

OIL ANALYSIS REPORT

Sample Rating Trend





Resample at the next service interval to monitor.

There is no indication of any contamination in the

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

oil is suitable for further service.

All component wear rates are normal.

Recommendation

Contamination

Fluid Condition

Wear

oil.

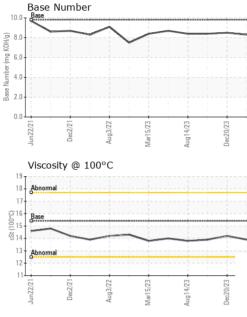
Machine Id 4650M Component **Diesel Engine** Fluid

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

Sample Number Client Info GFL0108832 GFL010883 GFL010883 <thgl010883< th=""> <thgl01883< th=""> G</thgl01883<></thgl010883<>	N SHP 15W40 (- GAL)	Jun2021	Dec2021 Aug2022	Mar2023 Aug2023 D	ec2023	
Sample Date Client Info 06 Jan 2024 20 Dec 2023 30 Nov 202 Machine Age hrs Client Info 16317 16184 16028 Oil Age hrs Client Info 16184 15166 15166 Oil Changed Client Info Changed NoRMAL NoRMAL NoRMAL CONTAMINATION method imit/base current history1 history1 Fuel WC Method >0.2 NEG NEG NEG Wear WC Method >0.2 NEG NEG Netory1 for ppm ASTM 05185m >20 <1 <1 <1 for ppm ASTM 05185m >2 0 0 0 0 Sliver ppm ASTM 05185m >2 0 <td< th=""><th>SAMPLE INFOR</th><th>MATION</th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></td<>	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 16317 16184 16028 Oil Age hrs Client Info 16184 15166 15166 Oil Age hrs Client Info 16184 15166 15166 Oil Age hrs Client Info 16184 15166 NoRMAL 16107 16	Sample Number		Client Info		GFL0108832	GFL0105860	GFL010148
Oil Age hrs Client Info 16184 15166 15166 Oil Changed Client Info Changed NorRMAL NorRMAL NorRMAL Sample Status Imitibase current NorRMAL NorRMAL NorRMAL CONTAMINATION method Joint Vortex NEG Nerd NorRMAL Water WC Method >0.2 NEG NEG NEG Water WC Method >0.2 NEG NEG NEG Weter WC Method >0.2 1 12 19 Chromium ppm ASTM D5185m >20 <1	Sample Date		Client Info		06 Jan 2024	20 Dec 2023	30 Nov 2023
Oil Changed Sample StatusClient InfoChanged NORMALNor Changed NORMALNor Changed NORMALCONTAMINATIONmethodimit/basecurrenthistory1history1FuelWC Method WC Method>3.0<1.0	Machine Age	hrs	Client Info		16317	16184	16028
Sample Status NORMAL NORMAL NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history1 Fuel WC Method >3.0 <1.0	Oil Age	hrs	Client Info		16184	15166	15166
CONTAMINATION method limit/base current history1 history1 Fuel WC Method >3.0 <1.0	Oil Changed		Client Info		Changed	Changed	Not Change
Fuel WC Method >3.0 <1.0 <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 history1 Iron ppm ASTM D5185m >20 <1	Sample Status				NORMAL	NORMAL	NORMAL
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 D5185m >20 <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >90 21 12 19 Chromium ppm ASTM D5185m >20 <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 21 12 19 Chromium ppm ASTM D5185m >20 <1	Water		WC Method	>0.2	NEG	NEG	NEG
Iron ppm ASTM D5185m >90 21 12 19 Chromium ppm ASTM D5185m >20 <1	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 <1 <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 <1 Titanium ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >20 3 2 2 Lead ppm ASTM D5185m >20 3 2 2 Lead ppm ASTM D5185m >20 3 2 2 Copper ppm ASTM D5185m >330 <1	Iron	ppm	ASTM D5185m	>90	21	12	19
Titanium ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >20 3 2 2 Lead ppm ASTM D5185m >20 3 2 2 Lead ppm ASTM D5185m >330 <1	Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >20 3 2 2 Lead ppm ASTM D5185m >20 3 2 2 Lead ppm ASTM D5185m >330 <1 1 1 Tin ppm ASTM D5185m >15 0 0 0 Vanadium ppm ASTM D5185m 0 0 0 0 Vanadium ppm ASTM D5185m 0 0 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 0 0 3 <1 Barium ppm ASTM D5185m 0 0 <110 0 Barium ppm ASTM D5185m 010 1058 1007 930 Calcium ppm ASTM D5185m 1010 1058 <	Nickel	ppm	ASTM D5185m	>2	0	<1	<1
Aluminum ppm ASTM D5185m >20 3 2 2 Lead ppm ASTM D5185m >40 0 0 0 Copper ppm ASTM D5185m >330 <1	Titanium	ppm	ASTM D5185m	>2	0	0	0
Lead ppm ASTM D5185m >40 0 0 0 Copper ppm ASTM D5185m >330 <1	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper ppm ASTM D5185m >330 <1 1 1 Tin ppm ASTM D5185m >15 0 0 0 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 0 <1	Aluminum	ppm	ASTM D5185m	>20	3	2	2
Tin ppm ASTM D5185m >15 0 0 0 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 0 3 <1	Lead	ppm	ASTM D5185m	>40	0	0	0
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 0 3 <1 Barium ppm ASTM D5185m 0 0 3 <1 2 Molybdenum ppm ASTM D5185m 0 0 <1 2 Magnesium ppm ASTM D5185m 0 0 <11 0 Magnesium ppm ASTM D5185m 0 0 <1100 1058 1007 930 Calcium ppm ASTM D5185m 1070 1138 1110 1098 Phosphorus ppm ASTM D5185m 1270 1351 1360 1240 Sulfur ppm ASTM D5185m 2060 3169 3139 4254 CONTAMINANTS m	Copper	ppm	ASTM D5185m	>330	<1	1	1
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 0 0 3 <1	Tin	ppm	ASTM D5185m	>15	0	0	0
ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 0 0 3 <1	Vanadium	ppm	ASTM D5185m		0	0	0
Boron ppm ASTM D5185m 0 0 3 <1 Barium ppm ASTM D5185m 0 0 <1	Cadmium	ppm	ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 0 0 <1 2 Molybdenum ppm ASTM D5185m 60 65 64 61 Manganese ppm ASTM D5185m 0 0 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 65 64 61 Manganese ppm ASTM D5185m 0 0 <1	Boron	ppm	ASTM D5185m	0	0	3	<1
Maganese ppm ASTM D5185m 0 0 <1 0 Magnesium ppm ASTM D5185m 1010 1058 1007 930 Calcium ppm ASTM D5185m 1070 1138 1110 1098 Phosphorus ppm ASTM D5185m 1070 1138 1110 1098 Zinc ppm ASTM D5185m 1150 1092 1162 968 Zinc ppm ASTM D5185m 1270 1351 1360 1240 Sulfur ppm ASTM D5185m 2060 3169 3139 4254 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 2 0 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.4 0.2 0.4 Nitration Abs/.1mm *ASTM D7415	Barium	ppm	ASTM D5185m	0	0	<1	2
Magnesium ppm ASTM D5185m 1010 1058 1007 930 Calcium ppm ASTM D5185m 1070 1138 1110 1098 Phosphorus ppm ASTM D5185m 1150 1092 1162 968 Zinc ppm ASTM D5185m 1270 1351 1360 1240 Sulfur ppm ASTM D5185m 2060 3169 3139 4254 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 3 4 2 Sodium ppm ASTM D5185m >20 2 0 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 7.8 6.6 7.9 Sulfation Abs/cm *ASTM D7624 >20 7.8 6.6 7.9 Sulfation Abs/.1mm *ASTM D	Molybdenum	ppm	ASTM D5185m	60	65	64	61
Calcium ppm ASTM D5185m 1070 1138 1110 1098 Phosphorus ppm ASTM D5185m 1150 1092 1162 968 Zinc ppm ASTM D5185m 1270 1351 1360 1240 Sulfur ppm ASTM D5185m 2060 3169 3139 4254 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 3 4 2 Sodium ppm ASTM D5185m >20 2 0 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D5185m >20 2 0 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.4 0.2 0.4 Nitration Abs/cm *ASTM D7624 >2	Manganese	ppm	ASTM D5185m	0	0	<1	0
Phosphorus ppm ASTM D5185m 1150 1092 1162 968 Zinc ppm ASTM D5185m 1270 1351 1360 1240 Sulfur ppm ASTM D5185m 2060 3169 3139 4254 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 3 4 2 Sodium ppm ASTM D5185m >20 2 0 1 INFRA-RED method limit/base current history1 history1 Soot % % *ASTM D5185m >20 2 0 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.4 0.2 0.4 Nitration Abs/cm *ASTM D7624 >20 7.8 6.6 7.9 Sulfation Abs/.1mm *ASTM D7415 <td< td=""><td>Magnesium</td><td>ppm</td><td>ASTM D5185m</td><td>1010</td><th>1058</th><td>1007</td><td>930</td></td<>	Magnesium	ppm	ASTM D5185m	1010	1058	1007	930
Zinc ppm ASTM D5185m 1270 1351 1360 1240 Sulfur ppm ASTM D5185m 2060 3169 3139 4254 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 3 4 2 Sodium ppm ASTM D5185m >25 3 4 2 Sodium ppm ASTM D5185m >20 2 0 1 INFRA-RED method limit/base current history1 history1 Soot % % *ASTM D7844 >6 0.4 0.2 0.4 Nitration Abs/cm *ASTM D7624 >20 7.8 6.6 7.9 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 18.7 19.7 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 <td>Calcium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>1070</td> <th>1138</th> <td>1110</td> <td>1098</td>	Calcium	ppm	ASTM D5185m	1070	1138	1110	1098
SulfurppmASTM D5185m2060316931394254CONTAMINANTSmethodlimit/basecurrenthistory1history1SiliconppmASTM D5185m>25342SodiumppmASTM D5185m>20201PotassiumppmASTM D5185m>20201INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>60.40.20.4NitrationAbs/cm*ASTM D7624>207.86.67.9SulfationAbs/1mm*ASTM D7415>3020.018.719.7FLUID DEGRADATION methodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2516.115.016.1	Phosphorus	ppm	ASTM D5185m	1150	1092	1162	968
CONTAMINANTSmethodlimit/basecurrenthistory1history1SiliconppmASTM D5185m>25342SodiumppmASTM D5185m464PotassiumppmASTM D5185m>20201INFRA-REDmethodlimit/basecurrenthistory1history1Soot %%*ASTM D7844>60.40.20.4NitrationAbs/cm*ASTM D7624>207.86.67.9SulfationAbs/cm*ASTM D7615>3020.018.719.7FLUID DEGRADATIONmethodlimit/basecurrenthistory1history1OxidationAbs/.1mm*ASTM D7414>2516.115.016.1	Zinc	ppm	ASTM D5185m	1270	1351	1360	1240
Silicon ppm ASTM D5185m >25 3 4 2 Sodium ppm ASTM D5185m 4 6 4 Potassium ppm ASTM D5185m >20 2 0 1 INFRA-RED method limit/base current history1 history1 Soot % % *ASTM D7844 >6 0.4 0.2 0.4 Nitration Abs/cm *ASTM D7624 >20 7.8 6.6 7.9 Sulfation Abs/cm *ASTM D7624 >20 7.8 6.6 7.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.1 15.0 16.1	Sulfur	ppm	ASTM D5185m	2060	3169	3139	4254
Sodium ppm ASTM D5185m 4 6 4 Potassium ppm ASTM D5185m >20 2 0 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.4 0.2 0.4 Nitration Abs/cm *ASTM D7624 >20 7.8 6.6 7.9 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 18.7 19.7 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 16.1 15.0 16.1	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 2 0 1 INFRA-RED method limit/base current history1 history1 Soot % % *ASTM D7844 >6 0.4 0.2 0.4 Nitration Abs/cm *ASTM D7624 >20 7.8 6.6 7.9 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 18.7 19.7 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 16.1 15.0 16.1	Silicon	ppm	ASTM D5185m	>25	3	4	2
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.4 0.2 0.4 Nitration Abs/cm *ASTM D7624 >20 7.8 6.6 7.9 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 18.7 19.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.1 15.0 16.1	Sodium	ppm	ASTM D5185m		4	6	4
Soot % % *ASTM D7844 >6 0.4 0.2 0.4 Nitration Abs/cm *ASTM D7624 >20 7.8 6.6 7.9 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 18.7 19.7 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 16.1 15.0 16.1	Potassium	ppm	ASTM D5185m	>20	2	0	1
Nitration Abs/cm *ASTM D7624 >20 7.8 6.6 7.9 Sulfation Abs/.1mm *ASTM D7615 >30 20.0 18.7 19.7 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 16.1 15.0 16.1	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 20.0 18.7 19.7 FLUID DEGRADATION method limit/base current history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 16.1 15.0 16.1	Soot %	%	*ASTM D7844	>6	0.4	0.2	0.4
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.1 15.0 16.1	Nitration	Abs/cm	*ASTM D7624	>20	7.8	6.6	7.9
Oxidation Abs/.1mm *ASTM D7414 >25 16.1 15.0 16.1	Sulfation	Abs/.1mm	*ASTM D7415	>30	20.0	18.7	19.7
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 9.8 8.3 8.5 8.4	Oxidation	Abs/.1mm	*ASTM D7414	>25	16.1	15.0	16.1
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8		8.5	8.4



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	
Mar15/23	Aug14/23 Dec20/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML	
Ma	Aug	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		method	limit/base	current	history1	history2	
		Visc @ 100°C	cSt	ASTM D445	15.4	13.9	14.2	13.9	
		GRAPHS							
		Ferrous Alloys							
Mart 5/2	Aug 14,73 Dec20,73	Non-ferrous Metal	Mart5/23	Aug 14/23					
		Jun22/21	Mar15/23	Aug14/23	neczu/za				
		Viscosity @ 100°C	:		10	Base Number			
		18 - Abnormal		· · · · · · · · · · · · · · · · · · ·	10		< _		
		17			(B)	.0-			
		⊋ ¹⁶ Base			Base Number (mg KOH/g)	.0-			
		D-16 Base 53 14			per (j				
		⁶³ 14	\sim		Mun 4	.0-			
		13 - Abnormal			ase 2	.0			
		12							
		11-12/2	/23 -	f/23 -	0		3/22 +	4/23	
		Jun22/21 Dec2/21 Aug3/22	Mar15/23	Aug 14/23	Deczu/ 23	Jun22/21 Dec2/21	Aug3/22 Mar15/23	Aug14/23 Dec20/23	
PESTING LABORATORY ertificate L2367	Laboratory Sample No. Lab Number Unique Number Test Package	: GFL0108832 : 06055789 : 10821738	6055789 Diagnosed : 10 Jan 2024 0821738 Diagnostician : Wes Davis				3 GFL Environmental - 415 - Michigan Ea 6200 Elmrido Sterling Heights, N US 4831 Contact: Frank Wola		