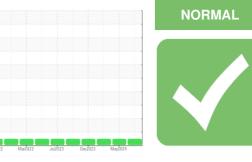


OIL ANALYSIS REPORT

SAMPLE INFORMATION metho

Sample Rating Trend



Machine Id

1960 Diesel Engine Fluid DIESEL ENGINE OIL SAE 5W30 (--- GAL)

Recommendation

Resample at the next service interval to monitor.

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		method	limit/base	current	history1	history2
Sample Number		Client Info		HRE0000549	HRE0000186	WC0887610
Sample Date		Client Info		12 Jun 2024	05 May 2024	28 Feb 2024
Machine Age	mls	Client Info		0	70247	0
Oil Age	mls	Client Info		0	6000	0
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
				NonimAE		
CONTAMINATIO	N	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
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	13	9	9
Chromium	ppm	ASTM D5185m	>20	0	<1	<1
Nickel	ppm	ASTM D5185m	>4	0	<1	<1
Titanium	ppm	ASTM D5185m		0	<1	<1
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>20	2	3	4
Lead	ppm	ASTM D5185m	>40	0	0	0
Copper	ppm	ASTM D5185m	>330	0	<1	<1
Tin	ppm	ASTM D5185m	>15	0	0	0
Vanadium	ppm	ASTM D5185m		0	<1	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method		current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 250	current 13	history1 21	history2 33
	ppm ppm					
Boron		ASTM D5185m	250	13	21	33
Boron Barium	ppm	ASTM D5185m ASTM D5185m	250 10	13 0	21 <1	33 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	250 10	13 0 193	21 <1 210	33 0 212
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100	13 0 193 32	21 <1 210 5	33 0 212 3
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450	13 0 193 32 708	21 <1 210 5 563	33 0 212 3 582
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000	13 0 193 32 708 1371	21 <1 210 5 563 1161	33 0 212 3 582 1120
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150	13 0 193 32 708 1371 631	21 <1 210 5 563 1161 556	33 0 212 3 582 1120 542
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	13 0 193 32 708 1371 631 797	21 <1 210 5 563 1161 556 688	33 0 212 3 582 1120 542 714
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 Limit/base	13 0 193 32 708 1371 631 797 3148	21 <1 210 5 563 1161 556 688 2580	33 0 212 3 582 1120 542 714 2464
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	13 0 193 32 708 1371 631 797 3148 current	21 <1 210 5 563 1161 556 688 2580 history1	33 0 212 3 582 1120 542 714 2464 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 >25	13 0 193 32 708 1371 631 797 3148 current 15	21 <1 210 5 563 1161 556 688 2580 history1 17	33 0 212 3 582 1120 542 714 2464 history2 19
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 >25	13 0 193 32 708 1371 631 797 3148 <u>current</u> 15 <1	21 <1 210 5 563 1161 556 688 2580 history1 17 0	33 0 212 3 582 1120 542 714 2464 history2 19 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 Imit/base >25	13 0 193 32 708 1371 631 797 3148 <u>current</u> 15 <1 0	21 <1 210 5 563 1161 556 688 2580 history1 17 0 2	33 0 212 3 582 1120 542 714 2464 history2 19 2 1
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 Iimit/base >25 >20 Iimit/base >3	13 0 193 32 708 1371 631 797 3148 <i>current</i> 15 <1 0 <i>current</i> 0.1	21 <1 210 5 563 1161 556 688 2580 history1 17 0 2 history1 0.1	33 0 212 3 582 1120 542 714 2464 history2 19 2 1 1 1 history2 0
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 Iimit/base >25 >20 Iimit/base >3	13 0 193 32 708 1371 631 797 3148 current 15 <1 0 0	21 <1 210 5 563 1161 556 688 2580 history1 17 0 2 2 history1	33 0 212 3 582 1120 542 714 2464 history2 19 2 1 1 history2
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 imit/base >25 >20 imit/base >3 >20	13 0 193 32 708 1371 631 797 3148 <i>current</i> 15 <1 0 <i>current</i> 0.1 10.4	21 <1 210 5 563 1161 556 688 2580 history1 17 0 2 history1 0.1 10.8 21.8	33 0 212 3 582 1120 542 714 2464 history2 19 2 1 1 history2 0 10.8 21.8
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 >25 >20 limit/base >3 >20 >30	13 0 193 32 708 1371 631 797 3148 current 15 <1 0 current 0.1 10.4 21.1 current	21 <1 210 5 563 1161 556 688 2580 history1 17 0 2 history1 0.1 10.8 21.8 history1	33 0 212 3 582 1120 542 714 2464 history2 19 2 19 2 1 1 history2 0 10.8 21.8 kistory2
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 imit/base >25 imit/base >3 >20 >30	13 0 193 32 708 1371 631 797 3148 current 15 <1 0 current 0.1 10.4 21.1	21 <1 210 5 563 1161 556 688 2580 history1 17 0 2 history1 0.1 10.8 21.8	33 0 212 3 582 1120 542 714 2464 history2 19 2 1 1 history2 0 10.8 21.8

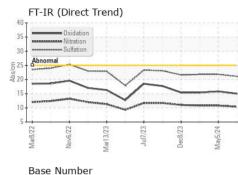
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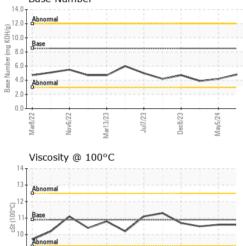
8. Mar8/22

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Mar13/23

OIL ANALYSIS REPORT



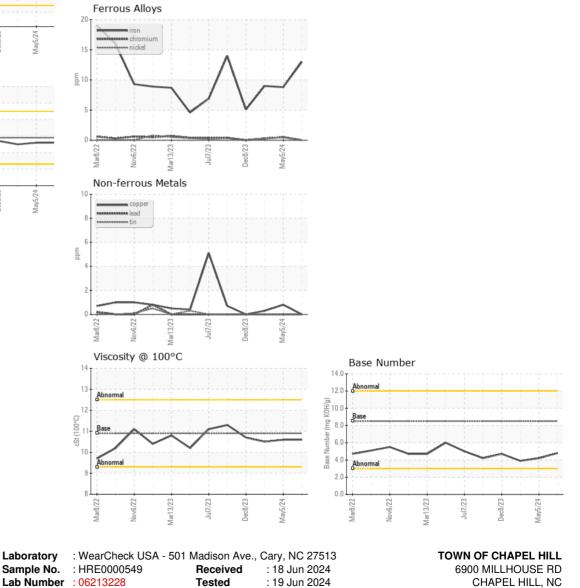


Dec8/23

May5/24

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	IES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	10.9	10.6	10.6	10.5

GRAPHS



Diagnosed : 20 Jun 2024 - Don Baldridge

CHAPEL HILL, NC US 27516 Contact: Lisa DePasqua ldepasqua@townofchapelhill.org T: (919)696-4941 F:

Certificate 12367

Unique Number : 11086092 Test Package : FLEET To discuss this sample report, contact Customer Service at 1-800-237-1369. * - Denotes test methods that are outside of the ISO 17025 scope of accreditation. Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Report Id: TOWCHANC [WUSCAR] 06213228 (Generated: 06/21/2024 18:28:49) Rev: 1

Contact/Location: Lisa DePasqua - TOWCHANC

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