

## **OIL ANALYSIS REPORT**

Sample Rating Trend

NORMAL



Diesel Engine

PETRO CANADA DURON SHP 10W30 (--- LTR)

### DIAGNOSIS Recommendation

Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

#### Contamination

Elevated aluminum (Al) and/or lead (Pb) and potassium (K) levels in your metals analysis are likely a result of solder flux release into the lubricant and is common on new equipment/components. There is no indication of any contamination in the oil.

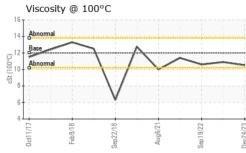
### Fluid Condition

The condition of the oil is acceptable for the time in service.

SAMPLE INFORMATION     method     limit/base     current     history1     history2       Sample Number     Client Info     GFL0191702     GFL0059397     GFL0059399       Sample Date     Client Info     14788     9999     0       Oil Age     hrs     Client Info     N/A     Changed     Changed       Sample States     Client Info     N/A     Changed     Changed     Changed       Sample States     Client Info     N/A     Changed     Changed     Changed       Sample States     Client Info     N/A     Changed     Changed     Changed       Sample States     method     Innit/base     current     history1     History2       Fuel     WC Method     >0.2     NEG     NEG     NEG       Oli Changed     WC Method     >0.2     NEG     NEG     NEG       Fuel     WC Method     >0.2     0     0     0     0       Transium     ppm     ASTM0588m     >120     0     1     1     1		- LIN)	0ct2017	Feb2018 Sep2018	Aug2021 Sep2022	Dec2023	
Sample Date     Client Info     24 Dec 2023     01 Mar 2023     19 Sep 2022       Machine Age     hrs     Client Info     14788     9999     0       Oil Age     hrs     Client Info     0     475     0       Oil Changed     Client Info     N/A     Changed     Changed       Sample Status     Imit/base     current     NoRMAL     NORMAL     NORMAL       CONTAMINATION     method     >3.0     <1.0	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age     hrs     Client Info     14788     9999     0       Oil Age     irrs     Client Info     0     475     0       Oil Changed     Client Info     N/A     Changed     Changed       Sample Status     NORMAL     NORMAL     NORMAL     NORMAL       CONTAMINATION     method     imit/base     current     istory1     istory2       Fuel     WC Method     >3.0     <1.0	Sample Number		Client Info		GFL0101702	GFL0059377	GFL0059989
Oil Age     Ins     Client Info     N/A     Changed     Changed       Sample Status     Image     NORMAL     NORMAL     NORMAL     NORMAL       CONTAMINATION     method     limit/base     current     historyl     historyl       Fuel     WC Method     >3.0     <1.0			Client Info		24 Dec 2023	01 Mar 2023	19 Sep 2022
Oil Changed Sample Status Client Info N/A Changed NORMAL Changed NORMAL Changed NORMAL Changed NORMAL   CONTAMINATION method imit/base current history1 history2   Fuel WC Method >3.0 <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 D5185(m) >120 5 2 2   Chromium ppm ASTM D5185(m) >20 0 0   Nickel ppm ASTM D5185(m) >20 0 0   Silver ppm ASTM D5185(m) >20 4 1 2   Lead ppm ASTM D5185(m) >20 0 0 0   Astm D5185(m) >10	Machine Age	hrs	Client Info		14788	9999	0
Sample Status     NORMAL     NORMAL     NORMAL     NORMAL     NORMAL       CONTAMINATION     method     imit/base     current     history1     history2       Fuel     WC Method     >3.0     <1.0	Oil Age	hrs	Client Info		0	475	0
CONTAMINATION     method     limit/base     current     history1     history2       Fuel     WC Method     >3.0     <1.0	Oil Changed		Client Info		N/A	Changed	Changed
Fuel     WC Method     >3.0     <1.0     <1.0     <1.0       Water     WC Method     >0.2     NEG     NEG     NEG       Glycol     WC Method     NEG     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185(m)     >20     0     0     0       Nickel     ppm     ASTM D5185(m)     >20     0     <1     0       Silver     ppm     ASTM D5185(m)     >2     0     <1     0       Copper     ppm     ASTM D5185(m)     >20     4     1     2       Lead     ppm     ASTM D5185(m)     >40     <1     <1     <1       Copper     ppm     ASTM D5185(m)     >15     <1     0     0       Cadmium     ppm     ASTM D5185(m)     0     0     0     0       Cadmium     ppm     ASTM D5185(m)     0     0     0     0 <th< td=""><td>Sample Status</td><td></td><td></td><td></td><th>NORMAL</th><td>NORMAL</td><td>NORMAL</td></th<>	Sample Status				NORMAL	NORMAL	NORMAL
Water     WC Method     >0.2     NEG     NEG     NEG       Glycol     WC Method     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185(m)     >20     0     0     0       Nickel     ppm     ASTM D5185(m)     >20     0     0     0       Silver     ppm     ASTM D5185(m)     >2     0     0     0       Auminum     ppm     ASTM D5185(m)     >20     4     1     2       Lead     ppm     ASTM D5185(m)     >20     4     1     <1	CONTAMINATI	ON	method	limit/base	current	history1	history2
Glycol     WC Method     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185(m)     >20     0     0     0       Nickel     ppm     ASTM D5185(m)     >20     0     <1	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM 05(8(m)     >120     5     2     2       Chromium     ppm     ASTM 05(8(m)     >20     0     0     0       Nickel     ppm     ASTM 05(8(m)     >5     <1	Water		WC Method	>0.2	NEG	NEG	NEG
Iron     ppm     ASTM D5185(m)     >120     5     2     2       Chromium     ppm     ASTM D5185(m)     >20     0     0     0       Nickel     ppm     ASTM D5185(m)     >2     0     <1	Glycol		WC Method		NEG	NEG	NEG
Chromium     ppm     ASTM D5185(m)     >20     0     0     0       Nickel     ppm     ASTM D5185(m)     >5     <1	WEAR METALS	S	method	limit/base	current	history1	history2
Nickel     ppm     ASTM D5185(m)     >5     <1     0     0       Titanium     ppm     ASTM D5185(m)     >2     0     <1	Iron	ppm	ASTM D5185(m)	>120	5	2	2
Titanium     ppm     ASTM D5185(m)     >2     0     <1     0       Silver     ppm     ASTM D5185(m)     >2     0     0     0       Aluminum     ppm     ASTM D5185(m)     >20     4     1     2       Lead     ppm     ASTM D5185(m)     >40     <1	Chromium	ppm	ASTM D5185(m)	>20	0	0	0
Titanium     ppm     ASTM D5185(m)     >2     0     <1     0       Silver     ppm     ASTM D5185(m)     >2     0     0     0       Aluminum     ppm     ASTM D5185(m)     >20     4     1     2       Lead     ppm     ASTM D5185(m)     >40     <1	Nickel	ppm	ASTM D5185(m)	>5	<1	0	0
Aluminum     ppm     ASTM D5185(m)     >20     4     1     2       Lead     ppm     ASTM D5185(m)     >40     <1	Titanium	ppm	ASTM D5185(m)	>2	0	<1	0
Lead     ppm     ASTM D5185(m)     >40     <1     <1     <1       Copper     ppm     ASTM D5185(m)     >330     1     <1	Silver	ppm	ASTM D5185(m)	>2	0	0	0
Copper     ppm     ASTM D5185(m)     >330     1     <1     <1     <1       Tin     ppm     ASTM D5185(m)     >15     <1	Aluminum	ppm	ASTM D5185(m)	>20	4	1	2
Tin     ppm     ASTM D5185(m)     >15     <1     0     0       Antimony     ppm     ASTM D5185(m)     0     0     0     0       Vanadium     ppm     ASTM D5185(m)     0     0     0     0       Beryllium     ppm     ASTM D5185(m)     0     0     0     0       Cadmium     ppm     ASTM D5185(m)     0     0     0     0       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185(m)     2     2     2     2     2       Barium     ppm     ASTM D5185(m)     0     0     0     0     0       Maganese     ppm     ASTM D5185(m)     0     0     <1     <1       Calcium     ppm     ASTM D5185(m)     050     943     938     917       Calcium     ppm     ASTM D5185(m)     1050     1029     1065     1039       Phosphorus     ppm     ASTM D5185(m)	Lead	ppm	ASTM D5185(m)	>40	<1	<1	<1
Antimony     ppm     ASTM D5185(m)     0     0     0     0       Vanadium     ppm     ASTM D5185(m)     0     0     0     0       Beryllium     ppm     ASTM D5185(m)     0     0     0     0       Cadmium     ppm     ASTM D5185(m)     0     0     0     0       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185(m)     2     2     2     2       Barium     ppm     ASTM D5185(m)     0     0     0     0       Molybdenum     ppm     ASTM D5185(m)     0     0     -<1	Copper	ppm	ASTM D5185(m)	>330	1	<1	<1
Vanadium     ppm     ASTM D5185(m)     0     0     0       Beryllium     ppm     ASTM D5185(m)     0     0     0       Cadmium     ppm     ASTM D5185(m)     0     0     0     0       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185(m)     2     2     2     2       Barium     ppm     ASTM D5185(m)     0     0     0     0       Molybdenum     ppm     ASTM D5185(m)     0     0     0     0     0       Magnesium     ppm     ASTM D5185(m)     0     0     <11	Tin	ppm	ASTM D5185(m)	>15	<1	0	0
Beryllium     ppm     ASTM D5185(m)     0     0     0     0       Cadmium     ppm     ASTM D5185(m)     0     0     0     0       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185(m)     2     2     2     2     2     2       Barium     ppm     ASTM D5185(m)     0     0     0     0     0     0       Molybdenum     ppm     ASTM D5185(m)     0     0     0     -1     <1       Magnesium     ppm     ASTM D5185(m)     050     57     57     55       Magnesium     ppm     ASTM D5185(m)     050     943     938     917       Calcium     ppm     ASTM D5185(m)     1050     1029     1065     1039       Phosphorus     ppm     ASTM D5185(m)     2600     26455     2640     2567       Lithium     ppm     ASTM D5185(m)     22     1     1     1	Antimony	ppm	ASTM D5185(m)		0	0	0
Cadmium     ppm     ASTM D5185(m)     0     0     0       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185(m)     2     2     2     2     2       Barium     ppm     ASTM D5185(m)     0     0     0     0     0       Molybdenum     ppm     ASTM D5185(m)     50     57     57     55       Manganese     ppm     ASTM D5185(m)     0     0     -1     -1       Magnesium     ppm     ASTM D5185(m)     950     943     938     917       Calcium     ppm     ASTM D5185(m)     950     984     1089     1032       Sulfur     ppm     ASTM D5185(m	Vanadium	ppm	ASTM D5185(m)		0	0	0
ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185(m)     2     2     2     2       Barium     ppm     ASTM D5185(m)     0     0     0     0       Molybdenum     ppm     ASTM D5185(m)     50     57     57     55       Manganese     ppm     ASTM D5185(m)     0     0     <1	Beryllium	ppm	ASTM D5185(m)		0	0	0
Boron     ppm     ASTM D5185(m)     2     2     2     2       Barium     ppm     ASTM D5185(m)     0     0     0     0       Molybdenum     ppm     ASTM D5185(m)     50     57     57     55       Manganese     ppm     ASTM D5185(m)     0     0     <1	Cadmium	ppm	ASTM D5185(m)		0	0	0
Barium     ppm     ASTM D5185(m)     0     0     0     0     0       Molybdenum     ppm     ASTM D5185(m)     50     57     57     55       Manganese     ppm     ASTM D5185(m)     0     0      <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum     ppm     ASTM D5185(m)     50     57     57     55       Manganese     ppm     ASTM D5185(m)     0     0     -1     <1	Boron	ppm	ASTM D5185(m)	2	2	2	2
Manganese     ppm     ASTM D5185(m)     0     0     <1     <1       Magnesium     ppm     ASTM D5185(m)     950     943     938     917       Calcium     ppm     ASTM D5185(m)     950     943     938     917       Calcium     ppm     ASTM D5185(m)     1050     1029     1065     1039       Phosphorus     ppm     ASTM D5185(m)     1955     984     1089     1032       Zinc     ppm     ASTM D5185(m)     1180     1138     1143     1119       Sulfur     ppm     ASTM D5185(m)     2600     2645     2640     2567       Lithium     ppm     ASTM D5185(m)     2600     current     history1     history2       Silicon     ppm     ASTM D5185(m)     >25     5     5     2       Sodium     ppm     ASTM D5185(m)     >20     5     <1	Barium	ppm	ASTM D5185(m)	0	0	0	0
Magnesium     ppm     ASTM D5185(m)     950     943     938     917       Calcium     ppm     ASTM D5185(m)     1050     1029     1065     1039       Phosphorus     ppm     ASTM D5185(m)     995     984     1089     1032       Zinc     ppm     ASTM D5185(m)     995     984     1089     1032       Zinc     ppm     ASTM D5185(m)     943     1143     1119       Sulfur     ppm     ASTM D5185(m)     2600     2645     2640     2567       Lithium     ppm     ASTM D5185(m)     2600     2645     2640     2567       Lithium     ppm     ASTM D5185(m)     2600     class     current     history1     history2       Silicon     ppm     ASTM D5185(m)     >25     5     5     2     2       Sodium     ppm     ASTM D5185(m)     >20     5     <1	Molybdenum	ppm	ASTM D5185(m)	50	57	57	55
Calcium     ppm     ASTM D5185(m)     1050     1029     1065     1039       Phosphorus     ppm     ASTM D5185(m)     995     984     1089     1032       Zinc     ppm     ASTM D5185(m)     995     984     1089     1032       Zinc     ppm     ASTM D5185(m)     1180     1138     1143     1119       Sulfur     ppm     ASTM D5185(m)     2600     2645     2640     2567       Lithium     ppm     ASTM D5185(m)     2600     2645     2640     2567       Lithium     ppm     ASTM D5185(m)     25     5     5     2       Solicon     ppm     ASTM D5185(m)     >25     5     5     2       Sodium     ppm     ASTM D5185(m)     >20     5     <1	Manganese	ppm	ASTM D5185(m)	0	0	<1	<1
Phosphorus     ppm     ASTM D5185(m)     995     984     1089     1032       Zinc     ppm     ASTM D5185(m)     1180     1138     1143     1119       Sulfur     ppm     ASTM D5185(m)     2600     2645     2640     2567       Lithium     ppm     ASTM D5185(m)     2600     2645     2640     2567       Lithium     ppm     ASTM D5185(m)     2600     current     history1     history2       Silicon     ppm     ASTM D5185(m)     >25     5     5     2       Sodium     ppm     ASTM D5185(m)     >20     5     <1	Magnesium	ppm	ASTM D5185(m)	950	943	938	917
Zinc     ppm     ASTM D5185(m)     1180     1138     1143     1119       Sulfur     ppm     ASTM D5185(m)     2600     2645     2640     2567       Lithium     ppm     ASTM D5185(m)     2600     2645     2640     2567       Lithium     ppm     ASTM D5185(m)            CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185(m)     >25     5     5     2       Sodium     ppm     ASTM D5185(m)     >20     5     <1     1       Potassium     ppm     ASTM D5185(m)     >20     5     <1     1       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     ASTM D7844*     >4     0     0     0       Nitration     Abs/cm     ASTM D7624*     >20     6.9     5.3     5.2	Calcium	ppm	ASTM D5185(m)	1050	1029	1065	1039
Sulfur     ppm     ASTM D5185(m)     2600     2645     2640     2567       Lithium     ppm     ASTM D5185(m)     Current     Astmosi     climit/base     current     history1     history2       Silicon     ppm     ASTM D5185(m)     >25     5     5     2       Sodium     ppm     ASTM D5185(m)     >20     5     <1     1       Potassium     ppm     ASTM D5185(m)     >20     5     <1     1       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     ASTM D7844*     >4     0     0     0       Nitration     Abs/cm     ASTM D7624*     >20     6.9     5.3     5.2	Phosphorus	ppm	ASTM D5185(m)	995	984	1089	1032
Lithium     ppm     ASTM D5185(m)     <1     <1     <1     <1       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185(m)     >25     5     5     2       Sodium     ppm     ASTM D5185(m)     >20     5     <1	Zinc	ppm	ASTM D5185(m)	1180	1138	1143	1119
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185(m)>25552SodiumppmASTM D5185(m)211PotassiumppmASTM D5185(m)>205<1	Sulfur	ppm	ASTM D5185(m)	2600	2645	2640	2567
Silicon     ppm     ASTM D5185(m)     >25     5     5     2       Sodium     ppm     ASTM D5185(m)     2     1     1       Potassium     ppm     ASTM D5185(m)     >20     5     <1     1       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     ASTM D7844*     >4     0     0     0       Nitration     Abs/cm     ASTM D7624*     >20     6.9     5.3     5.2	Lithium	ppm	ASTM D5185(m)		<1	<1	<1
Sodium     ppm     ASTM D5185(m)     2     1     1       Potassium     ppm     ASTM D5185(m)     >20     5     <1     1       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     ASTM D7844*     >4     0     0     0       Nitration     Abs/cm     ASTM D7624*     >20     6.9     5.3     5.2	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium     ppm     ASTM D5185(m)     >20     5     <1     1       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     ASTM D7844*     >4     0     0     0       Nitration     Abs/cm     ASTM D7624*     >20     6.9     5.3     5.2	Silicon	ppm	ASTM D5185(m)	>25	5	5	2
INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%ASTM D7844*>4000NitrationAbs/cmASTM D7624*>206.95.35.2	Sodium	ppm	ASTM D5185(m)		2	1	1
Soot %     %     ASTM D7844*     >4     0     0     0       Nitration     Abs/cm     ASTM D7624*     >20     6.9     5.3     5.2	Potassium	ppm	ASTM D5185(m)	>20	5	<1	1
Nitration     Abs/cm     ASTM D7624*     >20     6.9     5.3     5.2	INFRA-RED		method	limit/base	current	history1	history2
	Soot %	%	ASTM D7844*	>4	0	0	0
Sulfation     Abs/.1mm     ASTM D7415*     >30     18.5     20.1     18.7	Nitration	Abs/cm	ASTM D7624*	>20	6.9	5.3	5.2
	Sulfation	Abs/.1mm	ASTM D7415*	>30	18.5	20.1	18.7



# **OIL ANALYSIS REPORT**



Oxidation VISUAL Emulsified Water Free Water	Abs/.1mm scalar	ASTM D7414* method	>25 limit/base	15.4	14.2	14.6	
Emulsified Water	scalar	method	limit/base				
	scalar					histor	y2
	scalar	Visual* Visual*	>0.2	NEG NEG	NEG NEG	NEG NEG	
FLUID PROPE	RTIES	method	limit/base	current	history1	histor	y2
Visc @ 100°C	cSt	ASTM D7279(m)	12.00	10.5	10.9	10.6	
GRAPHS							
Iron (ppm)			10				
Severe			8	0 - Severe			
			E 6	0-			
Abnormal				0 - Abnormal			_
•			2	0-			
18					/18	22	23
Oct111 Feb9 Sep22	Auge	Sep19	Dec24	Oct11 Feb9	Sep22	Sep 19	Dec24/23
Aluminum (ppm)			, - 5		m)		
Severe				Smiller			
)+			3	0-			
Abnormal			udd 2	0 - Abnormal			
			1	0-			
					21	22	1
0ct11/ Feb9//	Aug6/	Sep 19/2	Dec24//	Oct11/ Feb9/	Sep22/	Sep 19/2	Dec24/23
Copper (ppm)				Silicon (ppm)			
Severe Abnormal						1	
) +							
			2	0		~	
						1	_
Oct11/1 Feb9/11	Aug6/2	ep 1 9/2	lec24/2:	Oct11/1 Feb9/18	ep22/1	iep 1 9/2;	Der24/23.
	0	0					
Abnormal				Sminn			
	A	-		las is i			
Abnormal	$/ \rightarrow$	$\sim$					
	/		2.	0 -			
					$\rightarrow$		
Oct11/17 Feb9/18 Sep22/18	Aug6/21	Sep 19/22	Dec24/23	Oct11/17 Feb9/18	Sep22/18 Aug6/21	Sep 1 9/22	Dec24/23
	GRAPHS Iron (ppm) Severe Abnormal Aluminum (ppm) Severe Abnormal Automal Copper (ppm) Severe Copper (ppm) Severe Copper (ppm) Severe Copper (ppm) Severe Copper (ppm)	GRAPHS Iron (ppm) Severe Abnormal Abnormal Abnormal Abnormal Abnormal Abnormal Abnormal Abnormal Abnormal Bevere Copper (ppm) Severe Abnormal Abnormal Bevere Abnormal Abnormal Bevere Abnormal Bill(Gep4) Copper (ppm) Severe Abnormal Bill(Gep4) Copper (ppm) Severe Abnormal Abnormal Bill(Gep4) Copper (ppm) Severe Abnormal Copper (ppm) Severe Abnormal Copper (ppm) Severe Abnormal Copper (ppm) Severe Abnormal Copper (ppm) Severe Abnormal Copper (ppm) Severe Abnormal Copper (ppm) Severe Copper (ppm) Copper (ppm) Severe Abnormal Copper (ppm) Copper	GRAPHS Iron (ppm)	GRAPHS     Iron (ppm)     Iron (ppm)	GRAPHS Iron (ppm)	CRAPHS Iron (ppm)	CRAPHS Iron (ppm)