

OIL ANALYSIS REPORT

Sample Rating Trend





Component

Diesel Engine

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.

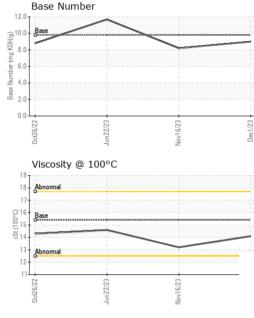
Fluid Condition

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

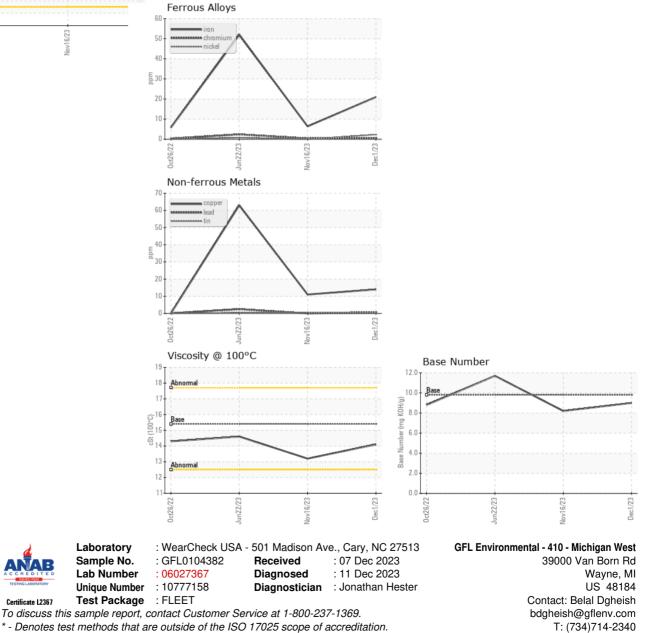
Sample Number Client Info OFL0104382 GFL0104382 GFL0059230 GFL0084892 Sample Date Client Info 01 Dec 2023 16 Nov 2022 22 Jun 2023 Machine Age hrs Client Info 21350 21245 63 Oil Anged Client Info 21350 21245 63 Oil Anged Client Info 21350 21245 63 Oil Age NorMAL NORMAL ABNORMAL Sample Status Interview Client Info Changed Changed Changed GONTAMINATION method >5 <1.0 <1.0 <1.0 Water WC Method >5 <1.0 <1.0 <1.0 Water WC Method >5 <1.0 <1.0 <1.0 Water WC Method >50 <1 <1.0 <1.0 Kiter ppm ASTM05155 >40 <1 0 <1 Kiter ppm ASTM05155 >40 <1 <1	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 21350 21245 22866 Oil Ghanged Client Info 21350 21245 63 Oil Ghanged Client Info 21350 21245 63 Sample Status Imit/base Current NoRMAL ABNORMAL CONTAMINATION method 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 NEG NEG NEG NEG Chromium ppm ASTM D5185m >20 <1 <1 2 Nickel ppm ASTM D5185m >20 2 4 6 Lead ppm ASTM D5185m >20 2 4 6 Auminum ppm ASTM D5185m >30 0 0 0 Auminum ppm ASTM D5185m >30	Sample Number		Client Info		GFL0104382	GFL0059230	GFL0084892
Oil Age Ins Client Info 21350 21245 63 Oil Changed Client Info Changed Changed Changed Sample Status Imit/base current NoRMAL ABNORMAL CONTAMINATION method Imit/base current Nistory1 history1 Fuel WC Method >5 <1.0 <1.0 <1.0 Water WC Method >0.2 REG NEG NEG Water WC Method >0.2 1 6 52 Chromium ppm ASTM D5185m >40 0 <1 Nickel ppm ASTM D5185m >20 <1 <1 2 Nickel ppm ASTM D5185m >3 0 0 <1 0 2 Copper ppm ASTM D5185m >30 14 11 63 3 14 11 63 3 Cadmium ppm ASTM D5185m 0 0 0<	Sample Date		Client Info		01 Dec 2023	16 Nov 2023	22 Jun 2023
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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 NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 21 6 52 Chromium ppm ASTM D5185m >4 2 0 <1 Titanium ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >20 2 4 6 Lead ppm ASTM D5185m >30 <1 11 63 Tin ppm ASTM D5185m 0 <0 <1 <1 Cadmium ppm ASTM D5185m 0 <0 <0 <1 B	Oil Changed		Client Info		Changed	Changed	Changed
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Water WC Method >0.2 NEG NEG NEG NEG Glycol WC Method Imit/base current history1 history2 Iron ppm ASTM D5185m >100 21 6 52 Chromium ppm ASTM D5185m >20 <1 <1 2 Nickel ppm ASTM D5185m >4 2 0 <1 Silver ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >20 2 4 6 Lead ppm ASTM D5185m >20 2 4 6 Lead ppm ASTM D5185m >10 0 0 2 Copper ppm ASTM D5185m 0 21 2 65 Barium ppm ASTM D5185m 0 211 2 65 Barium ppm ASTM D5185m 0 <1 1	CONTAMINAT	ION	method	limit/base	current	history1	history2
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Titanium ppm ASTM D5185m <1	Chromium	ppm	ASTM D5185m	>20	<1	<1	2
Silver ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >20 2 4 6 Lead ppm ASTM D5185m >40 <1	Nickel	ppm	ASTM D5185m	>4	2	0	<1
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Vanadium ppm ASTM D5185m 0 0 <1	Copper	ppm	ASTM D5185m	>330	14	11	63
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 21 2 65 Barium ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 0 current history1 history2 Manganese ppm ASTM D5185m 0 c1 c1 1 Magnesium ppm ASTM D5185m 0 c1 c1 1 Magnesium ppm ASTM D5185m 1010 4322 830 849 Calcium ppm ASTM D5185m 1070 1873 944 1020 Phosphorus ppm ASTM D5185m 1070 1873 944 1020 Sulfur ppm ASTM D5185m 1270 1209 1117 1192 Sulfur ppm ASTM D5185m	Tin	ppm	ASTM D5185m	>15	<1	<1	<1
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Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 56 52 131 Manganese ppm ASTM D5185m 0 <1 <1 1 Magnesium ppm ASTM D5185m 1010 432 830 849 Calcium ppm ASTM D5185m 1010 432 830 849 Calcium ppm ASTM D5185m 1070 1873 944 1020 Phosphorus ppm ASTM D5185m 1070 1873 944 1020 Sulfur ppm ASTM D5185m 1150 1045 923 840 Zinc ppm ASTM D5185m 1270 1209 11117 1192 Sulfur ppm ASTM D5185m 2060 3940 2839 3369 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m </th <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>							
Molybdenum ppm ASTM D5185m 60 56 52 131 Manganese ppm ASTM D5185m 0 <1	ADDITIVES		method	limit/base	current	history1	history2
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Magnesium ppm ASTM D5185m 1010 432 830 849 Calcium ppm ASTM D5185m 1070 1873 944 1020 Phosphorus ppm ASTM D5185m 1150 1045 923 840 Zinc ppm ASTM D5185m 1150 1045 923 840 Zinc ppm ASTM D5185m 1270 1209 1117 1192 Sulfur ppm ASTM D5185m 2060 3940 2839 3369 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 5 ▲ 49 Sodium ppm ASTM D5185m >20 1 6 14 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.2 0.7 Nitration Abs/.1mm *ASTM D7414 </th <th>Boron</th> <th></th> <th>ASTM D5185m</th> <th>0</th> <th>21</th> <th>2</th> <th>65</th>	Boron		ASTM D5185m	0	21	2	65
Calcium ppm ASTM D5185m 1070 1873 944 1020 Phosphorus ppm ASTM D5185m 1150 1045 923 840 Zinc ppm ASTM D5185m 1270 1209 1117 1192 Sulfur ppm ASTM D5185m 2060 3940 2839 3369 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 5 49 Sodium ppm ASTM D5185m >20 1 6 14 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.2 0.7 Nitration Abs/cm *ASTM D7624 >20 5.9 5.3 15.0 Sulfation Abs/.tmm *ASTM D7415 >30 17.9 18.7 24.6 FLUID DEGRADATION method	Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	21 0	2 0	65 0
Phosphorus ppm ASTM D5185m 1150 1045 923 840 Zinc ppm ASTM D5185m 1270 1209 1117 1192 Sulfur ppm ASTM D5185m 2060 3940 2839 3369 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 5 49 Sodium ppm ASTM D5185m >25 6 5 49 Sodium ppm ASTM D5185m >20 1 6 14 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.2 0.7 Nitration Abs/cm<*ASTM D7624 >20 5.9 5.3 15.0 Sulfation Abs/.1mm<*ASTM D7415 >30 17.9 18.7 24.6 FLUID DEGRADATION method limit/base current <th>Boron Barium Molybdenum</th> <th>ppm ppm</th> <th>ASTM D5185m ASTM D5185m ASTM D5185m</th> <th>0 0 60</th> <th>21 0 56</th> <th>2 0 52</th> <th>65 0 131</th>	Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	21 0 56	2 0 52	65 0 131
Zinc ppm ASTM D5185m 1270 1209 1117 1192 Sulfur ppm ASTM D5185m 2060 3940 2839 3369 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 5 49 Sodium ppm ASTM D5185m >20 1 6 14 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.2 0.7 Nitration Abs/cm *ASTM D7624 >20 5.9 5.3 15.0 Sulfation Abs/tmm *ASTM D7415 >30 17.9 18.7 24.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.tmm *ASTM D7414 >25 13.7 14.1 19.2	Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	21 0 56 <1	2 0 52 <1	65 0 131 1
Sulfur ppm ASTM D5185m 2060 3940 2839 3369 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 5 49 Sodium ppm ASTM D5185m >20 1 6 14 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.2 0.7 Nitration Abs/cm *ASTM D7624 >20 5.9 5.3 15.0 Sulfation Abs/.1mm *ASTM D7415 >30 17.9 18.7 24.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.7 14.1 19.2	Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	21 0 56 <1 432	2 0 52 <1 830	65 0 131 1 849
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Silicon ppm ASTM D5185m >25 6 5 49 Sodium ppm ASTM D5185m 0 3 1888 Potassium ppm ASTM D5185m >20 1 6 14 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.2 0.7 Nitration Abs/cm *ASTM D7624 >20 5.9 5.3 15.0 Sulfation Abs/.tmm *ASTM D7415 >30 17.9 18.7 24.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.tmm *ASTM D7414 >25 13.7 14.1 19.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	21 0 56 <1 432 1873 1045	2 0 52 <1 830 944 923 1117	65 0 131 1 849 1020 840 1192
Sodium ppm ASTM D5185m 0 3 ▲ 1888 Potassium ppm ASTM D5185m<>20 1 6 14 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844<>3 0.1 0.2 0.7 Nitration Abs/cm *ASTM D7624<>20 5.9 5.3 15.0 Sulfation Abs/.1mm *ASTM D7415<>30 17.9 18.7 24.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414<>25 13.7 14.1 19.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270	21 0 56 <1 432 1873 1045 1209	2 0 52 <1 830 944 923 1117	65 0 131 1 849 1020 840 1192
Potassium ppm ASTM D5185m >20 1 6 14 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.2 0.7 Nitration Abs/cm *ASTM D7624 >20 5.9 5.3 15.0 Sulfation Abs/.1mm *ASTM D7415 >30 17.9 18.7 24.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.7 14.1 19.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	21 0 56 <1 432 1873 1045 1209 3940	2 0 52 <1 830 944 923 1117 2839	65 0 131 1 849 1020 840 1192 3369
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.2 0.7 Nitration Abs/cm *ASTM D7624 >20 5.9 5.3 15.0 Sulfation Abs/.1mm *ASTM D7415 >30 17.9 18.7 24.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.7 14.1 19.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	21 0 56 <1 432 1873 1045 1209 3940 current	2 0 52 <1 830 944 923 1117 2839 history1	65 0 131 1 849 1020 840 1192 3369 history2 ▲ 49
Soot % % *ASTM D7844 >3 0.1 0.2 0.7 Nitration Abs/cm *ASTM D7624 >20 5.9 5.3 15.0 Sulfation Abs/.1mm *ASTM D7415 >30 17.9 18.7 24.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.7 14.1 19.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base >25	21 0 56 <1 432 1873 1045 1209 3940 current 6	2 0 52 <1 830 944 923 1117 2839 history1 5 3	65 0 131 1 849 1020 840 1192 3369 history2 ▲ 49 ▲ 1888
Nitration Abs/cm *ASTM D7624 >20 5.9 5.3 15.0 Sulfation Abs/.1mm *ASTM D7415 >30 17.9 18.7 24.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.7 14.1 19.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base >25	21 0 56 <1 432 1873 1045 1209 3940 current 6 0	2 0 52 <1 830 944 923 1117 2839 history1 5 3	65 0 131 1 849 1020 840 1192 3369 history2 ▲ 49 ▲ 1888
Sulfation Abs/.1mm *ASTM D7415 >30 17.9 18.7 24.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.7 14.1 19.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25	21 0 56 <1 432 1873 1045 1209 3940 current 6 0 1 1	2 0 52 <1 830 944 923 1117 2839 history1 5 3 6 kistory1	65 0 131 1 849 1020 840 1192 3369 history2 ▲ 49 ▲ 1888 14 history2
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Oxidation Abs/.1mm *ASTM D7414 >25 13.7 14.1 19.2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base	21 0 56 <1 432 1873 1045 1209 3940 current 6 0 1 1 current 0.1	2 0 52 <1 830 944 923 1117 2839 history1 5 3 6 history1 0.2	65 0 131 1 849 1020 840 1192 3369 history2 ▲ 49 ▲ 1888 14 14 bistory2
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	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >25 imit/base >3 >20	21 0 56 <1 432 1873 1045 1209 3940 <u>current</u> 6 0 1 1 <u>current</u> 0.1 5.9 17.9	2 0 52 <1 830 944 923 1117 2839 history1 5 3 6 <u>history1</u> 0.2 5.3 18.7	 65 0 131 1 849 1020 840 1192 3369 history2 ▲ 49 ▲ 1888 14 history2 0.7 15.0 24.6
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 2060 225 20 220 220 20 33 220 330	21 0 56 <1 432 1873 1045 1209 3940 Current 6 0 1 Current 0.1 5.9 17.9 Current	2 0 52 <1 830 944 923 1117 2839 history1 5 3 6 history1 0.2 5.3 18.7 history1	 65 0 131 1 849 1020 840 1192 3369 history2 ▲ 49 ▲ 1888 14 history2 0.7 15.0 24.6 history2



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	14.1	13.2	14.6
GRAPHS						



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

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