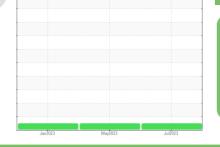


OIL ANALYSIS REPORT

Sample Rating Trend







Diesel Engine Fluid DIESEL ENGINE OIL SAE 15W40 (--- GAL)

DIAGNOSIS

Machine Id **1640** Component

Recommendation

Resample at the next service interval to monitor. Please specify the brand, type, and viscosity of the oil on your next sample.

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

Fluid Condition

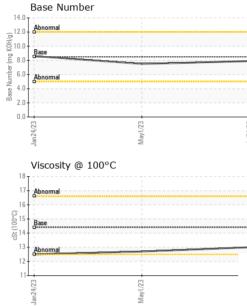
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORM	ATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0760064	WC0760025	WC0760036
Sample Date		Client Info		31 Jul 2023	01 May 2023	24 Jan 2023
Machine Age	hrs	Client Info		11127	98044	10040
Oil Age	hrs	Client Info		520	520	450
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATION	N	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>110	15	15	16
Chromium	ppm	ASTM D5185m	>4	<1	<1	<1
Nickel	ppm	ASTM D5185m	>2	0	<1	0
Titanium	ppm	ASTM D5185m		<1	0	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>25	2	1	3
Lead	ppm	ASTM D5185m	>45	<1	<1	<1
Copper	ppm	ASTM D5185m	>85	<1	<1	1
Tin	ppm	ASTM D5185m	>4	<1	<1	<1
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
			11 11 11			la la tarma O
ADDITIVES		method				history2
ADDITIVES Boron	ppm	Method ASTM D5185m	limit/base	current 4	history1 6	nistory2 16
	ppm ppm					
Boron	ppm	ASTM D5185m	250	4	6	16
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m	250 10	4 0	6 0	16 0
Boron Barium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	250 10	4 0 68	6 0 69	16 0 74
Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450	4 0 68 <1	6 0 69 <1	16 0 74 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100	4 0 68 <1 1058	6 0 69 <1 888	16 0 74 <1 820
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000	4 0 68 <1 1058 1303 1130	6 0 69 <1 888 1164	16 0 74 <1 820 1158
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150	4 0 68 <1 1058 1303	6 0 69 <1 888 1164 1031	16 0 74 <1 820 1158 897
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350	4 0 68 <1 1058 1303 1130 1444	6 0 69 <1 888 1164 1031 1258	16 0 74 <1 820 1158 897 1163
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250	4 0 68 <1 1058 1303 1130 1444 4119	6 0 69 <1 888 1164 1031 1258 3364	16 0 74 <1 820 1158 897 1163 3482
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	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	250 10 100 450 3000 1150 1350 4250 limit/base >30	4 0 68 <1 1058 1303 1130 1444 4119 current	6 0 69 <1 888 1164 1031 1258 3364 history1	16 0 74 <1 820 1158 897 1163 3482 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method	250 10 100 450 3000 1150 1350 4250 limit/base >30	4 0 68 <1 1058 1303 1130 1444 4119 current 5	6 0 69 <1 888 1164 1031 1258 3364 history1 5	16 0 74 <1 820 1158 897 1163 3482 history2 5
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >30 >158	4 0 68 <1 1058 1303 1130 1444 4119 <u>current</u> 5 4	6 0 69 <1 888 1164 1031 1258 3364 history1 5 2	16 0 74 <1 820 1158 897 1163 3482 history2 5 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >30 >158 >20 limit/base	4 0 68 <1 1058 1303 1130 1444 4119 current 5 4 4 4	6 0 69 <1 888 1164 1031 1258 3364 history1 5 2 3 3	16 0 74 <1 820 1158 897 1163 3482 history2 5 2 2 2 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 Imit/base >30 >158 >20 Imit/base >3	4 0 68 <1 1058 1303 1130 1444 4119 <u>current</u> 5 4 4 4 <u>current</u> 0.3	6 0 69 <1 888 1164 1031 1258 3364 history1 5 2 3 3 history1 0.3	16 0 74 <1 820 1158 897 1163 3482 history2 5 2 2 2 history2 0.3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 Imit/base >30 >158 >20 Imit/base >3	4 0 68 <1 1058 1303 1130 1444 4119 current 5 4 4 4	6 0 69 <1 888 1164 1031 1258 3364 history1 5 2 3 3	16 0 74 <1 820 1158 897 1163 3482 history2 5 2 2 2 history2
Boron Barium 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	250 10 100 450 3000 1150 1350 4250 imit/base >30 >158 >20 imit/base >3	4 0 68 <1 1058 1303 1130 1444 4119 current 5 4 4 4 current 0.3 8.5	6 0 69 <1 888 1164 1031 1258 3364 history1 5 2 3 3 history1 0.3 7.7	16 0 74 <1 820 1158 897 1163 3482 history2 5 2 2 2 history2 0.3 7.4
Boron Barium 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 *ASTM D7415	250 10 100 450 3000 1150 1350 4250 limit/base >30 >158 >20 limit/base >3 >20 >30 >30	4 0 68 <1 1058 1303 1130 1444 4119 <i>current</i> 5 4 4 4 <i>current</i> 0.3 8.5 19.6 <i>current</i>	6 0 69 <1 888 1164 1031 1258 3364 history1 5 2 3 3 history1 0.3 7.7 18.0 history1	16 0 74 <1 820 1158 897 1163 3482 history2 5 2 2 2 history2 0.3 7.4 18.7 bistory2
Boron Barium 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 D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >30 >158 >20 limit/base >3 >20 >30 20 >30	4 0 68 <1 1058 1303 1130 1444 4119 <u>current</u> 5 4 4 4 <u>current</u> 0.3 8.5 19.6	6 0 69 <1 888 1164 1031 1258 3364 history1 5 2 3 3 history1 0.3 7.7 18.0	16 0 74 <1 820 1158 897 1163 3482 history2 5 2 2 2 history2 0.3 7.4 18.7



OIL ANALYSIS REPORT

VISUAL



	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
1/23			*Visual	NORML	NORML	NORML	NORML
Jul3	Odor						NORML
	Emulsified Water						NEG
	Free Water	scalar	*Visual		NEG	NEG	NEG
	FLUID PROPER	TIES	method	limit/base	current	history1	history2
	Visc @ 100°C	cSt		14.4	13.0	12.7	12.5
	GRAPHS						
	Ferrous Alloys						
	iron						
	12 - nickel						
	1						
	6						
	4-						
	2-						
	0	27					
	an 24/2	lay1/2		ul31/2			
	,			7			
	¹⁰ T	lis					
	copper						
	8 - tin						
	6						
	u dd						
	4						
	2						
			10000001000000000000000000000000000000	1			
	0						
	Jan 24/23	May1/23		Jul31/23			
		2		- -			
	-	~					
	Viscosity @ 100°(C			Base Number		
	Viscosity @ 100°(C		14.0	Base Number		
	Viscosity @ 100°C	c		14.0			
	Viscosity @ 100°(c		14.0			
	Viscosity @ 100°(C		14.0	Abnormal		
	Viscosity @ 100°C	C		14.0	Abnormal		
	Viscosity @ 100°(¹⁸ ¹⁷ <u>Abnormal</u> ⁶ ⁸ ⁸ ⁸ ⁸ ⁸ ¹⁹ ¹⁸	C		14.0	Abnormal Base		
	Viscosity @ 100°(C		14.0	Abnormal Base		
	Viscosity @ 100°(18 17 Abnormal 16 315 Base 314 13 Abnormal	C		14.0 12.0 (0) HO 10.0 HO Bull 8.0 agumn 4.0 2.0 0.0	Abnormal Base	May1/23	
		Silt Debris Sand/Dirt Appearance Odor Emulsified Water Free Water FLUID PROPER Visc @ 100°C GRAPHS Ferrous Alloys	Silt scalar Debris scalar Sand/Dirt scalar Appearance scalar Odor scalar Emulsified Water scalar Free Water scalar Free Water scalar Free Water scalar Free Water scalar Free Water scalar Ferrous Alloys Ferrous Alloys Non-ferrous Metals	Silt scalar *Visual Debris scalar *Visual Appearance scalar *Visual Appearance scalar *Visual Emulsified Water scalar *Visual Free Water scalar *Visual Non-ferrous Alloys Non-ferrous Metals	Silt scalar *Visual NONE Debris scalar *Visual NONE Sand/Dirt scalar *Visual NORML Appearance scalar *Visual NORML Odor scalar *Visual NORML Emulsified Water scalar *Visual >0.2 Free Water scalar *Visual *V	Silt scalar *Visual NONE NONE Debris scalar *Visual NONE NONE Sand/Dirt scalar *Visual NONE NONE Appearance scalar *Visual NORML NORML Odor scalar *Visual NORML NORML Emulsified Water scalar *Visual >0.2 NEG Free Water scalar *Visual >0.2 NEG Free Water scalar *Visual NORML NORML Visc @ 100°C cSt ASTM D445 14.4 13.0 GRAPHS Ferrous Alloys	Silt scalar "Visual NONE NONE NONE Debris scalar "Visual NONE NONE NONE Sand/Dirt scalar "Visual NONE NONE NONE Appearance scalar "Visual NORML NORML NORML Odor scalar "Visual >0.2 NEG NEG Free Water scalar "Visual >0.2 NEG NEG Free Water scalar "Visual NORML NORML Visc@ 100°C cSt ASTM D445 14.4 13.0 12.7 GRAPHS Ferrous Alloys Internet and the scalar state of the