185m 1150 930 1043 1266   Zinc ppm ASTM D5185m 1270 1093 1310 1532   Sulfur ppm ASTM D5185m 2060 2427 3947 3944   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >25 4 3 6   Sodium ppm ASTM D5185m 5 2 4   Potassium ppm ASTM D5185m >20 2 8 6   INFRA-RED method limit/base current history1 history2   Soot % % *ASTM D7844 >3 0.8 0.1 0.1   Nitration Abs/cm *ASTM D7624 >20 8.4 4.9 6.4   Sulfation Abs/.1mm *ASTM D7415 >30 19.5 16.8 17.7   FLUID DEGRADATION method limit/base <td>Magnesium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>1010</td> <td>860</td> <td>979</td> <td>1168</td>	Magnesium	ppm	ASTM D5185m	1010	860	979	1168		
Zinc ppm ASTM D5185m 1270 1093 1310 1532   Sulfur ppm ASTM D5185m 2060 2427 3947 3944   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >25 4 3 6   Sodium ppm ASTM D5185m 5 2 4   Potassium ppm ASTM D5185m >20 2 8 6   INFRA-RED method limit/base current history1 history2   Soot % % *ASTM D7844 >3 0.8 0.1 0.1   Nitration Abs/cm *ASTM D7624 >20 8.4 4.9 6.4   Sulfation Abs/.1mm *ASTM D7415 >30 19.5 16.8 17.7   FLUID DEGRADATION method limit/base current history1 history2   Oxidation Abs/.1mm *ASTM D7414	Calcium	ppm	ASTM D5185m	1070	985	1050	1336		
Sulfur ppm ASTM D5185m 2060 2427 3947 3944   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >25 4 3 6   Sodium ppm ASTM D5185m 5 2 4   Potassium ppm ASTM D5185m >20 2 8 6   INFRA-RED method limit/base current history1 history2   Soot % % *ASTM D7844 >3 0.8 0.1 0.1   Nitration Abs/cm *ASTM D7624 >20 8.4 4.9 6.4   Sulfation Abs/.1mm *ASTM D7415 >30 19.5 16.8 17.7   FLUID DEGRADATION method limit/base current history1 history2   Oxidation Abs/.1mm *ASTM D7414 >25 15.6 12.3 13.3	Phosphorus	ppm	ASTM D5185m	1150	930	1043	1266		
Sulfur ppm ASTM D5185m 2060 2427 3947 3944   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >25 4 3 6   Sodium ppm ASTM D5185m 5 2 4   Potassium ppm ASTM D5185m >20 2 8 6   INFRA-RED method limit/base current history1 history2   Soot % % *ASTM D7844 >3 0.8 0.1 0.1   Nitration Abs/cm *ASTM D7624 >20 8.4 4.9 6.4   Sulfation Abs/.1mm *ASTM D7415 >30 19.5 16.8 17.7   FLUID DEGRADATION method limit/base current history1 history2   Oxidation Abs/.1mm *ASTM D7414 >25 15.6 12.3 13.3	Zinc	ppm	ASTM D5185m	1270	1093	1310	1532		
Silicon ppm ASTM D5185m >25 4 3 6   Sodium ppm ASTM D5185m 5 2 4   Potassium ppm ASTM D5185m >20 2 8 6   INFRA-RED method limit/base current history1 history2   Soot % % *ASTM D7844 >3 0.8 0.1 0.1   Nitration Abs/cm *ASTM D7624 >20 8.4 4.9 6.4   Sulfation Abs/.1mm *ASTM D7415 >30 19.5 16.8 17.7   FLUID DEGRADATION method limit/base current history1 history2   Oxidation Abs/.1mm *ASTM D7414 >25 15.6 12.3 13.3	Sulfur		ASTM D5185m		2427	3947	3944		
Sodium ppm ASTM D5185m 5 2 4   Potassium ppm ASTM D5185m >20 2 8 6   INFRA-RED method limit/base current history1 history2   Soot % % *ASTM D7844 >3 0.8 0.1 0.1   Nitration Abs/cm *ASTM D7624 >20 8.4 4.9 6.4   Sulfation Abs/.1mm *ASTM D7415 >30 19.5 16.8 17.7   FLUID DEGRADATION method limit/base current history1 history2   Oxidation Abs/.1mm *ASTM D7414 >25 15.6 12.3 13.3	CONTAMINAN	ITS	method	limit/base	current	history1	history2		
Potassium ppm ASTM D5185m >20 2 8 6   INFRA-RED method limit/base current history1 history2   Soot % % *ASTM D7844 >3 0.8 0.1 0.1   Nitration Abs/cm *ASTM D7624 >20 8.4 4.9 6.4   Sulfation Abs/.1mm *ASTM D7415 >30 19.5 16.8 17.7   FLUID DEGRADATION method limit/base current history1 history2   Oxidation Abs/.1mm *ASTM D7414 >25 15.6 12.3 13.3	Silicon	ppm	ASTM D5185m	>25	4	3	6		
INFRA-RED	Sodium	ppm	ASTM D5185m		5	2	4		
Soot % % *ASTM D7844 >3 0.8 0.1 0.1   Nitration Abs/cm *ASTM D7624 >20 8.4 4.9 6.4   Sulfation Abs/.1mm *ASTM D7415 >30 19.5 16.8 17.7   FLUID DEGRADATION method limit/base current history1 history2   Oxidation Abs/.1mm *ASTM D7414 >25 15.6 12.3 13.3	Potassium	ppm	ASTM D5185m	>20	2	8	6		
Nitration Abs/cm *ASTM D7624 >20 8.4 4.9 6.4   Sulfation Abs/.1mm *ASTM D7415 >30 19.5 16.8 17.7   FLUID DEGRADATION method limit/base current history1 history2   Oxidation Abs/.1mm *ASTM D7414 >25 15.6 12.3 13.3	INFRA-RED		method	limit/base	current	history1	history2		
Sulfation Abs/.1mm *ASTM D7415 >30 19.5 16.8 17.7   FLUID DEGRADATION method limit/base current history1 history2   Oxidation Abs/.1mm *ASTM D7414 >25 15.6 12.3 13.3	Soot %	%	*ASTM D7844	>3	8.0	0.1	0.1		
Sulfation Abs/.1mm *ASTM D7415 >30 19.5 16.8 17.7   FLUID DEGRADATION method limit/base current history1 history2   Oxidation Abs/.1mm *ASTM D7414 >25 15.6 12.3 13.3	Nitration	Abs/cm	*ASTM D7624	>20	8.4	4.9	6.4		
Oxidation Abs/.1mm *ASTM D7414 >25 <b>15.6</b> 12.3 13.3	Sulfation								
	FLUID DEGRAI	AOITAC	method	limit/base	current	history1	history2		
	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.6	12.3	13.3		
	Base Number (BN)				6.6	8.7	7.9		



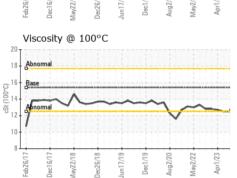
# **OIL ANALYSIS REPORT**



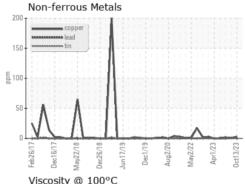
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
<b>Emulsified Water</b>	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
			>0.2			

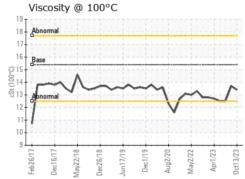
Bas	se Nu	ımber	-						
10.0 T Bas		-			*****	~			
€ 8.0				1111	V	_		ш	Λ
HO.04				1			- 17		1
8.00 0.8 Mumber (mg KOH/g) 0.8 0.0 0.9 0.9 0.0 0.8 0.0 0.8 0.0 0.8 0.0 0.8 0.0 0.8 0.0 0.8 0.0 0.8 0.0 0.8 0.0 0.8 0.0 0.8 0.0 0.8 0.0 0.8 0.0 0.8 0.0 0.8 0.0 0.8 0.0 0.8 0.0 0.8 0.0 0.8 0.0 0.0		щі					∴V		u).
<u>a</u>		Λ	71						
g 4.0	N	V							
S   1	V	ПŢ		V					
g 2.0+									
0.0	17			6	6	20 -	22	23	-
Feb26/17	Dec16/17	May22/18	Dec26/18	Jun17/19	Dec1/19	Aug2/20	May2/2	Apr1/23	
還	Dec	May	Dec	투	Ď	An	Š	A	

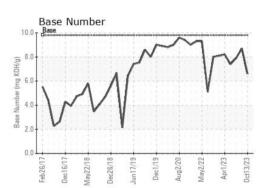




# **GRAPHS** Ferrous Alloys











Certificate L2367

Laboratory Sample No. Lab Number Unique Number : 10698411 Test Package : FLEET

: GFL0097224 : 05981116

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

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 17 Oct 2023 Diagnosed : 18 Oct 2023 Diagnostician : Don Baldridge

GFL Environmental - 073 - Warner Robins - Transwaste

155 Story Road Warner Robins, GA US 31093

Contact: JOSH MALONEY

jmaloney@gflenv.com

T: F:

\* - 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)