

# **OIL ANALYSIS REPORT**

Sample Rating Trend





#### Component Diesel Engine Fluid TEST OIL GOLD 4 (40 LTR)

#### DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor.

## Wear

All component wear rates are normal.

## Contamination

Elevated aluminum (Al) and/or lead (Pb) and potassium (K) levels in your metals analysis are likely a result of solder flux release into the lubricant and is common on new equipment/components. 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         WC0888806         WC081800         S300         Q3650         Q3509         Q3509         Q3509         Q3509         Q3509         Q3600         Q36000         Q360000         Q360000         Q360000         Q360000			Aug2023	Sep 2023 Nov2023	Dec2023 Feb2024	Mar2024	
Sample Date         Client Into         07 Mar 2024         22 Feb 2024         07 Feb 2024           Machine Age         kms         Client Info         316959         305680         295526           Oil Age         kms         Client Info         Not Changd         35309         35309           Oil Changed         Client Info         Not Changd         Not Changd         Not Changd         Not Changd           Sample Status         Client Info         Not Changd         ABINORMAL         ABINORMAL         Not Changd           GONTAMINATION         method         Imit/base         current         history1         history2           Fuel         WC Method         >0.2         NEG         0.0         NEG           Glycol         WC Method         >0.2         NEG         0.0         NEG           VEAR METALS         method         Imit/base         current         history1         history2           Iron         ppm         ASTM051800         >2         0         0         0           Silver         ppm         ASTM051800         >50         13         12         11           Lead         ppm         ASTM051800         >6         0         0         0     <	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age         kms         Client Info         316959         305680         296526           Oil Age         kms         Client Info         S5742         44463         35309           Oil Changed         Client Info         Not Changd         Not Changd         Not Changd         Not Changd           Sample Status         Imit/base         current         history!         history!         Not Changd           Fuel         WC Method         >3.0         <1.0	Sample Number		Client Info		WC0888906	WC0888886	WC0888896
Oil Age         kms         Client Info         55742         44463         35309           Oil Changed         Client Info         Not Changd         Not Changd         Not Changd           Sample Status         Client Info         Not Changd         Not Changd         Not Changd           CONTAMINATION         method         Init/base         current         history!         history!           Fuel         WC Method         >3.0         <1.0	Sample Date		Client Info		07 Mar 2024	22 Feb 2024	07 Feb 2024
Oil Changed Sample Status         Client Info         Not Changd NORMAL         Not Changd ABNORMAL         Not Changd ABNORMAL         Not Changd ABNORMAL           CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >3.0         <1.0         0.4         <1.0           Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         >2.00         40         35         31           Chromium         ppm         ASTM D518(m)         >200         40         35         31           Chromium         ppm         ASTM D518(m)         >20         0         0         0           Silver         ppm         ASTM D518(m)         >50         13         12         11           Lead         ppm         ASTM D518(m)         50         32         25         23           Tin         ppm         ASTM D518(m)         56         32         25         23           Titability         ppm         ASTM D518(m)         0         0         0         0           Copper         ppm         ASTM D518(m)         0         0	Machine Age	kms	Client Info		316959	305680	296526
Sample Status         NORMAL         ABNORMAL         NORMAL         Astrophysica         Astrophysica	Oil Age	kms	Client Info		55742	44463	35309
CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >3.0         <1.0	Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Fuel         WC Method         >3.0         <1.0         0.4         <1.0           Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         NEG         0.0         NEG           WEAR METALS         method         Imit/base         current         history1         history2           Iron         ppm         ASTM D5185(m)         >200         40         35         31           Chromium         ppm         ASTM D5185(m)         >2         0         0         0           Silver         ppm         ASTM D5185(m)         >2         1         <1	Sample Status				NORMAL	ABNORMAL	NORMAL
Water         WC Method         >0.2         NEG         NEG         NEG         NEG           Glycol         WC Method         NEG         0.0         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185(m)         >6         2         2         2           Nickel         ppm         ASTM D5185(m)         >3         <1	CONTAMINATIO	N	method	limit/base	current	history1	history2
Glycol         WC Method         NEG         0.0         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM 05185(m)         >200         40         35         31           Chromium         ppm         ASTM 05185(m)         >6         2         2         2           Nickel         ppm         ASTM 05185(m)         >3         <1	Fuel		WC Method	>3.0	<1.0	0.4	<1.0
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185(m)         >200         40         35         31           Chromium         ppm         ASTM D5185(m)         >6         2         2         2           Nickel         ppm         ASTM D5185(m)         >2         0         0         0           Silver         ppm         ASTM D5185(m)         >2         0         0         0           Aluminum         ppm         ASTM D5185(m)         >50         13         12         11           Lead         ppm         ASTM D5185(m)         >50         32         25         23           Tin         ppm         ASTM D5185(m)         >6         0         0         0           Vanadium         ppm         ASTM D5185(m)         0         0         0         0           Vanadium         ppm         ASTM D5185(m)         0         0         0         0           Vanadium         ppm         ASTM D5185(m)         0         0         0         0           Cadmium         ppm         ASTM D5185(m)         0         1 <t< td=""><td>Water</td><td></td><td>WC Method</td><td>&gt;0.2</td><th>NEG</th><td>NEG</td><td>NEG</td></t<>	Water		WC Method	>0.2	NEG	NEG	NEG
Iron         ppm         ASTM D5185(m)         >200         40         35         31           Chromium         ppm         ASTM D5185(m)         >6         2         2         2           Nickel         ppm         ASTM D5185(m)         >3         <1	Glycol		WC Method		NEG	0.0	NEG
Chromium         ppm         ASTM D5185(m)         >6         2         2         2           Nickel         ppm         ASTM D5185(m)         >3         <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel         ppm         ASTM D5185(m)         >3         <1         <1         <1           Titanium         ppm         ASTM D5185(m)         >2         0         0         0           Silver         ppm         ASTM D5185(m)         >2         <1	Iron	ppm	ASTM D5185(m)	>200	40	35	31
Titanium         ppm         ASTM D5185(m)         >2         0         0         0           Silver         ppm         ASTM D5185(m)         >2         <1	Chromium	ppm	ASTM D5185(m)	>6	2	2	2
Silver         ppm         ASTM D5185(m)         >2         <1         <1         <1           Aluminum         ppm         ASTM D5185(m)         >50         13         12         11           Lead         ppm         ASTM D5185(m)         >50         32         25         23           Tin         ppm         ASTM D5185(m)         >60         0         0         0           Antimony         ppm         ASTM D5185(m)         >6         0         0         0           Vanadium         ppm         ASTM D5185(m)         0         0         0         0           Vanadium         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         <1	Nickel	ppm	ASTM D5185(m)	>3	<1	<1	<1
Aluminum         ppm         ASTM D5185(m)         >50         13         12         11           Lead         ppm         ASTM D5185(m)         >10         <1	Titanium	ppm	ASTM D5185(m)	>2	0	0	0
Lead         ppm         ASTM D5185(m)         >10         <1         <1         <1         <1           Copper         ppm         ASTM D5185(m)         >50         32         25         23           Tin         ppm         ASTM D5185(m)         >6         0         0         0           Antimony         ppm         ASTM D5185(m)         0         0         0         0           Vanadium         ppm         ASTM D5185(m)         0         0         0         0         0           Beryllium         ppm         ASTM D5185(m)         0         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         0         0         0         0           Magnesium         ppm         ASTM D5185(m)         0         64         62         62           Magnesium         ppm         ASTM D5185(m)         950         983         1005         995           Calcium         ppm         ASTM D5185(m)         980         1129         1107         1113           Phosphorus	Silver	ppm	ASTM D5185(m)	>2	<1	<1	<1
Lead         ppm         ASTM D5185(m)         >10         <1         <1         <1         <1           Copper         ppm         ASTM D5185(m)         >50         32         25         23           Tin         ppm         ASTM D5185(m)         >6         0         0         0           Antimony         ppm         ASTM D5185(m)         0         0         0         0           Vanadium         ppm         ASTM D5185(m)         0         0         0         0           Cadmium         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         0         0         0           Magaenese         ppm         ASTM D5185(m)         0         <1	Aluminum	ppm	ASTM D5185(m)	>50	13	12	11
Tin         ppm         ASTM D5185(m)         >6         0         0         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           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         0         0         0           Molybdenum         ppm         ASTM D5185(m)         0         64         62         62           Manganese         ppm         ASTM D5185(m)         0         <1	Lead	ppm	ASTM D5185(m)	>10	<1	<1	<1
Antimony         ppm         ASTM D5185(m)         0         0         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           Cadmium         ppm         ASTM D5185(m)         0         0         0           Boron         ppm         ASTM D5185(m)         1         <1	Copper	ppm	ASTM D5185(m)	>50	32	25	23
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)         1         <1		ppm	ASTM D5185(m)	>6	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)         1         <1	Antimony	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)         1         <1         2         <1           Barium         ppm         ASTM D5185(m)         0         0         0         0         0         0           Molybdenum         ppm         ASTM D5185(m)         0         <1         <1         2         <1           Magnesium         ppm         ASTM D5185(m)         0         <1         <1         <1         <1         0         0           Magnesium         ppm         ASTM D5185(m)         0         <1         <1         <1         0           Magnesium         ppm         ASTM D5185(m)         950         983         1005         995           Calcium         ppm         ASTM D5185(m)         980         1129         1107         1113           Phosphorus         ppm         ASTM D5185(m)         2600         2230         2342         2489           Lithium         ppm         ASTM D5185(m)         20         23         2         <	Vanadium	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)         1         <1         2         <1           Barium         ppm         ASTM D5185(m)         0         0         0         0         0         0           Molybdenum         ppm         ASTM D5185(m)         0         <1         <1         2         <1           Magnesium         ppm         ASTM D5185(m)         0         <1         <1         <1         0         0           Magnesium         ppm         ASTM D5185(m)         950         983         1005         995         0           Calcium         ppm         ASTM D5185(m)         980         1129         1107         1113           Phosphorus         ppm         ASTM D5185(m)         1100         924         999         1028           Sulfur         ppm         ASTM D5185(m)         2600         2230         2342         2489           Lithium         ppm         ASTM D5185(m)         >50         4         4         4	Beryllium	ppm	ASTM D5185(m)		0	0	0
Boron         ppm         ASTM D5185(m)         1         <1         2         <1           Barium         ppm         ASTM D5185(m)         0         0         0         0           Molybdenum         ppm         ASTM D5185(m)         60         64         62         62           Manganese         ppm         ASTM D5185(m)         0         <1	-	ppm	ASTM D5185(m)		0	0	0
Barium         ppm         ASTM D5185(m)         0         0         0         0         0           Molybdenum         ppm         ASTM D5185(m)         60         64         62         62           Manganese         ppm         ASTM D5185(m)         0         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185(m)         60         64         62         62           Manganese         ppm         ASTM D5185(m)         0         <1	Boron	ppm	ASTM D5185(m)	1	<1	2	<1
Manganese         ppm         ASTM D5185(m)         0         <1         <1         0           Magnesium         ppm         ASTM D5185(m)         950         983         1005         995           Calcium         ppm         ASTM D5185(m)         980         1129         1107         1113           Phosphorus         ppm         ASTM D5185(m)         1100         924         999         1028           Zinc         ppm         ASTM D5185(m)         1100         924         999         1028           Sulfur         ppm         ASTM D5185(m)         1150         1211         1205         1208           Sulfur         ppm         ASTM D5185(m)         2600         2230         2342         2489           Lithium         ppm         ASTM D5185(m)         2600         2330         2342         2489           Silicon         ppm         ASTM D5185(m)         >50         4         4         4           Sodium         ppm         ASTM D5185(m)         >20         23         22         2           Potassium         ppm         ASTM D585(m)         >20         23         22         20           INFRA-RED         method	Barium	ppm	ASTM D5185(m)	0	0	0	0
Magnesium         ppm         ASTM D5185(m)         950         983         1005         995           Calcium         ppm         ASTM D5185(m)         980         1129         1107         1113           Phosphorus         ppm         ASTM D5185(m)         980         1129         1107         1113           Phosphorus         ppm         ASTM D5185(m)         1100         924         999         1028           Zinc         ppm         ASTM D5185(m)         1150         1211         1205         1208           Sulfur         ppm         ASTM D5185(m)         2600         2230         2342         2489           Lithium         ppm         ASTM D5185(m)         2600         2230         2342         2489           Silicon         ppm         ASTM D5185(m)         2600         22         2         2           Sodium         ppm         ASTM D5185(m)         >50         4         4         4           Sodium         ppm         ASTM D5185(m)         >20         23         22         20           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %	Molybdenum	ppm	ASTM D5185(m)	60	64	62	62
Calcium         ppm         ASTM D5185(m)         980         1129         1107         1113           Phosphorus         ppm         ASTM D5185(m)         1100         924         999         1028           Zinc         ppm         ASTM D5185(m)         1150         1211         1205         1208           Sulfur         ppm         ASTM D5185(m)         2600         2230         2342         2489           Lithium         ppm         ASTM D5185(m)         2600         2230         2342         2489           Lithium         ppm         ASTM D5185(m)         2600         2230         2342         2489           Lithium         ppm         ASTM D5185(m)         2600         2230         2342         2489           Solicon         ppm         ASTM D5185(m)         >50         4         4         4           Sodium         ppm         ASTM D5185(m)         >20         23         22         20           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         1.1         0.9         0.7           Nitration         Abs/cm	Manganese	ppm	ASTM D5185(m)	0	<1	<1	0
Phosphorus         ppm         ASTM D5185(m)         1100         924         999         1028           Zinc         ppm         ASTM D5185(m)         1150         1211         1205         1208           Sulfur         ppm         ASTM D5185(m)         2600         2230         2342         2489           Lithium         ppm         ASTM D5185(m)         2600         2230         2342         2489           Lithium         ppm         ASTM D5185(m)         2600         2230         2342         2489           Solicon         ppm         ASTM D5185(m)         21         <1	Magnesium	ppm	ASTM D5185(m)	950	983	1005	995
Zinc         ppm         ASTM D5185(m)         1150         1211         1205         1208           Sulfur         ppm         ASTM D5185(m)         2600         2230         2342         2489           Lithium         ppm         ASTM D5185(m)         2600         2230         2342         2489           Lithium         ppm         ASTM D5185(m)         2600         2230         2342         2489           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >50         4         4         4           Sodium         ppm         ASTM D5185(m)         >20         23         22         2           Potassium         ppm         ASTM D5185(m)         >20         23         22         20           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         1.1         0.9         0.7           Nitration         Abs/cm         ASTM D7624*         >20         10.8         10.8         9.3           Nitration         Abs/.tmm <t< td=""><td>Calcium</td><td>ppm</td><td>ASTM D5185(m)</td><td>980</td><th>1129</th><td>1107</td><td>1113</td></t<>	Calcium	ppm	ASTM D5185(m)	980	1129	1107	1113
Sulfur         ppm         ASTM D5185(m)         2600         2230         2342         2489           Lithium         ppm         ASTM D5185(m)         2600         <1	Phosphorus	ppm	ASTM D5185(m)	1100	924	999	1028
Sulfur         ppm         ASTM D5185(m)         2600         2230         2342         2489           Lithium         ppm         ASTM D5185(m)         2600          2230         2342         2489           Lithium         ppm         ASTM D5185(m)         2600                 CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >50         4         4         4           Sodium         ppm         ASTM D5185(m)         >50         4         4         4           Sodium         ppm         ASTM D5185(m)         >20         23         22         20           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         1.1         0.9         0.7           Nitration         Abs/cm         ASTM D7624*         >20         10.8         10.8         9.3           Nitration(Diff)         Abs/.m         ASTM D7415*         >30         22.6         21.2         20.7 <td>Zinc</td> <td>ppm</td> <td>ASTM D5185(m)</td> <td>1150</td> <th>1211</th> <td>1205</td> <td>1208</td>	Zinc	ppm	ASTM D5185(m)	1150	1211	1205	1208
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >50         4         4         4           Sodium         ppm         ASTM D5185(m)         >50         4         4         4           Sodium         ppm         ASTM D5185(m)         >20         23         22         20           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         1.1         0.9         0.7           Nitration         Abs/cm         ASTM D7624*         >20         10.8         10.8         9.3           Nitration(Diff)         Abs/cm         ASTM D7624*         >30         22.6         21.2         20.7	Sulfur		ASTM D5185(m)	2600	2230	2342	2489
Silicon         ppm         ASTM D5185(m)         >50         4         4         4           Sodium         ppm         ASTM D5185(m)         20         2         2         2           Potassium         ppm         ASTM D5185(m)         >20         23         22         20           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         1.1         0.9         0.7           Nitration         Abs/cm         ASTM D7624*         >20         10.8         10.8         9.3           Nitration(Diff)         Abs/cm         ASTM D7624*         >30         22.6         21.2         20.7	Lithium	ppm	ASTM D5185(m)		<1	<1	<1
Sodium         ppm         ASTM D5185(m)         2         1 <th2< th=""> <th2< th=""></th2<></th2<>	CONTAMINANTS	5	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185(m)         >20         23         22         20           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         1.1         0.9         0.7           Nitration         Abs/cm         ASTM D7624*         >20         10.8         10.8         9.3           Nitration(Diff)         Abs/cm         ASTM E2412*         14.4         14.1         11.2           Sulfation         Abs/.1mm         ASTM D7415*         >30         22.6         21.2         20.7	Silicon	ppm	ASTM D5185(m)	>50	4	4	4
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         1.1         0.9         0.7           Nitration         Abs/cm         ASTM D7624*         >20         10.8         10.8         9.3           Nitration(Diff)         Abs/cm         ASTM D7624*         >20         14.4         14.1         11.2           Sulfation         Abs/.tmm         ASTM D7415*         >30         22.6         21.2         20.7		ppm	ASTM D5185(m)		2	2	2
Soot %         %         ASTM D7844*         >3         1.1         0.9         0.7           Nitration         Abs/cm         ASTM D7624*         >20         10.8         10.8         9.3           Nitration(Diff)         Abs/cm         ASTM E2412*         14.4         14.1         11.2           Sulfation         Abs/.1mm         ASTM D7415*         >30         22.6         21.2         20.7	Potassium	ppm	ASTM D5185(m)	>20	23	22	20
Nitration         Abs/cm         ASTM D7624*         >20         10.8         10.8         9.3           Nitration(Diff)         Abs/cm         ASTM E2412*         14.4         14.1         11.2           Sulfation         Abs/.1mm         ASTM D7415*         >30         22.6         21.2         20.7	INFRA-RED		method	limit/base		history1	history2
Nitration(Diff)         Abs/cm         ASTM E2412*         14.4         14.1         11.2           Sulfation         Abs/.1mm         ASTM D7415*         >30         22.6         21.2         20.7	Soot %	%	ASTM D7844*	>3	1.1	0.9	0.7
Sulfation         Abs/.1mm         ASTM D7415*         >30         22.6         21.2         20.7	Nitration	Abs/cm	ASTM D7624*	>20	10.8	10.8	9.3
	Nitration(Diff)	Abs/cm	ASTM E2412*		14.4	14.1	11.2
Sulfation(Diff) Abs/cm ASTM E2412* 7.8 4.2 3.7	Sulfation	Abs/.1mm	ASTM D7415*	>30	22.6	21.2	20.7
	Sulfation(Diff)	Abs/cm	ASTM E2412*		7.8	4.2	3.7

Report Id: WFRBUR [WCAMIS] 02621058 (Generated: 03/12/2024 05:11:05) Rev: 1



cSt (100°C) B

10

Ab

Aug10/23

Sep22/23

# **OIL ANALYSIS REPORT**

Abs/.1mm ASTM D7414\*

Abs/cm ASTM E2412\*

mg KOH/g ASTM D2896\*

>25

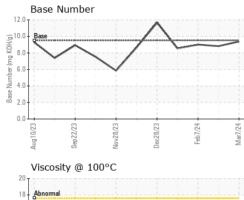
9.5

FLUID DEGRADATION

Oxidation

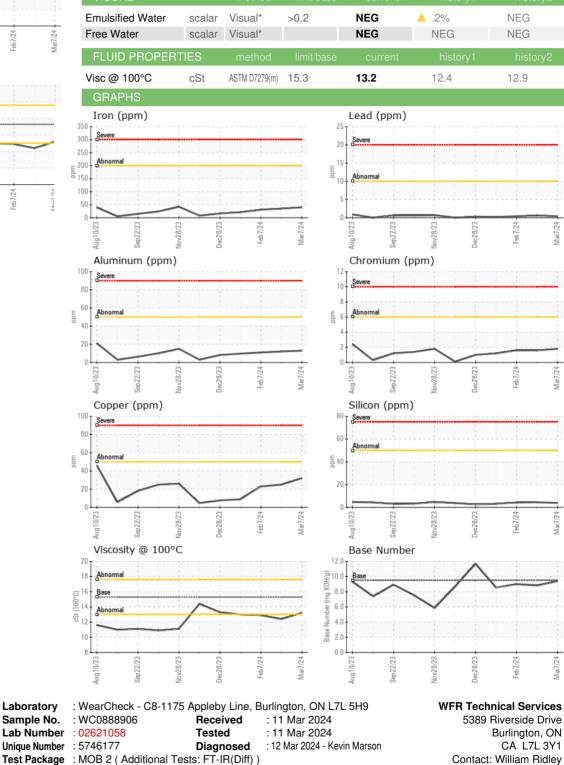
Oxidation(Diff)

Base Number (BN)



Feb7/24

lec28/23



18.2

13.8

9.38

17.4

14.1

8.82

16.3

11.4

9.01

/ar7/24

Mar7/24

T:

F:

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.

CALA

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