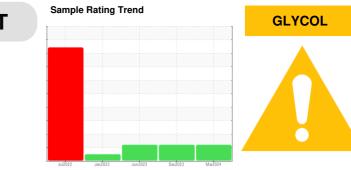


OIL ANALYSIS REPORT



history1

history2

SAMPLE INFORMATION method limit/base current

Machine Id 726068

Component Diesel Engine

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

DIAGNOSIS

Recommendation

We advise that you check for the source of the coolant leak. Check for low coolant level. We recommend an early resample to monitor this condition.

Wear

All component wear rates are normal.

Contamination

Sodium and/or potassium levels are high.

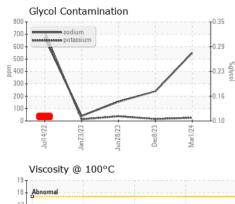
Fluid Condition

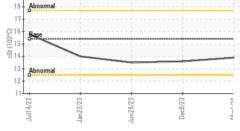
The BN result indicates that there is suitable alkalinity remaining in the oil.

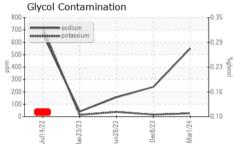
Sample Date Client Info 01 Mar 2024 08 Dec 2023 28 Jun 2023 Machine Age hrs Client Info 17571 17571 17571 Oil Age hrs Client Info 17571 17571 17571 Oil Changed Client Info N/A N/A N/A Sample Status Client Info N/A ABNORMAL ABNORMAL ABNORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0 <1.0 <1.0 Water wC Method >5.2 <1.0 <1.0 NEG Iron ppm ASTM 05185m >80 36 6 5 1.0 Nickel ppm ASTM 05185m >3 0 <1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 3 6 5 1 1 1 <td< th=""><th>SAMPLE INFURI</th><th></th><th>method</th><th>limit/base</th><th>current</th><th>nistory i</th><th>nistory2</th></td<>	SAMPLE INFURI		method	limit/base	current	nistory i	nistory2
Machine Age hrs Client Info 17571 17571 17571 17571 17571 Oil Age hrs Client Info N/A N/A N/A Sample Status I Imit Dot ABNORMAL ABNORMAL ABNORMAL ABNORMAL CONTAMINATION method Imit Dots current history fibrory Fuel WC Method >0.2 NEG NEG NEG Wetar Imit Dots fibrory Sibrory Reg NEG Sibrory Iron ppm ASTM D5185n >80 36 69 29 Chromium ppm ASTM D5185n >2 <1	Sample Number		Client Info		GFL0097503	GFL0097470	GFL0015792
Oil Age hrs Client Info 17571 17571 17571 17571 17571 Oil Changed Client Info NA N/A N/A N/A Sample Status Imit Date Limit Date Current history1 history2 Fuel WC Method >5 <1.0	Sample Date		Client Info		01 Mar 2024	08 Dec 2023	28 Jun 2023
Oil Changed Client Info N/A N/A N/A N/A Sample Status r ref ABNORMAL ABNORMAL ABNORMAL ABNORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0	Machine Age	hrs	Client Info		17571	17571	
Oli Changed Client Info N/A N/A N/A N/A Sample Status Image Status Image Status Image Status ABNORMAL ABNORMAL ABNORMAL ABNORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >0.2 NEG NEG NEG Water ppm ASTM D5185m >80 36 69 29 Chromium ppm ASTM D5185m >5 6 5 Nickel ppm ASTM D5185m >3 0 0 1 Aluminum ppm ASTM D5185m >30 6 5 9 Lead ppm ASTM D5185m >30 6 6 7 Adminum ppm ASTM D5185m >30 6 6 7 Lead ppm ASTM D5185m >5 0 0 2 2 Adminum ppm ASTM D5185m 0	Oil Age	hrs	Client Info		17571	17571	17571
Sample Status ABNORMAL ABNORMAL ABNORMAL ABNORMAL ABNORMAL ABNORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0	-				N/A	N/A	N/A
Fuel WC Method >5 <1.0 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG Wear WC Method >0.2 NEG NEG NEG NEG Wear ppm ASTM D5185m >80 36 69 29 Chromium ppm ASTM D5185m >2 <1 2 2 Nickel ppm ASTM D5185m >2 <1 2 2 Auminum ppm ASTM D5185m >3 0 0 1 1 Auminum ppm ASTM D5185m >30 3 6 2 2 Lead ppm ASTM D5185m >5 0 0 2 2 Vanadium ppm ASTM D5185m 0 0 0 2 2 ADDITIVES method limit/base current history1 history2 Barium ppm ASTM D5185m	-				ABNORMAL	ABNORMAL	ABNORMAL
Fuel WC Method >5 <1.0			mothod	limit/booo	ourropt	historyd	history
Water WC Method >0.2 NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >5 5 6 5 Nickel ppm ASTM D5185m >2 <1 2 2 Titanium ppm ASTM D5185m >3 0 1 2 Silver ppm ASTM D5185m >30 6 5 9 Lead ppm ASTM D5185m >30 3 3 6 Copper ppm ASTM D5185m >5 0 0 2 Vanadium ppm ASTM D5185m >5 0 0 2 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 61 23 9 Barium ppm ASTM D5185m 0 <1 19 0							
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >80 36 69 29 Chromium ppm ASTM D5185m >5 5 6 5 Nickel ppm ASTM D5185m >2 <1							
Iron ppm ASTM D5185m >80 36 69 29 Chromium ppm ASTM D5185m >5 5 6 5 Nickel ppm ASTM D5185m >2 <1	Water		WC Method	>0.2	NEG	NEG	NEG
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Chromium ppm ASTM D5185m >5 5 6 5 Nickel ppm ASTM D5185m >2 <1	Iron	ppm	ASTM D5185m	>80	36	69	29
Titanium ppm ASTM D5185m 0 <1 2 Silver ppm ASTM D5185m >3 0 0 1 Aluminum ppm ASTM D5185m >30 6 5 9 Lead ppm ASTM D5185m >30 3 3 6 Copper ppm ASTM D5185m >150 6 4 6 Tin ppm ASTM D5185m >5 0 0 2 Vanadium ppm ASTM D5185m 0 0 2 0 Cadmium ppm ASTM D5185m 0 61 23 9 Boron ppm ASTM D5185m 0 <1	Chromium		ASTM D5185m	>5	5	6	5
Silver ppm ASTM D5185m >30 0 0 1 Aluminum ppm ASTM D5185m >30 6 5 9 Lead ppm ASTM D5185m >30 3 3 6 Copper ppm ASTM D5185m >150 6 4 6 Tin ppm ASTM D5185m >5 0 0 2 Vanadium ppm ASTM D5185m 0 0 2 2 Vanadium ppm ASTM D5185m 0 0 0 2 2 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 <1 0 19 Molybdenum ppm ASTM D5185m 0 <1 1 3 Magnesium ppm ASTM D5185m 1010 993 916 846 Calcium ppm ASTM D5185m 1070 1170	Nickel	ppm	ASTM D5185m	>2	<1	2	2
Silver ppm ASTM D5185m >3 0 0 1 Aluminum ppm ASTM D5185m >30 6 5 9 Lead ppm ASTM D5185m >30 3 3 6 Copper ppm ASTM D5185m >150 6 4 6 7 Tin ppm ASTM D5185m >5 0 0 2 2 Vanadium ppm ASTM D5185m >5 0 0 2 Cadmium ppm ASTM D5185m 0 0 2 2 Boron ppm ASTM D5185m 0 61 2.3 9 Barium ppm ASTM D5185m 0 <1 0 19 Molybdenum ppm ASTM D5185m 0.0 <1 0 19 Magnesium ppm ASTM D5185m 1010 993 916 846 Calcium ppm ASTM D5185m 1070 1170 1126 1161 Phosphorus ppm ASTM D5185m 1	Titanium		ASTM D5185m		0	<1	2
Aluminum ppm ASTM D5185m >30 6 5 9 Lead ppm ASTM D5185m >30 3 3 6 Copper ppm ASTM D5185m >150 6 4 6 Tin ppm ASTM D5185m >5 0 0 2 Vanadium ppm ASTM D5185m <1	Silver			>3	0	0	1
Lead ppm ASTM D5185m >30 3 3 6 Copper ppm ASTM D5185m >150 6 4 6 Tin ppm ASTM D5185m >5 0 0 2 Vanadium ppm ASTM D5185m >5 0 0 2 Vanadium ppm ASTM D5185m 0 0 2 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 61 23 9 Barium ppm ASTM D5185m 0 <11	Aluminum		ASTM D5185m	>30	6	5	9
Copper ppm ASTM D5185m >150 6 4 6 Tin ppm ASTM D5185m >5 0 0 2 Vanadium ppm ASTM D5185m <	Lead		ASTM D5185m	>30	3	3	6
Vanadium ppm ASTM D5185m	Copper	ppm	ASTM D5185m	>150	6	4	6
Cadmium ppm ASTM D5185m 0 0 2 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 61 23 9 Barium ppm ASTM D5185m 0 <1 0 19 Molybdenum ppm ASTM D5185m 0 <1 0 19 Magnesium ppm ASTM D5185m 0 <1 0 19 Magnesium ppm ASTM D5185m 0 <1 <1 3 Magnesium ppm ASTM D5185m 1010 993 916 846 Calcium ppm ASTM D5185m 1070 1170 1126 1161 Phosphorus ppm ASTM D5185m 1270 1228 1289 1088 Sulfur ppm ASTM D5185m 2060 3083 2482 3299 CONTAMINANTS method <thimit base<="" th=""> current <t< td=""><td>Tin</td><td>ppm</td><td>ASTM D5185m</td><td>>5</td><th>0</th><td>0</td><td>2</td></t<></thimit>	Tin	ppm	ASTM D5185m	>5	0	0	2
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 61 23 9 Barium ppm ASTM D5185m 0 <1	Vanadium	ppm	ASTM D5185m		<1	<1	1
Boron ppm ASTM D5185m 0 61 23 9 Barium ppm ASTM D5185m 0 <1	Cadmium	ppm	ASTM D5185m		0	0	2
Barium ppm ASTM D5185m 0 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 84 69 60 Manganese ppm ASTM D5185m 0 <1	Boron	ppm	ASTM D5185m	0	61	23	9
Manganese ppm ASTM D5185m 0 <1 <1 3 Magnesium ppm ASTM D5185m 1010 993 916 846 Calcium ppm ASTM D5185m 1070 1170 1126 1161 Phosphorus ppm ASTM D5185m 1070 1044 1031 892 Zinc ppm ASTM D5185m 1270 1228 1289 1088 Sulfur ppm ASTM D5185m 2060 3083 2482 3299 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 15 13 12 Sodium ppm ASTM D5185m >20 26 16 38 Glycol % *ASTM D5185m >20 26 16 38 Glycol % *ASTM D5185m >20 26 16 38 INFRA-RED method limit/base	Barium	ppm	ASTM D5185m	0	<1	0	19
Magnesium ppm ASTM D5185m 1010 993 916 846 Calcium ppm ASTM D5185m 1070 1170 1126 1161 Phosphorus ppm ASTM D5185m 1070 1044 1031 892 Zinc ppm ASTM D5185m 1270 1228 1289 1088 Sulfur ppm ASTM D5185m 2060 3083 2482 3299 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 15 13 12 Sodium ppm ASTM D5185m >20 26 16 38 Glycol % *ASTM D2982 NEG NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 9.1 7.8 9.0 Sulfation Abs/.tmm <td>Molybdenum</td> <td>ppm</td> <td>ASTM D5185m</td> <td>60</td> <th>84</th> <td>69</td> <td>60</td>	Molybdenum	ppm	ASTM D5185m	60	84	69	60
Calcium ppm ASTM D5185m 1070 1170 1126 1161 Phosphorus ppm ASTM D5185m 1150 1044 1031 892 Zinc ppm ASTM D5185m 1270 1228 1289 1088 Sulfur ppm ASTM D5185m 2060 3083 2482 3299 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 15 13 12 Sodium ppm ASTM D5185m >20 15 13 12 Sodium ppm ASTM D5185m >20 26 16 38 Glycol % *ASTM D2982 NEG NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 9.1 7.8 9.0 Sulfation Abs/tim	Manganese	ppm	ASTM D5185m	0	<1	<1	3
Phosphorus ppm ASTM D5185m 1150 1044 1031 892 Zinc ppm ASTM D5185m 1270 1228 1289 1088 Sulfur ppm ASTM D5185m 2060 3083 2482 3299 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 15 13 12 Sodium ppm ASTM D5185m >20 15 33 12 Sodium ppm ASTM D5185m >20 15 13 12 Sodium ppm ASTM D5185m >20 26 16 38 Potassium ppm ASTM D2982 NEG NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.2 0.3 Nitration Abs/cm *ASTM D7624	Magnesium	ppm	ASTM D5185m	1010	993	916	846
ZincppmASTM D5185m1270122812891088SulfurppmASTM D5185m2060308324823299CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>20151312SodiumppmASTM D5185m▲ 551▲ 240▲ 156PotassiumppmASTM D5185m>20261638Glycol%*ASTM D2982NEGNEGNEGINFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>30.20.20.3NitrationAbs/cm*ASTM D7624>209.17.89.0SulfationAbs/.1mm*ASTM D7415>3019.118.520.2FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2	Calcium	ppm	ASTM D5185m	1070	1170	1126	1161
SulfurppmASTM D5185m2060308324823299CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>20151312SodiumppmASTM D5185m>20261638PotassiumppmASTM D5185m>20261638Glycol%*ASTM D2982NEGNEGNEGINFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>30.20.20.3NitrationAbs/cm*ASTM D7844>209.17.89.0SulfationAbs/.1mm*ASTM D7415>3019.118.520.2FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2	Phosphorus	ppm	ASTM D5185m	1150	1044	1031	892
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 15 13 12 Sodium ppm ASTM D5185m >20 15 13 12 Sodium ppm ASTM D5185m >20 26 16 38 Potassium ppm ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 9.1 7.8 9.0 Sulfation Abs/.imm *ASTM D7415 >30 19.1 18.5 20.2	Zinc	ppm	ASTM D5185m	1270	1228	1289	1088
Silicon ppm ASTM D5185m >20 15 13 12 Sodium ppm ASTM D5185m ▲ 551 240 156 Potassium ppm ASTM D5185m >20 26 16 38 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 9.1 7.8 9.0 Sulfation Abs/.1mm *ASTM D7415 >30 19.1 18.5 20.2	Sulfur	ppm	ASTM D5185m	2060	3083	2482	3299
Sodium ppm ASTM D5185m ▲ 551 240 156 Potassium ppm ASTM D5185m >20 26 16 38 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 9.1 7.8 9.0 Sulfation Abs/.tmm *ASTM D7415 >30 19.1 18.5 20.2 FLUID DEGRADATION method limit/base current history1 history2	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 26 16 38 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 9.1 7.8 9.0 Sulfation Abs/.imm *ASTM D7415 >30 19.1 18.5 20.2 FLUID DEGRADATION method limit/base current history1 history2	Silicon	ppm	ASTM D5185m	>20	15	13	12
Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 9.1 7.8 9.0 Sulfation Abs/.tmm *ASTM D7415 >30 19.1 18.5 20.2 FLUID DEGRADATION method limit/base current history1 history2	Sodium	ppm	ASTM D5185m		<u> </u>	<u> </u>	1 56
INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>30.20.20.3NitrationAbs/cm*ASTM D7624>209.17.89.0SulfationAbs/.imm*ASTM D7415>3019.118.520.2FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2	Potassium	ppm	ASTM D5185m	>20	26	16	38
Soot % % *ASTM D7844 >3 0.2 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 9.1 7.8 9.0 Sulfation Abs/.1mm *ASTM D7415 >30 19.1 18.5 20.2 FLUID DEGRADATION method limit/base current history1 history2	Glycol	%	*ASTM D2982		NEG	NEG	NEG
Nitration Abs/cm *ASTM D7624 >20 9.1 7.8 9.0 Sulfation Abs/.1mm *ASTM D7415 >30 19.1 18.5 20.2 FLUID DEGRADATION method limit/base current history1 history2	INFRA-RED		method	limit/base	current	history1	history2
Nitration Abs/cm *ASTM D7624 >20 9.1 7.8 9.0 Sulfation Abs/.1mm *ASTM D7415 >30 19.1 18.5 20.2 FLUID DEGRADATION method limit/base current history1 history2	Soot %	%	*ASTM D7844	>3	0.2	0.2	0.3
Sulfation Abs/.1mm *ASTM D7415 >30 19.1 18.5 20.2 FLUID DEGRADATION method limit/base current history1 history2		Abs/cm	*ASTM D7624	>20			9.0
	FLUID DEGRAD	DATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 9.8 14.1 10.6 10.0							



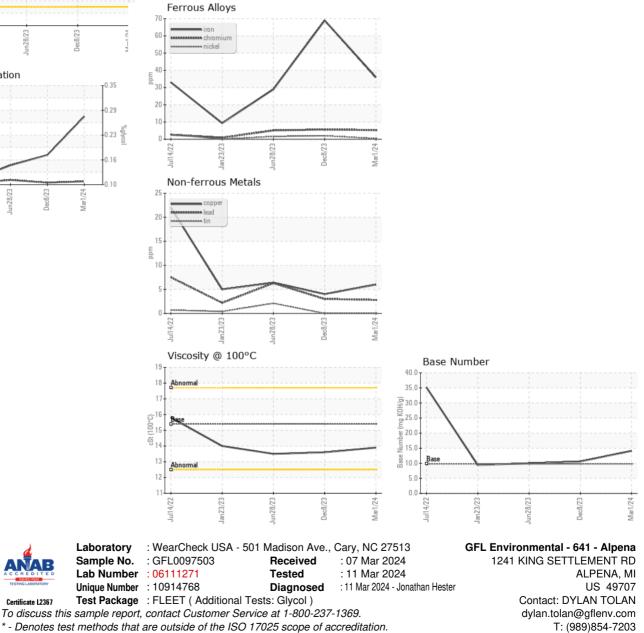
OIL ANALYSIS REPORT







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	RTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.9	13.6	13.5
GRAPHS						



Certificate L2367

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

F: