

PROBLEM SUMMARY

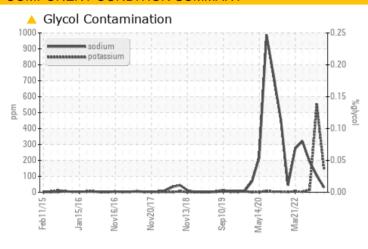
Sample Rating Trend

GLYCOL

Machine Id **3417** Component **Diesel Engine**

PETRO CANADA DURON SHP 15W40 (11 GAL)

COMPONENT CONDITION SUMMARY



RECOMMENDATION

We advise that you check for the source of the coolant leak. Check for low coolant level. 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				ABNORMAL	ABNORMAL	ATTENTION			
Sodium	ppm	ASTM D5185m		△ 30	<u>105</u>	<u>191</u>			
Potassium	maa	ASTM D5185m	>20	147	<u></u> 553	14			

Customer Id: GFL035 Sample No.: GFL0071561 Lab Number: 05888774 Test Package: FLEET



To manage this report scan the QR code

To discuss the diagnosis or test data: Jonathan Hester +1 919-379-4092 x4092 jhester@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 Glycol Access			?	We advise that you check for the source of the coolant leak.

HISTORICAL DIAGNOSIS

07 Jun 2023 Diag: Jonathan Hester

GLYCOL



We advise that you check for the source of the coolant leak. Check for low coolant level. 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. Sodium and/or potassium levels are high. The BN result indicates that there is suitable alkalinity remaining in the oil.



29 Dec 2022 Diag: Jonathan Hester

GLYCOL



We advise that you check for possible coolant leak. Check for low coolant level. 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. Sodium and/or potassium levels remain high. The BN result indicates that there is suitable alkalinity remaining in the oil.



05 Aug 2022 Diag: Jonathan Hester

GLYCOL



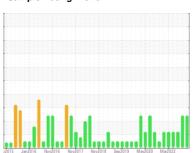
We advise that you check for possible coolant leak. Check for low coolant level. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition. All component wear rates are normal. Sodium and/or potassium levels are high. The BN result indicates that there is suitable alkalinity remaining in the oil.





OIL ANALYSIS REPORT

Sample Rating Trend



GLYCOL



Machine Id **3417** Component **Diesel Engine**

PETRO CANADA DURON SHP 15W40 (11 GAL)

DIAGNOSIS

Recommendation

We advise that you check for the source of the coolant leak. Check for low coolant level. 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

Sodium and/or potassium levels remain high.

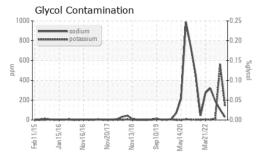
Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil.

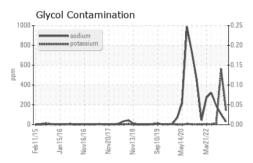
Sample Date Client Info 29 Jun 2023 07 Jun 2023 29 Dec 2022 Machine Age mls Client Info 124426 124426 124426 Oil Age mls Client Info 0 0 600 Oil Changed Client Info Changed Changed Changed ATTENTION CONTAMINATION method limit/base current history 1 history 2 Fuel WC Method 3-3 < 1.0	aal)		2015 Jan 20	16 Nov2016 Nov2017	Nov2018 Sep2019 May2020	Mar2022	
Sample Date Client Info 29 Jun 2023 07 Jun 2023 29 Dec 2022 Machine Age mls Client Info 124426 124426 124426 Oil Age mls Client Info 0 0 600 Oil Changed Client Info Changed Changed Changed ATTENTION CONTAMINATION method limit/base current history 1 history 2 Fuel WC Method 3-3 < 1.0	SAMPLE INFOR	MATION	method	limit/base	current	history 1	history 2
Sample Date Client Info 29 Jun 2023 07 Jun 2023 29 Dec 2022 Machine Age mls Client Info 124426 124426 124426 Oil Age mls Client Info 0 0 600 Oil Changed Client Info Changed Changed Changed ATTENTION CONTAMINATION method limit/base current history 1 history 2 Fuel WC Method 3-3 < 1.0 < 1.0 < 1.0 < 1.0 WEAR METALS method limit/base current history 1 history 2 Iron ppm ASTM D5185m >75 8 20 7 Ohromium ppm ASTM D5185m >5 <1	Sample Number		Client Info		GFL0071561	GFL0071551	GFL0061669
Oil Age mls Client Info Changed <	Sample Date		Client Info		29 Jun 2023	07 Jun 2023	29 Dec 2022
Client Info	Machine Age	mls	Client Info		124426	124426	124426
CONTAMINATION	Oil Age	mls	Client Info		0	0	600
CONTAMINATION	-		Client Info		Changed	Changed	Changed
WC Method Sa.0 <1.0 <1.0 <1.0 <1.0					_	_	ATTENTION
WEAR METALS method limit/base current history 1 history 2 Iron ppm ASTM D5185m >75 8 20 7 Chromium ppm ASTM D5185m >5 <1	CONTAMINAT	ION	method	limit/base	current	history 1	history 2
Iron	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
Chromium ppm ASTM D5185m >5 <1 1 <1 Nickel ppm ASTM D5185m >4 0 <1	WEAR METAL	.S	method	limit/base	current	history 1	history 2
Nickel	Iron	ppm	ASTM D5185m	>75	8	20	7
Titanium ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >2 0 <1	Chromium	ppm	ASTM D5185m	>5	<1	1	<1
Silver	Nickel	ppm	ASTM D5185m	>4	0	<1	0
Aluminum ppm ASTM D5185m >15 2 4 1 Lead ppm ASTM D5185m >25 <1	Titanium	ppm	ASTM D5185m	>2	0	0	0
Aluminum ppm ASTM D5185m >15 2 4 1 Lead ppm ASTM D5185m >25 <1 2 <1 Copper ppm ASTM D5185m >100 <1 <1 <1 Tin ppm ASTM D5185m >4 0 <1 <1 Vanadium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 4 7 17 Boron ppm ASTM D5185m 0 2 0 0 Boron ppm ASTM D5185m 0 2 0 0 Molybdenum ppm ASTM D5185m 0 2 0 0 Manganese ppm ASTM D5185m 0 4 7 1 1 Magnesium ppm ASTM D5185m 1070 1126 1256 1159 <	Silver	ppm	ASTM D5185m	>2	0	<1	0
Copper ppm ASTM D5185m >100 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <td>Aluminum</td> <td>ppm</td> <td>ASTM D5185m</td> <td>>15</td> <td>2</td> <td>4</td> <td>1</td>	Aluminum	ppm	ASTM D5185m	>15	2	4	1
Copper ppm ASTM D5185m >100 <1 <1 <1 Tin ppm ASTM D5185m >4 0 <1	Lead	ppm	ASTM D5185m	>25	<1	2	<1
Tin ppm ASTM D5185m > 4 0 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 <	Copper		ASTM D5185m	>100	<1	<1	<1
Vanadium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history 1 history 2 Boron ppm ASTM D5185m 0 4 7 17 Barium ppm ASTM D5185m 0 2 0 0 Molybdenum ppm ASTM D5185m 0 2 1 68 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 844 976 877 Calcium ppm ASTM D5185m 1070 1126 1256 1159 Phosphorus ppm ASTM D5185m 1270 1169 1455 1172 Sulfur ppm ASTM D5185m 2060 3060 4193 3660 CONTAMINANTS method limit/base current history 1			ASTM D5185m	>4	0	<1	<1
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history 1 history 2 Boron ppm ASTM D5185m 0 4 7 17 Barium ppm ASTM D5185m 0 2 0 0 Molybdenum ppm ASTM D5185m 60 65 71 68 Manganese ppm ASTM D5185m 0 <1	Vanadium		ASTM D5185m				
Boron					0		
Barium ppm ASTM D5185m 0 2 0 0 Molybdenum ppm ASTM D5185m 60 65 71 68 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 844 976 877 Calcium ppm ASTM D5185m 1070 1126 1256 1159 Phosphorus ppm ASTM D5185m 1150 1042 1156 1071 Zinc ppm ASTM D5185m 1270 1169 1455 1172 Sulfur ppm ASTM D5185m 2060 3060 4193 3660 CONTAMINANTS method limit/base current history 1 history 2 Silicon ppm ASTM D5185m >25 5 12 9 Sodium ppm ASTM D5185m >20 147 553 14 Glycol % *ASTM D58	ADDITIVES		method	limit/base	current	history 1	history 2
Molybdenum ppm ASTM D5185m 60 65 71 68 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 844 976 877 Calcium ppm ASTM D5185m 1070 1126 1256 1159 Phosphorus ppm ASTM D5185m 1070 1126 1256 1071 Zinc ppm ASTM D5185m 1270 1169 1455 1172 Sulfur ppm ASTM D5185m 2060 3060 4193 3660 CONTAMINANTS method limit/base current history 1 history 2 Silicon ppm ASTM D5185m >25 5 12 9 Sodium ppm ASTM D5185m >20 147 553 14 Glycol % *ASTM D5185m >20 147 553 14 Glycol % *ASTM D7844 <td>Boron</td> <td>ppm</td> <td>ASTM D5185m</td> <td>0</td> <td>4</td> <td>7</td> <td>17</td>	Boron	ppm	ASTM D5185m	0	4	7	17
Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 844 976 877 Calcium ppm ASTM D5185m 1070 1126 1256 1159 Phosphorus ppm ASTM D5185m 1150 1042 1156 1071 Zinc ppm ASTM D5185m 1270 1169 1455 1172 Sulfur ppm ASTM D5185m 2060 3060 4193 3660 CONTAMINANTS method limit/base current history 1 history 2 Silicon ppm ASTM D5185m >25 5 12 9 Sodium ppm ASTM D5185m >25 5 12 9 Sodium ppm ASTM D5185m >20 147 553 14 Glycol *ASTM D5185m >20 147 553 14 Glycol *ASTM D5185m >20 NEG <td>Barium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>0</td> <td>2</td> <td>0</td> <td>0</td>	Barium	ppm	ASTM D5185m	0	2	0	0
Magnesium ppm ASTM D5185m 1010 844 976 877 Calcium ppm ASTM D5185m 1070 1126 1256 1159 Phosphorus ppm ASTM D5185m 1150 1042 1156 1071 Zinc ppm ASTM D5185m 1270 1169 1455 1172 Sulfur ppm ASTM D5185m 2060 3060 4193 3660 CONTAMINANTS method limit/base current history 1 history 2 Silicon ppm ASTM D5185m >25 5 12 9 Sodium ppm ASTM D5185m >25 5 12 9 Sodium ppm ASTM D5185m >20 147 553 14 Glycol % *ASTM D5185m >20 NEG NEG NEG INFRA-RED method limit/base current history 1 history 2 Soot % % *ASTM	Molybdenum	ppm	ASTM D5185m	60	65	71	68
Magnesium ppm ASTM D5185m 1010 844 976 877 Calcium ppm ASTM D5185m 1070 1126 1256 1159 Phosphorus ppm ASTM D5185m 1150 1042 1156 1071 Zinc ppm ASTM D5185m 1270 1169 1455 1172 Sulfur ppm ASTM D5185m 2060 3060 4193 3660 CONTAMINANTS method limit/base current history 1 history 2 Silicon ppm ASTM D5185m >25 5 12 9 Sodium ppm ASTM D5185m >25 5 12 9 Sodium ppm ASTM D5185m >20 147 553 14 Glycol % *ASTM D5185m >20 NEG NEG NEG INFRA-RED method limit/base current history 1 history 2 Soot % % *ASTM	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Calcium ppm ASTM D5185m 1 070 1126 1256 1159 Phosphorus ppm ASTM D5185m 1 150 1042 1 156 1071 Zinc ppm ASTM D5185m 1270 1169 1455 1172 Sulfur ppm ASTM D5185m 2060 3060 4193 3660 CONTAMINANTS method limit/base current history 1 history 2 Solicon ppm ASTM D5185m >25 5 12 9 Sodium ppm ASTM D5185m >25 5 12 9 Sodium ppm ASTM D5185m >20 147 553 14 Glycol % *ASTM D5185m >20 147 553 14 Glycol % *ASTM D5282 NEG NEG NEG INFRA-RED method limit/base current history 1 history 2 Soot % % *ASTM D7844	-	ppm	ASTM D5185m	1010	844	976	877
Phosphorus ppm ASTM D5185m 1150 1042 1156 1071 Zinc ppm ASTM D5185m 1270 1169 1455 1172 Sulfur ppm ASTM D5185m 2060 3060 4193 3660 CONTAMINANTS method limit/base current history 1 history 2 Silicon ppm ASTM D5185m >25 5 12 9 Sodium ppm ASTM D5185m >25 5 12 9 Sodium ppm ASTM D5185m >20 147 553 14 Glycol % *ASTM D5185m >20 147 553 14 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history 1 history 2 Soot % % *ASTM D7844 >6 0.3 0.5 0.2 Nitration Abs/cm *ASTM D7415 >30<			ASTM D5185m	1070	1126	1256	1159
Zinc ppm ASTM D5185m 1270 1169 1455 1172 Sulfur ppm ASTM D5185m 2060 3060 4193 3660 CONTAMINANTS method limit/base current history 1 history 2 Silicon ppm ASTM D5185m >25 5 12 9 Sodium ppm ASTM D5185m >25 30 105 191 Potassium ppm ASTM D5185m >20 147 553 14 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history 1 history 2 Soot % % *ASTM D7844 >6 0.3 0.5 0.2 Nitration Abs/cm *ASTM D7624 >20 6.9 10.0 7.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.7 23.3 19.5 FLUID DEGRADATION method	Phosphorus		ASTM D5185m	1150	1042	1156	1071
Sulfur ppm ASTM D5185m 2060 3060 4193 3660 CONTAMINANTS method limit/base current history 1 history 2 Silicon ppm ASTM D5185m >25 5 12 9 Sodium ppm ASTM D5185m A 30 105 191 Potassium ppm ASTM D5185m >20 147 553 14 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history 1 history 2 Soot % % *ASTM D7844 >6 0.3 0.5 0.2 Nitration Abs/cm *ASTM D7624 >20 6.9 10.0 7.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.7 23.3 19.5 FLUID DEGRADATION method limit/base current history 1 history 2 Oxidation Abs/.1mm *ASTM D7414 >25	·						1172
Silicon ppm ASTM D5185m >25 5 12 9 Sodium ppm ASTM D5185m ▲ 30 ▲ 105 ▲ 191 Potassium ppm ASTM D5185m >20 ▲ 147 ▲ 553 14 Glycol % *ASTM D2982 NEG NEG NEG NEG INFRA-RED method limit/base current history 1 history 2 Soot % % *ASTM D7844 >6 0.3 0.5 0.2 Nitration Abs/cm *ASTM D7624 >20 6.9 10.0 7.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.7 23.3 19.5 FLUID DEGRADATION method limit/base current history 1 history 2 Oxidation Abs/.1mm *ASTM D7414 >25 15.8 19.5 14.9	-						
Sodium ppm ASTM D5185m ▲ 30 ▲ 105 ▲ 191 Potassium ppm ASTM D5185m >20 ▲ 147 ▲ 553 14 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history 1 history 2 Soot % % *ASTM D7844 >6 0.3 0.5 0.2 Nitration Abs/cm *ASTM D7624 >20 6.9 10.0 7.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.7 23.3 19.5 FLUID DEGRADATION method limit/base current history 1 history 2 Oxidation Abs/.1mm *ASTM D7414 >25 15.8 19.5 14.9	CONTAMINAN	ITS	method	limit/base	current	history 1	history 2
Potassium ppm ASTM D5185m >20 ▲ 147 ▲ 553 14 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history 1 history 2 Soot % % *ASTM D7844 >6 0.3 0.5 0.2 Nitration Abs/cm *ASTM D7624 >20 6.9 10.0 7.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.7 23.3 19.5 FLUID DEGRADATION method limit/base current history 1 history 2 Oxidation Abs/.1mm *ASTM D7414 >25 15.8 19.5 14.9	Silicon	ppm	ASTM D5185m	>25	5	12	9
NEG NEG	Sodium	ppm	ASTM D5185m		<u>^</u> 30	<u> </u>	<u></u> 191
INFRA-RED method limit/base current history 1 history 2 Soot % % *ASTM D7844 >6 0.3 0.5 0.2 Nitration Abs/cm *ASTM D7624 >20 6.9 10.0 7.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.7 23.3 19.5 FLUID DEGRADATION method limit/base current history 1 history 2 Oxidation Abs/.1mm *ASTM D7414 >25 15.8 19.5 14.9	Potassium	ppm	ASTM D5185m	>20	147	<u></u> 553	14
Soot % % *ASTM D7844 >6 0.3 0.5 0.2 Nitration Abs/cm *ASTM D7624 >20 6.9 10.0 7.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.7 23.3 19.5 FLUID DEGRADATION method limit/base current history 1 history 2 Oxidation Abs/.1mm *ASTM D7414 >25 15.8 19.5 14.9	Glycol	%	*ASTM D2982		NEG	NEG	NEG
Nitration Abs/cm *ASTM D7624 >20 6.9 10.0 7.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.7 23.3 19.5 FLUID DEGRADATION method limit/base current history 1 history 2 Oxidation Abs/.1mm *ASTM D7414 >25 15.8 19.5 14.9	INFRA-RED		method	limit/base	current	history 1	history 2
Nitration Abs/cm *ASTM D7624 >20 6.9 10.0 7.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.7 23.3 19.5 FLUID DEGRADATION method limit/base current history 1 history 2 Oxidation Abs/.1mm *ASTM D7414 >25 15.8 19.5 14.9	Soot %	%	*ASTM D7844	>6	0.3	0.5	0.2
Sulfation Abs/.1mm *ASTM D7415 >30 19.7 23.3 19.5 FLUID DEGRADATION method limit/base current history 1 history 2 Oxidation Abs/.1mm *ASTM D7414 >25 15.8 19.5 14.9							
Oxidation Abs/.1mm *ASTM D7414 >25 15.8 19.5 14.9							
	FLUID DEGRAI	DATION	method	limit/base	current	history 1	history 2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.8	19.5	14.9
	Base Number (BN)				8.7	8.0	10.1



OIL ANALYSIS REPORT



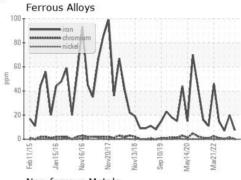
16 - Base	ormal						
14-	omial	A (1	_	/	-1
10	V	V	V	٧		1	
/							
8-							

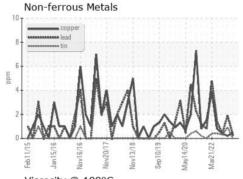


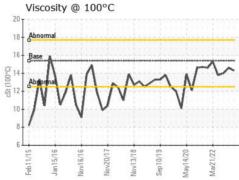
VISUAL		method	limit/base	current	history 1	history 2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

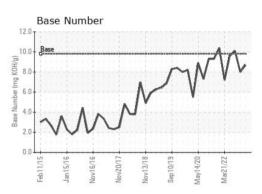
FLUID PROPI	EHIIES	method	iiiiii/base	current	flistory i	flistory 2
Visc @ 100°C	cSt	ASTM D445	15.4	14.3	14.6	14.0

GRAPHS













Certificate L2367

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

: GFL0071561 : 05888774

: 10539257

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 03 Jul 2023 Diagnosed

: 06 Jul 2023 Diagnostician : Jonathan Hester

Test Package : FLEET (Additional Tests: Glycol) 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 - 035 - Greensboro

1236 Elon Place High Point, NC US 27263

Contact: JORGE COSTA jorge.costa@gflenv.com T: (336)668-3712