

OIL ANALYSIS REPORT

Sample Rating Trend



721033-310086

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.

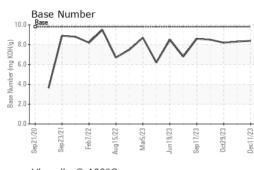
Fluid Condition

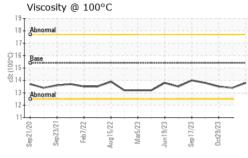
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Machine Age hrs Client Info 7810 7567 7506 Oil Age hrs Client Info 0 0 0 Oil Changed Client Info N/A N/A N/A	GAL)		ep2020 Sep2	021 Feb2022 Aug2022	Mar2023 Jun2023 Sep2023 Oct2	023 Dec202:	
Sample Date Client Info 11 De 2023 19 Nov 2023 29 Oct 2023 Machine Age hrs Client Info 7810 7567 7506 Oil Age hrs Client Info 0 0 0 0 Oil Changed Client Info N/A N/A N/A N/A N/A Sample Status Client Info N/A N/A N/A N/A N/A CONTAMINATION method limit/base current history! history! history! Fuel WC Method >5 <1.0	SAMPLE INFOF	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 7810 7567 7506 Oil Age hrs Client Info 0 0 0 Oil Age Krs Client Info N/A N/A N/A Sample Status 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 >0.2 NEG NEG NEG Otromium ppm ASTM D5185m >100 6 15 9 Chromium ppm ASTM D5185m >20 21 1 <1 0 Nickel ppm ASTM D5185m >20 2 8 5 ASTM D5185m >20 2 8 5 0 0 0 0 0 0 0	Sample Number		Client Info		GFL0086407	GFL0086397	GFL0086392
Oil Age Inrs Client Info 0 0 0 Oil Changed Client Info N/A N/A N/A N/A Sample Status Imit/base Imit/base Imit/base Initional Initional CONTAMINATION method Imit/base Imit/base Imit/base Initional Fuel WC Method S0.2 NEG NEG NEG Water WC Method S0.2 NEG NEG NEG Water WC Method S0.2 NEG NEG NEG Tron ppm ASTM D5185m >100 6 15 9 Chromium ppm ASTM D5185m >20 <1 1 1 1 Nickel ppm ASTM D5185m >30 <1 0 0 Silver ppm ASTM D5185m >40 <1 <1 0 Copper ppm ASTM D5185m >41 <1 0 0 V	Sample Date		Client Info		11 Dec 2023	19 Nov 2023	29 Oct 2023
Oli Changed Client Info N/A N/A N/A N/A Sample Status MorpMAL NORMAL NORMAL NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5.2 <1.0	Machine Age	hrs	Client Info		7810	7567	7506
Sample Status NORMAL NORMAL NORMAL NORMAL NORMAL 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 >0.2 NEG NEG NEG WeAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 6 15 9 Chromium ppm ASTM D5185m >20 <1 1 0 Nockel ppm ASTM D5185m >4 <1 <1 0 Auminum ppm ASTM D5185m >40 <1 <1 0 Copper ppm ASTM D5185m >330 <1 1 1 1 Tin ppm ASTM D5185m >6 2 7 7 <	Oil Age	hrs	Client Info		0	0	0
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 WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 6 15 9 Chromium ppm ASTM D5185m >20 <1 1 <1 0 Silver ppm ASTM D5185m >3 0 <1 0 0 Aluminum ppm ASTM D5185m >30 <1 1 1 1 1 Tin ppm ASTM D5185m >30 <1 1 1 0 Vanadium ppm ASTM D5185m 0 0 0 0 Addennium ppm ASTM D5185m 0 2 <th>Oil Changed</th> <th></th> <th>Client Info</th> <th></th> <th>N/A</th> <th>N/A</th> <th>N/A</th>	Oil Changed		Client Info		N/A	N/A	N/A
Fuel WC Method >5 <1.0	Sample Status				NORMAL	NORMAL	NORMAL
Water WC Method >0.2 NEG NEG NEG Glycol WC Method Imit/base current history1 history2 Iron ppm ASTM D5185m >100 6 15 9 Chromium ppm ASTM D5185m >20 <1 1 <1 0 Nickel ppm ASTM D5185m >4 <1 <1 0 0 Silver ppm ASTM D5185m >3 0 <1 0 0 Aluminum ppm ASTM D5185m >20 2 8 5 Lead ppm ASTM D5185m >30 <1 1 1 Tin ppm ASTM D5185m >40 <1 <1 0 Vanadium ppm ASTM D5185m >5 <1 <1 0 ADDITVES method Imit/base current History1 History2 Boron ppm ASTM D5185m 0 <	CONTAMINA	ION	method	limit/base	current	history1	history2
Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >20 <1 1 <1 Nickel ppm ASTM D5185m >20 <1 1 <1 Nickel ppm ASTM D5185m >4 <1 <1 0 Aluminum ppm ASTM D5185m >3 0 <1 0 Aluminum ppm ASTM D5185m >20 2 8 5 Lead ppm ASTM D5185m >20 2 8 5 Lead ppm ASTM D5185m >15 <1 1 0 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 11 9 0 Manganesium ppm ASTM D5185m 0 21 <1 <1 <1	Fuel		WC Method	>5	<1.0	<1.0	<1.0
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Chromium ppm ASTM D5185m >20 <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >4 <1	Iron	ppm	ASTM D5185m	>100	6	15	9
Titanium ppm ASTM D5185m <1	Chromium	ppm	ASTM D5185m	>20	<1	1	<1
Silver ppm ASTM D5185m >3 0 <1	Nickel	ppm	ASTM D5185m	>4	<1	<1	0
Aluminum ppm ASTM D5185m >20 2 8 5 Lead ppm ASTM D5185m >40 <1 <1 0 Copper ppm ASTM D5185m >330 <1 1 1 Tin ppm ASTM D5185m >15 <1 <1 0 Vanadium ppm ASTM D5185m >15 <1 <1 0 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 2 7 7 Boron ppm ASTM D5185m 0 2 7 7 Barium ppm ASTM D5185m 0 11 9 0 Molybdenum ppm ASTM D5185m 0 <1 <1 <1 <1 Magnanese ppm ASTM D5185m 1010 898 1048 838 Calcium ppm ASTM D5185m 1070 1039 <th>Titanium</th> <th>ppm</th> <th>ASTM D5185m</th> <th></th> <th><1</th> <th><1</th> <th>0</th>	Titanium	ppm	ASTM D5185m		<1	<1	0
Lead ppm ASTM D5185m >40 <1	Silver	ppm	ASTM D5185m	>3	0	<1	0
Copper ppm ASTM D5185m >330 <1	Aluminum	ppm	ASTM D5185m	>20	2	8	5
Tin ppm ASTM D5185m >15 <1	Lead	ppm	ASTM D5185m	>40	<1	<1	0
Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m <1 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 2 7 7 Barium ppm ASTM D5185m 0 11 9 0 Molybdenum ppm ASTM D5185m 0 11 9 0 Magnesium ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 898 1048 838 Calcium ppm ASTM D5185m 1070 1039 1283 1026 Phosphorus ppm ASTM D5185m 1070 1181 1459 1169 Sulfur ppm ASTM D5185m 2060 3473 4147 2823 CONTAMINANTS method limit/base current	Copper	ppm	ASTM D5185m	>330	<1	1	1
Cadmium ppm ASTM D5185m <1	Tin	ppm	ASTM D5185m	>15	<1	<1	0
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 2 7 7 Barium ppm ASTM D5185m 0 11 9 0 Molybdenum ppm ASTM D5185m 60 62 79 60 Magnesium ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 898 1048 838 Calcium ppm ASTM D5185m 1010 898 1048 838 Calcium ppm ASTM D5185m 1070 1039 1283 1026 Phosphorus ppm ASTM D5185m 1270 1181 1459 1169 Sulfur ppm ASTM D5185m 2060 3473 4147 2823 CONTAMINANTS method limit/base current history1 history2 Solium ppm ASTM D5185m	Vanadium	ppm	ASTM D5185m		0	0	0
Boron ppm ASTM D5185m 0 2 7 7 Barium ppm ASTM D5185m 0 11 9 0 Molybdenum ppm ASTM D5185m 60 62 79 60 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 898 1048 838 Calcium ppm ASTM D5185m 1010 898 1048 838 Calcium ppm ASTM D5185m 1070 1039 1283 1026 Phosphorus ppm ASTM D5185m 1570 956 1188 980 Zinc ppm ASTM D5185m 1270 1181 1459 1169 Sulfur ppm ASTM D5185m 2060 3473 4147 2823 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m	Cadmium	ppm	ASTM D5185m		<1	<1	0
Barium ppm ASTM D5185m 0 11 9 0 Molybdenum ppm ASTM D5185m 60 62 79 60 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 898 1048 838 Calcium ppm ASTM D5185m 1070 1039 1283 1026 Phosphorus ppm ASTM D5185m 1070 1181 1459 1169 Sulfur ppm ASTM D5185m 1270 1181 1459 1169 Sulfur ppm ASTM D5185m 2060 3473 4147 2823 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 4 12 7 INFRA-RED method limit/base <th>ADDITIVES</th> <th></th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 62 79 60 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 898 1048 838 Calcium ppm ASTM D5185m 1070 1039 1283 1026 Phosphorus ppm ASTM D5185m 1070 1039 1283 1026 Phosphorus ppm ASTM D5185m 1070 1039 1283 1026 Sulfur ppm ASTM D5185m 1270 1181 1459 1169 Sulfur ppm ASTM D5185m 2060 3473 4147 2823 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 4 12 7 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM	Boron	ppm	ASTM D5185m	0			7
Manganese ppm ASTM D5185m 0 <1	Barium	ppm	ASTM D5185m	0	11	9	0
Magnesium ppm ASTM D5185m 1010 898 1048 838 Calcium ppm ASTM D5185m 1070 1039 1283 1026 Phosphorus ppm ASTM D5185m 1150 956 1188 980 Zinc ppm ASTM D5185m 1270 1181 1459 1169 Sulfur ppm ASTM D5185m 2060 3473 4147 2823 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 9 6 Sodium ppm ASTM D5185m >20 4 12 7 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.7 0.6 Nitration Abs/.1mm *ASTM D7844 >3 0.4 0.7 9.7 8.8 Sulfation Abs/.1mm	Molybdenum	ppm	ASTM D5185m		62	79	60
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Zinc ppm ASTM D5185m 1270 1181 1459 1169 Sulfur ppm ASTM D5185m 2060 3473 4147 2823 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 9 6 Sodium ppm ASTM D5185m >25 4 9 6 Sodium ppm ASTM D5185m >20 4 12 7 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.7 0.6 Nitration Abs/cm *ASTM D7624 >20 7.2 9.7 8.8 Sulfation Abs/.1mm *ASTM D7615 >30 18.3 19.9 19.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 <th>Calcium</th> <th>ppm</th> <th>ASTM D5185m</th> <th>1070</th> <th></th> <th>1283</th> <th></th>	Calcium	ppm	ASTM D5185m	1070		1283	
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CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m<>25496SodiumppmASTM D5185m285PotassiumppmASTM D5185m204127INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>30.40.70.6NitrationAbs/cm*ASTM D7624>207.29.78.8SulfationAbs/lmm*ASTM D7615>3018.319.919.6FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2514.215.815.2	-	ppm			1181		
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Sodium ppm ASTM D5185m 2 8 5 Potassium ppm ASTM D5185m >20 4 12 7 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.7 0.6 Nitration Abs/cm *ASTM D7624 >20 7.2 9.7 8.8 Sulfation Abs/.1mm *ASTM D7415 >30 18.3 19.9 19.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 15.8 15.2		NTS					
Potassium ppm ASTM D5185m >20 4 12 7 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.7 0.6 Nitration Abs/cm *ASTM D7624 >20 7.2 9.7 8.8 Sulfation Abs/.1mm *ASTM D7415 >30 18.3 19.9 19.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 15.8 15.2				>25			
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.4 0.7 0.6 Nitration Abs/cm *ASTM D7624 >20 7.2 9.7 8.8 Sulfation Abs/.tmm *ASTM D7615 >30 18.3 19.9 19.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.tmm *ASTM D7414 >25 14.2 15.8 15.2							
Soot % % *ASTM D7844 >3 0.4 0.7 0.6 Nitration Abs/cm *ASTM D7624 >20 7.2 9.7 8.8 Sulfation Abs/.1mm *ASTM D7415 >30 18.3 19.9 19.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 15.8 15.2		ppm					
Nitration Abs/cm *ASTM D7624 >20 7.2 9.7 8.8 Sulfation Abs/.1mm *ASTM D7615 >30 18.3 19.9 19.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 15.8 15.2						· · · · · · · · · · · · · · · · · · ·	
Sulfation Abs/.1mm *ASTM D7415 >30 18.3 19.9 19.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 15.8 15.2							
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 15.8 15.2							
Oxidation Abs/.1mm *ASTM D7414 >25 14.2 15.8 15.2				>30	18.3	19.9	19.6
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 9.8 8.4 8.3 8.2				>25			
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.4	8.3	8.2

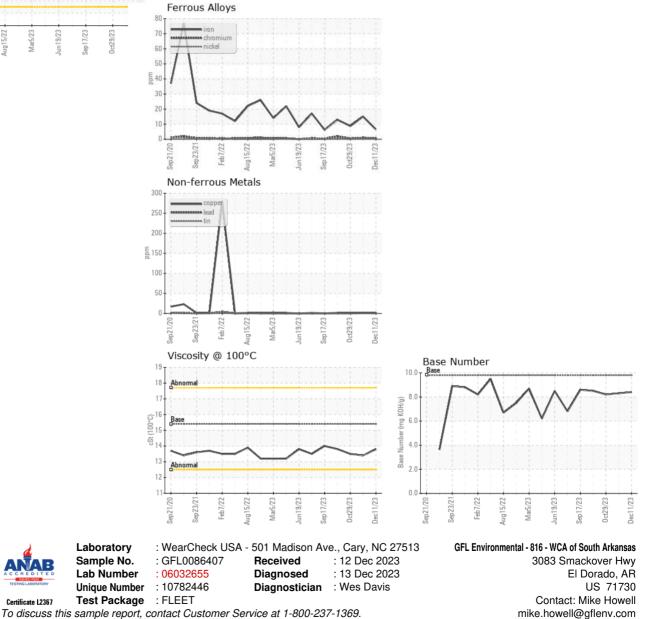


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VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*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	13.8	13.4	13.5
GRAPHS						





* - 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)

Т:

F:

Certificate L2367