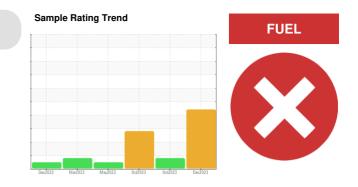


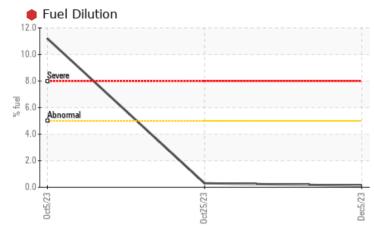
# **PROBLEM SUMMARY**



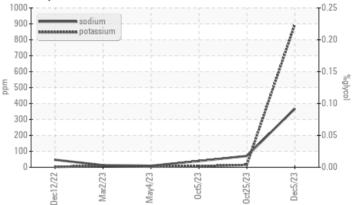
### Machine Id 122036

Component Diesel Engine Fluid PETRO CANADA DURON SHP 15W40 (--- GAL)

# COMPONENT CONDITION SUMMARY



# Glycol Contamination



## RECOMMENDATION

We advise that you check for the source of the coolant leak. Check for low coolant level. We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition.

PROBLEMATIC TEST RESULTS								
Sample Status				SEVERE	ABNORMAL	SEVERE		
Sodium	ppm	ASTM D5185m		<u> </u>	71	39		
Potassium	ppm	ASTM D5185m	>20	<u> </u>	15	6		
Fuel	%	ASTM D3524	>5	0.12	0.3	11.2		

Customer Id: GFL821 Sample No.: GFL0090289 Lab Number: 06027310 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 <u>customerservice@wearcheck.com</u>

RECOMMENDED ACTIONS							
Action	Status	Date	Done By	Description			
Change Fluid			?	We recommend that you drain the oil from the component if this has not already been done.			
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



FUEL



Oil and filter change at the time of sampling has been noted. No corrective action is recommended at this time. Resample at the next service interval to monitor.Cylinder, crank, or cam shaft wear is indicated. All other component wear rates are normal. Tests indicate that there is no fuel present in the oil. 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.



#### 05 Oct 2023 Diag: Wes Davis

We advise that you check the fuel injection system. The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.Metal levels are typical for a new component breaking in. There is a high amount of fuel present in the oil. Tests confirm the presence of fuel in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.



#### 04 May 2023 Diag: Wes Davis



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**

Sample Rating Trend

**FUEL** 

X

# Machine Id 122036

Component Diesel Engine

Fluid

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

## DIAGNOSIS

### Recommendation

We advise that you check for the source of the coolant leak. Check for low coolant level. We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition.

### Wear

All component wear rates are normal.

### Contamination

Sodium and/or potassium levels are high. There is a high concentration of glycol present in the oil.

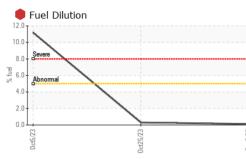
### Fluid Condition

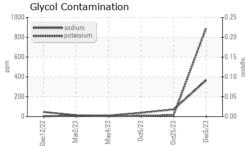
The BN result indicates that there is suitable alkalinity remaining in the oil. The oil is no longer serviceable due to the presence of contaminants.

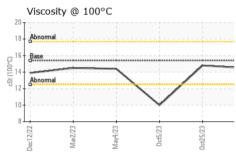
-		Dec2022	Mar2023 May2023	0ct2023 0ct2023	Dec2023	
SAMPLE INFORM	<b>MATION</b>	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0090289	GFL0090252	GFL0090145
Sample Date		Client Info		05 Dec 2023	25 Oct 2023	05 Oct 2023
Machine Age	hrs	Client Info		1813	24085	431860
Oil Age	hrs	Client Info		150	600	6000
Oil Changed		Client Info		Not Changd	Changed	Changed
Sample Status				SEVERE	ABNORMAL	SEVERE
CONTAMINATI	ON	method	limit/base	current	history1	history2
Water		WC Method	>0.2	NEG	NEG	NEG
WEAR METALS	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	15	<b>1</b> 30	27
Chromium	ppm	ASTM D5185m	>20	<1	2	<1
Nickel	ppm	ASTM D5185m	>4	<1	<1	0
Titanium	ppm	ASTM D5185m		11	<1	0
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>20	6	6	8
Lead	ppm	ASTM D5185m	>40	20	0	<1
Copper	ppm	ASTM D5185m	>330	1	2	3
Tin	ppm	ASTM D5185m	>15	<1	<1	0
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		<1	0	0
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	31	<1	5
Boron Barium	ppm ppm	ASTM D5185m ASTM D5185m	0	31 0	<1 0	5 0
				-		
Barium	ppm	ASTM D5185m	0	0	0	0
Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m	0 60	0 130	0 63	0 51
Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0	0 130 <1	0 63 <1	0 51 <1
Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0 1010	0 130 <1 584	0 63 <1 966	0 51 <1 773
Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0 1010 1070	0 130 <1 584 1339	0 63 <1 966 1071	0 51 <1 773 855
Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0 1010 1070 1150	0 130 <1 584 1339 713	0 63 <1 966 1071 988	0 51 <1 773 855 848
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0 1010 1070 1150 1270	0 130 <1 584 1339 713 802	0 63 <1 966 1071 988 1238	0 51 <1 773 855 848 1045
Barium 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	0 60 0 1010 1070 1150 1270 2060	0 130 <1 584 1339 713 802 3402	0 63 <1 966 1071 988 1238 2733	0 51 <1 773 855 848 1045 2908
Barium 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	0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b>	0 130 <1 584 1339 713 802 3402 current	0 63 <1 966 1071 988 1238 2733 history1	0 51 <1 773 855 848 1045 2908 history2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b>	0 130 <1 584 1339 713 802 3402 current 8	0 63 <1 966 1071 988 1238 2733 history1 9	0 51 <1 773 855 848 1045 2908 history2 9
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	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 <b>limit/base</b> >25 	0 130 <1 584 1339 713 802 3402 current 8 8 ▲ 368	0 63 <1 966 1071 988 1238 2733 history1 9 71	0 51 <1 773 855 848 1045 2908 history2 9 39
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm	ASTM D5185m 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 <b>limit/base</b> >25 	0 130 <1 584 1339 713 802 3402 Current 8 ▲ 368 ▲ 368 ▲ 896	0 63 <1 966 1071 988 1238 2733 history1 9 71 15	0 51 <1 773 855 848 1045 2908 history2 9 39 6
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel	ppm	ASTM D5185m ASTM D5185m	0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25 	0 130 <1 584 1339 713 802 3402 Current 8 ▲ 368 ▲ 896 ● 0.12	0 63 <1 966 1071 988 1238 2733 history1 9 71 15 0.3	0 51 <1 773 855 848 1045 2908 history2 9 39 39 6 € 11.2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel Glycol	ppm	ASTM D5185m ASTM D5244 *ASTM D2982	0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25 >20 >5	0 130 <1 584 1339 713 802 3402 Current 8 ▲ 368 ▲ 368 ▲ 896 ● 0.12 NEG	0 63 <1 966 1071 988 1238 2733 history1 9 71 15 0.3 NEG	0 51 <1 773 855 848 1045 2908 history2 9 39 6 11.2 NEG
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel Glycol INFRA-RED	ppm	ASTM D5185m ASTM D3524 *ASTM D2982	0 60 1010 1070 1150 1270 2060 <b>limit/base</b> >25 >20 >5 .5	0 130 <1 584 1339 713 802 3402 Current 8 ▲ 368 ▲ 896 ● 0.12 NEG Current	0 63 <1 966 1071 988 1238 2733 history1 9 71 15 0.3 NEG history1	0 51 <1 773 855 848 1045 2908 history2 9 39 6 6 11.2 NEG history2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel Glycol INFRA-RED Soot %	ppm	ASTM D5185m ASTM D5248 *ASTM D2982 method *ASTM D7844	0 60 1010 1070 1150 1270 2060 <b>limit/base</b> >25 >20 >5 .5	0 130 <1 584 1339 713 802 3402 Current 8 ▲ 368 ▲ 896 ● 0.12 NEG Current 0	0 63 <1 966 1071 988 1238 2733 history1 9 71 15 0.3 NEG history1 1.8	0 51 <1 773 855 848 1045 2908 <b>history2</b> 9 39 6 6 11.2 NEG <b>history2</b> 0.9
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel Glycol INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D3524 *ASTM D7844 *ASTM D7844	0 60 0 1010 1070 1150 1270 2060 <b>Imit/base</b> >25 >20 >5 <b>Imit/base</b> >3 >20	0 130 <1 584 1339 713 802 3402 Current 8 ▲ 368 ▲ 368 ▲ 368 ▲ 986 ● 0.12 NEG Current 0 4.0	0 63 <1 966 1071 988 1238 2733 history1 9 71 15 0.3 NEG history1 1.8 1.8 10.4	0 51 <1 773 855 848 1045 2908 <b>history2</b> 9 39 6 6 11.2 NEG 11.2 NEG 0.9 0.9 7.7
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel Glycol INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D3524 *ASTM D7844 *ASTM D7844	0 60 1010 1070 1150 1270 2060 <b>limit/base</b> >25 >20 >5 <b>limit/base</b> >3 >20 >30	0 130 <1 584 1339 713 802 3402 Current 8 ▲ 368 ▲ 896 ● 0.12 NEG Current 0 4.0 17.2	0 63 <1 966 1071 988 1238 2733 history1 9 71 15 0.3 NEG history1 1.8 1.8 10.4 22.6	0 51 <1 773 855 848 1045 2908 ► 1045 2908 ► 1045 2908 ► 1045 2908 ► 1045 2908 ► 1045 2908 ► 1045 2908 ► 1045 2908 ► 1045 2908 ► 1045 2908 ► 1045 2908 ► 1045 2908 ► 1045 1045 2908 ► 1045 1045 1045 2908 ► 1045 104

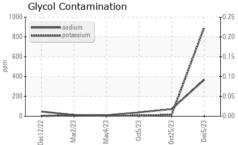


# **OIL ANALYSIS REPORT**









	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
Dec5/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
De	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
0.25	Free Water	scalar	*Visual		NEG	NEG	NEG
0.20	FLUID PROP	ERTIES	method	limit/base	current	history1	history2
0.15 gr	Visc @ 100°C	cSt	ASTM D445	15.4	14.5	14.8	10.0
0.10	GRAPHS						
0.05	Ferrous Alloys						
0.00	140 iron		Å				
Dec5/23	120 - chromium						
	100		/				
E	80						
	60		/				
	40-						
	20-			· · · · ·			
		n n		<u>27</u>			
	Dec12/22 Mar2/23	May4/23 0ct5/23	Jct25/23	Dec5/23			
	□		0	_			
0ct25/23 +	<sup>20</sup>			1			
0ct2	copper						
	15			/			
T <sup>0.25</sup>	<u></u> 10-						
0.20	8 10 -		/				
0.15	5-						
0.10		-	/				
	0						
0.05	Dec12/22 Mar2/23	May4/23 0ct5/23	0ct25/23	Dec5/23			
0.00		-	00				
Dec5/2	Viscosity @ 100°	C			Base Number		
	18 - Abnormal			10.	Base		
	17- 16 Page			(B <sup>0</sup> 8.	0		
ŝ	Dase			.0 .6 .6 .6 .6 .6 .4 .9 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2	0		
6				june la			
ć	경 13 - Abnormal		/	tunnu 4.	0		
	11-		/	ee 2.	0		
	10-	V					
	<sup>1</sup> 23 + 22 + 2	/23 -	/23	.0		/23+	/23-
	Dec12/22 Mar2/23	May4/23 0ct5/23	0ct25/23	Dec5/23	Dec12/22 Mar2/23	May4/23 0ct5/23	0ct25/23 Dec5/23
Loboratoria	· MaarChask UCA	501 Madi-		NO OZEN		ronmontal 00	
Laboratory Sample No.	: WearCheck USA - : GFL0090289	501 Madis Received		ary, NC 2751: Dec 2023	o GFL EÑVI		1 - Ozarks Hauling 3924 Olath Drive
Lab Number	: 06027310	Diagnose		Dec 2023			Lebanon, MO
Unique Number	: 10777101	Diagnost		athan Heste	r	c.	US 65536
Test Package	: FLEET ( Additiona						Landen Johnson
	contact Customer Ser re outside of the ISO						son@gflenv.com : (417)664-0010
	ifications are based on				(ICGM 106.2012)	'	. (417)004-0010 E·

\* - 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)

Certificate L2367 To discuss this

Page 4 of 4

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