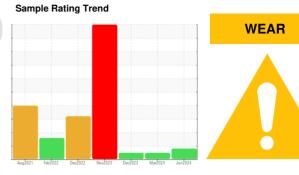


OIL ANALYSIS REPORT



Machine Id 4556M **Diesel Engine**

PETRO CANADA DURON SHP 15W40 (--- GAL)



DIAGNOSIS

Recommendation

Oil and filter change at the time of sampling has been noted. No corrective action is recommended at this time. Resample at the next service interval to monitor.

Wear

Cylinder, crank, or cam shaft wear is indicated.

Contamination

There is no indication of any contamination in the

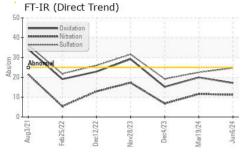
Fluid Condition

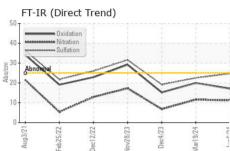
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

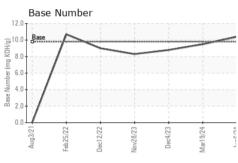
Sample Number Client Info GFL0122517 GFL0108875 GFL0101481 Sample Date Client Info 06 Jun 2024 19 Mar 2024 04 Dec 2023 Machine Age hrs Client Info 13487 13167 12629 Oil Age hrs Client Info Changed Not Changd Not Changd Oil Changed Client Info Changed Not Changd Not Changd Sample Status Client Info Changed Not Changd Not Changd Well WC Method >3.0 <1.0							
Sample Date	SAMPLE INFORM	<u> 1ATION</u>	method	limit/base	current	history1	history2
Machine Age hrs Client Info 13487 13167 12629 Oil Age hrs Client Info 12598 13167 12598 Oil Changed Client Info Changed Not Changd 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 <td>Sample Number</td> <td></td> <td>Client Info</td> <td></td> <th>GFL0122517</th> <td>GFL0108875</td> <td>GFL0101481</td>	Sample Number		Client Info		GFL0122517	GFL0108875	GFL0101481
Dil Age	Sample Date		Client Info		06 Jun 2024	19 Mar 2024	04 Dec 2023
Contained Client Info Changed Not Changed North N	Machine Age	hrs	Client Info		13487	13167	12629
ABNORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2	Oil Age	hrs	Client Info		12598	13167	12598
CONTAMINATION	Oil Changed		Client Info		Changed	Not Changd	Not Changd
Fuel	Sample Status				ABNORMAL	NORMAL	NORMAL
Water Glycol WC Method WC Method >0.2 NEG NEG NEG NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >90 ▲ 1777 29 51 Chromium ppm ASTM D5185m >20 3 0 <1	CONTAMINATION	ON	method	limit/base	current	history1	history2
Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >90 1777 29 51 Chromium ppm ASTM D5185m >20 3 0 <1 Nickel ppm ASTM D5185m >2 1 0 0 Siliver ppm ASTM D5185m >2 1 0 0 Aluminum ppm ASTM D5185m >2 1 0 0 Aluminum ppm ASTM D5185m >2 1 0 0 Copper ppm ASTM D5185m >20 5 6 2 Lead ppm ASTM D5185m >330 54 0 2 Lead ppm ASTM D5185m 0 0 0 0 Copper ppm ASTM D5185m 0 0 0 0 B	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 3 0 <1	WEAR METALS	3	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>90	<u> </u>	29	51
Titanium	Chromium	ppm	ASTM D5185m	>20	3	0	<1
Description	Nickel		ASTM D5185m	>2	1	0	0
Silver	Titanium		ASTM D5185m	>2	0	0	0
Aluminum	Silver				<1	0	
Lead	Aluminum	ppm	ASTM D5185m	>20	5	6	2
Copper ppm ASTM D5185m >330 54 0 2 Tin ppm ASTM D5185m >15 4 0 0 Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 2 <1	Lead				3	0	0
Tin	Copper		ASTM D5185m	>330	54	0	2
Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 2 <1 0 Barium ppm ASTM D5185m 0 0 0 2 Molybdenum ppm ASTM D5185m 0 0 0 0 2 Manganese ppm ASTM D5185m 0 2 0 0 Magnesium ppm ASTM D5185m 1010 960 944 853 Calcium ppm ASTM D5185m 1070 1052 1052 1005 Phosphorus ppm ASTM D5185m 1270 1277 1251 1113 Sulfur ppm ASTM D5185m 2060 3130 3459 3074 CONTAMINANTS method limit/base current history					4	0	0
ADDITIVES	Vanadium		ASTM D5185m		0	0	0
Boron	Cadmium		ASTM D5185m		0	0	
Barium ppm ASTM D5185m 0 0 0 2 Molybdenum ppm ASTM D5185m 60 56 56 55 Manganese ppm ASTM D5185m 0 2 0 0 Magnesium ppm ASTM D5185m 1010 960 944 853 Calcium ppm ASTM D5185m 1070 1052 1052 1005 Phosphorus ppm ASTM D5185m 1150 1003 1045 903 Zinc ppm ASTM D5185m 1270 1277 1251 1113 Sulfur ppm ASTM D5185m 2060 3130 3459 3074 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 4 6 Sodium ppm ASTM D5185m 7 17 2 Potassium ppm ASTM D5185m >20 <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	Boron	ppm	ASTM D5185m	0	2	<1	0
Molybdenum ppm ASTM D5185m 60 56 56 55 Manganese ppm ASTM D5185m 0 2 0 0 Magnesium ppm ASTM D5185m 1010 960 944 853 Calcium ppm ASTM D5185m 1070 1052 1052 1005 Phosphorus ppm ASTM D5185m 1150 1003 1045 903 Zinc ppm ASTM D5185m 1270 1277 1251 1113 Sulfur ppm ASTM D5185m 2060 3130 3459 3074 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 4 6 Sodium ppm ASTM D5185m >20 4 12 2 Potassium ppm ASTM D5185m >20 4 12 2 INFRA-RED method limit/base	Barium	ppm	ASTM D5185m	0	0	0	2
Manganese ppm ASTM D5185m 0 2 0 0 Magnesium ppm ASTM D5185m 1010 960 944 853 Calcium ppm ASTM D5185m 1070 1052 1052 1005 Phosphorus ppm ASTM D5185m 1150 1003 1045 903 Zinc ppm ASTM D5185m 1270 1277 1251 1113 Sulfur ppm ASTM D5185m 2060 3130 3459 3074 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 4 6 Sodium ppm ASTM D5185m 7 17 2 Potassium ppm ASTM D5185m >20 4 12 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20	Molybdenum	ppm	ASTM D5185m	60	56	56	55
Magnesium ppm ASTM D5185m 1010 960 944 853 Calcium ppm ASTM D5185m 1070 1052 1052 1005 Phosphorus ppm ASTM D5185m 1150 1003 1045 903 Zinc ppm ASTM D5185m 1270 1277 1251 1113 Sulfur ppm ASTM D5185m 2060 3130 3459 3074 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 4 6 Sodium ppm ASTM D5185m >25 11 4 6 Sodium ppm ASTM D5185m >20 4 12 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 11.2 11.6 6.8 Sulfation Abs/.1mm *AST	·		ASTM D5185m	0	2	0	0
Calcium ppm ASTM D5185m 1070 1052 1052 1005 Phosphorus ppm ASTM D5185m 1150 1003 1045 903 Zinc ppm ASTM D5185m 1270 1277 1251 1113 Sulfur ppm ASTM D5185m 2060 3130 3459 3074 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 4 6 Sodium ppm ASTM D5185m >25 11 4 6 Sodium ppm ASTM D5185m >20 4 12 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 2.8 1.4 0.6 Nitration Abs/cm *ASTM D7415 >30 24.7 22.5 19.2 FLUID DEGRADATION	Magnesium		ASTM D5185m	1010	960	944	853
Phosphorus ppm ASTM D5185m 1150 1003 1045 903 Zinc ppm ASTM D5185m 1270 1277 1251 1113 Sulfur ppm ASTM D5185m 2060 3130 3459 3074 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 4 6 Sodium ppm ASTM D5185m 7 17 2 Potassium ppm ASTM D5185m >20 4 12 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 2.8 1.4 0.6 Nitration Abs/cm *ASTM D7624 >20 11.2 11.6 6.8 Sulfation Abs/.1mm *ASTM D7415 >30 24.7 22.5 19.2 FLUID DEGRADATION method <	-		ASTM D5185m	1070	1052	1052	1005
Zinc ppm ASTM D5185m 1270 1277 1251 1113 Sulfur ppm ASTM D5185m 2060 3130 3459 3074 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 4 6 Sodium ppm ASTM D5185m 7 17 2 Potassium ppm ASTM D5185m >20 4 12 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 2.8 1.4 0.6 Nitration Abs/cm *ASTM D7624 >20 11.2 11.6 6.8 Sulfation Abs/.1mm *ASTM D7415 >30 24.7 22.5 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414	Phosphorus		ASTM D5185m	1150	1003	1045	903
Sulfur ppm ASTM D5185m 2060 3130 3459 3074 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 4 6 Sodium ppm ASTM D5185m 7 17 2 Potassium ppm ASTM D5185m >20 4 12 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 2.8 1.4 0.6 Nitration Abs/cm *ASTM D7624 >20 11.2 11.6 6.8 Sulfation Abs/.1mm *ASTM D7415 >30 24.7 22.5 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.1 20.0 15.2	Zinc		ASTM D5185m	1270		1251	1113
Silicon ppm ASTM D5185m >25 11 4 6 Sodium ppm ASTM D5185m 7 17 2 Potassium ppm ASTM D5185m >20 4 12 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 2.8 1.4 0.6 Nitration Abs/cm *ASTM D7624 >20 11.2 11.6 6.8 Sulfation Abs/.1mm *ASTM D7415 >30 24.7 22.5 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.1 20.0 15.2	Sulfur			2060	3130		3074
Sodium ppm ASTM D5185m 7 17 2 Potassium ppm ASTM D5185m >20 4 12 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 2.8 1.4 0.6 Nitration Abs/cm *ASTM D7624 >20 11.2 11.6 6.8 Sulfation Abs/.1mm *ASTM D7415 >30 24.7 22.5 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.1 20.0 15.2	CONTAMINANT	ΓS	method	limit/base	current	history1	history2
Sodium ppm ASTM D5185m 7 17 2 Potassium ppm ASTM D5185m >20 4 12 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 2.8 1.4 0.6 Nitration Abs/cm *ASTM D7624 >20 11.2 11.6 6.8 Sulfation Abs/.1mm *ASTM D7415 >30 24.7 22.5 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.1 20.0 15.2			ASTM D5185m	>25	11		6
Potassium ppm ASTM D5185m >20 4 12 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 2.8 1.4 0.6 Nitration Abs/cm *ASTM D7624 >20 11.2 11.6 6.8 Sulfation Abs/.1mm *ASTM D7415 >30 24.7 22.5 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.1 20.0 15.2	Sodium						
Soot % % *ASTM D7844 >6 2.8 1.4 0.6 Nitration Abs/cm *ASTM D7624 >20 11.2 11.6 6.8 Sulfation Abs/.1mm *ASTM D7415 >30 24.7 22.5 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.1 20.0 15.2	Potassium	ppm	ASTM D5185m	>20	4	12	2
Nitration Abs/cm *ASTM D7624 >20 11.2 11.6 6.8 Sulfation Abs/.1mm *ASTM D7415 >30 24.7 22.5 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.1 20.0 15.2	INFRA-RED		method	limit/base	current	history1	history2
Nitration Abs/cm *ASTM D7624 >20 11.2 11.6 6.8 Sulfation Abs/.1mm *ASTM D7415 >30 24.7 22.5 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.1 20.0 15.2	Soot %	%	*ASTM D7844	>6	2.8	1.4	0.6
Sulfation Abs/.1mm *ASTM D7415 >30 24.7 22.5 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.1 20.0 15.2	Nitration						
Oxidation							
	FLUID DEGRAD	ATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	17.1	20.0	
	Base Number (BN)	mg KOH/g		9.8	10.4	9.5	8.8

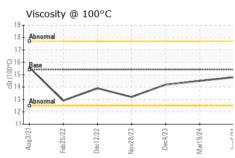


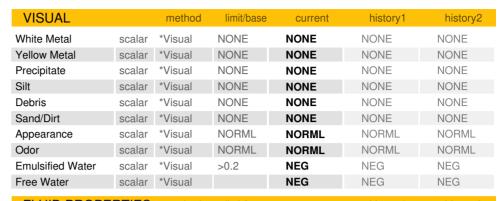
OIL ANALYSIS REPORT





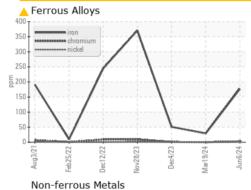


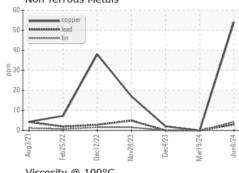


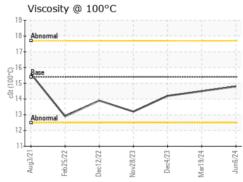


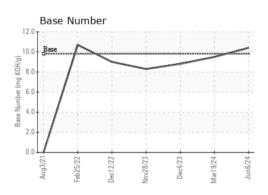
FLUID PROPI	ERITES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	14.8	14.5	14.2

GRAPHS













Certificate 12367

Laboratory Sample No.

: GFL0122517 Lab Number : 06215361 Unique Number : 11088225 Test Package : FLEET

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 20 Jun 2024 **Tested** : 21 Jun 2024

Diagnosed : 21 Jun 2024 - Sean Felton

To discuss this sample report, contact Customer Service at 1-800-237-1369.

 st - 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: (586)825-9514

GFL Environmental - 415 - Michigan East

Report Id: GFL415 [WUSCAR] 06215361 (Generated: 06/21/2024 15:55:20) Rev: 1

6200 Elmridge

US 48313

Sterling Heights, MI

Contact: Frank Wolak

fwolak@gflenv.com