

OIL ANALYSIS REPORT

Sample Rating Trend



Component **Diesel Engine** Fluid

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

Sample Number Client Info GFL0104250 GFL011049 GFL0104950 Sample Date Client Info 07 Mar 2024 26 Jan 2024 16 Jan 202 Machine Age hrs Client Info 16738 16448 108906 Oil Age hrs Client Info 300 600 0 Oil Changed Client Info Changed	· · ·	,	AprZ022 Ju	12023 Jul2023 Nov2023	Nov2023 Dec2023 Jan2024 Jan20	24 Mar2024	
Sample Date Client Info 07 Mar 2024 26 Jan 2024 16 Jan 2024 Machine Age hrs Client Info 15738 16448 109906 Oil Age hrs Client Info 300 600 0 Oil Changed Client Info Changed Ch	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 16738 16448 108906 Oil Age hrs Client Info 300 600 0 Oil Changed Client Info 300 600 0 0 Sample Status Imit Desc Current Historyl Historyl Historyl Fuel WC Method >3.0 <1.0	Sample Number		Client Info		GFL0104250	GFL0110049	GFL010999
Oil Age hrs Client Info 300 600 0 Oil Changed Client Info Changed Changed ABNORMAL ABNORMAL ABNORMAL CONTAMINATION method limit/base current historyl historyl Fuel WC Method >3.0 <1.0	Sample Date		Client Info		07 Mar 2024	26 Jan 2024	16 Jan 2024
Oil Changed Sample Status Client Info Changed NORMAL Changed ABNORMAL Changed ABNORMAL Changed ABNORMAL CONTAMINATION method imit/base current history1 history1 Fuel WC Method >3.0 <1.0	Machine Age	hrs	Client Info		16738	16448	108906
Sample Status NORMAL ABNORMAL ABNORMAL ABNORMAL CONTAMINATION method limit/base current history1 history1 Fuel WC Method >3.0 <1.0	Oil Age	hrs	Client Info		300	600	0
CONTAMINATION method limit/base current history1 history2 Fuel WC Method >3.0 <1.0	Oil Changed		Client Info		Changed	Changed	Changed
Fuel WC Method >3.0 <1.0 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG NEG Glycol WC Method NEG NEG NEG NEG NEG WEAR METALS method limit/base current history1 history1 Iron ppm ASTM 05185m >20 0 1 -1 Nickel ppm ASTM 05185m >2 0 <1	Sample Status				NORMAL	ABNORMAL	ABNORMA
Water WC Method >0.2 NEG NEG NEG NEG Glycol WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history1 Iron ppm ASTM 05185m >20 0 1 <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
Giycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >90 11 20 18 Chromium ppm ASTM D5185m >20 0 1 <1	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >90 11 20 18 Chromium ppm ASTM D5185m >20 0 1 <1	Water		WC Method	>0.2	NEG	NEG	NEG
Iron ppm ASTM D5185m >90 11 20 18 Chromium ppm ASTM D5185m >20 0 1 <1	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 0 1 <1 Nickel ppm ASTM D5185m >2 0 <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >2 0 <1 0 Titanium ppm ASTM D5185m >2 0 <1	Iron	ppm	ASTM D5185m	>90	11	20	18
Tittanium ppm ASTM D5185m >2 0 <1 0 Silver ppm ASTM D5185m >20 <1	Chromium	ppm	ASTM D5185m	>20	0	1	<1
Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >20 <1	Nickel	ppm	ASTM D5185m	>2	0	<1	0
Aluminum ppm ASTM D5185m >20 <1 5 2 Lead ppm ASTM D5185m >40 0 2 0 Copper ppm ASTM D5185m >330 0 2 <1	Titanium	ppm	ASTM D5185m	>2	0	<1	0
Lead ppm ASTM D5185m >40 0 2 0 Copper ppm ASTM D5185m >330 0 2 <1	Silver	ppm	ASTM D5185m	>2	0		
Copper ppm ASTM D5185m >330 0 2 <1 Tin ppm ASTM D5185m >15 0 <1	Aluminum	ppm		>20	<1		2
Tin ppm ASTM D5185m >15 0 <1 0 Vanadium ppm ASTM D5185m 0 0 <1 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 3 12 Barium ppm ASTM D5185m 0 0 0 0 0 Magnesiem ppm ASTM D5185m 0 0 0 <1 <1 Magnesium ppm ASTM D5185m 1010 869 832 866 Calcium ppm ASTM D5185m 1070 938 867 1007 Phosphorus ppm ASTM D5185m 1070 938 867 1007 Sulfur ppm ASTM D5185m 2060 2474 2643 2537 Socium ppm ASTM D5185m	Lead	ppm	ASTM D5185m	>40	0		0
Vanadium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 3 12 Barium ppm ASTM D5185m 0 0 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 0 0 Magnesium ppm ASTM D5185m 0 0 0 <1 <1 Magnesium ppm ASTM D5185m 0 0 <1 <1 0 Phosphorus ppm ASTM D5185m 1010 869 832 866 1007 Sulfur ppm ASTM D5185m 1270 1052 1113 1081 Sulfur ppm ASTM D5185m 2060 2474 2643 2537 <tr< td=""><td>Copper</td><td>ppm</td><td>ASTM D5185m</td><td>>330</td><th>0</th><td>2</td><td><1</td></tr<>	Copper	ppm	ASTM D5185m	>330	0	2	<1
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 0 0 3 12 Barium ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 60 55 59 56 Manganese ppm ASTM D5185m 0 0 <1	Tin	ppm	ASTM D5185m	>15	0	<1	0
ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 0 0 3 12 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 55 59 56 Manganese ppm ASTM D5185m 0 0 -<1	Vanadium	ppm	ASTM D5185m		0		0
Boron ppm ASTM D5185m 0 0 3 12 Barium ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 60 55 59 56 Manganese ppm ASTM D5185m 0 0 <1	Cadmium	ppm	ASTM D5185m		0	0	0
Barium pm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 55 59 56 Manganese ppm ASTM D5185m 0 0 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 55 59 56 Manganese ppm ASTM D5185m 0 0 <1	Boron	ppm					
Marganese ppm ASTM D5185m 0 0 <1 <1 Magnesium ppm ASTM D5185m 1010 869 832 866 Calcium ppm ASTM D5185m 1070 938 867 1007 Phosphorus ppm ASTM D5185m 1070 938 867 1007 Phosphorus ppm ASTM D5185m 1150 793 911 810 Zinc ppm ASTM D5185m 1270 1052 1113 1081 Sulfur ppm ASTM D5185m 2060 2474 2643 2537 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 10 7 Sodium ppm ASTM D5185m >20 0 5 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624		ppm	ASTM D5185m				÷
Magnesium ppm ASTM D5185m 1010 869 832 866 Calcium ppm ASTM D5185m 1070 938 867 1007 Phosphorus ppm ASTM D5185m 1150 793 911 810 Zinc ppm ASTM D5185m 1270 1052 1113 1081 Sulfur ppm ASTM D5185m 2060 2474 2643 2537 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 10 7 Sodium ppm ASTM D5185m >25 3 10 7 Sodium ppm ASTM D5185m >20 0 5 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 8.0 8.6 10.4 Sulfation Abs/.mm *ASTM D7624							
Calcium ppm ASTM D5185m 1070 938 867 1007 Phosphorus ppm ASTM D5185m 1150 793 911 810 Zinc ppm ASTM D5185m 1270 1052 1113 1081 Sulfur ppm ASTM D5185m 2060 2474 2643 2537 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 10 7 Sodium ppm ASTM D5185m >20 0 5 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 0.6 0.4 Nitration Abs/cm *ASTM D7844 >20 8.0 8.6 10.4 Sulfation Abs/.tmm *ASTM D7415 >30 19.0 19.8 21.7 FLUID DEGRADATION method <td< td=""><td>-</td><td>ppm</td><td></td><td></td><th></th><td></td><td></td></td<>	-	ppm					
Phosphorus ppm ASTM D5185m 1150 793 911 810 Zinc ppm ASTM D5185m 1270 1052 1113 1081 Sulfur ppm ASTM D5185m 2060 2474 2643 2537 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 10 7 Sodium ppm ASTM D5185m >25 3 10 7 Sodium ppm ASTM D5185m >20 0 5 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 0.6 0.4 Nitration Abs/cm *ASTM D7624 >20 8.0 8.6 10.4 Sulfation Abs/.tmm *ASTM D7415 >30 19.0 19.8 21.7 FLUID DEGRADATION method <thimit ba<="" td=""><td>-</td><td></td><td></td><td></td><th></th><td></td><td></td></thimit>	-						
Zinc ppm ASTM D5185m 1270 1052 1113 1081 Sulfur ppm ASTM D5185m 2060 2474 2643 2537 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 3 10 7 Sodium ppm ASTM D5185m >25 3 10 7 Sodium ppm ASTM D5185m >25 3 10 7 Sodium ppm ASTM D5185m >20 0 5 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 0.6 0.4 Nitration Abs/cm *ASTM D7624 >20 8.0 8.6 10.4 Sulfation Abs/.1mm *ASTM D7624 >20 8.0 19.0 19.8 21.7 FLUID DEGRADATION method		ppm					
Sulfur ppm ASTM D5185m 2060 2474 2643 2537 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 3 10 7 Sodium ppm ASTM D5185m >25 3 10 7 Sodium ppm ASTM D5185m >20 0 296 144 Potassium ppm ASTM D5185m >20 0 5 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 0.6 0.4 Nitration Abs/cm *ASTM D7624 >20 8.0 8.6 10.4 Sulfation Abs/.tmm *ASTM D7624 >20 8.0 19.8 21.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.tmm *ASTM D7414 </td <td></td> <td></td> <td></td> <td></td> <th></th> <td></td> <td></td>							
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 10 7 Sodium ppm ASTM D5185m >25 3 10 7 Sodium ppm ASTM D5185m >20 0 296 144 Potassium ppm ASTM D5185m >20 0 5 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 0.6 0.4 Nitration Abs/cm *ASTM D7624 >20 8.0 8.6 10.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.0 19.8 21.7 Cxidation Abs/.1mm *ASTM D7414 >25 15.6 15.5 20.8		ppm					
Silicon ppm ASTM D5185m >25 3 10 7 Sodium ppm ASTM D5185m 10 296 144 Potassium ppm ASTM D5185m >20 0 5 2 INFRA-RED method limit/base current history1 history1 Soot % % *ASTM D7844 >6 0.3 0.6 0.4 Nitration Abs/cm *ASTM D7624 >20 8.0 8.6 10.4 Sulfation Abs/.tmm *ASTM D7624 >20 8.0 8.6 10.4 Current history1 history2 30 19.0 19.8 21.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.tmm *ASTM D7414 >25 15.6 15.5 20.8					2474		
Sodium ppm ASTM D5185m 10 296 144 Potassium ppm ASTM D5185m >20 0 5 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 0.6 0.4 Nitration Abs/cm *ASTM D7624 >20 8.0 8.6 10.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.0 19.8 21.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.6 15.5 20.8		NTS					
Potassium ppm ASTM D5185m >20 0 5 2 INFRA-RED method limit/base current history1 history1 Soot % % *ASTM D7844 >6 0.3 0.6 0.4 Nitration Abs/cm *ASTM D7624 >20 8.0 8.6 10.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.0 19.8 21.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.6 15.5 20.8				>25			
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 0.6 0.4 Nitration Abs/cm *ASTM D7624 >20 8.0 8.6 10.4 Sulfation Abs/.Imm *ASTM D7415 >30 19.0 19.8 21.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.Imm *ASTM D7414 >25 15.6 15.5 20.8							
Soot % % *ASTM D7844 >6 0.3 0.6 0.4 Nitration Abs/cm *ASTM D7624 >20 8.0 8.6 10.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.0 19.8 21.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.6 15.5 20.8		ppm	ASTM D5185m			5	2
Nitration Abs/cm *ASTM D7624 >20 8.0 8.6 10.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.0 19.8 21.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.6 15.5 20.8	INFRA-RED		method	limit/base		history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 19.0 19.8 21.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.6 15.5 20.8					0.3		
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.6 15.5 20.8		Abs/cm	*ASTM D7624	>20			
Oxidation Abs/.1mm *ASTM D7414 >25 15.6 15.5 20.8	Sulfation	Abs/.1mm	*ASTM D7415	>30	19.0	19.8	21.7
	FLUID DEGRA		method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 9.8 8.0 9.5 8.0	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.6	15.5	20.8
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.0	9.5	8.0

DIAGNOSIS Recommendation

Resample at the next service interval to monitor.

Machine Id 4659M

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

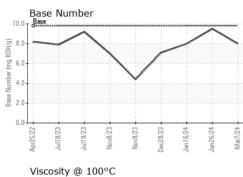
Fluid Condition

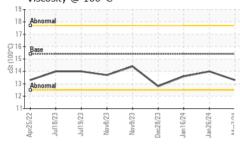
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.



OIL ANALYSIS REPORT

VISUAL





VISUAL						
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate		*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris		*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor		*Visual	NORML	NORML	NORML	NORML
Emulsified Water		*Visual	>0.2	NEG	NEG	NEG
Free Water		*Visual		NEG	NEG	NEG
FLUID PROPE		method	limit/base	current	history1	history2
Visc @ 100°C		ASTM D445		13.3	14.0	13.6
GRAPHS	001					1010
Ferrous Alloys						
60 T	٨	· · · ·				
50 - chromium						
nickel						
40-						
툡 30						
20	\	-				
\sim	L					
10						
		4 4				
Apr25/22 Jul18/23 Nov8/23	Nov9/23 Dec28/23	Jan 16/24 Jan 26/24	Mar7/24			
Ap Ju N	2 8	데 데				
	_		2			
Non-ferrous Meta	_		2			
Non-ferrous Meta	_		2			
10 copper	_		2			
10 copper	_		W			
8 6	_		N			
10 copper	_		2			
8 6	_		2			
8 6	_		2			
10 8 6 4 2 -	_					
10 8 10 10 10 10 10 10 10 10 10 10	ls					
10 8 6 4 2 -	ls		Mar124			
10 time	ls					
10 8 10 10 10 10 10 10 10 10 10 10	ls		Marilia Parila	Base Number		
Viscosity @ 100°C	ls		Marilia Parila	Base Number	-	
Viscosity @ 100°C	ls		40/10.0	Base Number	_	
CZCOPPER CCCOPPER Laad CCCOPPER Laad CCCOPPER Laad CCCOPPER CCCOPPE	ls		40/10.0	Base Number		
CZCOPPER CCCOPPER Laad CCCOPPER Laad CCCOPPER Laad CCCOPPER CCCOPPE	ls		40/10.0	Base Number		
Copper lead tin tin tin tin EZISION Viscosity @ 100°C	ls		40/10.0	Base Number		
10 6 6 6 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7	ls		40/10.0	Base Number		
10 8 10 10 10 10 10 10 10 10 10 10	ls		0.0 Per (um KOH101) 0.0 PER (Base Number		
10 6 6 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7	ls		10.0 (0)HOX but back to the form of the fo	Base Number		
10 8 10 10 10 10 10 10 10 10 10 10	lls	Jan 16/24	10.0 (0)(HOX) Multiple (0)(HOX) Multiple (0)(HOX			24
10 8 10 10 10 10 10 10 10 10 10 10	lls	Jan 16/24	10.0 (0)(HOX) Multiple (0)(HOX) Multiple (0)(HOX			an 16/24
10 8 10 10 10 10 10 10 10 10 10 10	ls	Jan 16/24	10.0 (0)HOX but back to the form of the fo			Jan 16/24
Uid Uid Uid Uid Uid Uid Uid Uid	Ils	+Clainer +Clainer	10.0 (0)HOX Bul Jaquink 4.0 2.0 0.0 40, NC 27513	Api25/22 Jult18/23	EZIBONN vironmental - 410) - Michigan We
Viscosity @ 100°C	Ils	+J2lg1uer +J2lg1uer hAve., Cary red : 11	10.0 (0,HO) Bul Jaquiny 9888 2.0 0.0 7, NC 27513 Mar 2024	Api25/22 Jult18/23	EZIBONN vironmental - 410) - Michigan We
Uiscosity @ 100°C Uiscosity @ 10°C Uiscosity	Ils EZERONON C D1 Madison Receiv Tested	+72191 uer +72191 uer +72191 uer +72191 uer +72191 uer +72191 uer	10.0 (0,HO) Bul Jaquiny 988 2.0 0.0 7, NC 27513 Mar 2024 Mar 2024	GFL En	EZIBONN vironmental - 410	- Michigan We 00 Van Born F Wayne,
Viscosity @ 100°C	Ils	+72191 uer +72191 uer +72191 uer +72191 uer +72191 uer +72191 uer	10.0 (0,HO) Bul Jaquiny 9888 2.0 0.0 7, NC 27513 Mar 2024	GFL En	EZQPU (FC) (FC) (FC) (FC) (FC) (FC) (FC) (FC)) - Michigan We

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

F:

T: (734)714-2340