

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id 426018-464 Component

Diesel Engine Fluid

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

Sample Number Client Info GFL0110187 GFL0060483 GFL0060483 GFL0060483 GFL0060483 GFL0060483 GFL0060483 GFL0060483 GFL0060483 GFL0060483 I 0 Oct 202 Machine Age hrs Client Info 2315 458659 23792 Oil Age hrs Client Info 600 0 600 Oil Changed Client Info Changed Chang			Jan2021		May2022 Oct2022 Mar2023	Feb2024	
Sample Date Client Info 28 Feb 2024 31 Mar 2023 10 Oct 202 Machine Age hrs Client Info 24315 458659 23792 Oil Age hrs Client Info 600 0 600 Oil Age hrs Client Info Changed NORMAL NORMAD NORMAD NORMAD </th <th>SAMPLE INFOR</th> <th>MATION</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 24315 458659 23792 Oil Age hrs Client Info 600 0 600 Oil Changed Client Info Changed	Sample Number		Client Info		GFL0110187	GFL0060483	GFL0060461
Oil Age hrs Client Info 600 0 600 Oil Changed Client Info Changed <td>Sample Date</td> <td></td> <td>Client Info</td> <td></td> <th>28 Feb 2024</th> <td>31 Mar 2023</td> <td>10 Oct 2022</td>	Sample Date		Client Info		28 Feb 2024	31 Mar 2023	10 Oct 2022
Oil Changed Sample Status Client Into Changed NORMAL Changed NORMAL Changed NORMAL Changed NORMAL CONTAMINATION method limit/base current history1 history1 Fuel WC Method >0.0 NEG NEG NEG Glycol WC Method >0.2 NEG NEG NEG VEAR METALS method imit/base current history1 history1 Iron ppm ASTM D5185m >12.0 6 0 7 Chromium ppm ASTM D5185m >20 0 0 0 Nickel ppm ASTM D5185m >20 0 0 0 Silver ppm ASTM D5185m >20 1 0 2 Lead ppm ASTM D5185m >30 1 1 2 Tin ppm ASTM D5185m 0 0 0 0 Copper ppm ASTM D5185m 0 0 0	Machine Age	hrs	Client Info		24315	458659	23792
Sample Status NORMAL NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history1 Fuel WC Method >3.0 <1.0	0	hrs	Client Info			0	
CONTAMINATION method limit/base current history1 history1 Fuel WC Method >3.0 <1.0	Oil Changed		Client Info		-	Changed	Changed
Fuel WC Method >3.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0	Sample Status				NORMAL	NORMAL	NORMAL
Water WC Method >0.2 NEG NEG NEG NEG Glycol WC Method Imit/base current history1 history1 Iron ppm ASTM D5185m >120 6 0 7 Chromium ppm ASTM D5185m >20 0 <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
Glycol WC Method NEG NEG NEG VEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >12:0 6 0 7 Chromium ppm ASTM D5185m >2:0 0 <1	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >12.0 6 0 7 Chromium ppm ASTM D5185m >20 0 <1	Water		WC Method	>0.2	NEG	NEG	NEG
Iron ppm ASTM D5185m >120 6 0 7 Chromium ppm ASTM D5185m >20 0 <1	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 0 <1 <1 Nickel ppm ASTM D5185m >5 0 0 0 Titanium ppm ASTM D5185m >2 0 0 <1	WEAR METAL	.S	method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >5 0 0 0 Titanium ppm ASTM D5185m >2 0 0 <1	Iron	ppm	ASTM D5185m	>120	6	0	7
Titanium ppm ASTM D5185m >2 0 0 <1 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >20 1 0 2 Lead ppm ASTM D5185m >40 4 <1	Chromium	ppm	ASTM D5185m	>20	0	<1	<1
Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >20 1 0 2 Lead ppm ASTM D5185m >40 4 <1	Nickel	ppm	ASTM D5185m	>5	0	0	0
Aluminum ppm ASTM D5185m >20 1 0 2 Lead ppm ASTM D5185m >40 4 <1	Titanium	ppm	ASTM D5185m	>2	0	0	<1
Lead ppm ASTM D5185m >40 4 <1 <1 Copper ppm ASTM D5185m >330 <1	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper ppm ASTM D5185m >330 <1 <1 2 Tin ppm ASTM D5185m >15 0 0 <1	Aluminum	ppm	ASTM D5185m	>20	1	0	2
Tin ppm ASTM D5185m >15 0 0 <1 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 Boron ppm ASTM D5185m 0 2 27 23 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 Magnese ppm ASTM D5185m 0 0 0 <11	Lead	ppm	ASTM D5185m	>40	4	<1	<1
Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 0 2 27 23 Barium ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 0 Manganese ppm ASTM D5185m 0 0 0 0 0 Magnesium ppm ASTM D5185m 0 0 0 0 <11 Magnesium ppm ASTM D5185m 1010 1015 718 694 Calcium ppm ASTM D5185m 1070 1064 1241 1241 Phosphorus ppm ASTM D5185m 1270 1281 1065 1028 Sulfur	Copper	ppm	ASTM D5185m	>330	<1	<1	2
Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 0 2 27 23 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 Magnese ppm ASTM D5185m 0 0 0 <1	Tin	ppm	ASTM D5185m	>15	0	0	<1
ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 0 2 27 23 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 56 52 46 Magnesium ppm ASTM D5185m 0 0 0 0 <1	Vanadium	ppm	ASTM D5185m		0	0	0
Boron ppm ASTM D5185m 0 2 27 23 Barium ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 60 56 52 46 Manganese ppm ASTM D5185m 0 0 0 0 Magnesium ppm ASTM D5185m 1010 1015 718 694 Calcium ppm ASTM D5185m 1010 1015 718 694 Calcium ppm ASTM D5185m 1070 1064 1241 1241 Phosphorus ppm ASTM D5185m 1270 1281 1065 1028 Sulfur ppm ASTM D5185m 2060 3369 2919 3225 CONTAMINANTS method limit/base current history1 history Silicon ppm ASTM D5185m >20 <1 0 0 Potassium	Cadmium	ppm	ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 60 56 52 46 Manganese ppm ASTM D5185m 0 0 0 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 56 52 46 Manganese ppm ASTM D5185m 0 0 0 <1	Boron	ppm	ASTM D5185m	0	2	27	23
Maganese ppm ASTM D5185m 0 0 0 <1 Magnesium ppm ASTM D5185m 1010 1015 718 694 Calcium ppm ASTM D5185m 1070 1064 1241 1241 Phosphorus ppm ASTM D5185m 1150 1080 902 853 Zinc ppm ASTM D5185m 1270 1281 1065 1028 Sulfur ppm ASTM D5185m 2060 3369 2919 3225 CONTAMINANTS method limit/base current history1 history Silicon ppm ASTM D5185m >25 2 3 2 Sodium ppm ASTM D5185m >20 <1	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 1015 718 694 Calcium ppm ASTM D5185m 1070 1064 1241 1241 Phosphorus ppm ASTM D5185m 1150 1080 902 853 Zinc ppm ASTM D5185m 1270 1281 1065 1028 Sulfur ppm ASTM D5185m 2060 3369 2919 3225 CONTAMINANTS method limit/base current history1 history Silicon ppm ASTM D5185m >25 2 3 2 Sodium ppm ASTM D5185m >20 <1	Molybdenum	ppm	ASTM D5185m	60	56	52	46
Calcium ppm ASTM D5185m 1070 1064 1241 1241 Phosphorus ppm ASTM D5185m 1150 1080 902 853 Zinc ppm ASTM D5185m 1270 1281 1065 1028 Sulfur ppm ASTM D5185m 2060 3369 2919 3225 CONTAMINANTS method limit/base current history1 history Silicon ppm ASTM D5185m >25 2 3 2 Sodium ppm ASTM D5185m >20 <1	Manganese	ppm	ASTM D5185m	0	0	0	<1
Phosphorus ppm ASTM D5185m 1150 1080 902 853 Zinc ppm ASTM D5185m 1270 1281 1065 1028 Sulfur ppm ASTM D5185m 2060 3369 2919 3225 CONTAMINANTS method limit/base current history1 history Silicon ppm ASTM D5185m >25 2 3 2 Sodium ppm ASTM D5185m >25 2 3 2 Sodium ppm ASTM D5185m >20 <1 0 0 Potassium ppm ASTM D5185m >20 <1 3 1 INFRA-RED method limit/base current history1 history1 Soot % % *ASTM D7624 >20 5.0 5.0 6.2 Sulfation Abs/.1mm *ASTM D7624 >20 5.0 5.0 6.2 Sulfation Abs/.1mm *ASTM D7414	Magnesium	ppm	ASTM D5185m	1010	1015	718	694
Zinc ppm ASTM D5185m 1270 1281 1065 1028 Sulfur ppm ASTM D5185m 2060 3369 2919 3225 CONTAMINANTS method limit/base current history1 history Silicon ppm ASTM D5185m >25 2 3 2 Sodium ppm ASTM D5185m >25 2 3 2 Sodium ppm ASTM D5185m >20 <1	Calcium	ppm	ASTM D5185m	1070	1064	1241	1241
Sulfur ppm ASTM D5185m 2060 3369 2919 3225 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 2 3 2 Sodium ppm ASTM D5185m >25 2 3 2 Sodium ppm ASTM D5185m >20 <1	Phosphorus	ppm	ASTM D5185m	1150	1080	902	853
CONTAMINANTSmethodlimit/basecurrenthistory1historySiliconppmASTM D5185m<>25232SodiumppmASTM D5185m<1	Zinc	ppm	ASTM D5185m	1270	1281	1065	1028
Silicon ppm ASTM D5185m >25 2 3 2 Sodium ppm ASTM D5185m <1 0 0 Potassium ppm ASTM D5185m >20 <1 0 0 Potassium ppm ASTM D5185m >20 <1 3 1 INFRA-RED method limit/base current history1 history Soot % % *ASTM D7844 >4 0.7 0.6 1 Nitration Abs/cm *ASTM D7624 >20 5.0 5.0 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 17.7 19.2 20.9 FLUID DEGRADATION method limit/base current history1 history Oxidation Abs/.1mm *ASTM D7414 >25 12.6 13.9 15.0	Sulfur	ppm	ASTM D5185m	2060	3369	2919	3225
Sodium ppm ASTM D5185m <1 0 0 Potassium ppm ASTM D5185m<>20 <1	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 <1 3 1 INFRA-RED method limit/base current history1 history Soot % % *ASTM D7844 >4 0.7 0.6 1 Nitration Abs/cm *ASTM D7624 >20 5.0 5.0 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 17.7 19.2 20.9 FLUID DEGRADATION method limit/base current history1 history Oxidation Abs/.1mm *ASTM D7414 >25 12.6 13.9 15.0	Silicon	ppm	ASTM D5185m	>25	2	3	2
INFRA-RED method limit/base current history1 history Soot % % *ASTM D7844 >4 0.7 0.6 1 Nitration Abs/cm *ASTM D7624 >20 5.0 5.0 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 17.7 19.2 20.9 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 12.6 13.9 15.0	Sodium	ppm	ASTM D5185m		<1	0	0
Soot % % *ASTM D7844 >4 0.7 0.6 1 Nitration Abs/cm *ASTM D7624 >20 5.0 5.0 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 17.7 19.2 20.9 FLUID DEGRADATION method limit/base current history1 history Oxidation Abs/.1mm *ASTM D7414 >25 12.6 13.9 15.0	Potassium	ppm	ASTM D5185m	>20	<1	3	1
Nitration Abs/cm *ASTM D7624 >20 5.0 5.0 6.2 Sulfation Abs/.1mm *ASTM D7624 >30 17.7 19.2 20.9 FLUID DEGRADATION method limit/base current history1 history Oxidation Abs/.1mm *ASTM D7414 >25 12.6 13.9 15.0	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 17.7 19.2 20.9 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 12.6 13.9 15.0	Soot %	%	*ASTM D7844	>4	0.7	0.6	1
FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 12.6 13.9 15.0	Nitration	Abs/cm	*ASTM D7624	>20	5.0	5.0	6.2
Oxidation Abs/.1mm *ASTM D7414 >25 12.6 13.9 15.0	Sulfation	Abs/.1mm	*ASTM D7415	>30	17.7	19.2	20.9
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 9.8 9.0 9.5 10.6	Oxidation	Abs/.1mm	*ASTM D7414	>25	12.6	13.9	15.0
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	9.0	9.5	10.6

DIAGNOSIS

Recommendation Resample at the next service interval to mo

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination oil.

Fluid Condition

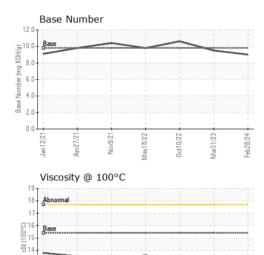
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition oil is suitable for further service.



13 Abnormal

Apr27/21

OIL ANALYSIS REPORT

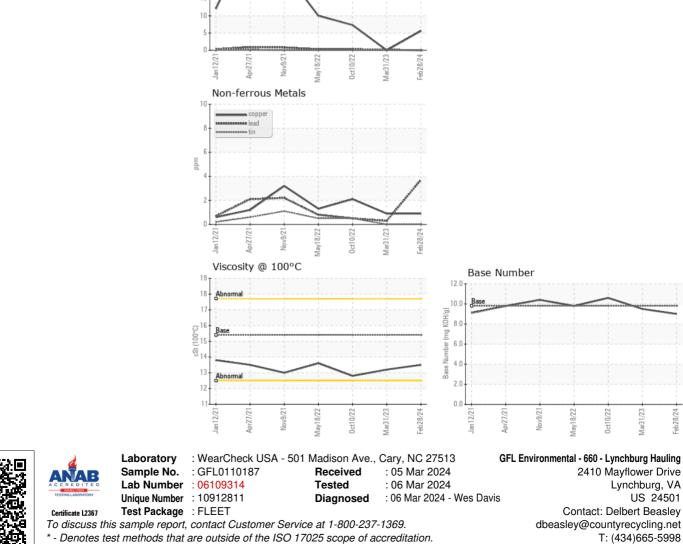


Jov9/21

Mav18/22

Mar31/23

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
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	RTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.5	13.2	12.8
GRAPHS						
Ferrous Alloys						
30 25						
20	\backslash					
10						



Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

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