

OIL ANALYSIS REPORT

Sample Rating Trend





Component Diesel Engine Fluid

PETRO CANADA DURON SHP 15W40 (9 GAL)





ct2020 May2021 Sep2021 Jan2022 Jun2022 Oct2022 May2023

I to monitor. Sample Date Client Info 23 Oct 2023 06 Apr 2023 03 Mar 2023 Machine Age hrs Client Info 12280 11826 11594 Initiation in the Client Info 454 222 300 Oil Age hrs Client Info Not Changd Not Changd N/A Sample Status Imathod Imathod Not Changd N/A NORMAL NORMAL </th <th></th> <th></th> <th></th> <th>ct2020 Ma</th> <th>y2021 Sep2021 Jan21</th> <th>022 Jun2022 Oct2022 N</th> <th>lar2023</th> <th></th>				ct2020 Ma	y2021 Sep2021 Jan21	022 Jun2022 Oct2022 N	lar2023	
It omonitor. Sample Date Client Info 23 Oct 2023 06 Apr 2023 03 Mar 2023 Machine Age hrs Client Info 12280 11826 11594 In Age hrs Client Info 454 222 300 Oil Age hrs Client Info Not Changd Not Changd N/A NorthMill Sample Status Immittoase current history1 history2 Suitable Glycol WC Method >3.0 <1.0		SAMPLE INFOR	MATION		limit/base	current		, , , , , , , , , , , , , , , , , , ,
Machine Age hrs Client Info 12280 11826 11594 In Algo No Age No 232 300 In ation in the Sample Status No Changd No Changd No Changd No Changd suitable notion of the Sample Status WC Method >3.0 <1.0				Client Info				PCA0090436
Oil Age hrs Client Info 454 232 300 ination in the Oil Changed Client Info Not Changed Not Cha	I to monitor.			Client Info				03 Mar 2023
Oil Changed Client Info Not Changd NA sample Status Imathon NORMAL NORMAL NORMAL Sample Status Imathon Imit/base current history1 history2 Fuel WC Method >3.0 <1.0		•	hrs	Client Info		12280		
Sample Status NORMAL NORMAL NORMAL NORMAL Suitable Indition of the CONTAMINATION method imit/base current history1 history2 Fuel WC Method >3.0 <1.0		-	hrs	Client Info		454	232	300
CONTAMINATION method limit/base current history1 suitable indition of the Fuel WC Method >3.0 <1.0		Oil Changed		Client Info		Not Changd	Not Changd	N/A
Suitable Indition of the Fuel WC Method >3.0 <1.0 <1.0 <1.0 <1.0 Glycol WC Method WC Method NEG NEG NEG Iron ppm ASTM D585m >120 18 25 14 Chromium ppm ASTM D585m >20 <1	nation in the	Sample Status				NORMAL	NORMAL	NORMAL
Suitable indition of the midition of the midition of the Glycol WC Method NEG NEG NEG Iron ppm ASTM D5185m<>120 18 25 14 Chromium ppm ASTM D5185m<>20 -1 -1 -1 Nickel ppm ASTM D5185m >20 -1 -1 -1 Nickel ppm ASTM D5185m >2 -1 0 -1 Nickel ppm ASTM D5185m >2 -1 0 0 Aluminum ppm ASTM D5185m >2 -1 0 0 Aluminum ppm ASTM D5185m >4 3 3 -1 1 1 Tin ppm ASTM D5185m >15 -1 0 0 0 Cadmium ppm ASTM D5185m 0 2 0 3 Barium ppm ASTM D5185m 0 4 0 0 Molybdenum ppm ASTM D5185m		CONTAMINAT	ION	method	limit/base	current	history1	history2
Addition of the Glycol WC Method NEG NEG NEG NEG Iron ppm ASTM D5185m >120 18 25 14 Chromium ppm ASTM D5185m >20 -1 -1 -1 Nickel ppm ASTM D5185m >2 -1 0 -0 Silver ppm ASTM D5185m >2 -1 0 0 Aluminum ppm ASTM D5185m >2 -1 0 0 Silver ppm ASTM D5185m >20 4 3 3 Lead ppm ASTM D5185m >330 13 -1 1 Tin ppm ASTM D5185m >15 <1	suitable	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
Iron ppm ASTM D5185m >120 18 25 14 Chromium ppm ASTM D5185m >20 <1		Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 <1 <1 <1 Nickel ppm ASTM D5185m >5 <1		WEAR METAL	.S	method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >5 <1 0 <1 Titanium ppm ASTM D5185m >2 <1		Iron	ppm	ASTM D5185m	>120	18	25	14
Titanium ppm ASTM D5185m >2 <1 0 0 Silver ppm ASTM D5185m >2 <1		Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Silver ppm ASTM D5165m >2 <1 0 0 Aluminum ppm ASTM D5185m >20 4 3 3 Lead ppm ASTM D5185m >330 13 <1		Nickel	ppm	ASTM D5185m	>5	<1	0	<1
Aluminum ppm ASTM D5185m >20 4 3 3 Lead ppm ASTM D5185m >40 <1		Titanium	ppm	ASTM D5185m	>2	<1	0	0
Lead ppm ASTM D5185m >40 <1 0 0 Copper ppm ASTM D5185m >330 13 <1		Silver	ppm	ASTM D5185m	>2	<1	0	0
Copper ppm ASTM D5185m >330 13 <1 1 Tin ppm ASTM D5185m >15 <1		Aluminum	ppm	ASTM D5185m	>20	4	3	3
Tin ppm ASTM D5185m >12.5 <1 0 <1 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m <1		Lead	ppm	ASTM D5185m	>40	<1	0	0
Tin ppm ASTM D5185m >15 <1 0 <1 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m <1		Copper	ppm	ASTM D5185m	>330	13	<1	1
Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m <1				ASTM D5185m	>15	<1		<1
Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 2 0 3 Barium ppm ASTM D5185m 0 4 0 0 Molybdenum ppm ASTM D5185m 0 41 1 <1		Vanadium		ASTM D5185m			0	0
Boron ppm ASTM D5185m 0 2 0 3 Barium ppm ASTM D5185m 0 4 0 0 Molybdenum ppm ASTM D5185m 60 66 59 60 Manganese ppm ASTM D5185m 0 <1		Cadmium		ASTM D5185m		<1		0
Barium ppm ASTM D5185m 0 4 0 0 Molybdenum ppm ASTM D5185m 60 66 59 60 Manganese ppm ASTM D5185m 0 <1		ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 66 59 60 Manganese ppm ASTM D5185m 0 <1		Boron	ppm	ASTM D5185m	0	2	0	3
Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 907 956 930 Calcium ppm ASTM D5185m 1070 1070 1069 1046 Phosphorus ppm ASTM D5185m 1150 1057 999 1015 Zinc ppm ASTM D5185m 1270 1189 1264 1260 Sulfur ppm ASTM D5185m 2060 3204 3275 3716 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 3 4 Sodium ppm ASTM D5185m >20 4 0 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 8.1 10.2 8.4 Sulfation Abs/:m *ASTM D7624		Barium	ppm	ASTM D5185m	0	4	0	0
Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 907 956 930 Calcium ppm ASTM D5185m 1070 1070 1069 1046 Phosphorus ppm ASTM D5185m 1150 1057 999 1015 Zinc ppm ASTM D5185m 1270 1189 1264 1260 Sulfur ppm ASTM D5185m 2060 3204 3275 3716 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 3 4 Sodium ppm ASTM D5185m >20 4 0 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 1 1.8 1.3 Nitration Abs/m *ASTM D7844		Molybdenum	ppm	ASTM D5185m	60	66	59	60
Magnesium ppm ASTM D5185m 1010 907 956 930 Calcium ppm ASTM D5185m 1070 1069 1046 Phosphorus ppm ASTM D5185m 1150 1057 999 1015 Zinc ppm ASTM D5185m 1270 1189 1264 1260 Sulfur ppm ASTM D5185m 2060 3204 3275 3716 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 3 4 Sodium ppm ASTM D5185m >20 4 0 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 1 1.8 1.3 Nitration Abs/cm *ASTM D7745 >30 19.3 21.3 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *AST			ppm	ASTM D5185m	0	<1	<1	<1
Calcium ppm ASTM D5185m 1070 1070 1069 1046 Phosphorus ppm ASTM D5185m 1150 1057 999 1015 Zinc ppm ASTM D5185m 1270 1189 1264 1260 Sulfur ppm ASTM D5185m 2060 3204 3275 3716 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 3 4 Sodium ppm ASTM D5185m >25 8 3 4 Sodium ppm ASTM D5185m >20 4 0 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 1 1.8 1.3 Nitration Abs/.tmm *ASTM D7624 >20 8.1 10.2 8.4 Sulfation Abs/.tmm *ASTM D7615		Magnesium	ppm	ASTM D5185m	1010	907	956	930
Phosphorus ppm ASTM D5185m 1150 1057 999 1015 Zinc ppm ASTM D5185m 1270 1189 1264 1260 Sulfur ppm ASTM D5185m 2060 3204 3275 3716 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 3 4 Sodium ppm ASTM D5185m >25 8 3 4 Sodium ppm ASTM D5185m >20 4 0 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 8.1 1.0.2 8.4 Sulfation Abs/cm *ASTM D7414 >30 19.3 21.3 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 </td <td>Calcium</td> <td></td> <td>ASTM D5185m</td> <td>1070</td> <td>1070</td> <td>1069</td> <td>1046</td>		Calcium		ASTM D5185m	1070	1070	1069	1046
Zinc ppm ASTM D5185m 1270 1189 1264 1260 Sulfur ppm ASTM D5185m 2060 3204 3275 3716 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 3 4 Sodium ppm ASTM D5185m >25 8 3 4 Sodium ppm ASTM D5185m >20 4 0 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 1 1.8 1.3 Nitration Abs/cm *ASTM D7624 >20 8.1 10.2 8.4 Sulfation Abs/.imm *ASTM D7415 >30 19.3 21.3 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.imm< *ASTM D7414		Phosphorus		ASTM D5185m	1150		999	1015
SulfurppmASTM D5185m2060320432753716CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25834SodiumppmASTM D5185m>20836PotassiumppmASTM D5185m>20401INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>411.81.3NitrationAbs/cm*ASTM D7624>208.110.28.4SulfationAbs/.imm*ASTM D7415>3019.321.319.0FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.imm*ASTM D7414>2514.214.813.1		Zinc		ASTM D5185m	1270	1189	1264	1260
Silicon ppm ASTM D5185m >25 8 3 4 Sodium ppm ASTM D5185m >20 3 7 6 Potassium ppm ASTM D5185m >20 4 0 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 1 1.8 1.3 Nitration Abs/cm *ASTM D7624 >20 8.1 10.2 8.4 Sulfation Abs/.imm *ASTM D7415 >30 19.3 21.3 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.imm *ASTM D7414 >25 14.2 14.8 13.1		Sulfur				3204	3275	3716
Sodium ppm ASTM D5185m 3 7 6 Potassium ppm ASTM D5185m >20 4 0 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 1 1.8 1.3 Nitration Abs/cm *ASTM D7624 >20 8.1 10.2 8.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.3 21.3 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 14.8 13.1		CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 4 0 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 1 1.8 1.3 Nitration Abs/cm *ASTM D7624 >20 8.1 10.2 8.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.3 21.3 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 14.8 13.1		Silicon	ppm	ASTM D5185m	>25	8	3	4
Potassium ppm ASTM D5185m >20 4 0 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 1 1.8 1.3 Nitration Abs/cm *ASTM D7624 >20 8.1 10.2 8.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.3 21.3 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 14.8 13.1		Sodium		ASTM D5185m		3	7	6
Soot % % *ASTM D7844 >4 1 1.8 1.3 Nitration Abs/cm *ASTM D7624 >20 8.1 10.2 8.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.3 21.3 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 14.8 13.1		Potassium		ASTM D5185m	>20	4	0	1
Nitration Abs/cm *ASTM D7624 >20 8.1 10.2 8.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.3 21.3 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 14.8 13.1		INFRA-RED		method	limit/base	current	history1	history2
Nitration Abs/cm *ASTM D7624 >20 8.1 10.2 8.4 Sulfation Abs/.1mm *ASTM D7415 >30 19.3 21.3 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.2 14.8 13.1		Soot %	%	*ASTM D7844	>4	1	1.8	1.3
SulfationAbs/.1mm*ASTM D7415>3019.321.319.0FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2514.214.813.1								
Oxidation Abs/.1mm *ASTM D7414 >25 14.2 14.8 13.1								
		FLUID DEGRA	DAT <u>IO</u> N	method	limit/base	current	history1	history2
		Oxidation	Abs/.1mm	*ASTM D7414	>25	14.2	14.8	13.1
		Base Number (BN)				8.8	7.5	8.5

Resample at the next service interval to monitor

Wear

All component wear rates are normal.

Contamination

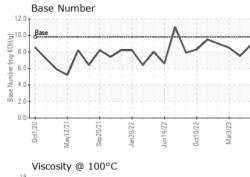
There is no indication of any contamination in the oil.

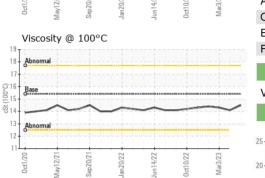
Fluid Condition

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

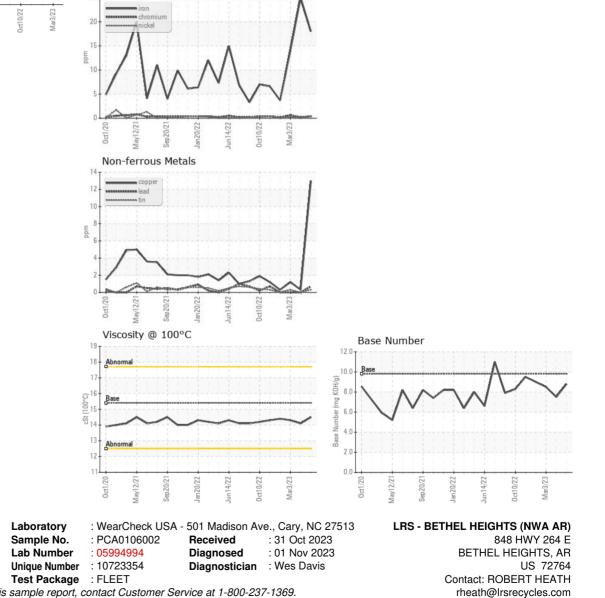


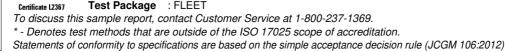
OIL ANALYSIS REPORT





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	14.5	14.1	14.3
GRAPHS						
Ferrous Alloys						





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