

OIL ANALYSIS REPORT

(TE6321)
910009

Diesel Engine

Fluid

PETRO CANADA DURON SHP 15W40 (32 QTS)

um/022 Aug/020 Sap/020 Mar0021 Aug/021 Dec0021 Au/0022 Feb/0023 Sap/0023

Sample Rating Trend



DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Woor

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil

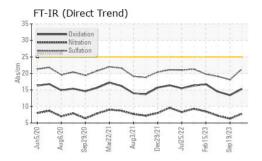
Fluid Condition

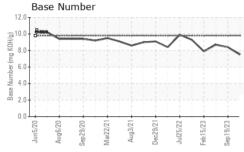
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

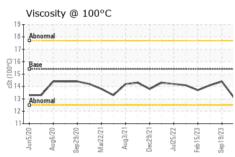
Sample Number Client Info GFL0090140 GFL007156 GFL007159 Sample Date Client Info 16 Apr 2024 19 Sep 2023 20 Apr 2023 20	(10)						
Sample Date	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 10581 9483 1046 Oil Age hrs Client Info 10581 9483 600 Oil Changed Client Info NoRMAL NORMAL NORMAL Sample Status method Imitibase current history1 history2 Fuel WC Method >5 <1.0	Sample Number		Client Info		GFL0090140	GFL0075169	GFL0071590
Machine Age hrs Client Info 10581 9483 1046 Oil Age hrs Client Info 10581 9483 600 Oil Changed Client Info NoRMAL NORMAL NORMAL Sample Status method Imitibase current history1 history2 Fuel WC Method >5 <1.0	Sample Date		Client Info		16 Apr 2024	19 Sep 2023	20 Apr 2023
Cilient Info	Machine Age	hrs	Client Info		-		1046
NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 history2 Nate Nate	Oil Age	hrs	Client Info		10581	9483	600
NORMAL NORMAL NORMAL CONTAMINATION method imit/base current history1 history2 history2 water WC Method >5 <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 <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 <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 <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 <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 <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 <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 <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 <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 <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 <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 <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 <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 <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 <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 <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 <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 <1.0 <	-		Client Info		Not Changd	Not Changd	Changed
Fuel	-				NORMAL	NORMAL	NORMAL
Water Glycol WC Method >0.2 NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 38 6 9 Chromium ppm ASTM D5185m >20 3 <1 2 Nickel ppm ASTM D5185m >4 <1 0 0 Silver ppm ASTM D5185m >4 <1 0 0 Silver ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >20 9 5 0 Lead ppm ASTM D5185m >40 <1 0 0 Copper ppm ASTM D5185m >15 <1 <1 0 0 Caddhium ppm ASTM D5185m >15 <1 <1 0 0 ASTM D5185m 0 177 <	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>5	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Chromium	Glycol		WC Method		NEG	NEG	NEG
Chromium	WEAR METAL	.S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	38	6	9
Titanium	Chromium	ppm	ASTM D5185m	>20	3	<1	2
Silver	Nickel	ppm	ASTM D5185m	>4	<1	0	0
Aluminum	Titanium	ppm	ASTM D5185m		<1	0	0
Lead	Silver	ppm	ASTM D5185m	>3	0	0	0
Copper ppm ASTM D5185m >330 1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <0 0 <1 <0 0 0 <1 <0 0 0 0 <1 <0 0 0 0 0 <1 <0 0	Aluminum	ppm	ASTM D5185m	>20	9	5	0
Tin	Lead	ppm	ASTM D5185m	>40	<1	0	0
Vanadium ppm ASTM D5185m <1 0 0 Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 177 1 <1 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 102 63 58 Manganese ppm ASTM D5185m 0 <1 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 500 922 837 Calcium ppm ASTM D5185m 1070 1238 1098 994 Phosphorus ppm ASTM D5185m 1150 1029 1038 962 Zinc ppm ASTM D5185m 1270 1191 1224 1134 Sulfur ppm ASTM D5185m 2060 3338	Copper	ppm	ASTM D5185m	>330	1	<1	<1
Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 177 1 <1	Tin	ppm	ASTM D5185m	>15	<1	<1	0
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 177 1 <1	Vanadium	ppm	ASTM D5185m		<1	0	0
Boron ppm ASTM D5185m 0 1777 1 <1	Cadmium	ppm	ASTM D5185m		<1	0	0
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 102 63 58 Manganese ppm ASTM D5185m 0 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 102 63 58 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 500 922 837 Calcium ppm ASTM D5185m 1070 1238 1098 994 Phosphorus ppm ASTM D5185m 1150 1029 1038 962 Zinc ppm ASTM D5185m 1270 1191 1224 1134 Sulfur ppm ASTM D5185m 2060 3338 3294 2865 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 3 4 Sodium ppm ASTM D5185m >20 21 7 4 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7844 >3	Boron	ppm	ASTM D5185m	0	177	1	<1
Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 500 922 837 Calcium ppm ASTM D5185m 1070 1238 1098 994 Phosphorus ppm ASTM D5185m 1150 1029 1038 962 Zinc ppm ASTM D5185m 1270 1191 1224 1134 Sulfur ppm ASTM D5185m 2060 3338 3294 2865 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 3 4 Sodium ppm ASTM D5185m >20 21 7 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 0.4 0.6 Nitration Abs/am *ASTM D7	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 500 922 837 Calcium ppm ASTM D5185m 1070 1238 1098 994 Phosphorus ppm ASTM D5185m 1150 1029 1038 962 Zinc ppm ASTM D5185m 1270 1191 1224 1134 Sulfur ppm ASTM D5185m 2060 3338 3294 2865 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 3 4 Sodium ppm ASTM D5185m >20 21 7 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 0.4 0.6 Nitration Abs/cm *ASTM D7624 >20 7.8 6.3 7.2 Sulfation Abs/.1mm *ASTM D741	Molybdenum	ppm	ASTM D5185m	60	102	63	58
Calcium ppm ASTM D5185m 1070 1238 1098 994 Phosphorus ppm ASTM D5185m 1150 1029 1038 962 Zinc ppm ASTM D5185m 1270 1191 1224 1134 Sulfur ppm ASTM D5185m 2060 3338 3294 2865 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 3 4 Sodium ppm ASTM D5185m >20 21 7 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 7.8 6.3 7.2 Sulfation Abs/.mm *ASTM D7415 >30 21.3 18.1 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus ppm ASTM D5185m 1150 1029 1038 962 Zinc ppm ASTM D5185m 1270 1191 1224 1134 Sulfur ppm ASTM D5185m 2060 3338 3294 2865 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 3 4 Sodium ppm ASTM D5185m >25 8 3 4 Sodium ppm ASTM D5185m >20 21 7 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 0.4 0.6 Nitration Abs/cm *ASTM D7624 >20 7.8 6.3 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 18.1 19.1 FLUID DEGRADATION method<	Magnesium	ppm	ASTM D5185m	1010	500	922	837
Zinc ppm ASTM D5185m 1270 1191 1224 1134 Sulfur ppm ASTM D5185m 2060 3338 3294 2865 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 3 4 Sodium ppm ASTM D5185m >25 8 3 2 3 Potassium ppm ASTM D5185m >20 21 7 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 0.4 0.6 Nitration Abs/cm *ASTM D7624 >20 7.8 6.3 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 18.1 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation	Calcium	ppm	ASTM D5185m	1070	1238	1098	994
Sulfur ppm ASTM D5185m 2060 3338 3294 2865 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 3 4 Sodium ppm ASTM D5185m 63 2 3 Potassium ppm ASTM D5185m >20 21 7 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 0.4 0.6 Nitration Abs/cm *ASTM D7624 >20 7.8 6.3 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 18.1 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 13.4 14.5	Phosphorus	ppm	ASTM D5185m	1150	1029	1038	962
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 3 4 Sodium ppm ASTM D5185m 63 2 3 Potassium ppm ASTM D5185m >20 21 7 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 0.4 0.6 Nitration Abs/cm *ASTM D7624 >20 7.8 6.3 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 18.1 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 13.4 14.5	Zinc	ppm	ASTM D5185m	1270	1191	1224	1134
Silicon ppm ASTM D5185m >25 8 3 4 Sodium ppm ASTM D5185m >20 63 2 3 Potassium ppm ASTM D5185m >20 21 7 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 0.4 0.6 Nitration Abs/cm *ASTM D7624 >20 7.8 6.3 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 18.1 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 13.4 14.5	Sulfur	ppm	ASTM D5185m	2060	3338	3294	2865
Sodium ppm ASTM D5185m 63 2 3 Potassium ppm ASTM D5185m >20 21 7 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 0.4 0.6 Nitration Abs/cm *ASTM D7624 >20 7.8 6.3 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 18.1 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 13.4 14.5	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 21 7 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 0.4 0.6 Nitration Abs/cm *ASTM D7624 >20 7.8 6.3 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 18.1 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 13.4 14.5	Silicon	ppm	ASTM D5185m	>25	8		
INFRA-RED	Sodium	ppm	ASTM D5185m		63		3
Soot % *ASTM D7844 >3 0.7 0.4 0.6 Nitration Abs/cm *ASTM D7624 >20 7.8 6.3 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 18.1 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 13.4 14.5	Potassium	ppm	ASTM D5185m	>20	21	7	4
Nitration Abs/cm *ASTM D7624 >20 7.8 6.3 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 18.1 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 13.4 14.5	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 21.3 18.1 19.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 13.4 14.5	Soot %	%	*ASTM D7844	>3	0.7	0.4	0.6
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 13.4 14.5	Nitration	Abs/cm	*ASTM D7624	>20	7.8	6.3	7.2
Oxidation Abs/.1mm *ASTM D7414 >25 15.3 13.4 14.5	Sulfation	Abs/.1mm	*ASTM D7415	>30	21.3	18.1	19.1
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 9.8 7.5 8.4 8.7	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.3	13.4	14.5
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	7.5	8.4	8.7



OIL ANALYSIS REPORT



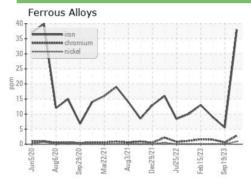


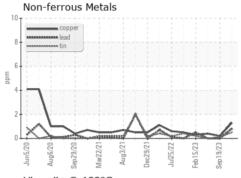


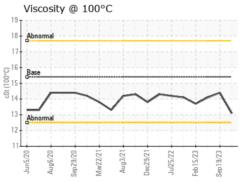
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

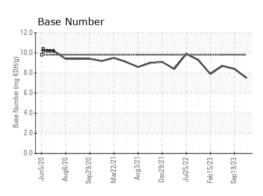
FLUID PROP	ERTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.1	14.4	14.1

GRAPHS













Certificate 12367

Laboratory Sample No. Lab Number : 06155061 Unique Number : 10990484 Test Package : FLEET

: GFL0090140

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

: 24 Apr 2024 Diagnosed : 24 Apr 2024 - Jonathan Hester

: 19 Apr 2024

GFL Environmental - 044 - Elizabeth City 657 Old US 17 Elizabeth City, NC US 27909

Contact: TOM BAIRD tom.baird@gflenv.com T: (252)562-2645

Submitted By: TOM BAIRD

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)

F: (252)264-4411