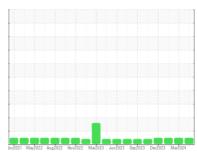


# **OIL ANALYSIS REPORT**

Sample Rating Trend







Machine Id
1957
Component

Component

Diesel Engine

DIESEL ENGINE OIL SAE 5W30 (--- GAL)

### DIAGNOSIS

### 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

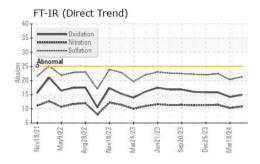
## **Fluid Condition**

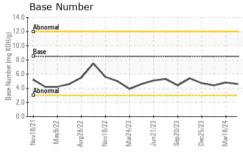
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

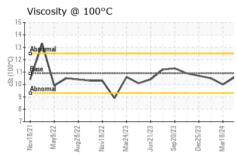
SAMPLE INFORMATION   method   limit/base   current   history1   history2				022 Aug2022 Nov2022 Ma			
Sample Date	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Date   Client Info   30 May 2024   18 Mar 2024   18 Feb 2024   Machine Age   mis   Client Info   0	Sample Number		Client Info		HRE0000159	HRE0000109	WC0887589
Machine Age         mls         Client Info         0         127697         123646           Oil Age         mls         Client Info         0         0         6000           Oil Changed         Client Info         Changed         Changed         Changed           Sample Status         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         >0.2         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >10         10         9         7           Chromium         ppm         ASTM D5185m         >20         0         1         <1         1           Iron         ppm         ASTM D5185m         >20         0         1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1 <td< th=""><th>•</th><th></th><th>Client Info</th><th></th><th>30 May 2024</th><th>18 Mar 2024</th><th>18 Feb 2024</th></td<>	•		Client Info		30 May 2024	18 Mar 2024	18 Feb 2024
Oil Age         mls         Client Info         Changed         Changed <t< td=""><th></th><td>mls</td><td>Client Info</td><td></td><th>•</th><td>127697</td><td>123646</td></t<>		mls	Client Info		•	127697	123646
NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2	•	mls	Client Info		0	0	6000
NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2	-		Client Info		Changed	Changed	Changed
Fuel   WC Method   S5   C1.0   C1.0   C1.0   C1.0	-				NORMAL	NORMAL	NORMAL
Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         Imitibase         current         history1         history2           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         10         9         7           Chromium         ppm         ASTM D5185m         >20         0         1         <1           Nickel         ppm         ASTM D5185m         >4         0         1         0           Silver         ppm         ASTM D5185m         >4         0         1         <1           Silver         ppm         ASTM D5185m         >30         0         0         0           Aluminum         ppm         ASTM D5185m         >40         0         <1         0           Copper         ppm         ASTM D5185m         >40         0         <1         0           Capper         ppm         ASTM D5185m         >15         <1         <1         0           Capper         ppm         ASTM D5185m         >10         <1         0	CONTAMINATION	N	method	limit/base	current	history1	history2
WEG Neg         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         10         9         7           Chromium         ppm         ASTM D5185m         >20         0         1         <1           Nickel         ppm         ASTM D5185m         >4         0         1         <1           Silver         ppm         ASTM D5185m         >3         0         0         0           Aluminum         ppm         ASTM D5185m         >20         4         4         4           Lead         ppm         ASTM D5185m         >40         0         <1         0           Copper         ppm         ASTM D5185m         >40         0         <1         0           Vanadium         ppm         ASTM D5185m         0         <1         0         <1         0           Vanadium         ppm         ASTM D5185m         0         <1         0         <1         0           Vanadium         ppm         ASTM D5185m         10         <1         1<	Fuel		WC Method	>5	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         0         1         <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	10	9	7
Titanium	Chromium	ppm	ASTM D5185m	>20	0	1	<1
Silver	Nickel	ppm	ASTM D5185m	>4	0	1	0
Aluminum         ppm         ASTM D5185m         >20         4         4         4           Lead         ppm         ASTM D5185m         >40         0         <1         0           Copper         ppm         ASTM D5185m         >330         0         <1         <1           Tin         ppm         ASTM D5185m         >15         <1         <1         0           Vanadium         ppm         ASTM D5185m         0         <1         0           Cadmium         ppm         ASTM D5185m         0         <1         0           Cadmium         ppm         ASTM D5185m         250         34         35         27           Boron         ppm         ASTM D5185m         10         <1         1         11           Molybdenum         ppm         ASTM D5185m         100         <1         1         11           Molybdenum         ppm         ASTM D5185m         100         213         252         204           Manganese         ppm         ASTM D5185m         100         213         252         204           Manganesium         ppm         ASTM D5185m         300         1225         1510         111	Titanium	ppm	ASTM D5185m		0	<1	<1
Lead	Silver	ppm	ASTM D5185m	>3	0	0	0
Copper         ppm         ASTM D5185m         >330         0         <1	Aluminum	ppm	ASTM D5185m	>20	4	4	4
Tin	Lead	ppm	ASTM D5185m	>40	0	<1	0
Vanadium         ppm         ASTM D5185m         0         <1	Copper	ppm	ASTM D5185m	>330	0	<1	<1
Cadmium         ppm         ASTM D5185m         0         <1	Tin	ppm	ASTM D5185m	>15	<1	<1	0
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         250         34         35         27           Barium         ppm         ASTM D5185m         10         <1         1         11           Molybdenum         ppm         ASTM D5185m         100         213         252         204           Manganese         ppm         ASTM D5185m         15         4         4           Magnesium         ppm         ASTM D5185m         450         626         773         558           Calcium         ppm         ASTM D5185m         3000         1225         1510         1116           Phosphorus         ppm         ASTM D5185m         1350         710         906         658           Sulfur         ppm         ASTM D5185m         4250         2946         3406         2726           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         16         21         16           Sodium         ppm         ASTM D5185m         >20	Vanadium	ppm	ASTM D5185m		0	<1	0
Boron	Cadmium	ppm	ASTM D5185m		0	<1	0
Barium         ppm         ASTM D5185m         10         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         100         213         252         204           Manganese         ppm         ASTM D5185m         15         4         4           Magnesium         ppm         ASTM D5185m         450         626         773         558           Calcium         ppm         ASTM D5185m         3000         1225         1510         1116           Phosphorus         ppm         ASTM D5185m         1150         588         777         587           Zinc         ppm         ASTM D5185m         1350         710         906         658           Sulfur         ppm         ASTM D5185m         4250         2946         3406         2726           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         16         21         16           Sodium         ppm         ASTM D5185m         >20         0         2         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         *ASTM D7844         >3         0.1	Boron	ppm	ASTM D5185m	250	34	35	27
Manganese         ppm         ASTM D5185m         15         4         4           Magnesium         ppm         ASTM D5185m         450         626         773         558           Calcium         ppm         ASTM D5185m         3000         1225         1510         1116           Phosphorus         ppm         ASTM D5185m         1150         588         777         587           Zinc         ppm         ASTM D5185m         1350         710         906         658           Sulfur         ppm         ASTM D5185m         4250         2946         3406         2726           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         16         21         16           Sodium         ppm         ASTM D5185m         >20         0         2         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1         0         0           Nitration         Abs/cm         *ASTM D7845         >30 <t< th=""><th>Barium</th><th>ppm</th><th>ASTM D5185m</th><th>10</th><th>&lt;1</th><th>1</th><th>11</th></t<>	Barium	ppm	ASTM D5185m	10	<1	1	11
Magnesium         ppm         ASTM D5185m         450         626         773         558           Calcium         ppm         ASTM D5185m         3000         1225         1510         1116           Phosphorus         ppm         ASTM D5185m         1150         588         777         587           Zinc         ppm         ASTM D5185m         1350         710         906         658           Sulfur         ppm         ASTM D5185m         4250         2946         3406         2726           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         16         21         16           Sodium         ppm         ASTM D5185m         >20         0         2         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1         0         0           Nitration         Abs/.1mm         *ASTM D7624         >20         10.8         10.3         11.4           Sulfation         Abs/.1mm         *ASTM D7414<	Molybdenum	ppm	ASTM D5185m	100	213	252	204
Calcium         ppm         ASTM D5185m         3000         1225         1510         1116           Phosphorus         ppm         ASTM D5185m         1150         588         777         587           Zinc         ppm         ASTM D5185m         1350         710         906         658           Sulfur         ppm         ASTM D5185m         4250         2946         3406         2726           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         16         21         16           Sodium         ppm         ASTM D5185m         >20         0         2         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1         0         0           Nitration         Abs/cm         *ASTM D7624         >20         10.8         10.3         11.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.3         20.3         22.4           FLUID DEGRADATION         method	Manganese	ppm	ASTM D5185m		15	4	4
Phosphorus         ppm         ASTM D5185m         1150         588         777         587           Zinc         ppm         ASTM D5185m         1350         710         906         658           Sulfur         ppm         ASTM D5185m         4250         2946         3406         2726           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         16         21         16           Sodium         ppm         ASTM D5185m         >20         0         2         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1         0         0           Nitration         Abs/cm         *ASTM D7624         >20         10.8         10.3         11.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.3         20.3         22.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm	Magnesium	ppm	ASTM D5185m	450	626	773	558
Zinc         ppm         ASTM D5185m         1350         710         906         658           Sulfur         ppm         ASTM D5185m         4250         2946         3406         2726           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         16         21         16           Sodium         ppm         ASTM D5185m         >20         0         2         2           Potassium         ppm         ASTM D5185m         >20         0         2         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1         0         0           Nitration         Abs/cm         *ASTM D7624         >20         10.8         10.3         11.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.3         20.3         22.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 </th <th>Calcium</th> <th>ppm</th> <th>ASTM D5185m</th> <th>3000</th> <th>1225</th> <th>1510</th> <th>1116</th>	Calcium	ppm	ASTM D5185m	3000	1225	1510	1116
Sulfur         ppm         ASTM D5185m         4250         2946         3406         2726           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         16         21         16           Sodium         ppm         ASTM D5185m         >20         0         2         2           Potassium         ppm         ASTM D5185m         >20         0         2         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1         0         0           Nitration         Abs/cm         *ASTM D7624         >20         10.8         10.3         11.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.3         20.3         22.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.9         14.2         15.8	Phosphorus	ppm	ASTM D5185m	1150	588	777	587
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         16         21         16           Sodium         ppm         ASTM D5185m         3         0         1           Potassium         ppm         ASTM D5185m         >20         0         2         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1         0         0           Nitration         Abs/cm         *ASTM D7624         >20         10.8         10.3         11.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.3         20.3         22.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.9         14.2         15.8	Zinc	ppm	ASTM D5185m	1350	710	906	658
Silicon         ppm         ASTM D5185m         >25         16         21         16           Sodium         ppm         ASTM D5185m         3         0         1           Potassium         ppm         ASTM D5185m         >20         0         2         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1         0         0           Nitration         Abs/cm         *ASTM D7624         >20         10.8         10.3         11.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.3         20.3         22.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.9         14.2         15.8	Sulfur	ppm	ASTM D5185m	4250	2946	3406	2726
Sodium         ppm         ASTM D5185m         3         0         1           Potassium         ppm         ASTM D5185m         >20         0         2         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1         0         0           Nitration         Abs/cm         *ASTM D7624         >20         10.8         10.3         11.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.3         20.3         22.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.9         14.2         15.8	CONTAMINANTS	;	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         0         2         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1         0         0           Nitration         Abs/cm         *ASTM D7624         >20         10.8         10.3         11.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.3         20.3         22.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.9         14.2         15.8		ppm		>25			
INFRA-RED	Sodium	ppm	ASTM D5185m		3	0	1
Soot %         %         *ASTM D7844 >3         0.1         0         0           Nitration         Abs/cm         *ASTM D7624 >20         10.8         10.3         11.4           Sulfation         Abs/.1mm         *ASTM D7415 >30         21.3         20.3         22.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         14.9         14.2         15.8	Potassium	ppm	ASTM D5185m	>20	0	2	2
Nitration         Abs/cm         *ASTM D7624         >20         10.8         10.3         11.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.3         20.3         22.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.9         14.2         15.8	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         21.3         20.3         22.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.9         14.2         15.8	Soot %	%	*ASTM D7844	>3	0.1	0	0
FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     14.9     14.2     15.8	Nitration	Abs/cm	*ASTM D7624	>20	10.8	10.3	11.4
Oxidation Abs/.1mm *ASTM D7414 >25 <b>14.9</b> 14.2 15.8	Sulfation	Abs/.1mm	*ASTM D7415	>30	21.3	20.3	22.4
	FLUID DEGRADA	ATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 8.5 4.6 4.8 4.4	Oxidation	Abs/.1mm	*ASTM D7414	>25	14.9	14.2	15.8
	Base Number (BN)	mg KOH/g	ASTM D2896	8.5	4.6	4.8	4.4



# **OIL ANALYSIS REPORT**







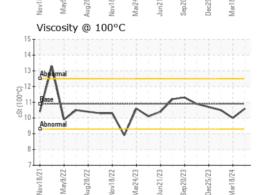
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
<b>Emulsified Water</b>	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

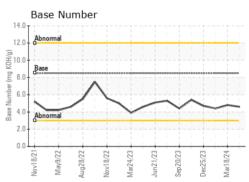
FLUID PROPERTIES		method				history2	
Visc @ 100°C	cSt	ASTM D445	10.9	10.6	10.0	10.5	

### **GRAPHS**

Non-ferrous Metals

# Ferrous Alloys









Certificate 12367

Sample No. Lab Number : 06196212 Unique Number : 11058335 Test Package : FLEET

To discuss this sample report, contact Customer Service at 1-800-237-1369.

ppm

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : HRE0000159 Received : 31 May 2024 **Tested** : 03 Jun 2024

Diagnosed

: 03 Jun 2024 - Don Baldridge

US 27516 Contact: Lisa DePasqua Idepasqua@townofchapelhill.org T: (919)696-4941

TOWN OF CHAPEL HILL

6900 MILLHOUSE RD

CHAPEL HILL, NC

\* - 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)