

# **OIL ANALYSIS REPORT**

Sample Rating Trend



## Machine Id **CO3** Component **Diesel Engine** Fluid **VALVOLINE 15W40 (--- GAL)**

#### DIAGNOSIS

# Recommendation

Resample at the next service interval to monitor. Please specify the component make and model with your next sample.

# 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         IL0034222         IL05952598         IL05852997           Sample Date         Client Info         05 Nov 2023         16 Aug 2023         11 May 2023           Machine Age         mls         Client Info         129979         117005         105127           Oil Age         mls         Client Info         0         12000         0           Oil Changed         Client Info         0         12000         0           Oil Changed         Client Info         Changed         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           Wear METALS         method         Imit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         26         15         11           Chromium         ppm         ASTM D5185m         >20         1         <1         <1           Nickel         ppm         ASTM D5185m         >30         0			0012021 0	lecŻ021 JunŻ022 NovŻ0:			
Sample Date         Client Info         05 Nov 2023         16 Aug 2023         11 May 2023           Machine Age         mis         Client Info         129979         117005         105127           Oil Age         mis         Client Info         0         12000         0           Oil Changed         Client Info         0         NA         N/A           Sample Status         method         Imit/base         current         Nistory1         NoRMAL           CONTAMINATION         method         S5         <1.0         <1.0         <1.0           Water         WC Method         >5.2         <1.0         <1.0         NeG           Glycol         WC Method         >0.2         NEG         NEG         NEG           VEAR METALS         method         imit/base         current         history1         history2           Iron         ppm         ASTM D5165m         >100         26         15         11           Chromium         ppm         ASTM D5165m         >20         7         2         6           Itanium         ppm         ASTM D5165m         >330         3         2         <1           Itanium         ppm         ASTM D5	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Machine Age         mis         Client Info         0         129979         117005         105127           Oil Aga         mis         Client Info         0         12000         0           Sample Status         Client Info         0         NORMAL         NORMAL         NORMAL           Sample Status         method         imit/base         current         History1         +istory2           Fuel         WC Method         >5         <1.0         <1.0         <1.0           Water         WC Method         >0.2         NEG         NEG         NEG           WEAR METALS         WC Method         >0.2         NEG         NEG         NEG           Cromon         ppm         ASTM DS185m         >100         26         15         11           Chromium         ppm         ASTM DS185m         >20         1         <1         <1           Nickel         ppm         ASTM DS185m         >20         7         2         6           Silver         ppm         ASTM DS185m         >30         0         <1         1           Nickel         ppm         ASTM DS185m         >30         0         <1         1 <t< th=""><th>Sample Number</th><th></th><th>Client Info</th><th></th><th>IL0034222</th><th>IL05952598</th><th>IL05852997</th></t<>	Sample Number		Client Info		IL0034222	IL05952598	IL05852997
Oil Age         mis         Client Info         0         12000         0           Oil Changed         Client Info         Changed         N/A         N/A           Sample Status         Imit/bass         current         history1         history2           Evel         WC Method         >5         <1.0         <1.0         <1.0           Water         WC Method         >0         2         NEG         NEG         NEG           Water         WC Method         >0         26         15         11	Sample Date		Client Info		05 Nov 2023	16 Aug 2023	11 May 2023
Oli Changed Sample Status         Client Info         Changed NORMAL         N/A         N/A           Sample Status         method         limit/base         current         history1         history2           Fuel         WC Method         >5         <1.0	Machine Age	mls	Client Info		129979	117005	105127
Sample Status         NORMAL         NORMAL         NORMAL         NORMAL         NORMAL         NORMAL           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         NOR         NEG         NEG         NEG           WeAR METALS         method         imit/base         current         history1         history2           Iron         ppm         ASTM 05185         >100         26         15         11           Chromium         ppm         ASTM 05185         >20         1         <1         <1         <1           Nokel         ppm         ASTM 05185         >3         0         0         <1         <1         <1         <1         <1         <1         <1         <1         <1         0         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1 <t< th=""><th>Oil Age</th><th>mls</th><th>Client Info</th><th></th><th>0</th><th>12000</th><th>0</th></t<>	Oil Age	mls	Client Info		0	12000	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         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         26         15         11           Chromium         ppm         ASTM D5185m         >4         0         0         <1           Titanium         ppm         ASTM D5185m         >3         0         0         <1           Silver         ppm         ASTM D5185m         >30         3         2         <1           Tin         ppm         ASTM D5185m         >15         <1         <1         <1           Copper         ppm         ASTM D5185m         16         0         0         <1           Cadmium         ppm         ASTM D5185m         1         <1         <1         <1 <td< th=""><th>Oil Changed</th><th></th><th>Client Info</th><th></th><th>Changed</th><th>N/A</th><th>N/A</th></td<>	Oil Changed		Client Info		Changed	N/A	N/A
Fuel         WC Method         >5         <1.0	Sample Status				NORMAL	NORMAL	NORMAL
Water         WC Method         >0.2         NEG         NEG         NEG         NEG           Glycol         WC Method         Imit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         26         15         11           Chromium         ppm         ASTM D5185m         >20         1         <1         <1           Nickel         ppm         ASTM D5185m         >4         0         0         <1           Silver         ppm         ASTM D5185m         >4         0         0         <1           Aluminum         ppm         ASTM D5185m         >3         0         0         <1           Aluminum         ppm         ASTM D5185m         >20         7         2         6           Lead         ppm         ASTM D5185m         >30         3         2         <1           Tin         ppm         ASTM D5185m         >30         3         2         <1           Vanadium         ppm         ASTM D5185m         1         0         0         0           Addenium         ppm         ASTM D5185m         19         70         80	CONTAMINATION	١	method	limit/base	current	history1	history2
Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         26         15         11           Chromium         ppm         ASTM D5185m         >20         1         <1         <1           Nickel         ppm         ASTM D5185m         >4         0         0         <1           Nickel         ppm         ASTM D5185m         >4         0         0         <1           Aluminum         ppm         ASTM D5185m         >20         7         2         6           Lead         ppm         ASTM D5185m         >30         3         2         <1           Tin         ppm         ASTM D5185m         >15         <1         <1         0           Vanadium         ppm         ASTM D5185m         1         0         0         0           Cadmium         pm         ASTM D5185m         15         <1         <1         1           Vanadium         ppm         ASTM D5185m         11         <1         <1         1      Vanad	Fuel		WC Method	>5	<1.0	<1.0	<1.0
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         26         15         11           Chromium         ppm         ASTM D5185m         >20         1         <1         <1           Nickel         ppm         ASTM D5185m         >20         1         <1         <1           Titanium         ppm         ASTM D5185m         >3         0         0         <1           Silver         ppm         ASTM D5185m         >3         0         0         <1           Aluminum         ppm         ASTM D5185m         >20         7         2         6           Lead         ppm         ASTM D5185m         >30         3         2         <1           Copper         ppm         ASTM D5185m         >15         <1         <1         <1           Cadmium         ppm         ASTM D5185m         0         0         0         0           Additum         ppm         ASTM D5185m         1         0         0         0           Copper         ppm         ASTM D5185m         1         0         0	Water		WC Method	>0.2	NEG	NEG	NEG
Iron         ppm         ASTM D5185m         >100         26         15         11           Chromium         ppm         ASTM D5185m         >20         1         <1         <1           Nickel         ppm         ASTM D5185m         >4         0         0         <1           Titanium         ppm         ASTM D5185m         >3         0         0         <1           Silver         ppm         ASTM D5185m         >3         0         0         <1           Aluminum         ppm         ASTM D5185m         >3         0         0         <1           Copper         ppm         ASTM D5185m         >40         <1         <1         0         <1           Cadmium         ppm         ASTM D5185m         >15         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1 <t< th=""><th>Glycol</th><th></th><th>WC Method</th><th></th><th>NEG</th><th>NEG</th><th>NEG</th></t<>	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         1         <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel         ppm         ASTM D5185m         >4         0         0         <1	Iron	ppm	ASTM D5185m	>100	26	15	11
Titanium         ppm         ASTM D5185m         <1	Chromium	ppm	ASTM D5185m	>20	1	<1	<1
Silver         ppm         ASTM D5185m         >3         0         0         <1	Nickel	ppm	ASTM D5185m	>4	0	0	<1
Aluminum         ppm         ASTM D5185m         >20         7         2         6           Lead         ppm         ASTM D5185m         >40         <1         <1         0           Copper         ppm         ASTM D5185m         >330         3         2         <1           Tin         ppm         ASTM D5185m         >15         <1         <1         <1           Cadmium         ppm         ASTM D5185m         >15         <1         0         <1           Cadmium         ppm         ASTM D5185m         >15         <1         0         <1           Cadmium         ppm         ASTM D5185m         1         0         0         0         0           ADDITIVES         method         Imit/base         current         history1         history2           Boron         ppm         ASTM D5185m         39         37         137         47           Barium         ppm         ASTM D5185m         14         0         0         0           Molybdenum         ppm         ASTM D5185m         1554         1250         14444         1258           Phosphorus         ppm         ASTM D5185m         1554	Titanium	ppm	ASTM D5185m		<1	<1	<1
Lead         ppm         ASTM D5185m         >40         <1	Silver	ppm		>3	0	0	<1
Copper         ppm         ASTM D5185m         >330         3         2         <1	Aluminum	ppm	ASTM D5185m	>20	7	2	6
Tin         ppm         ASTM D5185m         >15         <1	Lead	ppm	ASTM D5185m	>40	<1	<1	0
Vanadium         ppm         ASTM D5185m         <1	Copper	ppm	ASTM D5185m	>330	3	2	<1
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         39         37         137         47           Barium         ppm         ASTM D5185m         1         0         0         0           Molybdenum         ppm         ASTM D5185m         1         0         0         0           Magnese         ppm         ASTM D5185m         1         <1	Tin	ppm	ASTM D5185m	>15	<1	<1	<1
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         39         37         137         47           Barium         ppm         ASTM D5185m         1         0         0         0           Molybdenum         ppm         ASTM D5185m         49         70         80         59           Manganese         ppm         ASTM D5185m         1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         1         1         1	Vanadium	ppm	ASTM D5185m		<1	0	<1
Boron         ppm         ASTM D5185m         39         37         137         47           Barium         ppm         ASTM D5185m         1         0         0         0           Molybdenum         ppm         ASTM D5185m         1         0         0         0           Manganese         ppm         ASTM D5185m         49         70         80         59           Magnesium         ppm         ASTM D5185m         1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         1         1         1 <t< th=""><th>Cadmium</th><th>ppm</th><th>ASTM D5185m</th><th></th><th>0</th><th>0</th><th>0</th></t<>	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         1         0         0         0           Molybdenum         ppm         ASTM D5185m         49         70         80         59           Manganese         ppm         ASTM D5185m         1         <1         <1         <1           Magnesium         ppm         ASTM D5185m         616         559         537         751           Calcium         ppm         ASTM D5185m         1554         1250         1444         1258           Phosphorus         ppm         ASTM D5185m         1554         1250         1444         1258           Phosphorus         ppm         ASTM D5185m         1069         1014         1172         1021           Zinc         ppm         ASTM D5185m         2624         2604         3640         3224           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         7         7           Sodium         ppm         ASTM D5185m         >20         11         11         5           INFRA-RED         method         limit/base	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         49         70         80         59           Manganese         ppm         ASTM D5185m         1         <1         <1         <1           Magnesium         ppm         ASTM D5185m         616         559         537         751           Calcium         ppm         ASTM D5185m         1554         1250         1444         1258           Phosphorus         ppm         ASTM D5185m         199         771         911         791           Zinc         ppm         ASTM D5185m         1069         1014         1172         1021           Sulfur         ppm         ASTM D5185m         2624         2604         3640         3224           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         7         7           Sodium         ppm         ASTM D5185m         >20         11         11         5           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         'ASTM D7844 <t< th=""><th>Boron</th><th>ppm</th><th>ASTM D5185m</th><th>39</th><th>37</th><th>137</th><th>47</th></t<>	Boron	ppm	ASTM D5185m	39	37	137	47
Manganese         ppm         ASTM D5185m         1         <1	<b>D</b> ·			-	-	0	0
Magnesium         ppm         ASTM D5185m         616         559         537         751           Calcium         ppm         ASTM D5185m         1554         1250         1444         1258           Phosphorus         ppm         ASTM D5185m         1954         1250         1444         1258           Phosphorus         ppm         ASTM D5185m         899         771         911         791           Zinc         ppm         ASTM D5185m         1069         1014         1172         1021           Sulfur         ppm         ASTM D5185m         2624         2604         3640         3224           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         7         7           Sodium         ppm         ASTM D5185m         >20         11         11         5           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.5         0.5         0.4           Nitration         Abs/.1mm         *ASTM D741	Barium	ppm	ASTM D5185m	1	0	0	0
Calcium         ppm         ASTM D5185m         1554         1250         1444         1258           Phosphorus         ppm         ASTM D5185m         899         771         911         791           Zinc         ppm         ASTM D5185m         1069         1014         1172         1021           Sulfur         ppm         ASTM D5185m         2624         2604         3640         3224           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         7         7           Sodium         ppm         ASTM D5185m         >20         11         11         5           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.5         0.5         0.4           Nitration         Abs/.rm         *ASTM D7624         >20         11.2         10.1         10.8           Sulfation         Abs/.lmm         *ASTM D7415         >30         24.4         22.7         22.1           FLUID DEGRADATION         method					-		
Phosphorus         ppm         ASTM D5185m         899         771         911         791           Zinc         ppm         ASTM D5185m         1069         1014         1172         1021           Sulfur         ppm         ASTM D5185m         2624         2604         3640         3224           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         7         7           Sodium         ppm         ASTM D5185m         >25         8         7         7           Sodium         ppm         ASTM D5185m         >20         11         11         5           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.5         0.5         0.4           Nitration         Abs/cm         *ASTM D7624         >20         11.2         10.1         10.8           Sulfation         Abs/.tmm         *ASTM D7415         >30         24.4         22.7         22.1           FLUID DEGRADATION         method         limit/	Molybdenum	ppm	ASTM D5185m	49	70	80	59
Zinc         ppm         ASTM D5185m         1069         1014         1172         1021           Sulfur         ppm         ASTM D5185m         2624         2604         3640         3224           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         7         7           Sodium         ppm         ASTM D5185m         >25         8         7         7           Sodium         ppm         ASTM D5185m         >20         111         11         5           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.5         0.5         0.4           Nitration         Abs/cm         *ASTM D7624         >20         11.2         10.1         10.8           Sulfation         Abs/.tmm         *ASTM D7415         >30         24.4         22.7         22.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.tmm         *ASTM D74	Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m	49 1	70 <1	80 <1	59 <1
Sulfur         ppm         ASTM D5185m         2624         2604         3640         3224           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         7         7           Sodium         ppm         ASTM D5185m         >25         8         7         7           Sodium         ppm         ASTM D5185m         >20         11         11         5           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.5         0.5         0.4           Nitration         Abs/cm         *ASTM D7624         >20         11.2         10.1         10.8           Sulfation         Abs/.imm         *ASTM D7415         >30         24.4         22.7         22.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.imm         *ASTM D7414         >25         23.4         19.3         21.4	Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	49 1 616	70 <1 559	80 <1 537	59 <1 751
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25877SodiumppmASTM D5185m>20322PotassiumppmASTM D5185m>2011115INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>30.50.50.4NitrationAbs/cm*ASTM D7624>2011.210.110.8SulfationAbs/.imm*ASTM D7415>3024.422.722.1FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.imm*ASTM D7414>2523.419.321.4	Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	49 1 616 1554	70 <1 559 1250	80 <1 537 1444	59 <1 751 1258 791
Silicon         ppm         ASTM D5185m         >25         8         7         7           Sodium         ppm         ASTM D5185m         2         2         2           Potassium         ppm         ASTM D5185m         >20         11         11         5           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.5         0.5         0.4           Nitration         Abs/cm         *ASTM D7624         >20         11.2         10.1         10.8           Sulfation         Abs/.imm         *ASTM D7415         >30         24.4         22.7         22.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.imm         *ASTM D7414         >25         23.4         19.3         21.4	Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	49 1 616 1554 899	70 <1 559 1250 771	80 <1 537 1444 911	59 <1 751 1258 791
Sodium         ppm         ASTM D5185m         3         2         2           Potassium         ppm         ASTM D5185m         >20         11         11         5           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.5         0.5         0.4           Nitration         Abs/cm         *ASTM D7624         >20         11.2         10.1         10.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         24.4         22.7         22.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         23.4         19.3         21.4	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	49 1 616 1554 899 1069	70 <1 559 1250 771 1014	80 <1 537 1444 911 1172	59 <1 751 1258 791 1021
Potassium         ppm         ASTM D5185m         >20         11         11         5           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.5         0.5         0.4           Nitration         Abs/cm         *ASTM D7624         >20         11.2         10.1         10.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         24.4         22.7         22.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         23.4         19.3         21.4	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	49 1 616 1554 899 1069 2624	70 <1 559 1250 771 1014 2604	80 <1 537 1444 911 1172 3640	59 <1 751 1258 791 1021 3224
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.5         0.5         0.4           Nitration         Abs/cm         *ASTM D7624         >20         11.2         10.1         10.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         24.4         22.7         22.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         23.4         19.3         21.4	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	49 1 616 1554 899 1069 2624 <i>limit/base</i>	70 <1 559 1250 771 1014 2604 current	80 <1 537 1444 911 1172 3640 history1	59 <1 751 1258 791 1021 3224 history2
Soot %         %         *ASTM D7844         >3         0.5         0.5         0.4           Nitration         Abs/cm         *ASTM D7624         >20         11.2         10.1         10.8           Sulfation         Abs/.1mm         *ASTM D7615         >30         24.4         22.7         22.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         23.4         19.3         21.4	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	49 1 616 1554 899 1069 2624 <i>limit/base</i>	70 <1 559 1250 771 1014 2604 current 8	80 <1 537 1444 911 1172 3640 history1 7	59 <1 751 1258 791 1021 3224 history2 7
Nitration         Abs/cm         *ASTM D7624         >20         11.2         10.1         10.8           Sulfation         Abs/.1mm         *ASTM D7615         >30         24.4         22.7         22.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         23.4         19.3         21.4	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m ASTM D5185m	49 1 616 1554 899 1069 2624 <i>limit/base</i> >25	70 <1 559 1250 771 1014 2604 <u>current</u> 8 3	80 <1 537 1444 911 1172 3640 history1 7 2	59 <1 751 1258 791 1021 3224 history2 7 2
Sulfation         Abs/.1mm         *ASTM D7415         >30         24.4         22.7         22.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         23.4         19.3         21.4	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	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 ASTM D5185m	49 1 616 1554 899 1069 2624 <b>limit/base</b> >25 >20	70 <1 559 1250 771 1014 2604 current 8 3 11	80 <1 537 1444 911 1172 3640 history1 7 2 11	59 <1 751 1258 791 1021 3224 history2 7 2 5
FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     23.4     19.3     21.4	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	49 1 616 1554 899 1069 2624 2624 2624 25 25 20 20 <b>imit/base</b>	70 <1 559 1250 771 1014 2604 current 8 3 11 current	80 <1 537 1444 911 1172 3640 history1 7 2 11 history1	59 <1 751 1258 791 1021 3224 history2 7 2 5 5 history2
Oxidation Abs/.1mm *ASTM D7414 >25 23.4 19.3 21.4	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	49 1 616 1554 899 1069 2624 <b>limit/base</b> >25 >20 <b>limit/base</b> >3	70 <1 559 1250 771 1014 2604 <u>current</u> 8 3 11 <u>current</u> 0.5	80 <1 537 1444 911 1172 3640 history1 7 2 11 11 history1 0.5	59 <1 751 1258 791 1021 3224 history2 7 2 5 5 history2 0.4
	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	49 1 616 1554 899 1069 2624 2624 2624 >25 >20 <u>limit/base</u> >3 >20	70 <1 559 1250 771 1014 2604 <u>current</u> 8 3 11 <u>current</u> 0.5 11.2	80 <1 537 1444 911 1172 3640 <u>history1</u> 7 2 11 7 2 11 0.5 10.1	59 <1 751 1258 791 1021 3224 history2 7 2 5 5 history2 0.4 10.8
Base Number (BN)         mg KOH/g         ASTM D2896         6.9         5.4         6.7         6.9	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624	49 1 616 1554 899 1069 2624 <b>imit/base</b> >25 >20 <b>imit/base</b> >3 >20 >30	70 <1 559 1250 771 1014 2604 <u>current</u> 8 3 11 <u>current</u> 0.5 11.2 24.4	80 <1 537 1444 911 1172 3640 history1 7 2 11 7 2 11 0.5 10.1 22.7	59 <1 751 1258 791 1021 3224 history2 7 2 5 history2 0.4 10.8 22.1
	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	49 1 616 1554 899 1069 2624 imit/base >25 20 imit/base >3 >20 >30 imit/base	70 <1 559 1250 771 1014 2604 current 8 3 11 current 0.5 11.2 24.4 current	80 <1 537 1444 911 1172 3640 history1 7 2 11 7 2 11 0.5 10.1 22.7 history1	59 <1 751 1258 791 1021 3224 history2 7 2 5 history2 0.4 10.8 22.1 history2



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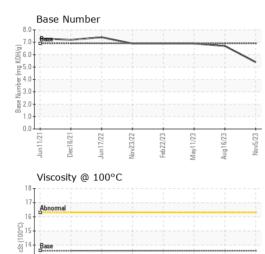
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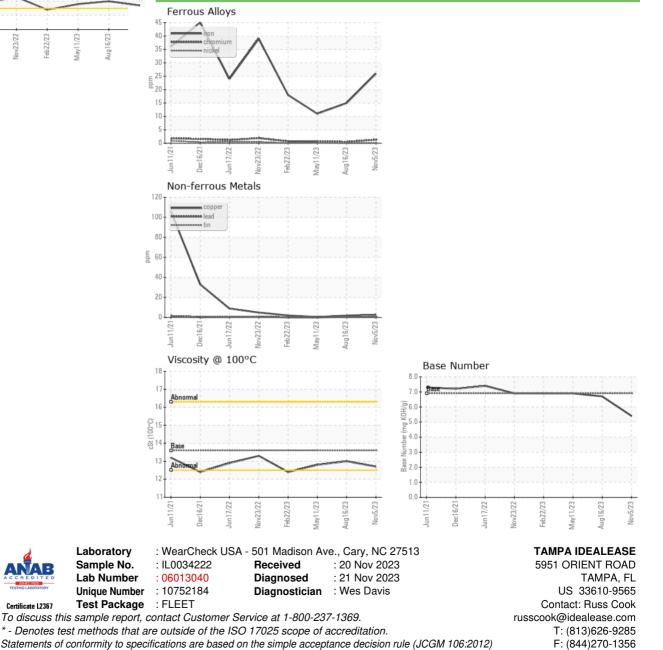
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# **OIL ANALYSIS REPORT**



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 PROPERT	TIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	13.6	12.7	13.0	12.8
GRAPHS						



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