

OIL ANALYSIS REPORT

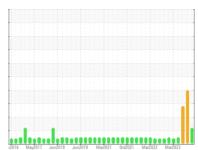
Sample Rating Trend

GLYCOL



Component **Diesel Engine**

PETRO CANADA DURON SHP 15W40 (10 GAL)





DIAGNOSIS

Recommendation

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.

Wear

All component wear rates are normal.

Contamination

Sodium and/or potassium levels remain high.

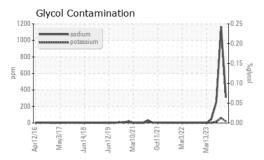
▲ Fluid Condition

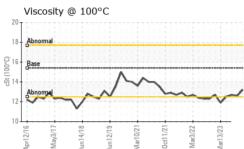
The BN result indicates that there is suitable alkalinity remaining in the oil.

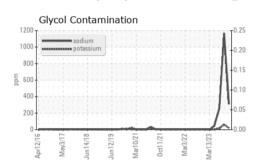
SAMPLE INFORMATION method limit/base current history1 history2	2016 May2017 Jun2018 Jun2019 May2021 0s2021 May2022 May2023 2						
Sample Date Client Info 09 Jan 2024 23 Oct 2023 07 Aug 2023 Machine Age hrs Client Info 24489 23928 23431 Oil Age hrs Client Info 600 600 600 Oil Changed Client Info Changed Changed Changed Changed Changed Changed Changed ABNORMAL A	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Date Client Info Q9 Jan 2024 23 Oct 2023 07 Aug 2023 Machine Age hrs Client Info 24499 23928 23431 Oil Age hrs Client Info 600 600 600 600 Oil Changed Client Info Changed Chang	Sample Number		Client Info		PCA0101776	PCA0095856	PCA0101741
Machine Age hrs Client Info 24499 23928 23431 Oil Age hrs Client Info 600 600 600 Oil Changed Client Info Changed			Client Info		09 Jan 2024	23 Oct 2023	07 Aug 2023
Oil Changed Sample Status Client Info Changed ABNORMAL ABNORMA	•	hrs	Client Info		24499	23928	-
Oil Changed Sample Status Client Info Changed ABNORMAL ABNORMA	Oil Age	hrs	Client Info		600	600	600
Sample Status Method Imitibase Current Inistory1 ABNORMAL Fuel WC Method >3.0 <1.0	-		Client Info		Changed	Changed	Changed
Fuel WC Method So.2 NEG NEG NEG	-				_	ABNORMAL	ABNORMAL
Water WC Method >0.2 NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >165 8 66 81 Chromium ppm ASTM D5185m >5 <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >165 8 66 81 Chromium ppm ASTM D5185m >5 <1	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
Iron	Water		WC Method	>0.2	NEG	NEG	NEG
Chromium	WEAR METAL	.S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>165	8	66	81
Titanium	Chromium	ppm	ASTM D5185m	>5	<1	2	4
Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >20 2 6 6 Lead ppm ASTM D5185m >150 1 18 0 Copper ppm ASTM D5185m >90 4 15 4 Tin ppm ASTM D5185m >5 <1 <1 <1 Vanadium ppm ASTM D5185m <1 0 <1 <1 Cadmium ppm ASTM D5185m 0 <1 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 20 22 13 Boron ppm ASTM D5185m 0 20 22 13 Barium ppm ASTM D5185m 0 72 119 77 Mangaes ppm ASTM D5185m 10 693	Nickel	ppm	ASTM D5185m	>4	<1	<1	0
Aluminum ppm ASTM D5185m >20 2 6 6 Lead ppm ASTM D5185m >150 1 18 0 Copper ppm ASTM D5185m >90 4 15 4 Tin ppm ASTM D5185m >5 <1	Titanium	ppm	ASTM D5185m	>2	0	<1	<1
Lead ppm ASTM D5185m >150 1 18 0 Copper ppm ASTM D5185m >90 4 15 4 Tin ppm ASTM D5185m >5 <1 <1 <1 <1 Vanadium ppm ASTM D5185m 0 <1 0 0 Cadmium ppm ASTM D5185m 0 20 <2 1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 20 22 13 ADDITIVES method limit/base current history1 history2 ADDITIVES method limit/base current history1 history2 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 21 1 1 AD	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper ppm ASTM D5185m >90 4 15 4 Tin ppm ASTM D5185m >5 <1	Aluminum	ppm	ASTM D5185m	>20	2	6	6
Tin ppm ASTM D5185m >5 <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	Lead	ppm	ASTM D5185m	>150	1	18	0
Vanadium ppm ASTM D5185m <1 0 0 Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 20 22 13 Barium ppm ASTM D5185m 0 0 3 0 Molybdenum ppm ASTM D5185m 0 0 3 0 Molybdenum ppm ASTM D5185m 0 <1 <1 1 Manganese ppm ASTM D5185m 0 <1 <1 1 Magnesium ppm ASTM D5185m 1010 693 812 895 Calcium ppm ASTM D5185m 1070 1253 1236 1196 Phosphorus ppm ASTM D5185m 1070 1181 1218 1251 Sulfur ppm ASTM D5185m 2060 3176 3313	Copper	ppm	ASTM D5185m	>90	4	15	4
Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 20 22 13 Barium ppm ASTM D5185m 0 0 3 0 Molybdenum ppm ASTM D5185m 60 72 119 77 Manganese ppm ASTM D5185m 0 <1 <1 1 Magnesium ppm ASTM D5185m 1010 693 812 895 Calcium ppm ASTM D5185m 1070 1253 1236 1196 Phosphorus ppm ASTM D5185m 1150 957 983 1037 Zinc ppm ASTM D5185m 1270 1181 1218 1251 Sulfur ppm ASTM D5185m 2060 3176 3313 3693 CONTAMINANTS method limit/base current	Tin	ppm	ASTM D5185m	>5	<1	<1	<1
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 20 22 13 Barium ppm ASTM D5185m 0 0 3 0 Molybdenum ppm ASTM D5185m 60 72 119 77 Manganese ppm ASTM D5185m 0 <1	Vanadium	ppm	ASTM D5185m		<1	0	0
Boron ppm ASTM D5185m 0 20 22 13 Barium ppm ASTM D5185m 0 0 3 0 Molybdenum ppm ASTM D5185m 60 72 119 77 Manganese ppm ASTM D5185m 1010 693 812 895 Calcium ppm ASTM D5185m 1070 1253 1236 1196 Phosphorus ppm ASTM D5185m 1070 1253 1236 1196 Phosphorus ppm ASTM D5185m 1270 1181 1218 1251 Sulfur ppm ASTM D5185m 2060 3176 3313 3693 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >35 10 35 4 36 Sodium ppm ASTM D5185m >20 19 60 16 60 INFRA-RED <	Cadmium	ppm	ASTM D5185m		0	<1	0
Barium ppm ASTM D5185m 0 0 3 0 Molybdenum ppm ASTM D5185m 60 72 119 77 Manganese ppm ASTM D5185m 0 <1 <1 1 Magnesium ppm ASTM D5185m 1010 693 812 895 Calcium ppm ASTM D5185m 1070 1253 1236 1196 Phosphorus ppm ASTM D5185m 1150 957 983 1037 Zinc ppm ASTM D5185m 1270 1181 1218 1251 Sulfur ppm ASTM D5185m 2060 3176 3313 3693 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >355 10 35 36 Sodium ppm ASTM D5185m >20 19 60 16 Glycol *ASTM D2982 NE	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 72 119 77 Manganese ppm ASTM D5185m 0 <1 <1 1 Magnesium ppm ASTM D5185m 1010 693 812 895 Calcium ppm ASTM D5185m 1070 1253 1236 1196 Phosphorus ppm ASTM D5185m 1150 957 983 1037 Zinc ppm ASTM D5185m 1270 1181 1218 1251 Sulfur ppm ASTM D5185m 2060 3176 3313 3693 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >35 10 35 36 Sodium ppm ASTM D5185m >20 19 60 16 Glycol % *ASTM D5185m >20 19 60 NEG INFRA-RED method	Boron	ppm	ASTM D5185m	0	20	22	13
Manganese ppm ASTM D5185m 0 <1 <1 1 Magnesium ppm ASTM D5185m 1010 693 812 895 Calcium ppm ASTM D5185m 1070 1253 1236 1196 Phosphorus ppm ASTM D5185m 1150 957 983 1037 Zinc ppm ASTM D5185m 1270 1181 1218 1251 Sulfur ppm ASTM D5185m 2060 3176 3313 3693 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >35 10 35 4 36 Sodium ppm ASTM D5185m >35 10 35 4 36 Sodium ppm ASTM D5185m >20 19 60 16 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method <td></td> <td>ppm</td> <td>ASTM D5185m</td> <td>0</td> <th>0</th> <td>3</td> <td>0</td>		ppm	ASTM D5185m	0	0	3	0
Magnesium ppm ASTM D5185m 1010 693 812 895 Calcium ppm ASTM D5185m 1070 1253 1236 1196 Phosphorus ppm ASTM D5185m 1150 957 983 1037 Zinc ppm ASTM D5185m 1270 1181 1218 1251 Sulfur ppm ASTM D5185m 2060 3176 3313 3693 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >35 10 35 36 Sodium ppm ASTM D5185m >30 19 60 16 Glycol % *ASTM D5185m >20 19 60 16 Glycol % *ASTM D5185m >20 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D762	Molybdenum	ppm	ASTM D5185m	60	72	119	77
Calcium ppm ASTM D5185m 1070 1253 1236 1196 Phosphorus ppm ASTM D5185m 1150 957 983 1037 Zinc ppm ASTM D5185m 1270 1181 1218 1251 Sulfur ppm ASTM D5185m 2060 3176 3313 3693 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >35 10 35 4 36 Sodium ppm ASTM D5185m >309 4 1165 253 Potassium ppm ASTM D5185m >20 19 60 16 Glycol % *ASTM D584b >7.5 0.2 NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >7.5 0.2 0.9 0.9 Nitration Abs/.	Manganese	ppm	ASTM D5185m	0	<1	<1	1
Phosphorus ppm ASTM D5185m 1150 957 983 1037 Zinc ppm ASTM D5185m 1270 1181 1218 1251 Sulfur ppm ASTM D5185m 2060 3176 3313 3693 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >35 10 35 4 36 Sodium ppm ASTM D5185m >35 10 4 35 4 36 Sodium ppm ASTM D5185m >20 19 4 60 16 Glycol % *ASTM D5185m >20 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >7.5 0.2 0.9 0.9 Nitration Abs/.1mm *ASTM D7415 >30 18.1 23.6 21.3	Magnesium	ppm	ASTM D5185m	1010	693	812	895
Zinc ppm ASTM D5185m 1270 1181 1218 1251 Sulfur ppm ASTM D5185m 2060 3176 3313 3693 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >35 10 35 36 Sodium ppm ASTM D5185m >20 19 60 16 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >7.5 0.2 0.9 0.9 Nitration Abs/cm *ASTM D7624 >20 7.2 13.4 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 23.6 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 <td>Calcium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>1070</td> <th>1253</th> <td>1236</td> <td>1196</td>	Calcium	ppm	ASTM D5185m	1070	1253	1236	1196
Sulfur ppm ASTM D5185m 2060 3176 3313 3693 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >35 10 35 36 Sodium ppm ASTM D5185m >309 1165 253 Potassium ppm ASTM D5185m >20 19 60 16 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >7.5 0.2 0.9 0.9 Nitration Abs/cm *ASTM D7624 >20 7.2 13.4 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 23.6 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25	Phosphorus	ppm	ASTM D5185m	1150	957	983	1037
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >35 10 △ 35 △ 36 Sodium ppm ASTM D5185m △ 309 △ 1165 △ 253 Potassium ppm ASTM D5185m >20 19 △ 60 16 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >7.5 0.2 0.9 0.9 Nitration Abs/cm *ASTM D7624 >20 7.2 13.4 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 23.6 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.2 18.5 16.8	Zinc	ppm	ASTM D5185m	1270	1181	1218	1251
Silicon ppm ASTM D5185m >35 10 ▲ 35 ▲ 36 Sodium ppm ASTM D5185m ▲ 309 ▲ 1165 ▲ 253 Potassium ppm ASTM D5185m >20 19 ▲ 60 16 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >7.5 0.2 0.9 0.9 Nitration Abs/cm *ASTM D7624 >20 7.2 13.4 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 23.6 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.2 18.5 16.8	Sulfur	ppm	ASTM D5185m	2060	3176	3313	3693
Sodium ppm ASTM D5185m ▲ 309 ▲ 1165 ▲ 253 Potassium ppm ASTM D5185m >20 19 ▲ 60 16 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >7.5 0.2 0.9 0.9 Nitration Abs/cm *ASTM D7624 >20 7.2 13.4 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 23.6 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.2 18.5 16.8	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 19 ▲ 60 16 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >7.5 0.2 0.9 0.9 Nitration Abs/cm *ASTM D7624 >20 7.2 13.4 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 23.6 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.2 18.5 16.8	Silicon	ppm	ASTM D5185m	>35	10	△ 35	▲ 36
Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >7.5 0.2 0.9 0.9 Nitration Abs/cm *ASTM D7624 >20 7.2 13.4 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 23.6 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.2 18.5 16.8	Sodium	ppm	ASTM D5185m		^ 309	<u>1165</u>	<u>\$\text{253}\$</u>
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >7.5 0.2 0.9 0.9 Nitration Abs/cm *ASTM D7624 >20 7.2 13.4 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 23.6 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.2 18.5 16.8	Potassium	ppm	ASTM D5185m	>20	19	6 0	16
Soot % % *ASTM D7844 >7.5 0.2 0.9 0.9 Nitration Abs/cm *ASTM D7624 >20 7.2 13.4 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 23.6 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.2 18.5 16.8	Glycol	%	*ASTM D2982		NEG	NEG	NEG
Nitration Abs/cm *ASTM D7624 >20 7.2 13.4 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 23.6 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.2 18.5 16.8	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 18.1 23.6 21.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.2 18.5 16.8	Soot %	%	*ASTM D7844	>7.5	0.2	0.9	0.9
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.2 18.5 16.8	Nitration	Abs/cm	*ASTM D7624	>20	7.2	13.4	11.0
Oxidation	Sulfation	Abs/.1mm	*ASTM D7415	>30	18.1	23.6	21.3
	FLUID DEGRAI	DATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 9.8 8.9 9.2 7.0	Oxidation	Abs/.1mm	*ASTM D7414	>25	13.2	18.5	16.8
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.9	9.2	7.0



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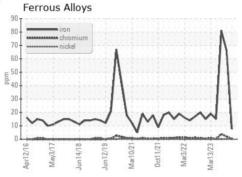


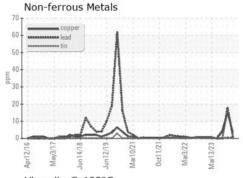


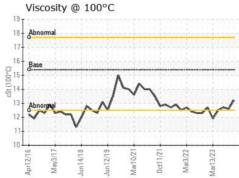
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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

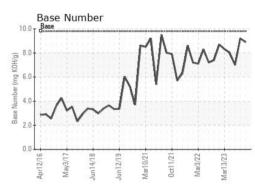
FLUID PROPE	ERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.2	12.6	12.7

GRAPHS













Certificate L2367

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

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : PCA0101776 : 06057877 : 10829259

Recieved Diagnosed

: 11 Jan 2024 : 15 Jan 2024 : Jonathan Hester

Diagnostician

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 - 002 - Vance-Granville

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Contact: Cameron King cameron.king@gflenv.com

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