

OIL ANALYSIS REPORT

Sample Rating Trend

NORMAL

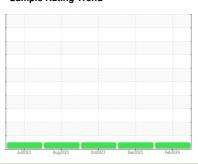


(BD56625) {UNASSIGNED} Machine Id 711049

Component

1 Diesel Engine

PETRO CANADA DURON SHP 15W40 (7 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

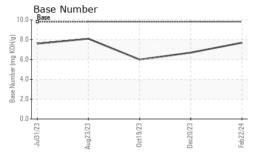
Fluid Condition

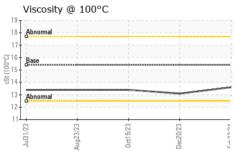
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Date	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 5766 5169 4583 Oil Olange hrs Client Info 597 586 539 Oil Changed	Sample Number		Client Info		GFL0106708	GFL0097685	GFL0097703
Oil Age hrs Client Info 597 586 539 Oil Changed Client Info Changed Change Changea Changea Changea Changea </th <th>Sample Date</th> <th></th> <th>Client Info</th> <th></th> <th>22 Feb 2024</th> <th>20 Dec 2023</th> <th>19 Oct 2023</th>	Sample Date		Client Info		22 Feb 2024	20 Dec 2023	19 Oct 2023
Oil Changed Sample Status Client Info Changed NORMAL Changed NORMAL Changed NORMAL NORMAL NORMAL O 4.0 4.0 VEX. V	Machine Age	hrs	Client Info		5766	5169	4583
Sample Status	Oil Age	hrs	Client Info		597	586	539
Fuel	Oil Changed		Client Info		Changed	Changed	Changed
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
Water Glycol WC Method WC Method >0.2 NEG NEG NEG NEG NEG WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >90 18 30 59 Chromium ppm ASTM D5185m >20 1 2 3 Nickel ppm ASTM D5185m >2 0 1 2 Silver ppm ASTM D5185m >2 0 0 <1 <1 Silver ppm ASTM D5185m >2 0 0 <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	CONTAMINATI	ON	method	limit/base	current	history1	history2
WEAR METALS method limit/base current history1 history1 history1 limit/base current history1 history1 history1 limit/base current history1 history1 history1 history1 limit/base current limit/base c	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >90 18 30 59 Chromium ppm ASTM D5185m >20 1 2 3 Nickel ppm ASTM D5185m >2 0 -1 -2 Titanium ppm ASTM D5185m >2 0 -1 -1 Silver ppm ASTM D5185m >2 0 0 -1 Aluminum ppm ASTM D5185m >2 0 0 -1 Lead ppm ASTM D5185m >40 -1 -1 -1 Copper ppm ASTM D5185m >40 -1 -1 -1 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 -1 Boron ppm ASTM D5185m 0 0 0	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 1 2 3 Nickel ppm ASTM D5185m >2 0 1 2 Titanium ppm ASTM D5185m >2 0 <1 <1 Silver ppm ASTM D5185m >2 0 0 <1 <1 Aluminum ppm ASTM D5185m >20 2 3 4 Lead ppm ASTM D5185m >20 2 2 6 Copper ppm ASTM D5185m >40 <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 <	WEAR METALS	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>90	18	30	59
Titanium	Chromium	ppm	ASTM D5185m	>20	1	2	3
Silver	Nickel	ppm	ASTM D5185m	>2	0	1	2
Aluminum ppm ASTM D5185m >20 2 3 4 Lead ppm ASTM D5185m >40 <1	Titanium	ppm	ASTM D5185m	>2	0	<1	<1
Aluminum ppm ASTM D5185m >20 2 3 4 Lead ppm ASTM D5185m >40 <1	Silver				0	0	<1
Lead ppm ASTM D5185m >40 <1 <1 <1 Copper ppm ASTM D5185m >330 2 2 6 Tin ppm ASTM D5185m >15 <1 1 <1 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 3 1 1 Barium ppm ASTM D5185m 0 3 1 1 Barium ppm ASTM D5185m 0 0 0 5 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 0 <1 <1 <1 <1 Calcium ppm ASTM D5185m 10.70 911 <t< td=""><th>Aluminum</th><td>ppm</td><td>ASTM D5185m</td><td>>20</td><th>2</th><td>3</td><td>4</td></t<>	Aluminum	ppm	ASTM D5185m	>20	2	3	4
Copper ppm ASTM D5185m >330 2 2 6 Tin ppm ASTM D5185m >15 <1	Lead			>40	<1	<1	<1
Tin ppm ASTM D5185m >15 <1 1 <1 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 <1 ADDITIVES method limit/base current history1 history1 ADDITIVES Boron ppm ASTM D5185m 0 3 1 1 Barium ppm ASTM D5185m 0 0 0 0 5 Molybdenum ppm ASTM D5185m 0 <1 <1 <1 Manganese ppm ASTM D5185m 0 <1 <1 <1 <1 Magnesium ppm ASTM D5185m 0 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1<	Copper		ASTM D5185m	>330	2	2	6
Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 <1 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 0 3 1 1 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 859 964 854 Calcium ppm ASTM D5185m 1070 911 1078 1054 Phosphorus ppm ASTM D5185m 1270 1186 1246 1175 Sulfur ppm ASTM D5185m 2060 2667 3087 2422 CONTAMINANTS method limit/base current history1 <t< td=""><th></th><td></td><td></td><td></td><th><1</th><td>1</td><td><1</td></t<>					<1	1	<1
Cadmium ppm ASTM D5185m 0 0 <1 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 0 3 1 1 Barium ppm ASTM D5185m 0 0 0 5 Molybdenum ppm ASTM D5185m 0 -1 <1	Vanadium		ASTM D5185m		0	0	0
Boron					-		
Barium ppm ASTM D5185m 0 0 0 5 Molybdenum ppm ASTM D5185m 60 52 56 58 Manganese ppm ASTM D5185m 0 <1	ADDITIVES		method	limit/base	current	history1	history2
Barium ppm ASTM D5185m 0 0 0 5 Molybdenum ppm ASTM D5185m 60 52 56 58 Manganese ppm ASTM D5185m 0 <1	Boron	ppm	ASTM D5185m	0	3	1	1
Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 859 964 854 Calcium ppm ASTM D5185m 1070 911 1078 1054 Phosphorus ppm ASTM D5185m 1150 922 1051 974 Zinc ppm ASTM D5185m 1270 1186 1246 1175 Sulfur ppm ASTM D5185m 2060 2667 3087 2422 CONTAMINANTS method limit/base current history1 history1 history1 history1 Silicon ppm ASTM D5185m >25 3 4 7 Sodium ppm ASTM D5185m >20 2 2 7 INFRA-RED method limit/base current history1 history1 Soot % *ASTM D7844 >6 0.5 0.5 0.7 Nitration Abs/:nm	Barium	ppm	ASTM D5185m	0	0	0	5
Magnesium ppm ASTM D5185m 1010 859 964 854 Calcium ppm ASTM D5185m 1070 911 1078 1054 Phosphorus ppm ASTM D5185m 1150 922 1051 974 Zinc ppm ASTM D5185m 1270 1186 1246 1175 Sulfur ppm ASTM D5185m 2060 2667 3087 2422 CONTAMINANTS method limit/base current history1 history1 history1 Silicon ppm ASTM D5185m >25 3 4 7 Sodium ppm ASTM D5185m >25 6 11 Potassium ppm ASTM D5185m >20 2 2 7 INFRA-RED method limit/base current history1 history1 history2 Soot % % *ASTM D7624 >20 8.9 8.9 10.7 Sulfation <td< td=""><th>Molybdenum</th><td>ppm</td><td>ASTM D5185m</td><td>60</td><th>52</th><td>56</td><td>58</td></td<>	Molybdenum	ppm	ASTM D5185m	60	52	56	58
Magnesium ppm ASTM D5185m 1010 859 964 854 Calcium ppm ASTM D5185m 1070 911 1078 1054 Phosphorus ppm ASTM D5185m 1150 922 1051 974 Zinc ppm ASTM D5185m 1270 1186 1246 1175 Sulfur ppm ASTM D5185m 2060 2667 3087 2422 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 3 4 7 Sodium ppm ASTM D5185m >25 6 11 Potassium ppm ASTM D5185m >20 2 2 7 INFRA-RED method limit/base current history1 history1 history1 Soot % % *ASTM D7624 >20 8.9 8.9 10.7 Sulfation Abs/.1mm <td< td=""><th>•</th><td></td><td>ASTM D5185m</td><td>0</td><th><1</th><td><1</td><td><1</td></td<>	•		ASTM D5185m	0	<1	<1	<1
Calcium ppm ASTM D5185m 1070 911 1078 1054 Phosphorus ppm ASTM D5185m 1150 922 1051 974 Zinc ppm ASTM D5185m 1270 1186 1246 1175 Sulfur ppm ASTM D5185m 2060 2667 3087 2422 CONTAMINANTS method limit/base current history1 histor Silicon ppm ASTM D5185m >25 3 4 7 Sodium ppm ASTM D5185m 5 6 11 Potassium ppm ASTM D5185m >20 2 2 7 INFRA-RED method limit/base current history1 histor Soot % % *ASTM D7624 >20 8.9 8.9 10.7 Nitration Abs/.1mm *ASTM D7415 >30 19.5 19.6 22.8 FLUID DEGRADATION method limit/	-		ASTM D5185m	1010	859	964	854
Phosphorus ppm ASTM D5185m 1150 922 1051 974 Zinc ppm ASTM D5185m 1270 1186 1246 1175 Sulfur ppm ASTM D5185m 2060 2667 3087 2422 CONTAMINANTS method limit/base current history1 history Silicon ppm ASTM D5185m >25 3 4 7 Sodium ppm ASTM D5185m 5 6 11 Potassium ppm ASTM D5185m >20 2 2 7 INFRA-RED method limit/base current history1 history1 history1 Soot % % *ASTM D7624 >20 8.9 8.9 10.7 Nitration Abs/:nm *ASTM D7415 >30 19.5 19.6 22.8 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/:1mm	-		ASTM D5185m	1070	911	1078	1054
Zinc ppm ASTM D5185m 1270 1186 1246 1175 Sulfur ppm ASTM D5185m 2060 2667 3087 2422 CONTAMINANTS method limit/base current history1 histor Silicon ppm ASTM D5185m >25 3 4 7 Sodium ppm ASTM D5185m 5 6 11 Potassium ppm ASTM D5185m >20 2 2 7 INFRA-RED method limit/base current history1 histor Soot % % *ASTM D7844 >6 0.5 0.5 0.7 Nitration Abs/cm *ASTM D7624 >20 8.9 8.9 10.7 Sulfation Abs/.1mm *ASTM D7415 >30 19.5 19.6 22.8 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 <td< td=""><th>Phosphorus</th><td></td><td>ASTM D5185m</td><td>1150</td><th>922</th><td>1051</td><td>974</td></td<>	Phosphorus		ASTM D5185m	1150	922	1051	974
Sulfur ppm ASTM D5185m 2060 2667 3087 2422 CONTAMINANTS method limit/base current history1 histor Silicon ppm ASTM D5185m >25 3 4 7 Sodium ppm ASTM D5185m 5 6 11 Potassium ppm ASTM D5185m >20 2 2 7 INFRA-RED method limit/base current history1 histor Soot % % *ASTM D7844 >6 0.5 0.5 0.7 Nitration Abs/cm *ASTM D7624 >20 8.9 8.9 10.7 Sulfation Abs/.1mm *ASTM D7415 >30 19.5 19.6 22.8 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 16.6 17.1 21.4			ASTM D5185m	1270	1186	1246	1175
Silicon ppm ASTM D5185m >25 3 4 7 Sodium ppm ASTM D5185m 5 6 11 Potassium ppm ASTM D5185m >20 2 2 7 INFRA-RED method limit/base current history1 history1 history1 Soot % % *ASTM D7844 >6 0.5 0.5 0.7 Nitration Abs/cm *ASTM D7624 >20 8.9 8.9 10.7 Sulfation Abs/.1mm *ASTM D7415 >30 19.5 19.6 22.8 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 16.6 17.1 21.4	Sulfur		ASTM D5185m	2060	2667	3087	2422
Sodium ppm ASTM D5185m 5 6 11 Potassium ppm ASTM D5185m >20 2 2 7 INFRA-RED method limit/base current history1 history1 history1 Soot % % *ASTM D7844 >6 0.5 0.5 0.7 Nitration Abs/cm *ASTM D7624 >20 8.9 8.9 10.7 Sulfation Abs/.1mm *ASTM D7415 >30 19.5 19.6 22.8 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 16.6 17.1 21.4	CONTAMINAN	TS	method	limit/base	current	history1	history2
Sodium ppm ASTM D5185m 5 6 11 Potassium ppm ASTM D5185m >20 2 2 7 INFRA-RED method limit/base current history1 history1 history1 Soot % % *ASTM D7844 >6 0.5 0.5 0.7 Nitration Abs/cm *ASTM D7624 >20 8.9 8.9 10.7 Sulfation Abs/.1mm *ASTM D7415 >30 19.5 19.6 22.8 FLUID DEGRADATION method limit/base current history1 history1 history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.6 17.1 21.4	Silicon	ppm	ASTM D5185m	>25	3	4	7
Potassium ppm ASTM D5185m >20 2 2 7 INFRA-RED method limit/base current history1 history1 Soot % % *ASTM D7844 >6 0.5 0.5 0.7 Nitration Abs/cm *ASTM D7624 >20 8.9 8.9 10.7 Sulfation Abs/.1mm *ASTM D7415 >30 19.5 19.6 22.8 FLUID DEGRADATION method limit/base current history1 history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.6 17.1 21.4	Sodium	• •	ASTM D5185m			6	11
Soot % % *ASTM D7844 >6 0.5 0.5 0.7 Nitration Abs/cm *ASTM D7624 >20 8.9 8.9 10.7 Sulfation Abs/.1mm *ASTM D7415 >30 19.5 19.6 22.8 FLUID DEGRADATION method limit/base current history1 history1 history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 16.6 17.1 21.4			ASTM D5185m	>20			
Nitration Abs/cm *ASTM D7624 >20 8.9 8.9 10.7 Sulfation Abs/.1mm *ASTM D7415 >30 19.5 19.6 22.8 FLUID DEGRADATION method limit/base current history1 history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 16.6 17.1 21.4	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 19.5 19.6 22.8 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 16.6 17.1 21.4	Soot %	%	*ASTM D7844	>6	0.5	0.5	0.7
Sulfation Abs/.1mm *ASTM D7415 >30 19.5 19.6 22.8 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 16.6 17.1 21.4	Nitration	Abs/cm	*ASTM D7624	>20			10.7
Oxidation							
	FLUID DEGRAD	ATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	16.6	17.1	21.4
Dase Nulliber (DIV) IIII NOLIVI MSTIVI DE030 3.0 1.1 0./ 0./	Base Number (BN)	mg KOH/g	ASTM D2896		7.7	6.7	6.0



OIL ANALYSIS REPORT



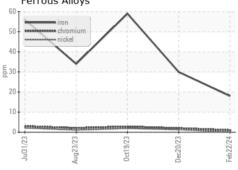


VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

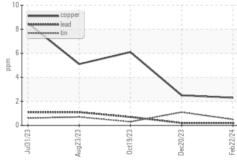
FLUID PROPI	ERTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.6	13.1	13.4

GRAPHS

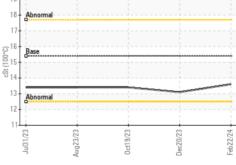
Ferrous Alloys

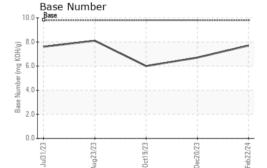
















Laboratory Sample No.

Lab Number : 06105876 Unique Number : 10909373

: GFL0106708

Received **Tested** Diagnosed

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : 01 Mar 2024 : 02 Mar 2024

: 02 Mar 2024 - Wes Davis

GFL Environmental - 405 - Arbor Hills

7400 Napier Rd NORTHVILLE, MI US 48168

Contact: Anthony Hopkins ahopkins@gflenv.com

Test Package : FLEET Certificate L2367 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)

T:

F: