

### **OIL ANALYSIS REPORT**

Sample Rating Trend



# Machine Id 924036-260254

Component Diesel Engine

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

#### DIAGNOSIS

#### Recommendation

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 are high. Test for glycol is negative.

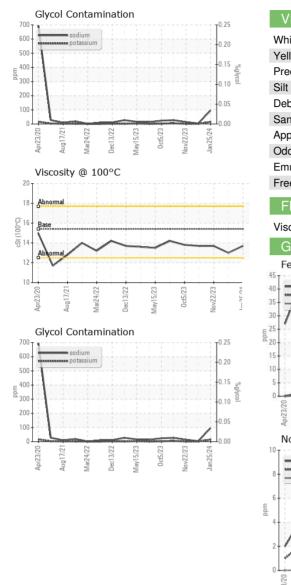
#### Fluid Condition

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.

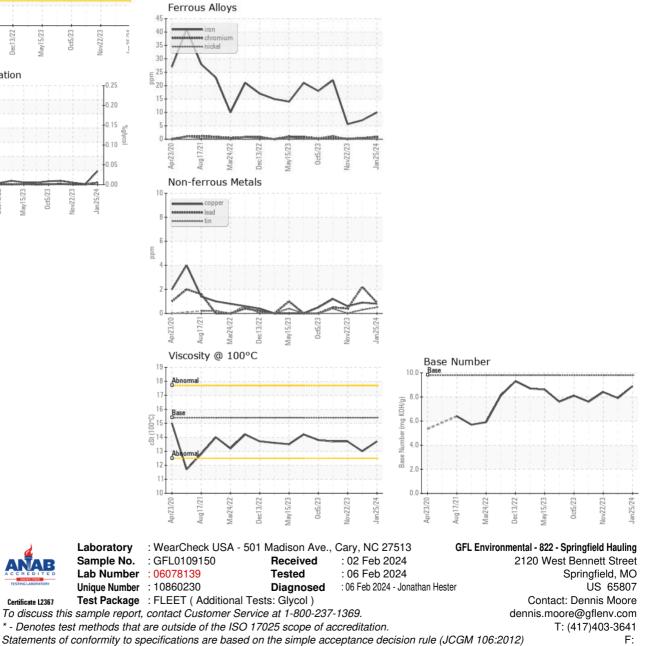
SAMPLE INFORMATION     method     imitibase     current     history1     history2       Sample Number     Client Info     GFL0109150     GFL0098317     GFL0098290       Sample Date     Client Info     10835     10693     10521       Oil Age     hrs     Client Info     6600     700     150       Oil Age     hrs     Client Info     6600     700     150       Oil Changed     Client Info     6600     700     150       Sample Status     Imit/base     current     history1     history2       Fuel     WC Method     >5     <1.0     <1.0     <1.0       Water     WC Method     >0.2     NEG     NEG     NEG       VerAr METALS     method     Imit/base     current     history2       Iron     ppm     ASTM051855     >20     <1     <1     <1       Nickel     ppm     ASTM051855     >30     0     0     0       Silver     ppm     ASTM0518555     >40     <1     <1 </th <th>GAL)</th> <th></th> <th>4pr2020 Au</th> <th>2021 Mar2022 Dec203</th> <th>2 May2023 Oct2023 Nov20</th> <th>23 Jan2024</th> <th></th>	GAL)		4pr2020 Au	2021 Mar2022 Dec203	2 May2023 Oct2023 Nov20	23 Jan2024	
Sample Date     Client Info     25 Jan 2024     14 Dec 2023     22 Nov 2023       Machine Age     hrs     Client Info     10835     10693     10521       Oil Age     hrs     Client Info     600     700     150       Oil Changed     Client Info     Changed     Not Changed     Not MAL     NORMAL       Sample Status     Client Info     Changed     Not Changed     Not Changed     Nor MAL       Verance     WC Method     >5.5     <1.0     <1.0     <1.0       Water     WC Method     >0.2     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM 05155     >100     10     7     6       Chromium     ppm     ASTM 05155     >100     10     7     1       Iran     ppm     ASTM 05155     >30     0     0     0       Iran     ppm     ASTM 05155     >30     0     0     0       <	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Oil Age     hrs     Client Info     600     700     150       Oil Changed     Client Info     Changed     N/A     NORMAL     N/A       Sample Status     Imit/base     current     history1     history2       Fuel     WC Method     >5     <1.0     <1.0     <1.0       Water     WC Method     >5     <1.0     <1.0     <1.0       Veater     WC Method     >2.0     <1     <1     <1       Iron     ppm     ASTM D5185m     >100     0     7     6       Chromium     ppm     ASTM D5185m     >20     <1     <1     <1     <1       Nickel     ppm     ASTM D5185m     >20     <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							
Oil Changed Sample Status     Client Info     Changed ATTENTION     NJA     NJA       CONTAMINATION     method     Imil/base     current     history1     Nistory2       Fuel     WC Method     >5.5     <1.0     <1.0     <1.0       Water     WC Method     >5.5     <1.0     <1.0     <1.0       WEAR METALS     method     Imil/base     current     history1     history2       Iron     ppm     ASTM 05185m     >20     <1     <1     <1       Nickel     ppm     ASTM 05185m     >20     <1     <1     <1       Nickel     ppm     ASTM 05185m     >20     <1     <1     <1       Nickel     ppm     ASTM 05185m     >20     <1     <1     <1     <1       Lead     ppm     ASTM 05185m     >20     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     0     0     <1     <1     <1     0     0     <1     <1     <1 </th <th>Machine Age</th> <th>hrs</th> <th>Client Info</th> <th></th> <th>10835</th> <th>10693</th> <th>10521</th>	Machine Age	hrs	Client Info		10835	10693	10521
Sample Status     ATTENTION     NORMAL     NORMAL       CONTAMINATION     method     imit/base     current     history1     history2       Fuel     WC Method     >5.     <1.0     <1.0     <1.0       Water     WC Method     >0.2     NEG     NEG     NEG       WEAR METALS     method     imit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >100     10     7     6       Chromium     ppm     ASTM D5185m     >20     <1     <1     0       Nickel     ppm     ASTM D5185m     >20     <1     <1     0       Silver     ppm     ASTM D5185m     >20     <1     1     <1     <1       Lead     ppm     ASTM D5185m     >20     <1     <1     <1     <1     <1       Copper     ppm     ASTM D5185m     >330     <1     <1     <1     0       Vanadium     ppm     ASTM D5185m     0     0     0 </th <th>Oil Age</th> <th>hrs</th> <th>Client Info</th> <th></th> <th>600</th> <th>700</th> <th>150</th>	Oil Age	hrs	Client Info		600	700	150
CONTAMINATION     method     imit/base     current     history1     history2       Fuel     WC Method     >5     <1.0     <1.0     <1.0       Water     WC Method     >0.2     NEG     NEG     NEG       Wear     WC Method     >0.2     NEG     NEG     NEG       Wear     ppm     ASTM D5185m     >100     10     7     6       Chromium     ppm     ASTM D5185m     >20     <1     <1     0       Nickel     ppm     ASTM D5185m     >4     <1     0     0     0       Irininum     ppm     ASTM D5185m     >20     <1     1     <1     1       Lead     ppm     ASTM D5185m     >30     0     0     0     1     <1     1	Oil Changed		Client Info		Changed	Not Changd	N/A
Fuel     WC Method     >5     <1.0     <1.0     <1.0       Water     WC Method     >0.2     NEG     NEG     NEG       Wear     WC Method     >0.2     NEG     NEG     NEG       WEAR METALS     method     imit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >100     10     7     6       Chromium     ppm     ASTM D5185m     >20     <1     <1     <1       Nickel     ppm     ASTM D5185m     >20     <1     1     <1     <1       Silver     ppm     ASTM D5185m     >20     <1     1     <1     <1       Lead     ppm     ASTM D5185m     >20     <1     1     <1     <1       Capper     ppm     ASTM D5185m     >30     0     0     0     0       Cadmium     ppm     ASTM D5185m     0     0     0     0     0       Cadmium     ppm     ASTM D5185m     0	Sample Status				ATTENTION	NORMAL	NORMAL
Water     WC Method     >0.2     NEG     NEG     NEG       Wear     ppm     ASTM D5185m     >100     10     7     6       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     7     6       Chromium     ppm     ASTM D5185m     >20     <1	Fuel		WC Method	>5	<1.0	<1.0	<1.0
Iron     ppm     ASTM D5185m     >100     10     7     6       Chromium     ppm     ASTM D5185m     >20     <1	Water		WC Method	>0.2	NEG	NEG	NEG
Chromium     ppm     ASTM D5185m     >20     <1     <1     <1       Nickel     ppm     ASTM D5185m     >4     <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel     ppm     ASTM D5185m     >4     <1     <1     <1     0       Titanium     ppm     ASTM D5185m     >3     0     0     0       Silver     ppm     ASTM D5185m     >20     <1	Iron	ppm	ASTM D5185m	>100	10	7	6
Titanium     ppm     ASTM D5185m     <1     0     <1       Silver     ppm     ASTM D5185m     >3     0     0     0       Aluminum     ppm     ASTM D5185m     >20     <1	Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Silver     ppm     ASTM D5185m     >3     0     0     0       Aluminum     ppm     ASTM D5185m     >20     <1	Nickel	ppm	ASTM D5185m	>4	<1	<1	0
Aluminum     ppm     ASTM D5185m     >20     <1     1     <1       Lead     ppm     ASTM D5185m     >40     <1	Titanium	ppm	ASTM D5185m		<1	0	<1
Lead     ppm     ASTM D5185m     >40     <1     2     <1       Copper     ppm     ASTM D5185m     >330     <1	Silver	ppm	ASTM D5185m	>3	0	0	0
Copper     ppm     ASTM D5185m     >330     <1     <1     <1       Tin     ppm     ASTM D5185m     >15     <1	Aluminum	ppm	ASTM D5185m	>20	<1	1	<1
Tin     ppm     ASTM D5185m     >15     <1     <1     0       Vanadium     ppm     ASTM D5185m     0     0     <1	Lead	ppm	ASTM D5185m	>40	<1	2	<1
Vanadium     ppm     ASTM D5185m     0     0     <1       Cadmium     ppm     ASTM D5185m     <1	Copper	ppm	ASTM D5185m	>330	<1	<1	<1
Cadmium     ppm     ASTM D5185m     <1     0     0       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     0     0     2     0       Barium     ppm     ASTM D5185m     0     0     0     0     0       Marganese     ppm     ASTM D5185m     0     <1     <1     <1     <1       Magnesium     ppm     ASTM D5185m     0     <11     <1     <1     <1       Magnesium     ppm     ASTM D5185m     1010     943     932     958       Calcium     ppm     ASTM D5185m     1270     1213     1257     1255       Sulfur     ppm     ASTM		ppm	ASTM D5185m	>15	<1		
ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     0     0     2     0       Barium     ppm     ASTM D5185m     0     0     0     0     0       Barium     ppm     ASTM D5185m     0     67     59     58       Manganese     ppm     ASTM D5185m     0     <1	Vanadium	ppm	ASTM D5185m		0	0	<1
Boron     ppm     ASTM D5185m     0     0     0     2     0       Barium     ppm     ASTM D5185m     0     0     0     0     0       Molybdenum     ppm     ASTM D5185m     60     67     59     58       Manganese     ppm     ASTM D5185m     0     <1	Cadmium	ppm	ASTM D5185m		<1	0	0
Barium     ppm     ASTM D5185m     0     0     0     0       Molybdenum     ppm     ASTM D5185m     60     67     59     58       Manganese     ppm     ASTM D5185m     0     <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum     ppm     ASTM D5185m     60     67     59     58       Manganese     ppm     ASTM D5185m     0     <1	Boron	ppm					
Marganese     ppm     ASTM D5185m     0     <1     <1     <1       Magnesium     ppm     ASTM D5185m     1010     943     932     958       Calcium     ppm     ASTM D5185m     1070     972     1019     1038       Phosphorus     ppm     ASTM D5185m     1150     990     1061     1046       Zinc     ppm     ASTM D5185m     1270     1213     1257     1255       Sulfur     ppm     ASTM D5185m     2060     3082     2961     2938       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     6     3     2       Sodium     ppm     ASTM D5185m     >20     14     1     <1	Barium	ppm	ASTM D5185m	0	0		
Magnesium     ppm     ASTM D5185m     1010     943     932     958       Calcium     ppm     ASTM D5185m     1070     972     1019     1038       Phosphorus     ppm     ASTM D5185m     1150     990     1061     1046       Zinc     ppm     ASTM D5185m     1270     1213     1257     1255       Sulfur     ppm     ASTM D5185m     2060     3082     2961     2938       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     6     3     2       Sodium     ppm     ASTM D5185m     >25     6     3     2       Sodium     ppm     ASTM D5185m     >20     14     1     <1       Glycol     %     *ASTM D5185m     >20     14     1     <1       Glycol     %     *ASTM D5185m     >20     14     0.5     0.3       INFRA-RED     method     limit/base	Molybdenum	ppm		60	-		
Calcium     ppm     ASTM D5185m     1070     972     1019     1038       Phosphorus     ppm     ASTM D5185m     1150     990     1061     1046       Zinc     ppm     ASTM D5185m     1270     1213     1257     1255       Sulfur     ppm     ASTM D5185m     2060     3082     2961     2938       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     6     3     2       Sodium     ppm     ASTM D5185m     >20     14     1     <1	0	ppm	ASTM D5185m		<1		
Phosphorus     ppm     ASTM D5185m     1150     990     1061     1046       Zinc     ppm     ASTM D5185m     1270     1213     1257     1255       Sulfur     ppm     ASTM D5185m     2060     3082     2961     2938       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     6     3     2       Sodium     ppm     ASTM D5185m     >25     6     3     2       Sodium     ppm     ASTM D5185m     >20     14     1     <1	0	ppm					958
Zinc     ppm     ASTM D5185m     1270     1213     1257     1255       Sulfur     ppm     ASTM D5185m     2060     3082     2961     2938       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     6     3     2       Sodium     ppm     ASTM D5185m     >25     6     3     2       Sodium     ppm     ASTM D5185m     >20     14     1     <1		ppm					
SulfurppmASTM D5185m2060308229612938CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25632SodiumppmASTM D5185m>2014113PotassiumppmASTM D5185m>20141<1	·	ppm					
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25632SodiumppmASTM D5185m▲ 96413PotassiumppmASTM D5185m>20141<1					-		
Silicon   ppm   ASTM D5185m   >25   6   3   2     Sodium   ppm   ASTM D5185m   >20   4   13     Potassium   ppm   ASTM D5185m   >20   14   1   <1     Glycol   %   *ASTM D2982   NEG   NEG   NEG   NEG     INFRA-RED   method   limit/base   current   history1   history2     Soot %   %   *ASTM D7844   >3   0.4   0.5   0.3     Nitration   Abs/cm   *ASTM D7624   >20   6.3   8.4   6.0     Sulfation   Abs/.tmm   *ASTM D7415   >30   18.5   20.1   18.4     FLUID DEGRADATION   method   limit/base   current   history1   history2     Oxidation   Abs/.tmm   *ASTM D7414   >25   13.5   16.2   13.8			ASTM D5185m	2060	3082	2961	2938
Sodium     ppm     ASTM D5185m     ▲ 96     4     13       Potassium     ppm     ASTM D5185m     >20     14     1     <1	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium     ppm     ASTM D5185m     >20     14     1     <1       Glycol     %     *ASTM D2982     NEG     NEG     NEG     NEG       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     0.4     0.5     0.3       Nitration     Abs/cm     *ASTM D7624     >20     6.3     8.4     6.0       Sulfation     Abs/.1mm     *ASTM D7415     >30     18.5     20.1     18.4       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.5     16.2     13.8	Silicon	ppm	ASTM D5185m	>25	6	3	2
Glycol     %     *ASTM D2982     NEG     NEG     NEG       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     0.4     0.5     0.3       Nitration     Abs/cm     *ASTM D7624     >20     6.3     8.4     6.0       Sulfation     Abs/.1mm     *ASTM D7415     >30     18.5     20.1     18.4       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.5     16.2     13.8	Sodium	ppm	ASTM D5185m		<b>A</b> 96	4	13
INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     0.4     0.5     0.3       Nitration     Abs/cm     *ASTM D7624     >20     6.3     8.4     6.0       Sulfation     Abs/.tmm     *ASTM D7615     >30     18.5     20.1     18.4       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.tmm     *ASTM D7414     >25     13.5     16.2     13.8	Potassium	ppm	ASTM D5185m	>20		1	
Soot %     %     *ASTM D7844     >3     0.4     0.5     0.3       Nitration     Abs/cm     *ASTM D7624     >20     6.3     8.4     6.0       Sulfation     Abs/.1mm     *ASTM D7415     >30     18.5     20.1     18.4       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.5     16.2     13.8	Glycol	%	*ASTM D2982		NEG	NEG	NEG
Nitration     Abs/cm     *ASTM D7624     >20     6.3     8.4     6.0       Sulfation     Abs/.1mm     *ASTM D7415     >30     18.5     20.1     18.4       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.5     16.2     13.8	INFRA-RED		method	limit/base	current	history1	history2
Sulfation     Abs/.1mm     *ASTM D7415     >30     18.5     20.1     18.4       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.5     16.2     13.8	Soot %	%	*ASTM D7844	>3	0.4	0.5	0.3
FLUID DEGRADATION method limit/base current history1 history2   Oxidation Abs/.1mm *ASTM D7414 >25 13.5 16.2 13.8	Nitration	Abs/cm	*ASTM D7624	>20	6.3	8.4	6.0
Oxidation Abs/.1mm *ASTM D7414 >25 <b>13.5</b> 16.2 13.8	Sulfation	Abs/.1mm	*ASTM D7415	>30	18.5	20.1	18.4
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
Base Number (BN)     mg KOH/g     ASTM D2896     9.8     8.9     7.9     8.4	Oxidation	Abs/.1mm	*ASTM D7414	>25	13.5	16.2	13.8
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.9	7.9	8.4



## **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
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPE	RTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.7	13.0	13.7
GRAPHS						





Report Id: GFL822 [WUSCAR] 06078139 (Generated: 02/08/2024 08:42:00) Rev: 1

Certificate L2367

Submitted By: Dennis Moore