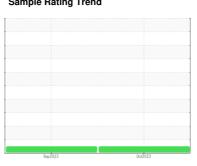


OIL ANALYSIS REPORT

Sample Rating Trend







Machine Id 14

Component **Diesel Engine**

PETRO CANADA DURON SHP 15W40 (--- 0

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor. Please specify the component make and model with your next sample.

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

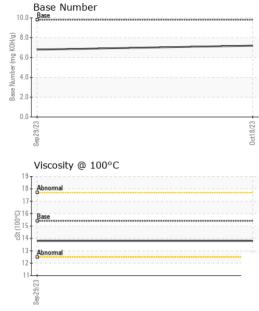
Fluid Condition

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 0	GAL)			Sep2023	0ct2023		
Sample Date Client Info 0	SAMPLE INFOR	RMATION	method	limit/base	current	history1	history2
Machine Age mls	Sample Number		Client Info		GFL0088201	GFL0088183	
Oil Age mls Client Info N/A Not Changed	Sample Date		Client Info		18 Oct 2023	29 Sep 2023	
Contamped Client Info N/A Not Changd Contample Status Normal Normal Normal Normal Contamped Normal Normal	Machine Age	mls	Client Info		0		
Oil Changed Client Info N/A Not Changed NORMAL NORMAL	Oil Age	mls	Client Info		0	0	
Fuel	Oil Changed		Client Info		N/A	Not Changd	
Fuel	Sample Status				NORMAL	NORMAL	
WEAR METALS	CONTAMINAT	ΓΙΟΝ	method	limit/base	current	history1	history2
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >10 32 33 Chromium ppm ASTM D5185m >20 <1	Fuel		WC Method	>5	<1.0	<1.0	
	Glycol		WC Method		NEG	NEG	
Chromium ppm ASTM D5185m >20 <1 1	WEAR METAL	_S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	32	33	
Titanium	Chromium	ppm	ASTM D5185m	>20	<1	1	
Silver	Nickel	ppm	ASTM D5185m	>4	0	<1	
Aluminum	Titanium	ppm	ASTM D5185m		0	0	
Lead	Silver	ppm	ASTM D5185m	>3	0	0	
Copper	Aluminum	ppm	ASTM D5185m	>20	3	4	
Tin	Lead	ppm	ASTM D5185m	>40	0	0	
Vanadium ppm ASTM D5185m 0 0 Cadmium ppm ASTM D5185m 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 3 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 0 60 62 61 Manganese ppm ASTM D5185m 0 <1 <1 Manganesium ppm ASTM D5185m 1010 997 983 Calcium ppm ASTM D5185m 1070 1098 1070 Phosphorus ppm ASTM D5185m 1270 1358 1304 Sulfur ppm ASTM D5185m 2060 2954 2868 CONTAMINANTS method limit/base current	Copper	ppm	ASTM D5185m	>330	<1	<1	
Vanadium ppm ASTM D5185m 0 0 Cadmium ppm ASTM D5185m 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 3 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 0 60 62 61 Manganese ppm ASTM D5185m 0 <1 <1 Magnesium ppm ASTM D5185m 1010 997 983 Calcium ppm ASTM D5185m 1070 1098 1070 Phosphorus ppm ASTM D5185m 1270 1358 1304 Sulfur ppm ASTM D5185m 2060 2954 2868 CONTAMINANTS method limit/base current	Tin	ppm	ASTM D5185m	>15	<1	<1	
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 3 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 60 62 61 Manganese ppm ASTM D5185m 0 <1	Vanadium		ASTM D5185m		0	0	
Boron ppm ASTM D5185m 0 0 0 0 0 0 0 0	Cadmium	ppm	ASTM D5185m		0	0	
Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 60 62 61 Manganese ppm ASTM D5185m 0 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 62 61 Manganese ppm ASTM D5185m 0 <1	Boron	ppm	ASTM D5185m	0	0	3	
Manganese ppm ASTM D5185m 0 <1 <1 Magnesium ppm ASTM D5185m 1010 997 983 Calcium ppm ASTM D5185m 1070 1098 1070 Phosphorus ppm ASTM D5185m 1150 1062 1056 Zinc ppm ASTM D5185m 1270 1358 1304 Sulfur ppm ASTM D5185m 2060 2954 2868 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 7 Sodium ppm ASTM D5185m >20 2 3 Potassium ppm ASTM D5185m >20 2 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624	Barium	ppm	ASTM D5185m	0	0	0	
Magnesium ppm ASTM D5185m 1010 997 983 Calcium ppm ASTM D5185m 1070 1098 1070 Phosphorus ppm ASTM D5185m 1150 1062 1056 Zinc ppm ASTM D5185m 1270 1358 1304 Sulfur ppm ASTM D5185m 2060 2954 2868 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 7 Sodium ppm ASTM D5185m 27 20 Potassium ppm ASTM D5185m >20 2 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 10.3 10.8 Sulfation Abs/.1mm	Molybdenum	ppm	ASTM D5185m	60	62	61	
Calcium ppm ASTM D5185m 1070 1098 1070 Phosphorus ppm ASTM D5185m 1150 1062 1056 Zinc ppm ASTM D5185m 1270 1358 1304 Sulfur ppm ASTM D5185m 2060 2954 2868 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 7 Sodium ppm ASTM D5185m >20 2 3 Potassium ppm ASTM D5185m >20 2 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.4 Nitration Abs/.1mm *ASTM D7415 >30 22.8 21.7 FLUID DEGRADATION method limi	Manganese	ppm	ASTM D5185m	0	<1	<1	
Phosphorus ppm ASTM D5185m 1150 1062 1056 Zinc ppm ASTM D5185m 1270 1358 1304 Sulfur ppm ASTM D5185m 2060 2954 2868 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 7 Sodium ppm ASTM D5185m >20 2 3 Potassium ppm ASTM D5185m >20 2 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.4 Nitration Abs/cm *ASTM D7415 >30 22.8 21.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm <t< td=""><td>Magnesium</td><td>ppm</td><td>ASTM D5185m</td><td>1010</td><th>997</th><td>983</td><td></td></t<>	Magnesium	ppm	ASTM D5185m	1010	997	983	
Zinc ppm ASTM D5185m 1270 1358 1304 Sulfur ppm ASTM D5185m 2060 2954 2868 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 7 Sodium ppm ASTM D5185m 27 20 Potassium ppm ASTM D5185m >20 2 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.4 Nitration Abs/cm *ASTM D7624 >20 10.3 10.8 Sulfation Abs/.1mm *ASTM D7415 >30 22.8 21.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm	Calcium	ppm	ASTM D5185m	1070	1098	1070	
Sulfur ppm ASTM D5185m 2060 2954 2868 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 7 Sodium ppm ASTM D5185m 27 20 Potassium ppm ASTM D5185m >20 2 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.4 Nitration Abs/cm *ASTM D7624 >20 10.3 10.8 Sulfation Abs/.1mm *ASTM D7415 >30 22.8 21.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.5 20.8	Phosphorus	ppm	ASTM D5185m	1150	1062	1056	
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 7 Sodium ppm ASTM D5185m 27 20 Potassium ppm ASTM D5185m >20 2 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.4 Nitration Abs/cm *ASTM D7624 >20 10.3 10.8 Sulfation Abs/.1mm *ASTM D7415 >30 22.8 21.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.5 20.8	Zinc	ppm	ASTM D5185m	1270	1358	1304	
Silicon ppm ASTM D5185m >25 6 7 Sodium ppm ASTM D5185m 27 20 Potassium ppm ASTM D5185m >20 2 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.4 Nitration Abs/cm *ASTM D7624 >20 10.3 10.8 Sulfation Abs/.1mm *ASTM D7415 >30 22.8 21.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.5 20.8	Sulfur	ppm	ASTM D5185m	2060	2954	2868	
Sodium ppm ASTM D5185m 27 20 Potassium ppm ASTM D5185m >20 2 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.4 Nitration Abs/cm *ASTM D7624 >20 10.3 10.8 Sulfation Abs/.1mm *ASTM D7415 >30 22.8 21.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.5 20.8	CONTAMINA	NTS	method	limit/base	current	history1	history2
Sodium ppm ASTM D5185m 27 20 Potassium ppm ASTM D5185m >20 2 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.4 Nitration Abs/cm *ASTM D7624 >20 10.3 10.8 Sulfation Abs/.1mm *ASTM D7415 >30 22.8 21.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.5 20.8	Silicon	ppm	ASTM D5185m	>25	6	7	
Potassium ppm ASTM D5185m >20 2 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.4 Nitration Abs/cm *ASTM D7624 >20 10.3 10.8 Sulfation Abs/.1mm *ASTM D7415 >30 22.8 21.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.5 20.8	Sodium		ASTM D5185m		27	20	
Soot % % *ASTM D7844 >3 0.4 0.4 Nitration Abs/cm *ASTM D7624 >20 10.3 10.8 Sulfation Abs/.1mm *ASTM D7415 >30 22.8 21.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.5 20.8	Potassium	ppm	ASTM D5185m	>20	2	3	
Nitration Abs/cm *ASTM D7624 >20 10.3 10.8 Sulfation Abs/.1mm *ASTM D7415 >30 22.8 21.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.5 20.8	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 22.8 21.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.5 20.8	Soot %	%	*ASTM D7844	>3	0.4	0.4	
Sulfation Abs/.1mm *ASTM D7415 >30 22.8 21.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.5 20.8	Nitration	Abs/cm	*ASTM D7624	>20	10.3	10.8	
Oxidation							
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	21.5	20.8	
	Base Number (BN)	mg KOH/g			7.2	6.8	



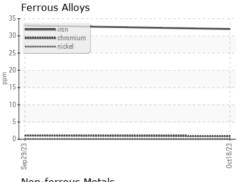
OIL ANALYSIS REPORT



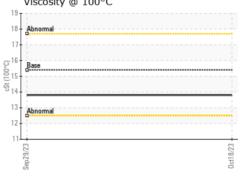
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	
Precipitate	scalar	*Visual	NONE	NONE	NONE	
Silt	scalar	*Visual	NONE	NONE	NONE	
Debris	scalar	*Visual	NONE	NONE	NONE	
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	
Appearance	scalar	*Visual	NORML	NORML	NORML	
Odor	scalar	*Visual	NORML	NORML	NORML	
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	
Free Water	scalar	*Visual		NEG	NEG	

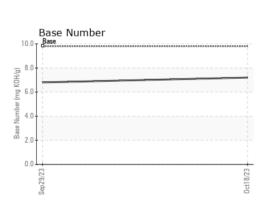
L LLOID PROPI		method			riistory i	History2
Visc @ 100°C	cSt	ASTM D445	15.4	13.8	13.8	

GRAPHS



10	copper				
8	sessesses till				
6-					
4					
2					
0		 -	-	 	-
	Sep 29/23				Oct18/23









Certificate L2367

Laboratory Sample No.

Lab Number Unique Number : 10724958

: GFL0088201 : 05996598 Test Package : FLEET

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 02 Nov 2023 Diagnosed

: 02 Nov 2023 Diagnostician : Wes Davis

GFL Environmental - 820 - Joplin Hauling

3700 West 7th Street Joplin, MO US 64801 Contact: James Jarrett

jjarrett@gflenv.com T: (417)310-2802

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)