

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.

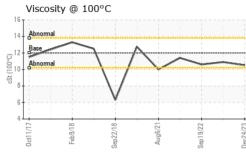
Fluid Condition

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)