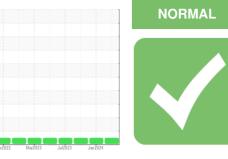


## **OIL ANALYSIS REPORT**

SAMPLE INFORMATION method

Sample Rating Trend



Machine Id

### 1954 Component 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.

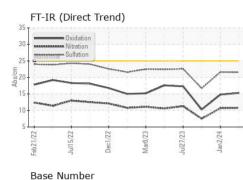
### Fluid Condition

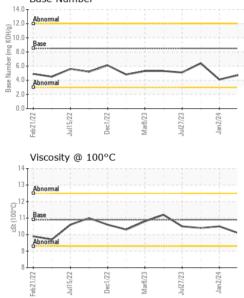
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORM	ATION	method	limit/base	current	history1	history2
Sample Number		Client Info		HRE0000116	WC0810308	WC0860357
Sample Date		Client Info		14 Apr 2024	02 Jan 2024	20 Nov 2023
Machine Age	mls	Client Info		114872	110728	106491
Oil Age	mls	Client Info		6000	0	6000
•	11115					
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
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	8	8	3
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Nickel	ppm		>4	<1	0	<1
Titanium	ppm	ASTM D5185m		<1	0	<1
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>20	3	2	2
Lead	ppm	ASTM D5185m	>40	۲ ح1	0	0
			>330	<1	<1	<1
Copper Tin	ppm				0	
	ppm	ASTM D5185m	>15	<1		<1
Vanadium	ppm	ASTM D5185m		0	0	<1
Cadmium	ppm	ASTM D5185m		<1	0	<1
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 250	current 31	history1 30	history2 78
	ppm ppm					
Boron		ASTM D5185m	250	31	30	78
Boron Barium	ppm	ASTM D5185m ASTM D5185m	250 10	31 0	30 4	78 <1
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	250 10	31 0 217	30 4 207	78 <1 191
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100	31 0 217 4	30 4 207 3	78 <1 191 <1
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450	31 0 217 4 621	30 4 207 3 611	78 <1 191 <1 554
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000	31 0 217 4 621 1284	30 4 207 3 611 1174	78 <1 191 <1 554 1113
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	31 0 217 4 621 1284 626	30 4 207 3 611 1174 585	78 <1 191 <1 554 1113 561
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	31 0 217 4 621 1284 626 725 2771	30 4 207 3 611 1174 585 690 2799	78 <1 191 <1 554 1113 561 679 2588
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	31 0 217 4 621 1284 626 725 2771 current	30 4 207 3 611 1174 585 690 2799 history1	78 <1 191 <1 554 1113 561 679 2588 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 <b>method</b>	250 10 100 450 3000 1150 1350 4250	31 0 217 4 621 1284 626 725 2771 current 20	30 4 207 3 611 1174 585 690 2799 history1 17	78 <1 191 <1 554 1113 561 679 2588 history2 7
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 <b>method</b> ASTM D5185m	250 10 100 450 3000 1150 1350 4250 <b>limit/base</b> >25	31 0 217 4 621 1284 626 725 2771 current 20 0	30 4 207 3 611 1174 585 690 2799 history1 17 0	78 <1 191 <1 554 1113 561 679 2588 history2 7 <1
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 <b>method</b>	250 10 100 450 3000 1150 1350 4250 <b>limit/base</b> >25	31 0 217 4 621 1284 626 725 2771 current 20	30 4 207 3 611 1174 585 690 2799 history1 17	78 <1 191 <1 554 1113 561 679 2588 history2 7
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 <b>method</b> ASTM D5185m	250 10 100 450 3000 1150 1350 4250 <b>limit/base</b> >25	31 0 217 4 621 1284 626 725 2771 current 20 0	30 4 207 3 611 1174 585 690 2799 history1 17 0	78 <1 191 <1 554 1113 561 679 2588 history2 7 <1
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 <b>limit/base</b> >25 >20	31 0 217 4 621 1284 626 725 2771 current 20 0 2	30 4 207 3 611 1174 585 690 2799 history1 17 0 2	78 <1 191 <1 554 1113 561 679 2588 history2 7 <1 <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 <b>Imit/base</b> >25 >20 <b>Imit/base</b> >3	31 0 217 4 621 1284 626 725 2771 current 20 0 2 2 current	30 4 207 3 611 1174 585 690 2799 history1 17 0 2 2 history1	78 <1 191 <1 554 1113 561 679 2588 history2 7 <1 <1 <1 <1 <1
Boron Barium 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	250 10 100 450 3000 1150 1350 4250 <b>Imit/base</b> >25 >20 <b>Imit/base</b> >3	31 0 217 4 621 1284 626 725 2771 current 20 0 2 2 0 2 current	30 4 207 3 611 1174 585 690 2799 history1 17 0 2 2 history1 0	78 <1 191 <1 554 1113 561 679 2588 history2 7 <1 <1 <1 <1 history2 0
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 <b>i</b> mit/base >25 >20 <b>i</b> mit/base >3 >20	31 0 217 4 621 1284 626 725 2771 <i>current</i> 20 0 2 2 <i>current</i> 0 10.8	30 4 207 3 611 1174 585 690 2799 history1 17 0 2 2 history1 0 10.7	78 <1 191 <1 554 1113 561 679 2588 history2 7 <1 <1 <1 history2 0 7.5
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 D7844	250 10 100 450 3000 1150 1350 4250 <b>imit/base</b> >25 >20 <b>imit/base</b> >3 >20 >30	31 0 217 4 621 1284 626 725 2771 current 20 0 2 0 2 current 0 10.8 21.5 current	30 4 207 3 611 1174 585 690 2799 history1 17 0 2 2 history1 0 10.7 21.6 history1	78 <1 191 <1 554 1113 561 679 2588 history2 7 <1 <1 <1 istory2 0 7.5 16.7 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 D7844 *ASTM D7624 *ASTM D7415	250 10 100 450 3000 1150 1350 4250 <b>imit/base</b> >25 <b>imit/base</b> >3 >20 >30	31 0 217 4 621 1284 626 725 2771 <i>current</i> 20 0 2 2 <i>current</i> 0 10.8 21.5	30 4 207 3 611 1174 585 690 2799 history1 17 0 2 2 history1 0 10.7 21.6	78 <1 191 <1 554 1113 561 679 2588 history2 7 <1 <1 <1 <1 <1 0 7.5 16.7

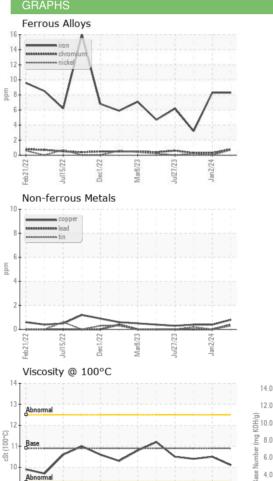


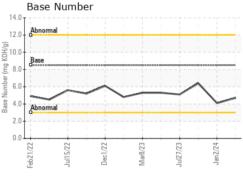
# **OIL ANALYSIS REPORT**





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	IES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	10.9	10.1	10.5	10.4





TOWN OF CHAPEL HILL Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 Sample No. :HRE0000116 Received 6900 MILLHOUSE RD : 15 Apr 2024 Lab Number : 06148457 Tested : 16 Apr 2024 CHAPEL HILL, NC Unique Number : 10978535 : 17 Apr 2024 - Jonathan Hester Diagnosed US 27516 Test Package : FLEET Contact: Lisa DePasqua Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369. ldepasqua@townofchapelhill.org \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation. T: (919)696-4941 Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012) F:

Mar8/23 -

Jul27/23

Jan2/24

Dec1/22.

∞ Feb21/22

Jul15/22 .

Contact/Location: Lisa DePasqua - TOWCHANC