

OIL ANALYSIS REPORT

ORT



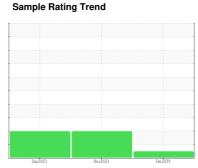


Area (BD49684) {UNASSIGNED} Machine Id 913184

Component

1 Diesel Engine

PETRO CANADA DURON SHP 15W40 (9 GAL)





DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil

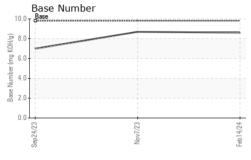
Fluid Condition

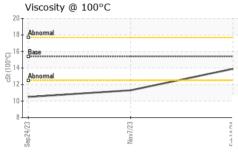
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Date Client Info 14 Feb 2024 07 Nov 2023 24 Sep 20. Machine Age hrs Client Info 1995 1170 802 Oil Age hrs Client Info 225 702 802 Oil Changed Client Info Changed Changed Changed Changed Sample Status NORMAL ABNORMAL ABNORMAL ABNORMAL CONTAMINATION method Imilibase current history1 history1 Fuel WC Method >3.0 <1.0 <1.0 0.2 Water WC Method >3.0 <1.0 <1.0 0.2 Glycol WC Method NEG NEG NEG NEG NEG WEAR METALS method limi/base current history1 history1 history1 Iron ppm ASTM D5185m >20 <1 1 1 1 1 1 1 1 1 1 1 1 1 1 </th <th>SAMPLE INFORM</th> <th>MATION</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 1995 1170 802 Oil Age hrs Client Info 225 702 802 Oil Changed Changed Changed Changed Changed Sample Status NORMAL ABNORMAL ABNORMAL CONTAMINATION method limit/base current history1 Fuel WC Method >3.0 <1.0	Sample Number		Client Info		GFL0106678	GFL0097655	GFL0087267
Oil Age hrs Client Info 225 702 802 Oil Changed Sample Status Client Info Changed Changed Changed Changed Changed Changed Changed ABNORMAL	Sample Date		Client Info		14 Feb 2024	07 Nov 2023	24 Sep 2023
Oil Changed Sample Status Client Info Sample Status Changed NORMAL ABNORMAL ABNO	Machine Age	hrs	Client Info		1995	1170	802
Sample Status	Oil Age	hrs	Client Info		225	702	802
CONTAMINATION method limit/base current history1 history1 Fuel WC Method >3.0 <1.0 <1.0 0.2 Water WC Method >0.2 NEG NEG NEG Glycol WC Method 10.2 NEG NEG NEG WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5188m >12.0 9 46 49 Chromium ppm ASTM D5188m >2.0 <1 1 1 Nickel ppm ASTM D5188m >2.0 <1 <1 1 Silver ppm ASTM D5188m >2.0 2 4 3 Lead ppm ASTM D5188m >2.0 2 4 3 Lead ppm ASTM D5188m >33.0 0 105 162 Tin ppm ASTM D5188m 33.0 0 0 0 0 </th <th>Oil Changed</th> <th></th> <th>Client Info</th> <th></th> <th>Changed</th> <th>Changed</th> <th>Changed</th>	Oil Changed		Client Info		Changed	Changed	Changed
Fuel	Sample Status				NORMAL	ABNORMAL	ABNORMAL
Water Glycol WC Method >0.2 NEG NEG NEG NEG NEG NEG WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >120 9 46 49 Chromium ppm ASTM D5185m >20 <1 1 1 Nickel ppm ASTM D5185m >5 <1 3 3 Silver ppm ASTM D5185m >2 0 <1 <1 Sliver ppm ASTM D5185m >2 0 <1 <1 Aluminum ppm ASTM D5185m >2 0 <1 <1 Lead ppm ASTM D5185m >40 0 <1 0 Copper ppm ASTM D5185m >40 0 <1 3 3 Vanadium ppm ASTM D5185m 0 0 0 0 0 Cadmium ppm ASTM D5185m 0	CONTAMINATI	ON	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	0.2
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 <1	WEAR METALS	S	method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >5 <1 3 3 Titanium ppm ASTM D5185m >2 0 <1	Iron	ppm	ASTM D5185m	>120	9	46	49
Titanium ppm ASTM D5185m >2 0 <1 <1 Silver ppm ASTM D5185m >2 0 <1	Chromium	ppm	ASTM D5185m	>20	<1	1	1
Titanium ppm ASTM D5185m >2 0 <1 <1 Silver ppm ASTM D5185m >2 0 <1	Nickel			>5	<1	3	3
Silver ppm ASTM D5185m >2 0 <1 <1 Aluminum ppm ASTM D5185m >20 2 4 3 Lead ppm ASTM D5185m >20 2 4 3 Copper ppm ASTM D5185m >40 0 <1 0 Copper ppm ASTM D5185m >330 0 105 162 Tin ppm ASTM D5185m 0 0 0 0 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 2 51 121 Boron ppm ASTM D5185m 0 2 51 121 Barium ppm ASTM D5185m 0 2 51 121 Barium ppm ASTM D5185m 0 4 3 4 Magnesium ppm ASTM D5185m 0 <1 3 4 </td <th>Titanium</th> <td></td> <td>ASTM D5185m</td> <td>>2</td> <th>0</th> <td></td> <td><1</td>	Titanium		ASTM D5185m	>2	0		<1
Aluminum ppm ASTM D5185m >20 2 4 3 Lead ppm ASTM D5185m >40 0 <1	Silver		ASTM D5185m	>2	0	<1	<1
Lead ppm ASTM D5185m >40 0 <1 0 Copper ppm ASTM D5185m >330 0 105 162 Tin ppm ASTM D5185m >15 <1 3 3 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 0 2 51 121 Barium ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 0 2 55 92 110 Manganese ppm ASTM D5185m 0 <1 3 4 Magnesium ppm ASTM D5185m 1010 908 705 725 Calcium ppm ASTM D5185m 1070 <th>Aluminum</th> <td></td> <td>ASTM D5185m</td> <td>>20</td> <th>2</th> <td>4</td> <td>3</td>	Aluminum		ASTM D5185m	>20	2	4	3
Copper ppm ASTM D5185m >330 0 105 162 Tin ppm ASTM D5185m >15 <1	Lead				0	<1	0
Tin ppm ASTM D5185m >15 <1 3 3 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 0 2 51 121 Barium ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 60 55 92 110 Manganese ppm ASTM D5185m 0 <1 3 4 Magnesium ppm ASTM D5185m 1010 908 705 725 Calcium ppm ASTM D5185m 1070 952 1270 1423 Phosphorus ppm ASTM D5185m 1270 1224 908 883 Sulfur ppm ASTM D5185m 2060 <th>Copper</th> <td></td> <td>ASTM D5185m</td> <td>>330</td> <th>0</th> <td>105</td> <td>162</td>	Copper		ASTM D5185m	>330	0	105	162
Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 0 2 51 121 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 Manganese ppm ASTM D5185m 0 <1 3 4 Magnesium ppm ASTM D5185m 1010 908 705 725 Calcium ppm ASTM D5185m 1070 952 1270 1423 Phosphorus ppm ASTM D5185m 1270 1224 908 883 Sulfur ppm ASTM D5185m 2060 2981 1987 2131 CONTAMINANTS method limit/base current <th></th> <td></td> <td>ASTM D5185m</td> <td>>15</td> <th><1</th> <td>3</td> <td>3</td>			ASTM D5185m	>15	<1	3	3
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 0 2 51 121 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 55 92 110 Manganese ppm ASTM D5185m 0 <1	Vanadium		ASTM D5185m		0	0	0
Boron ppm ASTM D5185m 0 2 51 121 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 55 92 110 Manganese ppm ASTM D5185m 0 <1 3 4 Magnesium ppm ASTM D5185m 1010 908 705 725 Calcium ppm ASTM D5185m 1070 952 1270 1423 Phosphorus ppm ASTM D5185m 1270 1224 908 883 Sulfur ppm ASTM D5185m 1270 1224 908 883 Sulfur ppm ASTM D5185m 2060 2981 1987 2131 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >225 2 49 69 Sodium ppm ASTM D5185m	Cadmium				0		0
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 55 92 110 Manganese ppm ASTM D5185m 0 <1 3 4 Magnesium ppm ASTM D5185m 1010 908 705 725 Calcium ppm ASTM D5185m 1070 952 1270 1423 Phosphorus ppm ASTM D5185m 1150 1044 716 717 Zinc ppm ASTM D5185m 1270 1224 908 883 Sulfur ppm ASTM D5185m 2060 2981 1987 2131 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 2 49 69 Sodium ppm ASTM D5185m >20 <1 5 6 INFRA-RED method limit/base </th <th>ADDITIVES</th> <th></th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	ADDITIVES		method	limit/base	current	history1	history2
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 55 92 110 Manganese ppm ASTM D5185m 0 <1	Boron	ppm	ASTM D5185m	0	2	51	121
Manganese ppm ASTM D5185m 0 <1 3 4 Magnesium ppm ASTM D5185m 1010 908 705 725 Calcium ppm ASTM D5185m 1070 952 1270 1423 Phosphorus ppm ASTM D5185m 1150 1044 716 717 Zinc ppm ASTM D5185m 1270 1224 908 883 Sulfur ppm ASTM D5185m 2060 2981 1987 2131 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 2 49 69 Sodium ppm ASTM D5185m >20 <1	Barium		ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 908 705 725 Calcium ppm ASTM D5185m 1070 952 1270 1423 Phosphorus ppm ASTM D5185m 1150 1044 716 717 Zinc ppm ASTM D5185m 1270 1224 908 883 Sulfur ppm ASTM D5185m 2060 2981 1987 2131 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 2 49 69 Sodium ppm ASTM D5185m >20 <1 5 6 INFRA-RED method limit/base current history1 history1 Soot % % *ASTM D7624 >20 5.5 6.4 10.9 Sulfation Abs/.1mm *ASTM D7415 >30 18.3 19.0 24.2 FLUID DEGRADATION method <	Molybdenum	ppm	ASTM D5185m	60	55	92	110
Magnesium ppm ASTM D5185m 1010 908 705 725 Calcium ppm ASTM D5185m 1070 952 1270 1423 Phosphorus ppm ASTM D5185m 1150 1044 716 717 Zinc ppm ASTM D5185m 1270 1224 908 883 Sulfur ppm ASTM D5185m 2060 2981 1987 2131 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 2 49 69 Sodium ppm ASTM D5185m >20 <1	Manganese	ppm	ASTM D5185m	0	<1	3	4
Calcium ppm ASTM D5185m 1070 952 1270 1423 Phosphorus ppm ASTM D5185m 1150 1044 716 717 Zinc ppm ASTM D5185m 1270 1224 908 883 Sulfur ppm ASTM D5185m 2060 2981 1987 2131 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 2 49 69 Sodium ppm ASTM D5185m >20 <1	-		ASTM D5185m	1010	908	705	725
Zinc ppm ASTM D5185m 1270 1224 908 883 Sulfur ppm ASTM D5185m 2060 2981 1987 2131 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 2 49 69 Sodium ppm ASTM D5185m 20 <1	-		ASTM D5185m	1070	952	1270	1423
Zinc ppm ASTM D5185m 1270 1224 908 883 Sulfur ppm ASTM D5185m 2060 2981 1987 2131 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 2 49 69 Sodium ppm ASTM D5185m >20 <1 5 6 INFRA-RED method limit/base current history1 history1 Soot % % *ASTM D7844 >4 0.1 0.1 0.9 Nitration Abs/cm *ASTM D7624 >20 5.5 6.4 10.9 Sulfation Abs/.1mm *ASTM D7415 >30 18.3 19.0 24.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.0 14.7 22.8	Phosphorus		ASTM D5185m	1150	1044	716	717
Sulfur ppm ASTM D5185m 2060 2981 1987 2131 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 49 69 Sodium ppm ASTM D5185m 4 7 3 Potassium ppm ASTM D5185m >20 <1 5 6 INFRA-RED method limit/base current history1 history1 Soot % % *ASTM D7844 >4 0.1 0.1 0.9 Nitration Abs/cm *ASTM D7624 >20 5.5 6.4 10.9 Sulfation Abs/.1mm *ASTM D7415 >30 18.3 19.0 24.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.0 14.7 22.8			ASTM D5185m	1270	1224	908	883
Silicon ppm ASTM D5185m >25 2 49 69 Sodium ppm ASTM D5185m 4 7 3 Potassium ppm ASTM D5185m >20 <1 5 6 INFRA-RED method limit/base current history1 history1 Soot % % *ASTM D7844 >4 0.1 0.1 0.9 Nitration Abs/cm *ASTM D7624 >20 5.5 6.4 10.9 Sulfation Abs/.1mm *ASTM D7415 >30 18.3 19.0 24.2 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 14.0 14.7 22.8	Sulfur		ASTM D5185m	2060	2981	1987	2131
Sodium ppm ASTM D5185m 4 7 3 Potassium ppm ASTM D5185m >20 <1 5 6 INFRA-RED method limit/base current history1 history1 Soot % % *ASTM D7844 >4 0.1 0.1 0.9 Nitration Abs/cm *ASTM D7624 >20 5.5 6.4 10.9 Sulfation Abs/.1mm *ASTM D7415 >30 18.3 19.0 24.2 FLUID DEGRADATION method limit/base current history1 history Oxidation Abs/.1mm *ASTM D7414 >25 14.0 14.7 22.8	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 <1	Silicon	ppm	ASTM D5185m	>25	2	4 9	6 9
Potassium ppm ASTM D5185m >20 <1	Sodium	• •	ASTM D5185m		4	7	3
Soot % % *ASTM D7844 >4 0.1 0.1 0.9 Nitration Abs/cm *ASTM D7624 >20 5.5 6.4 10.9 Sulfation Abs/.1mm *ASTM D7415 >30 18.3 19.0 24.2 FLUID DEGRADATION method limit/base current history1 history1 history Oxidation Abs/.1mm *ASTM D7414 >25 14.0 14.7 22.8	Potassium	ppm	ASTM D5185m	>20	<1	5	6
Nitration Abs/cm *ASTM D7624 >20 5.5 6.4 10.9 Sulfation Abs/.1mm *ASTM D7415 >30 18.3 19.0 24.2 FLUID DEGRADATION method limit/base current history1 history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.0 14.7 22.8	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 18.3 19.0 24.2 FLUID DEGRADATION method limit/base current history1 history Oxidation Abs/.1mm *ASTM D7414 >25 14.0 14.7 22.8	Soot %	%	*ASTM D7844	>4	0.1	0.1	0.9
Sulfation Abs/.1mm *ASTM D7415 >30 18.3 19.0 24.2 FLUID DEGRADATION method limit/base current history1 history Oxidation Abs/.1mm *ASTM D7414 >25 14.0 14.7 22.8	Nitration	Abs/cm	*ASTM D7624	>20	5.5	6.4	10.9
Oxidation Abs/.1mm *ASTM D7414 >25 14.0 14.7 22.8	Sulfation		*ASTM D7415	>30			24.2
	FLUID DEGRAD	ATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	14.0	14.7	22.8
	Base Number (BN)	mg KOH/g			8.6	8.7	7.0



OIL ANALYSIS REPORT

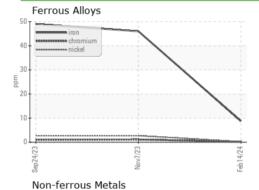


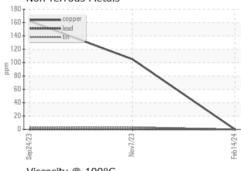


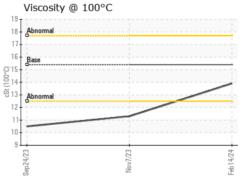
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

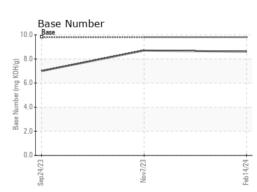
FLUID PROPI	ERIIES	method			riistory i	Historyz
Visc @ 100°C	cSt	ASTM D445	15.4	13.9	11.3	▲ 10.5

GRAPHS













Certificate L2367

Laboratory Sample No.

Lab Number : 06094874 Unique Number : 10887727

: GFL0106678 Test Package : FLEET

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received **Tested** Diagnosed

: 20 Feb 2024 : 21 Feb 2024

: 21 Feb 2024 - Wes Davis

GFL Environmental - 405 - Arbor Hills 7400 Napier Rd

NORTHVILLE, MI US 48168

Contact: Anthony Hopkins ahopkins@gflenv.com

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)

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