

OIL ANALYSIS REPORT

Sample Rating Trend





Component Diesel Engine

Fluid PETRO CANADA DURON SHP 15W40 (--- 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 INFORMATION method limit/base current history1 history2 Sample Number Client Info 20 Mar 2024 02 Nov 2023 06 Sep 2023 Machine Age mis Client Info 0 0 0 Oil Age mis Client Info 0 0 0 0 Oil Changed Client Info 0 0 0 0 0 Sample Status Client Info 0 Not Changd Not Changd Not Changd Sample Status WO Method >5 <1.0 <1.0 <1.0 Year WC Method >0.2 NEG NEG NEG Glycol WC Method >0.2 NEG NEG NEG Vickel ppm ASTM 05185m<>>100 17 3 10				lec2022 Jan2023 Mar20			
Sample Date Client Info 20 Mar 2024 02 Nov 2023 06 Sep 2023 Machine Age mis Client Info 0 0 0 Oil Age mis Client Info 0 0 0 Oil Changed Client Info Not Changd Not Changd Nor Changd Nor Changd Sample Status method Imit/base current History1 History2 Fuel WC Method >5.5 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG Glycol WC Method >0.2 NEG NEG NEG Velar METALS method Imit/base current history1 history2 Iron ppm ASTM 05165m >100 17 3 10 Chromium ppm ASTM 05165m >20 1 0 0 Itanium ppm ASTM 05165m >330 2 0 1 Silver p	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Machine Age mis Client Info 0 0 0 Oil Age rnis Client Info Not Changd Not Changd Not Changd Sample Status Imit/base current Not Changd Not Changd CONTAMINATION method imit/base current history1 history2 Fuel WC Method >5 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG Glycol WC Method >0 1 0 <1.0 Chromium ppm ASTM D5185m >100 17 3 10 Chromium ppm ASTM D5185m >20 1 0 <1 Nickel ppm ASTM D5185m >20 4 1 3 Silver ppm ASTM D5185m >20 4 1 3 Copper ppm ASTM D5185m >330 2 0 1 Yanadium ppm </th <th>Sample Number</th> <th></th> <th>Client Info</th> <th></th> <th></th> <th>GFL0083069</th> <th>GFL0069137</th>	Sample Number		Client Info			GFL0083069	GFL0069137
Oil Age mis Client Info 0 0 0 Oil Changed Client Info Not Changd Not Changd Not Changd Sample Status Imit/base current history1 Not Changd CONTAMINATION method Imit/base current history1 Not Changd Water WC Method >5 <1.0 <1.0 <1.0 Water WC Method >0 NEG NEG NEG Wear WC Method >0 17 3 10 Chromium ppm ASTM D5185m >4 1 0 <1 Nickel ppm ASTM D5185m >4 1 31 0 Chromium ppm ASTM D5185m >3 0 0 <1 Nickel ppm ASTM D5185m >3 0 0 <1 Copper ppm ASTM D5185m >3 0 0 <1 Cadmium ppm <t< th=""><th>Sample Date</th><th></th><th>Client Info</th><th></th><th>20 Mar 2024</th><th>02 Nov 2023</th><th>06 Sep 2023</th></t<>	Sample Date		Client Info		20 Mar 2024	02 Nov 2023	06 Sep 2023
Oli Changed Sample Status Client Info Not Changd NORMAL Not Changd NORMAL Not Changd NORMAL Not Changd NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0	Machine Age	mls	Client Info		0	0	0
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CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG Glycol WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 17 3 10 Chromium ppm ASTM D5185m >4 <1 0 <1 Nickel ppm ASTM D5185m >3 0 0 0 Itanium ppm ASTM D5185m >3 0 0 1 Silver ppm ASTM D5185m >30 2 0 1 Silver ppm ASTM D5185m >1 0 <1 0 Copper ppm ASTM D5185m <1 0 0 1 Vanadi	Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Fuel WC Method >5 <1.0	Sample Status				NORMAL	NORMAL	NORMAL
Water WC Method >0.2 NEG NEG NEG NEG Glycol WC Method Imit/base current history1 history2 Iron ppm ASTM D5185m >100 17 3 10 Chromium ppm ASTM D5185m >20 1 0 <1 Nickel ppm ASTM D5185m >4 <1 0 0 Silver ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >40 2 0 1 1 Copper ppm ASTM D5185m >20 4 1 3 Lead ppm ASTM D5185m >40 2 0 1 1 Vanadium ppm ASTM D5185m >1 0 0 1 1 1 1 1 0 0 1 1 1 1 1 1 1 1 1 <t< th=""><th>CONTAMINAT</th><th>ION</th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></t<>	CONTAMINAT	ION	method	limit/base	current	history1	history2
Glycol WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 17 3 10 Chromium ppm ASTM D5185m >20 1 0 <1 Nickel ppm ASTM D5185m >4 <1 0 0 Aluminum ppm ASTM D5185m >20 4 1 3 Lead ppm ASTM D5185m >20 4 1 3 Lead ppm ASTM D5185m >20 4 1 3 Vanadium ppm ASTM D5185m >1 0 0 1 Vanadium ppm ASTM D5185m <1 0 0 1 Vanadium ppm ASTM D5185m <1 0 0 1 Vanadium ppm ASTM D5185m <1 0 1 1 <th>Fuel</th> <th></th> <th>WC Method</th> <th>>5</th> <th><1.0</th> <th><1.0</th> <th><1.0</th>	Fuel		WC Method	>5	<1.0	<1.0	<1.0
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 17 3 10 Chromium ppm ASTM D5185m >20 1 0 <1 Nickel ppm ASTM D5185m >20 1 0 0 Titanium ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >30 0 0 1 Copper ppm ASTM D5185m >20 4 1 3 Lead ppm ASTM D5185m >20 4 1 3 Copper ppm ASTM D5185m >20 1 0 1 Vanadium ppm ASTM D5185m >330 2 0 1 Vanadium ppm ASTM D5185m 15 1 0 0 Cademium ppm ASTM D5185m 0 9 11	Water		WC Method	>0.2	NEG	NEG	NEG
Iron ppm ASTM D5185m >100 17 3 10 Chromium ppm ASTM D5185m >20 1 0 <1 Nickel ppm ASTM D5185m >4 <1 0 0 Titanium ppm ASTM D5185m >3 0 0 0 Silver ppm ASTM D5185m >20 4 1 3 Lead ppm ASTM D5185m >20 4 1 3 Copper ppm ASTM D5185m >20 4 1 0 <1 Vanadium ppm ASTM D5185m >330 2 0 1 1 Vanadium ppm ASTM D5185m >15 1 0 0 0 Cadmium ppm ASTM D5185m 0 <1 0 0 0 Mandanese ppm ASTM D5185m 0 <1 0 1 1 Molybdenum ppm	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 1 0 <1	WEAR METAL	S	method	limit/base	current	history1	history2
Chromium ppm ASTM D5185m >20 1 0 <1	Iron	ppm	ASTM D5185m	>100	17	3	10
Nickel ppm ASTM D5185m >4 <1	Chromium		ASTM D5185m	>20	1	0	<1
Titanium ppm ASTM D5185m <1	Nickel		ASTM D5185m	>4	<1	0	0
Silver ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >20 4 1 3 Lead ppm ASTM D5185m >40 2 0 <1	Titanium						
Aluminum ppm ASTM D5185m >20 4 1 3 Lead ppm ASTM D5185m >40 2 0 <1 Copper ppm ASTM D5185m >330 2 0 1 Tin ppm ASTM D5185m >15 1 0 <1 Vanadium ppm ASTM D5185m <1 0 0 0 Cadmium ppm ASTM D5185m <1 0 0 0 ADDITIVES method Imit/base current history1 history2 Boron ppm ASTM D5185m 0 9 11 8 Barium ppm ASTM D5185m 0 <1 0 0 Molybdenum ppm ASTM D5185m 0 <1 0 1 Magnesium ppm ASTM D5185m 1070 1340 979 1098 Phosphorus ppm ASTM D5185m 1270 1564 1187				>3			
Lead ppm ASTM D5185m >40 2 0 <1							
Copper ppm ASTM D5185m >330 2 0 1 Tin ppm ASTM D5185m >15 1 0 <1 Vanadium ppm ASTM D5185m >15 1 0 0 Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 9 11 8 Barium ppm ASTM D5185m 0 <1 0 0 Molybdenum ppm ASTM D5185m 0 <1 0 1 Magnesium ppm ASTM D5185m 1010 1227 884 1002 Calcium ppm ASTM D5185m 1070 1340 979 1098 Phosphorus ppm ASTM D5185m 1070 1385 920 1062 Zinc ppm ASTM D5185m 1270 1564 1187<							
Tin ppm ASTM D5185m >15 1 0 <1				>330	2	0	
Vanadium ppm ASTM D5185m <1						0	<1
Cadmium ppm ASTM D5185m <1	Vanadium		ASTM D5185m		<1	0	0
Boron ppm ASTM D5185m 0 9 11 8 Barium ppm ASTM D5185m 0 <1	Cadmium		ASTM D5185m		<1	0	0
Barium ppm ASTM D5185m 0 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 87 63 65 Manganese ppm ASTM D5185m 0 <1 0 1 Magnesium ppm ASTM D5185m 1010 1227 884 1002 Calcium ppm ASTM D5185m 1070 1340 979 1098 Phosphorus ppm ASTM D5185m 1150 1385 920 1062 Zinc ppm ASTM D5185m 1270 1564 1187 1346 Sulfur ppm ASTM D5185m 2060 4056 2971 3975 CONTAMINATY method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 1 1 2 Sodium ppm ASTM D5185m >20 1 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D764 <td< th=""><th>Boron</th><th>ppm</th><th>ASTM D5185m</th><th>0</th><th>9</th><th>11</th><th>8</th></td<>	Boron	ppm	ASTM D5185m	0	9	11	8
Maganese ppm ASTM D5185m 0 <1	Barium	ppm	ASTM D5185m	0	<1	0	0
Magnesium ppm ASTM D5185m 1010 1227 884 1002 Calcium ppm ASTM D5185m 1070 1340 979 1098 Phosphorus ppm ASTM D5185m 1150 1385 920 1062 Zinc ppm ASTM D5185m 1270 1564 1187 1346 Sulfur ppm ASTM D5185m 2060 4056 2971 3975 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 3 5 Sodium ppm ASTM D5185m >20 1 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1.8 0.5 1.2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 <t< th=""><th>Molybdenum</th><th>ppm</th><th>ASTM D5185m</th><th>60</th><th>87</th><th>63</th><th>65</th></t<>	Molybdenum	ppm	ASTM D5185m	60	87	63	65
Calcium ppm ASTM D5185m 1070 1340 979 1098 Phosphorus ppm ASTM D5185m 1150 1385 920 1062 Zinc ppm ASTM D5185m 1270 1564 1187 1346 Sulfur ppm ASTM D5185m 2060 4056 2971 3975 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 3 5 Sodium ppm ASTM D5185m >20 1 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1.8 0.5 1.2 Nitration Abs/cm *ASTM D7415 >30 20.9 18.0 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM	Manganese	ppm	ASTM D5185m	0	<1	0	1
Phosphorus ppm ASTM D5185m 1150 1385 920 1062 Zinc ppm ASTM D5185m 1270 1564 1187 1346 Sulfur ppm ASTM D5185m 2060 4056 2971 3975 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 3 5 Sodium ppm ASTM D5185m >25 8 3 5 Sodium ppm ASTM D5185m >20 1 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1.8 0.5 1.2 Nitration Abs/cm *ASTM D7624 >20 9.0 5.4 7.2 Sulfation Abs/1mm *ASTM D7415 >30 20.9 18.0 19.2 FLUID DEGRADATION method limit/bas	Magnesium	ppm	ASTM D5185m	1010	1227	884	1002
Zinc ppm ASTM D5185m 1270 1564 1187 1346 Sulfur ppm ASTM D5185m 2060 4056 2971 3975 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 3 5 Sodium ppm ASTM D5185m >25 8 3 5 Sodium ppm ASTM D5185m >20 1 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1.8 0.5 1.2 Nitration Abs/cm *ASTM D7624 >20 9.0 5.4 7.2 Sulfation Abs/tmm *ASTM D7415 >30 20.9 18.0 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.tmm *ASTM D7414	Calcium	ppm	ASTM D5185m	1070	1340	979	1098
Sulfur ppm ASTM D5185m 2060 4056 2971 3975 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 3 5 Sodium ppm ASTM D5185m >25 8 3 5 Potassium ppm ASTM D5185m >20 1 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1.8 0.5 1.2 Nitration Abs/cm *ASTM D7624 >20 9.0 5.4 7.2 Sulfation Abs/.tmm *ASTM D7415 >30 20.9 18.0 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.tmm *ASTM D7414 >25 15.0 13.1 13.7	Phosphorus	ppm	ASTM D5185m	1150	1385	920	1062
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25835SodiumppmASTM D5185m233PotassiumppmASTM D5185m>20112INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>31.80.51.2NitrationAbs/cm*ASTM D7624>209.05.47.2SulfationAbs/.tmm*ASTM D7415>3020.918.019.2FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.tmm*ASTM D7414>2515.013.113.7	Zinc	ppm	ASTM D5185m	1270	1564	1187	1346
Silicon ppm ASTM D5185m >25 8 3 5 Sodium ppm ASTM D5185m 2 3 3 Potassium ppm ASTM D5185m 20 1 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1.8 0.5 1.2 Nitration Abs/cm *ASTM D7624 >20 9.0 5.4 7.2 Sulfation Abs/tmm *ASTM D7415 >30 20.9 18.0 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.0 13.1 13.7	Sulfur	ppm	ASTM D5185m	2060	4056	2971	3975
Sodium ppm ASTM D5185m 2 3 3 Potassium ppm ASTM D5185m >20 1 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1.8 0.5 1.2 Nitration Abs/cm *ASTM D7624 >20 9.0 5.4 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 18.0 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.0 13.1 13.7	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 1 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1.8 0.5 1.2 Nitration Abs/cm *ASTM D7624 >20 9.0 5.4 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 18.0 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.0 13.1 13.7	Silicon	ppm	ASTM D5185m	>25	8	3	5
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1.8 0.5 1.2 Nitration Abs/cm *ASTM D7624 >20 9.0 5.4 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 18.0 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.0 13.1 13.7	Sodium	ppm	ASTM D5185m		2	3	3
Soot % % *ASTM D7844 >3 1.8 0.5 1.2 Nitration Abs/cm *ASTM D7624 >20 9.0 5.4 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 18.0 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.0 13.1 13.7	Potassium	ppm	ASTM D5185m	>20	1	1	2
Nitration Abs/cm *ASTM D7624 >20 9.0 5.4 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 18.0 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.0 13.1 13.7	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 20.9 18.0 19.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.0 13.1 13.7	Soot %	%	*ASTM D7844	>3	1.8	0.5	1.2
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.0 13.1 13.7	Nitration	Abs/cm	*ASTM D7624	>20	9.0	5.4	7.2
Oxidation Abs/.1mm *ASTM D7414 >25 15.0 13.1 13.7	Sulfation	Abs/.1mm	*ASTM D7415	>30	20.9	18.0	19.2
	FI LIID DEGRA		method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 9.8 9.6 9.5 9.5	I LOID DEGITIVE						
			*ASTM D7414	>25	15.0	13.1	13.7



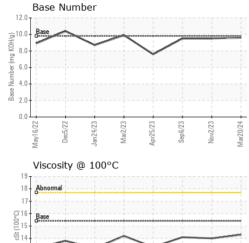
13 Abnormal

12 11 May16/22

Dec5/22 -

lan24/23

OIL ANALYSIS REPORT



Mar2/23

nr75/73

Sep6/23

	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
Nov2/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Ma	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	RTIES	method	limit/base	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445	15.4	14.3	14.0	14.1
	GRAPHS						
	Ferrous Alloys						
Nov223 Nov223	Non-ferrous Meta		23 23 Nov223	/24 Maz0/24 M			
	May16/22 Dec5/22 Jan24/23	Mar2/23 Apr25/23	Sep6/23 Nov2/23	Mar20/24			
	Viscosity @ 100°C	2			Base Number		
	18 - Abnormal			12			
	17-		· · · · · · · · · · · · · · · · · · ·	(B	0.0 Base	\sim	
	Base			Base Number (mg KOH/g) 6	3.0	\sim	
	Base 15 70 15		*******	jer (jer le	s.0 -		
	⁸³ 14	\sim			1.0		
	13 - Abnormal	\sim		ase			
	12			2	2.0-		
		3 53	3 53		3 5 50.0	3 53	23
	May16/22 Dec5/22 Jan24/23	Mar2/23 Apr25/23	Sep6/23 Nov2/23	Mar20/24	May16/22 Dec5/22 Jan24/23	Mar2/23 Apr25/23	Sep 6/23 Nov2/23 Mar20/24
Laboratory Sample No. Lab Number Unique Number Test Package	: WearCheck USA - 50 : GFL0089560 : 06130114 : 10949579	1 Madiso Recei Teste Diagr	n Ave., Cary i ved : 27 i d : 27	, NC 27513 7 Mar 2024 7 Mar 2024 7 Mar 2024 - \	GFL Enviro Wes Davis Cont	onmental - 072 - Am 361 Mc	ericus - Transwaste Math Mill Road Americus, GA US 31719 HEINZERLING

VISUAI method limit/base current historv1 historv2

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)

Certificate L2367

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