

OIL ANALYSIS REPORT

Sample Rating Trend

NORMAL



Machine Id 813052 Component Diesel Engine Fluid

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

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Moar

Metal levels are typical for a new component breaking in.

Contamination

There is no indication of any contamination in the

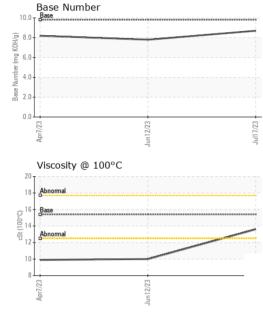
Fluid Condition

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 GFL0067865 GFL0067944 GFL0067994 GFL0067994 GFL0067994 O7 Apr 2023 O7 Apr	N SHP 15W40 (GAL)	Ap	2023	Jun 2023 Jul 20	23	
Sample Date	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 799 227 227 Oil Age hrs Client Info 223 227 0 Oil Changed Client Info Changed N/A N/A Sample Status NORMAL ABNORMAL ABNORMAL CONTAMINATION method Imitibase current history1 Fuel WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >120 11 47 29 Chromium ppm ASTM D5185m >20 <1 2 1 Nickel ppm ASTM D5185m >20 <1 2 1 Nickel ppm ASTM D5185m >2 0 <1 2 Lead ppm ASTM D5185m >20 <1 <1 <1 <1 Vanadium ppm ASTM D5185m 0 <td< th=""><th>Sample Number</th><th></th><th>Client Info</th><th></th><th>GFL0067865</th><th>GFL0067944</th><th>GFL0067990</th></td<>	Sample Number		Client Info		GFL0067865	GFL0067944	GFL0067990
Oil Age hrs Client Info 223 227 0 Oil Changed NIA NIA NIA NIA Sample Status NORMAL ABNORMAL ABNORMAL ABNORMAL ABNORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >120 11 47 29 Chromium ppm ASTM D5185m >20 <1 2 1 Iron ppm ASTM D5185m >20 <1 2 1 Silver ppm ASTM D5185m >2 0 <1 0 Silver ppm ASTM D5185m >20 <1 5 4 Lead ppm ASTM D5185m >20 <1 5 4 Lead ppm <	Sample Date		Client Info		17 Jul 2023	12 Jun 2023	07 Apr 2023
Oil Age hrs Client Info 223 227 0 Oil Changed NIA NIA NIA NIA Sample Status NORMAL ABNORMAL ABNORMAL ABNORMAL ABNORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >120 11 47 29 Chromium ppm ASTM D5185m >20 <1 2 1 Iron ppm ASTM D5185m >20 <1 2 1 Silver ppm ASTM D5185m >2 0 <1 0 Silver ppm ASTM D5185m >2 0 <1 5 4 Lead ppm ASTM D5185m >2 0 0 0 6 Tin p	Machine Age	hrs	Client Info		799	227	
NORMAL ABNORMAL ABNORMAL ABNORMAL ABNORMAL CONTAMINATION method imit/base current history1 history2 history2		hrs	Client Info		223	227	0
NORMAL ABNORMAL ABNORMAL ABNORMAL ABNORMAL CONTAMINATION method imit/base current history1 history2 history2	Oil Changed		Client Info		Changed	N/A	N/A
Fuel	-				_	ABNORMAL	ABNORMAL
Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >120 11 47 29 Chromium ppm ASTM D5185m >20 <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	0.3
Irron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 <1 2 1 Nickel ppm ASTM D5185m >5 1 13 9 Titanium ppm ASTM D5185m >2 0 <1	WEAR METAL	.S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>120	11	47	29
Silver	Chromium	ppm	ASTM D5185m	>20	<1	2	1
Description	Nickel	ppm		>5	1	13	9
Silver	Titanium		ASTM D5185m	>2	0	<1	0
Aluminum	Silver				<1	<1	<1
Lead ppm ASTM D5185m >40 0 0 <1 Copper ppm ASTM D5185m >330 3 20 6 Tin ppm ASTM D5185m >15 <1 4 2 Vanadium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 18 272 370 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 60 67 130 115 Manganese ppm ASTM D5185m 0 <1 7 5 Magnesium ppm ASTM D5185m 1010 987 707 632 Calcium ppm ASTM D5185m 100 1163 1740	Aluminum		ASTM D5185m	>20	<1	5	4
Copper ppm ASTM D5185m >330 3 20 6 Tin ppm ASTM D5185m >15 <1	Lead			>40			<1
Tin ppm ASTM D5185m >15 <1 4 2 Vanadium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 18 272 370 Barium ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 60 67 130 115 Manganese ppm ASTM D5185m 0 <1 7 5 Manganesium ppm ASTM D5185m 1010 987 707 632 Calcium ppm ASTM D5185m 1070 1163 1740 1412 Phosphorus ppm ASTM D5185m 1270 1314 931 880 Sulfur ppm ASTM D5185m 2060 3861 2851 2394 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11				>330		20	
Vanadium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 18 272 370 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 60 67 130 115 Manganese ppm ASTM D5185m 0 <1 7 5 Magnesium ppm ASTM D5185m 1010 987 707 632 Calcium ppm ASTM D5185m 1070 1163 1740 1412 Phosphorus ppm ASTM D5185m 1270 1314 931 880 Sulfur ppm ASTM D5185m 2060 3861 2851 2394 CONTAMINANTS method limit/base current					_		
Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 18 272 370 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 67 130 115 Manganese ppm ASTM D5185m 0 <1				7.0			
Boron ppm ASTM D5185m 0 18 272 370 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 67 130 115 Manganese ppm ASTM D5185m 0 <1 7 5 Magnesium ppm ASTM D5185m 1010 987 707 632 Calcium ppm ASTM D5185m 1070 1163 1740 1412 Phosphorus ppm ASTM D5185m 1270 1314 931 880 Sulfur ppm ASTM D5185m 2060 3861 2851 2394 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 95 & 86 Sodium ppm ASTM D5185m >20 0 4 5 INFRA-RED method limit/base </td <td></td> <td></td> <td></td> <td></td> <th>-</th> <td></td> <td></td>					-		
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 67 130 115 Manganese ppm ASTM D5185m 0 <1 7 5 Magnesium ppm ASTM D5185m 1010 987 707 632 Calcium ppm ASTM D5185m 1070 1163 1740 1412 Phosphorus ppm ASTM D5185m 1150 1050 724 703 Zinc ppm ASTM D5185m 1270 1314 931 880 Sulfur ppm ASTM D5185m 2060 3861 2851 2394 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 495 86 Sodium ppm ASTM D5185m 22 2 2 2 Potassium ppm ASTM D5185m </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
Molybdenum ppm ASTM D5185m 60 67 130 115 Manganese ppm ASTM D5185m 0 <1 7 5 Magnesium ppm ASTM D5185m 1010 987 707 632 Calcium ppm ASTM D5185m 1070 1163 1740 1412 Phosphorus ppm ASTM D5185m 1150 1050 724 703 Zinc ppm ASTM D5185m 1270 1314 931 880 Sulfur ppm ASTM D5185m 2060 3861 2851 2394 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m 22 2 2 2 Potassium ppm ASTM D5185m 20 0 4 5 INFRA-RED method limit/base current history1 history2 Soot % * ASTM D7844 >4	Boron	ppm	ASTM D5185m	0	18	272	370
Manganese ppm ASTM D5185m 0 <1 7 5 Magnesium ppm ASTM D5185m 1010 987 707 632 Calcium ppm ASTM D5185m 1070 1163 1740 1412 Phosphorus ppm ASTM D5185m 1150 1050 724 703 Zinc ppm ASTM D5185m 1270 1314 931 880 Sulfur ppm ASTM D5185m 2060 3861 2851 2394 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 95 A86 Sodium ppm ASTM D5185m >20 0 4 5 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.4 0.2 Nitration Abs/:1mm *ASTM D7815	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 987 707 632 Calcium ppm ASTM D5185m 1070 1163 1740 1412 Phosphorus ppm ASTM D5185m 1150 1050 724 703 Zinc ppm ASTM D5185m 1270 1314 931 880 Sulfur ppm ASTM D5185m 2060 3861 2851 2394 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 495 486 Sodium ppm ASTM D5185m 20 0 4 5 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.4 0.2 Nitration Abs/.1mm *ASTM D7415 >30 18.7 25.2 22.9 FLUID DEGRADATION *ASTM D74	Molybdenum	ppm	ASTM D5185m	60	67	130	115
Magnesium ppm ASTM D5185m 1010 987 707 632 Calcium ppm ASTM D5185m 1070 1163 1740 1412 Phosphorus ppm ASTM D5185m 1150 1050 724 703 Zinc ppm ASTM D5185m 1270 1314 931 880 Sulfur ppm ASTM D5185m 2060 3861 2851 2394 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 95 86 Sodium ppm ASTM D5185m 20 0 4 5 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.4 0.2 Nitration Abs/.1mm *ASTM D7415 >30 18.7 25.2 22.9 FLUID DEGRADATION method <th< td=""><td>Manganese</td><td>ppm</td><td>ASTM D5185m</td><td>0</td><th><1</th><td>7</td><td>5</td></th<>	Manganese	ppm	ASTM D5185m	0	<1	7	5
Phosphorus ppm ASTM D5185m 1150 1050 724 703 Zinc ppm ASTM D5185m 1270 1314 931 880 Sulfur ppm ASTM D5185m 2060 3861 2851 2394 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 40 95 40 86 Sodium ppm ASTM D5185m 22 2	-			1010	987	707	632
Phosphorus ppm ASTM D5185m 1150 1050 724 703 Zinc ppm ASTM D5185m 1270 1314 931 880 Sulfur ppm ASTM D5185m 2060 3861 2851 2394 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 4 95 4 86 Sodium ppm ASTM D5185m 2 2 2 2 Potassium ppm ASTM D5185m >20 0 4 5 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.4 0.2 Nitration Abs/cm *ASTM D7624 >20 6.7 10.3 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 25.2 22.9 FLUID DEGRADAT	Calcium		ASTM D5185m	1070	1163	1740	1412
Zinc ppm ASTM D5185m 1270 1314 931 880 Sulfur ppm ASTM D5185m 2060 3861 2851 2394 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 95 86 Sodium ppm ASTM D5185m 2 2 2 2 Potassium ppm ASTM D5185m >20 0 4 5 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.4 0.2 Nitration Abs/cm *ASTM D7624 >20 6.7 10.3 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 25.2 22.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm	Phosphorus					724	703
Sulfur ppm ASTM D5185m 2060 3861 2851 2394 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 11 ▲ 95 ▲ 86 Sodium ppm ASTM D5185m 2 2 2 2 Potassium ppm ASTM D5185m >20 0 4 5 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.4 0.2 Nitration Abs/cm *ASTM D7624 >20 6.7 10.3 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 25.2 22.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.8 23.9 19.6			ASTM D5185m				
Silicon ppm ASTM D5185m >25 11 ▲ 95 ▲ 86 Sodium ppm ASTM D5185m 2 2 2 2 Potassium ppm ASTM D5185m >20 0 4 5 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.4 0.2 Nitration Abs/cm *ASTM D7624 >20 6.7 10.3 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 25.2 22.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.8 23.9 19.6			ASTM D5185m				
Sodium ppm ASTM D5185m 2 2 2 2 2 Potassium ppm ASTM D5185m >20 0 4 5 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.4 0.2 Nitration Abs/cm *ASTM D7624 >20 6.7 10.3 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 25.2 22.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.8 23.9 19.6	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 0 4 5 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.4 0.2 Nitration Abs/cm *ASTM D7624 >20 6.7 10.3 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 25.2 22.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.8 23.9 19.6	Silicon	ppm	ASTM D5185m	>25	11	△ 95	▲ 86
INFRA-RED	Sodium	ppm	ASTM D5185m		2	2	2
Soot % *ASTM D7844 >4 0.3 0.4 0.2 Nitration Abs/cm *ASTM D7624 >20 6.7 10.3 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 25.2 22.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.8 23.9 19.6	Potassium	ppm	ASTM D5185m	>20	0	4	5
Nitration Abs/cm *ASTM D7624 >20 6.7 10.3 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 25.2 22.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.8 23.9 19.6	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 18.7 25.2 22.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.8 23.9 19.6	Soot %	%	*ASTM D7844	>4	0.3	0.4	0.2
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.8 23.9 19.6	Nitration	Abs/cm	*ASTM D7624	>20	6.7	10.3	7.1
Oxidation Abs/.1mm *ASTM D7414 >25 14.8 23.9 19.6	Sulfation	Abs/.1mm	*ASTM D7415	>30	18.7	25.2	22.9
	FLUID DEGRAI	OITAC	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 9.8 8.7 7.8 8.2	Oxidation	Abs/.1mm	*ASTM D7414	>25	14.8	23.9	19.6
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.7	7.8	8.2



OIL ANALYSIS REPORT



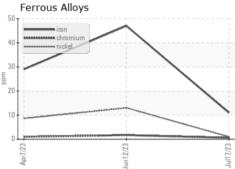
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

13.6

10.0

Visc @	100°C
GRA	РНС

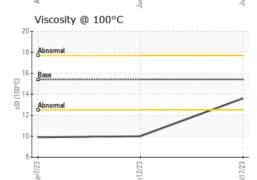
Non-ferrous Metals

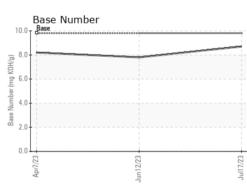


cSt

ASTM D445 15.4

든 10·









Certificate L2367

Laboratory Sample No. Lab Number Unique Number : 10565009 Test Package : FLEET

: GFL0067865 : 05903653

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

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

: 20 Jul 2023 : 21 Jul 2023 Diagnostician : Wes Davis

GFL Environmental - 654S - Midlothian

12230 Deergrove Road Midlothian, VA US 23112

9.9

Contact: Corbin Umphlet cumphlet@gflenv.com T:

* - 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: