

OIL ANALYSIS REPORT









Machine Id 4647M Component **Diesel Engine**

PETRO CANADA DURON SHP 15W40 (5 GAL)

DIAGNOSIS

Recommendation

We advise that you check the fuel injection system. Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor. (Customer Sample Comment: Resample)

Wear

All component wear rates are normal.

Contamination

There is a moderate amount of fuel present in the

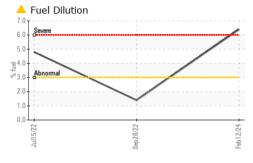
▲ Fluid Condition

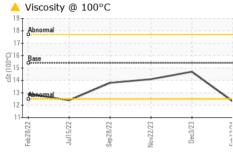
Fuel is present in the oil and is lowering the viscosity. The BN result indicates that there is suitable alkalinity remaining in the oil.

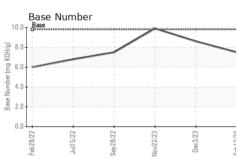
SAMPLE INFORMATION method limit/base current history1 history2	ON SHP 15W40 (5	GAL)	Feb 2022	Jul2022 Sep2022	Nov2023 Dec2023	Feb2024	
Sample Date Client Info 12 Feb 2024 03 Dec 2023 22 Nov 2023 Machine Age hrs Client Info 18493 17959 17870 Oil Age hrs Client Info 534 600 580 Oil Changed Client Info Changed ABNORMAL Changed ABNORMAL ANDRMAL ABNORMAL CONTAMINATION method limit/base current history1 history2 Water WC Method NEG NEG NEG NEG Glycol WC Method NEG NEG NEG NEG WEAR METALS method limi/base current history1 history2 Iron ppm ASTM D5185m >90 10 11 66 Chromium ppm ASTM D5185m >20 <1	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 18493 17959 17870 Oil Age hrs Client Info 534 600 580 Oil Changed Client Info Changed Changed Changed ABNORMAL NORMAL ABNORMAL ABNORMAL CONTAMINATION method limil/base current history1 history2 Water WC Method >0.2 NEG NEG NEG Uron ppm ASTM D5185m >90 10 11 66 Chromium ppm ASTM D5185m >90 10 11 66 Chromium ppm ASTM D5185m >20 -1 0 3 Nickel ppm ASTM D5185m >20 0 0 -1 Aluminum ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5	Sample Number		Client Info		GFL0106700	GFL0097739	GFL0097730
Oil Age hrs Client Info 534 600 580 Oil Changed Sample Status Client Info Changed ABNORMAL Changed Changed ABNORMAL Changed ABNORMAL Changed ABNORMAL Changed ABNORMAL Changed ABNORMAL	Sample Date		Client Info		12 Feb 2024	03 Dec 2023	22 Nov 2023
Oil Changed Sample Status Client Info Changed ABNORMAL ABNORMA	Machine Age	hrs	Client Info		18493	17959	17870
ABNORMAL NORMAL ABNORMAL	Oil Age	hrs	Client Info		534	600	580
CONTAMINATION method limit/base current history1 history2 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 >90 10 11 66 Chromium ppm ASTM D5185m >20 <1 0 3 Nickel ppm ASTM D5185m >2 0 0 <1 Silver ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >20 2 <1 6 Lead ppm ASTM D5185m >20 2 <1 4 Copper ppm ASTM D5185m >40 0 0 0 Copper ppm ASTM D5185m >33.0 <1 <1 2 Tin<	Oil Changed		Client Info		Changed	Changed	Changed
Water WC Method >0.2 NEG NEG NEG Glycol WC Method Imit/base current history1 history2 WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >90 10 11 66 Chromium ppm ASTM D5185m >20 <1	Sample Status				ABNORMAL	NORMAL	ABNORMAL
Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >90 10 11 66 Chromium ppm ASTM D5185m >20 <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >90 10 11 66 Chromium ppm ASTM D5185m >20 <1	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>90	10	11	66
Titanium	Chromium	ppm	ASTM D5185m	>20	<1	0	3
Sliver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >20 2 <1 ▲ 6 Lead ppm ASTM D5185m >40 0 0 0 Copper ppm ASTM D5185m >330 <1 <1 2 Tin ppm ASTM D5185m >15 0 0 0 Vanadium ppm ASTM D5185m >1 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 6 7 3 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 <1 Magnesium ppm ASTM D5185m 1010 888 868	Nickel	ppm	ASTM D5185m	>2	0	0	<1
Aluminum ppm ASTM D5185m >20 2 <1 ▲ 6 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 <1 2 Tin ppm ASTM D5185m >15 0 0 0 Vanadium ppm ASTM D5185m <1 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 6 7 3 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 0 Manganese ppm ASTM D5185m 0 0 0 <1 1 Calcium ppm ASTM D5185m 1070 970 1155 1166 Phosphorus ppm ASTM D5185m 1270	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper ppm ASTM D5185m >330 <1 <1 2 Tin ppm ASTM D5185m >15 0 0 0 Vanadium ppm ASTM D5185m <1	Aluminum	ppm	ASTM D5185m	>20	2	<1	6
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Vanadium ppm ASTM D5185m -1 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 6 7 3 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 Manganese ppm ASTM D5185m 0 0 0 0 <1 Magnesium ppm ASTM D5185m 1010 888 868 1013 Calcium ppm ASTM D5185m 1070 970 1155 1166 Phosphorus ppm ASTM D5185m 1270 1218 1262 1438 Sulfur ppm ASTM D5185m 1270 1218 1262 1438 Sulfur ppm ASTM D5185m 2060 2959	Copper	ppm	ASTM D5185m	>330	<1	<1	2
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 6 7 3 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 51 60 89 Manganese ppm ASTM D5185m 0 0 0 <1	Tin	ppm	ASTM D5185m	>15	0	0	0
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 6 7 3 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 Manganese ppm ASTM D5185m 0 0 0 0 Magnesium ppm ASTM D5185m 1010 888 868 1013 Calcium ppm ASTM D5185m 1070 970 1155 1166 Phosphorus ppm ASTM D5185m 1270 1218 1262 1438 Zinc ppm ASTM D5185m 220 1218 1262 1438 Sulfur ppm ASTM D5185m 2060 2959 3258 3395 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 </td <th>Vanadium</th> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <th><1</th> <td>0</td> <td>0</td>	Vanadium	ppm	ASTM D5185m		<1	0	0
Boron ppm ASTM D5185m 0 6 7 3 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 51 60 89 Manganese ppm ASTM D5185m 0 0 0 <1	Cadmium	ppm	ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 51 60 89 Manganese ppm ASTM D5185m 0 0 0 <1							
Molybdenum ppm ASTM D5185m 60 51 60 89 Manganese ppm ASTM D5185m 0 0 0 <1 Magnesium ppm ASTM D5185m 1010 888 868 1013 Calcium ppm ASTM D5185m 1070 970 1155 1166 Phosphorus ppm ASTM D5185m 1150 1006 1032 1158 Zinc ppm ASTM D5185m 1270 1218 1262 1438 Sulfur ppm ASTM D5185m 2060 2959 3258 3395 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 △ 26 Sodium ppm ASTM D5185m >20 <1 0 6 Fuel % ASTM D5185m >20 <1 0 6 Fuel % ASTM D5185m </td <th>ADDITIVES</th> <td></td> <td>method</td> <td>limit/base</td> <th>current</th> <td>history1</td> <td>history2</td>	ADDITIVES		method	limit/base	current	history1	history2
Manganese ppm ASTM D5185m 0 0 0 <1 Magnesium ppm ASTM D5185m 1010 888 868 1013 Calcium ppm ASTM D5185m 1070 970 1155 1166 Phosphorus ppm ASTM D5185m 1150 1006 1032 1158 Zinc ppm ASTM D5185m 1270 1218 1262 1438 Sulfur ppm ASTM D5185m 2060 2959 3258 3395 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 26 Sodium ppm ASTM D5185m >20 <1 0 6 Fuel % ASTM D5185m >20 <1 0 6 Fuel % ASTM D524 >3.0 6.4 <1.0 <1.0 INFRA-RED method limit/base <		ppm					
Magnesium ppm ASTM D5185m 1010 888 868 1013 Calcium ppm ASTM D5185m 1070 970 1155 1166 Phosphorus ppm ASTM D5185m 1150 1006 1032 1158 Zinc ppm ASTM D5185m 1270 1218 1262 1438 Sulfur ppm ASTM D5185m 2060 2959 3258 3395 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 26 Sodium ppm ASTM D5185m >20 <1 0 6 Fuel % ASTM D5185m >20 <1 0 6 Fuel % ASTM D5185m >20 <1 0 6 Fuel % ASTM D3524 >3.0 6.4 <1.0 <1.0 INFRA-RED method limit/base	Boron		ASTM D5185m	0	6	7	3
Calcium ppm ASTM D5185m 1070 970 1155 1166 Phosphorus ppm ASTM D5185m 1150 1006 1032 1158 Zinc ppm ASTM D5185m 1270 1218 1262 1438 Sulfur ppm ASTM D5185m 2060 2959 3258 3395 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 △ 26 Sodium ppm ASTM D5185m >20 <1	Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	6 0	7	3
Phosphorus ppm ASTM D5185m 1150 1006 1032 1158 Zinc ppm ASTM D5185m 1270 1218 1262 1438 Sulfur ppm ASTM D5185m 2060 2959 3258 3395 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 26 Sodium ppm ASTM D5185m >21 2 4666 Potassium ppm ASTM D5185m >20 <1	Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	6 0 51	7 0 60	3 0 89
Zinc ppm ASTM D5185m 1270 1218 1262 1438 Sulfur ppm ASTM D5185m 2060 2959 3258 3395 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 ▲ 26 Sodium ppm ASTM D5185m >21 2 ▲ 466 Potassium ppm ASTM D5185m >20 <1	Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	6 0 51 0	7 0 60	3 0 89 <1
Sulfur ppm ASTM D5185m 2060 2959 3258 3395 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 ▲ 26 Sodium ppm ASTM D5185m 21 2 ▲ 466 Potassium ppm ASTM D5185m >20 <1 0 6 Fuel % ASTM D3524 >3.0 ▲ 6.4 <1.0 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 0.3 1.4 Nitration Abs/cm *ASTM D7624 >20 8.6 6.7 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 18.6 22.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414<	Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	6 0 51 0 888	7 0 60 0 868	3 0 89 <1 1013
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 ▲ 26 Sodium ppm ASTM D5185m 21 2 ▲ 466 Potassium ppm ASTM D5185m >20 <1 0 6 Fuel % ASTM D3524 >3.0 ▲ 6.4 <1.0 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 0.3 1.4 Nitration Abs/cm *ASTM D7624 >20 8.6 6.7 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 18.6 22.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.2 14.6 18.0	Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	6 0 51 0 888 970	7 0 60 0 868 1155	3 0 89 <1 1013 1166
Silicon ppm ASTM D5185m >25 4 4 ▲ 26 Sodium ppm ASTM D5185m 21 2 ▲ 466 Potassium ppm ASTM D5185m >20 <1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	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	6 0 51 0 888 970 1006	7 0 60 0 868 1155 1032	3 0 89 <1 1013 1166 1158
Sodium ppm ASTM D5185m 21 2 466 Potassium ppm ASTM D5185m >20 <1 0 6 Fuel % ASTM D3524 >3.0 6.4 <1.0 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 0.3 1.4 Nitration Abs/cm *ASTM D7624 >20 8.6 6.7 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 18.6 22.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.2 14.6 18.0	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 ASTM D5185m	0 0 60 0 1010 1070 1150	6 0 51 0 888 970 1006 1218	7 0 60 0 868 1155 1032 1262	3 0 89 <1 1013 1166 1158
Potassium ppm ASTM D5185m >20 <1	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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	6 0 51 0 888 970 1006 1218 2959	7 0 60 0 868 1155 1032 1262 3258	3 0 89 <1 1013 1166 1158 1438 3395
Fuel % ASTM D3524 >3.0 6.4 <1.0	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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	6 0 51 0 888 970 1006 1218 2959	7 0 60 0 868 1155 1032 1262 3258 history1	3 0 89 <1 1013 1166 1158 1438 3395 history2
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 0.3 1.4 Nitration Abs/cm *ASTM D7624 >20 8.6 6.7 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 18.6 22.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.2 14.6 18.0	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	6 0 51 0 888 970 1006 1218 2959 current	7 0 60 0 868 1155 1032 1262 3258 history1	3 0 89 <1 1013 1166 1158 1438 3395 history2 ▲ 26
Soot % % *ASTM D7844 >6 0.3 0.3 1.4 Nitration Abs/cm *ASTM D7624 >20 8.6 6.7 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 18.6 22.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.2 14.6 18.0	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 Iimit/base >25	6 0 51 0 888 970 1006 1218 2959 current 4 21	7 0 60 0 868 1155 1032 1262 3258 history1 4	3 0 89 <1 1013 1166 1158 1438 3395 history2 ▲ 26 ▲ 466
Nitration Abs/cm *ASTM D7624 >20 8.6 6.7 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 18.6 22.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.2 14.6 18.0	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25	6 0 51 0 888 970 1006 1218 2959 current 4 21 <1	7 0 60 0 868 1155 1032 1262 3258 history1 4 2 0	3 0 89 <1 1013 1166 1158 1438 3395 history2 △ 26 △ 466 6
Sulfation Abs/.1mm *ASTM D7415 >30 19.4 18.6 22.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.2 14.6 18.0	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 >3.0	6 0 51 0 888 970 1006 1218 2959 current 4 21 <1 ▲ 6.4	7 0 60 0 868 1155 1032 1262 3258 history1 4 2 0 <1.0	3 0 89 <1 1013 1166 1158 1438 3395 history2 △ 26 △ 466 6 <1.0
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.2 14.6 18.0	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 >3.0	6 0 51 0 888 970 1006 1218 2959 current 4 21 <1 ▲ 6.4 current	7 0 60 0 868 1155 1032 1262 3258 history1 4 2 0 <1.0	3 0 89 <1 1013 1166 1158 1438 3395 history2 ▲ 26 ▲ 466 6 <1.0
Oxidation Abs/.1mm *ASTM D7414 >25 16.2 14.6 18.0	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 60 0 1010 1150 1270 2060 limit/base >25 >20 >3.0 limit/base	6 0 51 0 888 970 1006 1218 2959 current 4 21 <1 ▲ 6.4 current 0.3	7 0 60 0 868 1155 1032 1262 3258 history1 4 2 0 <1.0 history1 0.3	3 0 89 <1 1013 1166 1158 1438 3395 history2 ▲ 26 ▲ 466 6 <1.0 history2
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844	0 0 60 0 1010 1150 1270 2060 limit/base >25 >20 >3.0 limit/base >6 >20	6 0 51 0 888 970 1006 1218 2959 current 4 21 <1 ▲ 6.4 current 0.3 8.6	7 0 60 0 868 1155 1032 1262 3258 history1 4 2 0 <1.0 history1 0.3 6.7	3 0 89 <1 1013 1166 1158 1438 3395 history2 △ 26 △ 466 6 <1.0 history2 1.4 11.0
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7624	0 0 0 0 1010 1150 1270 2060 limit/base >25 >20 >3.0 limit/base >6 >20 >30	6 0 51 0 888 970 1006 1218 2959 current 4 21 <1 ▲ 6.4 current 0.3 8.6 19.4	7 0 60 0 868 1155 1032 1262 3258 history1 4 2 0 <1.0 history1 0.3 6.7 18.6	3 0 89 <1 1013 1166 1158 1438 3395 history2 ▲ 26 ▲ 466 6 <1.0 history2 1.4 11.0 22.6
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm	ASTM D5185m ASTM D78185m ASTM D78144 *ASTM D7844 *ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 >3.0 limit/base >6 >20 >30 limit/base	6 0 51 0 888 970 1006 1218 2959 current 4 21 <1 ▲ 6.4 current 0.3 8.6 19.4 current	7 0 60 0 868 1155 1032 1262 3258 history1 4 2 0 <1.0 history1 0.3 6.7 18.6 history1	3 0 89 <1 1013 1166 1158 1438 3395 history2 △ 26 △ 466 6 <1.0 history2 1.4 11.0 22.6 history2



OIL ANALYSIS REPORT



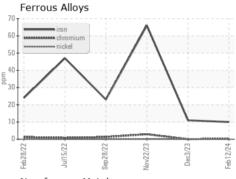


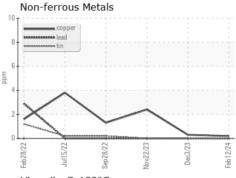


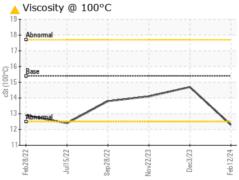
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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

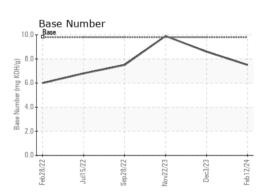
FLUID PROPE	RHES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	12.3	14.7	14.1

GRAPHS













Laboratory Sample No. Unique Number: 10885503

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0106700 Lab Number : 06092650

Received **Tested** Diagnosed

: 19 Feb 2024 : 20 Feb 2024

: 20 Feb 2024 - Don Baldridge

GFL Environmental - 405 - Arbor Hills 7400 Napier Rd

NORTHVILLE, MI US 48168 Contact: Anthony Hopkins

ahopkins@gflenv.com

Test Package: FLEET (Additional Tests: FuelDilution, PercentFuel) To discuss this sample report, contact Customer Service at 1-800-237-1369.

* - 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)

T:

F: