

### **OIL ANALYSIS REPORT**

Sample Rating Trend

VISCOSITY



Machine Id 722002

Component Diesel Engine

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

Sample Number         Client Info         GFL0102869         GFL0102875         GFL005357           Sample Date         Client Info         21 Mar 2024         08 Jan 2024         27 Sep 2023           Dil Age         hrs         Client Info         0         0         0           Dil Age         hrs         Client Info         28048         27714         27131           Dil Changed         Client Info         N/A         N/A         N/A           Sample Status         Client Info         N/A         N/A         N/A           CONTAMINATION         method         Imit/base         current         history1         history2           Water         WC Method         >0.2         NEG         NEG         NEG           WEAR METALS         method         Imit/base         current         history1         history2           fon         ppm         ASTM051680         >20         0         -1         0           Silver         ppm         ASTM051680         >2         10         0         -1           formum         ppm         ASTM051680         >2         0         0         -1           Silver         ppm         ASTM051680         >4	N SHP 15W40 (-	GAL)	Лау2020 Oc	±2020 Jun2021 Nov20	21 Aug2022 Jul2023 Sep20	23 Mar2024	
Sample Date         Client Info         21 Mar 2024         08 Jan 2024         27 Sep 2023           Machine Age         hrs         Client Info         0         0         0           Dil Age         hrs         Client Info         28048         27714         27131           Dil Changed         Client Info         N/A         N/A         N/A           Sample Status         Imit Info         N/A         ABNORMAL         ABNORMAL         NORMAL           CONTAMINATION         method         Imit Info         N/A         ABNORMAL         NORMAL           VEAR         WC Method         >0.2         NEG         NEG         NEG           Vikel         ppm         ASTM051600         >120         8         10         7           Vikel         ppm         ASTM051600         >22         <1         0         0           Vikel         ppm         ASTM051600         >22         <1         0         0           Copper         ppm         ASTM051600         >20         4         1         1           ead         ppm         ASTM051600         >20         0         0         0           Copper         ppm         ASTM05160	SAMPLE INFOR	RMATION	method	limit/base	current	history1	history2
Machine AgehrsClient Info000Di AgehrsClient Info280482771427131Di ChangedClient InfoN/AN/AN/ADi ChangedClient InfoN/AN/AN/ASample StatusImit/basecurrenthistory!history!CONTAMINATIONwethodJo.2NEGNEGNEGWaterWC MethodSo.2NEGNEGNEGWEAR METALSmethodlimit/basecurrenthistory!history!ronppmASTMD5185(m)>200<1	Sample Number		Client Info		GFL0102869	GFL0102875	GFL0053572
Dil Age         Ins         Client Info         28048         27714         27131           Dil Changed         Client Info         N/A         N/A         N/A         N/A           Sample Status         Image         Image         Control         ABNORMAL         ABNORMAL         NORMAL           CONTAMINATION         method         Imit/base         current         history1         history2           Water         WC Method         >0.2         NEG         NEG         NEG           Silycol         WC Method         >0.2         NEG         NEG         NEG           WEAR METALS         method         Imit/base         current         history2         no           ron         ppm         ASTM 05180m         >20         0         <1	Sample Date		Client Info		21 Mar 2024	08 Jan 2024	27 Sep 2023
Dil Changed         Client Info         N/A         N/A         N/A         N/A           Sample Status         Image Status         Image Status         ABNORMAL         ABNORMAL         NORMAL           CONTAMINATION         method         Image Status         Need         NEG         NEG           Water         WC Method         >0.2         NEG         NEG         NEG           Water         WC Method         >0.2         NEG         NEG         NEG           WEAR METALS         method         Iimit/base         current         history1         history2           from         ppm         ASTM D518(m)         >120         8         10         7           Kickel         ppm         ASTM D518(m)         >2         0         0         1           Nickel         ppm         ASTM D518(m)         >2         0         0         2         1           Lead         ppm         ASTM D518(m)         >300         <1	Machine Age	hrs	Client Info		0	0	0
Sample Status         Method         Imit/base         Current         history1         NoRMAL           CONTAMINATION         method         limit/base         current         history1         history2           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 D5185(m)         >120         8         10         7           Chromium         ppm         ASTM D5185(m)         >2         <1	Oil Age	hrs	Client Info		28048	27714	27131
CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         >0.2         NEG         NEG         NEG         NEG           Glycol         WC Method         >0.2         NEG         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185(m)         >20         0         <1	Oil Changed		Client Info		N/A	N/A	N/A
Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         Imil/base         current         history1         history2           Iron         ppm         ASTM D5185(m)         >120         8         10         7           Chromium         ppm         ASTM D5185(m)         >20         0         <1	Sample Status				ABNORMAL	ABNORMAL	NORMAL
Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM 05185(m)         >120         8         10         7           Chromium         ppm         ASTM 05185(m)         >20         0         <1	CONTAMINAT	ΓΙΟΝ	method	limit/base	current	history1	history2
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185(m)         >120         8         10         7           Chromium         ppm         ASTM D5185(m)         >20         0         -1         0           Nickel         ppm         ASTM D5185(m)         >2         -1         0         0           Silver         ppm         ASTM D5185(m)         >2         0         0         -1           Aluminum         ppm         ASTM D5185(m)         >2         0         0         -1           Lead         ppm         ASTM D5185(m)         >20         4         4         1           Lead         ppm         ASTM D5185(m)         >20         4         -1         -1           Copper         ppm         ASTM D5185(m)         >20         -1         0         0           Cadmium         ppm         ASTM D5185(m)         >330         <1	Water		WC Method	>0.2	NEG	NEG	NEG
Iron         ppm         ASTM D5185(m)         >120         8         10         7           Chromium         ppm         ASTM D5185(m)         >20         0         <1	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185(m)         >20         0         <1         0           Nickel         ppm         ASTM D5185(m)         >5         <1	WEAR METAL	_S	method	limit/base	current	history1	history2
Nickel         ppm         ASTM D5/85(m)         >5         <1         2         0           Titanium         ppm         ASTM D5/85(m)         >2         <1	Iron	ppm	ASTM D5185(m)	>120	8	10	7
Titanium         ppm         ASTM D5185(m)         >2         <1         0         0           Silver         ppm         ASTM D5185(m)         >2         0         0         <1	Chromium	ppm	ASTM D5185(m)	>20	0	<1	0
Silver         ppm         ASTM D5185(m)         >2         0         0         <1           Aluminum         ppm         ASTM D5185(m)         >20         4         4         1           Lead         ppm         ASTM D5185(m)         >20         4         4         1           Copper         ppm         ASTM D5185(m)         >330         <1         <1         <1           Tin         ppm         ASTM D5185(m)         >15         0         <1         0           Antimony         ppm         ASTM D5185(m)         0         0         0         0         0           Vanadium         ppm         ASTM D5185(m)         0         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         44         25         8           Barium         ppm         ASTM D5185(m)         0         0         0         0         0           Molybdenum         ppm         ASTM D5185(m)         0         0         0         0         0           Galaium         ppm	Nickel	ppm	ASTM D5185(m)	>5	<1	2	0
Silver         ppm         ASTM D5185(m)         >2         0         0         <1           Aluminum         ppm         ASTM D5185(m)         >20         4         4         1           Lead         ppm         ASTM D5185(m)         >40         0         2         <1           Copper         ppm         ASTM D5185(m)         >330         <1         <1         <1           Tin         ppm         ASTM D5185(m)         >15         0         <1         0           Antimony         ppm         ASTM D5185(m)         0         0         0         0           Vanadium         ppm         ASTM D5185(m)         0         0         0         0         0           Cadmium         ppm         ASTM D5185(m)         0         44         25         8           Barium         ppm         ASTM D5185(m)         0         0         0         0         0           Molybdenum         ppm         ASTM D5185(m)         0         0         0         0         0           Garium         ppm         ASTM D5185(m)         0         0         0         0           Garium         ppm         ASTM D5185(m) <td>Titanium</td> <td></td> <td>ASTM D5185(m)</td> <td>&gt;2</td> <td>&lt;1</td> <td>0</td> <td>0</td>	Titanium		ASTM D5185(m)	>2	<1	0	0
Lead         ppm         ASTM D5185(m)         >40         0         2         <1           Copper         ppm         ASTM D5185(m)         >330         <1	Silver	ppm	ASTM D5185(m)	>2	0	0	<1
Lead         ppm         ASTM D5185(m)         >40         0         2         <1           Copper         ppm         ASTM D5185(m)         >330         <1	Aluminum	ppm	ASTM D5185(m)	>20	4	4	1
Tin         ppm         ASTM D5185(m)         >15         0         <1         0           Antimony         ppm         ASTM D5185(m)         0         0         0         0           Vanadium         ppm         ASTM D5185(m)         0         0         0         0           Beryllium         ppm         ASTM D5185(m)         0         0         0         0           Cadmium         ppm         ASTM D5185(m)         0         0         0         0           Boron         ppm         ASTM D5185(m)         0         44         25         8           Barium         ppm         ASTM D5185(m)         0         44         42         57           Manganese         ppm         ASTM D5185(m)         0         0         0         0           Marganesium         ppm         ASTM D5185(m)         1010         489         495         909           Calcium         ppm         ASTM D5185(m)         1070         1620         1607         1070           Phosphorus         ppm         ASTM D5185(m)         1270         836         879         1130           Sulfur         ppm         ASTM D5185(m)         2060	Lead	ppm			0	2	<1
Tin         ppm         ASTM D5185(m)         >15         0         <1         0           Antimony         ppm         ASTM D5185(m)         0         0         0         0           Vanadium         ppm         ASTM D5185(m)         0         0         0         0           Beryllium         ppm         ASTM D5185(m)         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         44         25         8           Barium         ppm         ASTM D5185(m)         0         44         42         57           Manganese         ppm         ASTM D5185(m)         0         0         0         0           Marganese         ppm         ASTM D5185(m)         1010         489         495         909           Calcium         ppm         ASTM D5185(m)         1070         1620         1607         1070           Phosphorus         ppm         ASTM D5185(m)         1270         836         879         1130           Sulfur         ppm         ASTM D5185(m)         2060	Copper		ASTM D5185(m)	>330	<1	<1	<1
Antimony         ppm         ASTM D5185(m)         0         0         0           Vanadium         ppm         ASTM D5185(m)         0         0         0         0           Beryllium         ppm         ASTM D5185(m)         0         0         0         0           Cadmium         ppm         ASTM D5185(m)         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         44         25         8           Barium         ppm         ASTM D5185(m)         0         0         0         <11	Tin		ASTM D5185(m)	>15	0	<1	0
Vanadium         ppm         ASTM D5185(m)         0         0         0           Beryllium         ppm         ASTM D5185(m)         0         0         0           Cadmium         ppm         ASTM D5185(m)         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         44         25         8           Barium         ppm         ASTM D5185(m)         0         0         0         -1           Molybdenum         ppm         ASTM D5185(m)         0         0         0         0         -1           Marganese         ppm         ASTM D5185(m)         0         0         0         0         0           Calcium         ppm         ASTM D5185(m)         1010         489         495         909           Calcium         ppm         ASTM D5185(m)         1070         1620         1607         1070           Phosphorus         ppm         ASTM D5185(m)         1270         836         879         1130           Sulfur         ppm         ASTM D5185(m)         2060         2025 </td <td>Antimony</td> <td></td> <td></td> <td></td> <td>0</td> <td>0</td> <td>0</td>	Antimony				0	0	0
Beryllium         ppm         ASTM D5185(m)         0         0         0           Cadmium         ppm         ASTM D5185(m)         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         44         25         8           Barium         ppm         ASTM D5185(m)         0         0         0         <1	•				0	0	0
Cadmium         ppm         ASTM D5185(m)         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         44         25         8           Barium         ppm         ASTM D5185(m)         0         0         0         <1	Beryllium		ASTM D5185(m)		0	0	0
Boron         ppm         ASTM D5185(m)         0         44         25         8           Barium         ppm         ASTM D5185(m)         0         0         0         <1	-				0	0	0
Barium         ppm         ASTM D5185(m)         0         0         0         <1           Molybdenum         ppm         ASTM D5185(m)         60         44         42         57           Manganese         ppm         ASTM D5185(m)         0         0         0         0         0           Magnesium         ppm         ASTM D5185(m)         1010         489         495         909           Calcium         ppm         ASTM D5185(m)         1070         1620         1607         1070           Phosphorus         ppm         ASTM D5185(m)         1150         707         729         959           Zinc         ppm         ASTM D5185(m)         1270         836         879         1130           Sulfur         ppm         ASTM D5185(m)         2060         2025         2059         2504           Lithium         ppm         ASTM D5185(m)         2060         21         <1	ADDITIVES		method	limit/base	current	history1	history2
Barium         ppm         ASTM D5185(m)         0         0         0         <1           Molybdenum         ppm         ASTM D5185(m)         60         44         42         57           Manganese         ppm         ASTM D5185(m)         0         0         0         0           Magnesium         ppm         ASTM D5185(m)         1010         489         495         909           Calcium         ppm         ASTM D5185(m)         1070         1620         1607         1070           Phosphorus         ppm         ASTM D5185(m)         1150         707         729         959           Zinc         ppm         ASTM D5185(m)         1270         836         879         1130           Sulfur         ppm         ASTM D5185(m)         2060         2025         2059         2504           Lithium         ppm         ASTM D5185(m)         2060         21         <1	Boron	ppm	ASTM D5185(m)	0	44	25	8
Molybdenum         ppm         ASTM D5185(m)         60         44         42         57           Manganese         ppm         ASTM D5185(m)         0         0         0         0         0         0           Magnesium         ppm         ASTM D5185(m)         1010         489         495         909           Calcium         ppm         ASTM D5185(m)         1010         489         495         909           Calcium         ppm         ASTM D5185(m)         1070         1620         1607         1070           Phosphorus         ppm         ASTM D5185(m)         1070         836         879         1130           Sulfur         ppm         ASTM D5185(m)         2060         2025         2059         2504           Lithium         ppm         ASTM D5185(m)         2060         2025         2059         2504           Silicon         ppm         ASTM D5185(m)         2060         2025         3         4         7           Sodium         ppm         ASTM D5185(m)         >25         3         4         7           Sodium         ppm         ASTM D5185(m)         >20         <1         2         3	Barium		ASTM D5185(m)	0	0	0	<1
Manganese         ppm         ASTM D5185(m)         0         0         0         0         0           Magnesium         ppm         ASTM D5185(m)         1010         489         495         909           Calcium         ppm         ASTM D5185(m)         1070         1620         1607         1070           Phosphorus         ppm         ASTM D5185(m)         1150         707         729         959           Zinc         ppm         ASTM D5185(m)         1270         836         879         1130           Sulfur         ppm         ASTM D5185(m)         2060         2025         2059         2504           Lithium         ppm         ASTM D5185(m)         2060         2025         2059         2504           Silicon         ppm         ASTM D5185(m)         2060         2025         3         4         7           Sodium         ppm         ASTM D5185(m)         225         3         4         7           Sodium         ppm         ASTM D5185(m)         >20         <1	Molybdenum		ASTM D5185(m)	60	44	42	57
Magnesium         ppm         ASTM D5185(m)         1010         489         495         909           Calcium         ppm         ASTM D5185(m)         1070         1620         1607         1070           Phosphorus         ppm         ASTM D5185(m)         1150         707         729         959           Zinc         ppm         ASTM D5185(m)         1270         836         879         1130           Sulfur         ppm         ASTM D5185(m)         2060         2025         2059         2504           Lithium         ppm         ASTM D5185(m)         2060         2025         2059         2504           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         3         4         7           Sodium         ppm         ASTM D5185(m)         >20         <1				0	0	0	0
Calcium         ppm         ASTM D5185(m)         1070         1620         1607         1070           Phosphorus         ppm         ASTM D5185(m)         1150         707         729         959           Zinc         ppm         ASTM D5185(m)         1270         836         879         1130           Sulfur         ppm         ASTM D5185(m)         2060         2025         2059         2504           Lithium         ppm         ASTM D5185(m)         2060         2025         2059         2504           Lithium         ppm         ASTM D5185(m)         2060         2025         2059         2504           Solicon         ppm         ASTM D5185(m)         2060         current         history1         history2           Solicon         ppm         ASTM D5185(m)         >25         3         4         7           Sodium         ppm         ASTM D5185(m)         >20         <1	-				489	495	909
Phosphorus         ppm         ASTM D5185(m)         1150         707         729         959           Zinc         ppm         ASTM D5185(m)         1270         836         879         1130           Sulfur         ppm         ASTM D5185(m)         2060         2025         2059         2504           Lithium         ppm         ASTM D5185(m)         2060         2025         2059         2504           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         3         4         7           Sodium         ppm         ASTM D5185(m)         >25         3         4         7           Sodium         ppm         ASTM D5185(m)         >20         <1	-		ASTM D5185(m)	1070	1620	1607	1070
Zinc         ppm         ASTM D5185(m)         1270         836         879         1130           Sulfur         ppm         ASTM D5185(m)         2060         2025         2059         2504           Lithium         ppm         ASTM D5185(m)         2060         2025         2059         2504           Lithium         ppm         ASTM D5185(m)         2060         <1	Phosphorus		ASTM D5185(m)			729	959
Sulfur         ppm         ASTM D5185(m)         2060         2025         2059         2504           Lithium         ppm         ASTM D5185(m)         2060         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         3         4         7           Sodium         ppm         ASTM D5185(m)         >25         3         4         7           Sodium         ppm         ASTM D5185(m)         >20         <1         2         3           Potassium         ppm         ASTM D5185(m)         >20         <1         2         1           Fuel         %         ASTM D593*         >3.0         2.2         2.4         1.1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         0.1         0.2         0           Nitration         Abs/cm         ASTM D7624*         >20         8.5         9.2         5.7			ASTM D5185(m)	1270	836	879	1130
Lithium         ppm         ASTM D5185(m)         <1         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         3         4         7           Sodium         ppm         ASTM D5185(m)         >25         3         4         7           Sodium         ppm         ASTM D5185(m)         >20         <1         2         3           Potassium         ppm         ASTM D5185(m)         >20         <1         2         1           Fuel         %         ASTM D593*         >3.0         2.2         2.4         1.1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         0.1         0.2         0           Nitration         Abs/cm         ASTM D7624*         >20         8.5         9.2         5.7	Sulfur		ASTM D5185(m)	2060		2059	
Silicon         ppm         ASTM D5185(m)         >25         3         4         7           Sodium         ppm         ASTM D5185(m)         2         2         3           Potassium         ppm         ASTM D5185(m)         >20         <1         2         1           Fuel         %         ASTM D7593*         >3.0         2.2         2.4         1.1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         0.1         0.2         0           Nitration         Abs/cm         ASTM D7624*         >20         8.5         9.2         5.7							
Sodium         ppm         ASTM D5185(m)         2         2         3           Potassium         ppm         ASTM D5185(m)         >20         <1	CONTAMINAN	NTS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185(m)         >20         <1         2         1           Fuel         %         ASTM D7593*         >3.0         2.2         2.4         1.1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         0.1         0.2         0           Nitration         Abs/cm         ASTM D7624*         >20         8.5         9.2         5.7	Silicon	ppm	ASTM D5185(m)	>25	3	4	7
Potassium         ppm         ASTM D5185(m)         >20         <1         2         1           Fuel         %         ASTM D7593*         >3.0         2.2         2.4         1.1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         0.1         0.2         0           Nitration         Abs/cm         ASTM D7624*         >20         8.5         9.2         5.7	Sodium	ppm	ASTM D5185(m)		2	2	3
Fuel         %         ASTM D7593*         >3.0         2.2         2.4         1.1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         0.1         0.2         0           Nitration         Abs/cm         ASTM D7624*         >20         8.5         9.2         5.7	Potassium			>20	<1	2	1
Soot %         %         ASTM D7844*         >4         0.1         0.2         0           Nitration         Abs/cm         ASTM D7624*         >20         8.5         9.2         5.7	Fuel		ASTM D7593*	>3.0	2.2	2.4	1.1
Nitration         Abs/cm         ASTM D7624*         >20         8.5         9.2         5.7	INFRA-RED		method	limit/base	current	history1	history2
	Soot %	%	ASTM D7844*	>4	0.1	0.2	0
	Nitration	Abs/cm	ASTM D7624*	>20	8.5	9.2	5.7
	Sulfation						

# DIAGNOSIS

### Recommendation

No corrective action is recommended at this time. Confirm the source of the lubricant being utilized for top-up/fill. Resample at the next service interval to monitor.

### Wear

All component wear rates are normal.

#### Contamination

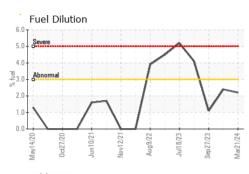
Light fuel dilution occurring. No other contaminants were detected in the oil.

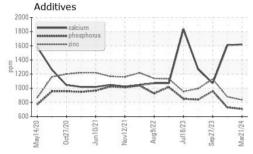
#### Fluid Condition

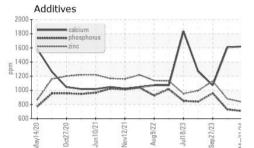
Viscosity of sample indicates oil is within SAE 30 range, advise investigate. This plus the additive levels indicates that this is not the same brand, or type of oil as reported. The condition of the oil is acceptable for the time in service.

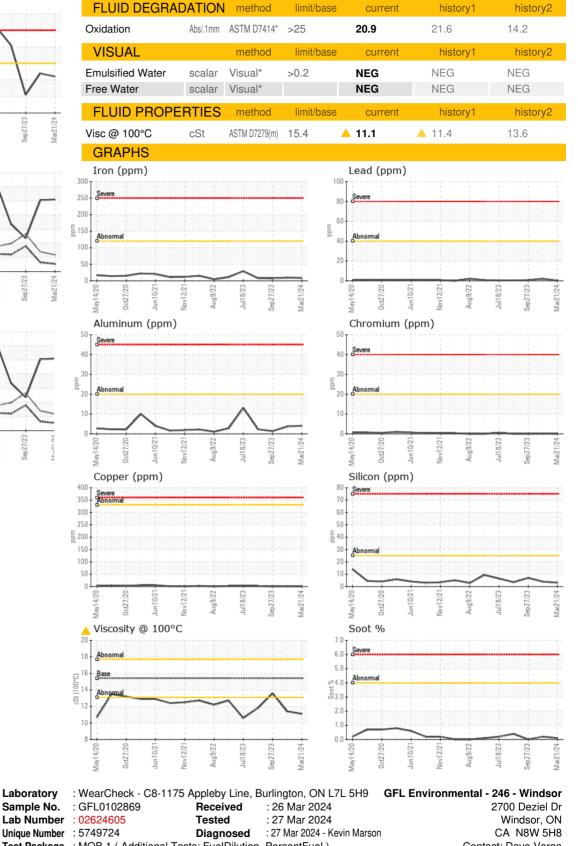


# **OIL ANALYSIS REPORT**









Accredited Laboratory Test Package : MOB 1 (Additional Tests: FuelDilution, PercentFuel) To discuss this sample report, contact Customer Service at 1-800-268-2131. Test denoted (\*) outside scope of accreditation, (m) method modified, (e) tested at external lab. Validity of results and interpretation are based on the sample and information as supplied.

Contact: Dave Varga dvarga@gflenv.com T: (519)944-8009 F:

CALA

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