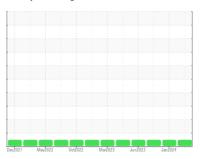


OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



Machine Id 1806 Component Diesel Engine

DIESEL ENGINE OIL SAE 15W40 (--- GAL)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor. Please specify the component make and model with your next sample. 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.

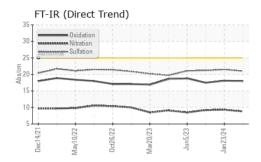
Fluid Condition

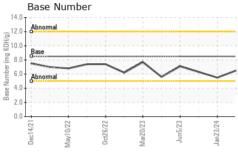
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

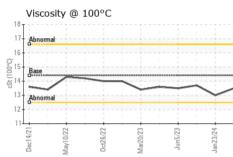
SAMPLE INFORMATION method imit/base current history1 history2			Dec2021	May2022 0ct2022	Mar2023 Jun2023 Ja	in2024	
Sample Date	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Client Info	Sample Number		Client Info		HRE0000125	WC0810280	WC0860379
Oil Age mls Client Info Changed N/A			Client Info		28 Mar 2024	23 Jan 2024	01 Oct 2023
Oil Changed Sample Status Client Info Changed NORMAL NORMAL NORMAL N/A NORMAL NORMAL N/A NORMAL NORMAL CONTAMINATION method limit/base current fistory1 fistory2 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 firon Iron ppm ASTM D5185m >100 7 10 4 Chromium ppm ASTM D5185m >20 <1 <1 <1 Nickel ppm ASTM D5185m >3 0 0 0 Silver ppm ASTM D5185m >3 0 0 0 Silver ppm ASTM D5185m >40 0 <1 <1 Copper ppm ASTM D5185m >30 0 0 <1	Machine Age	mls	Client Info		178866	173400	167783
Sample Status	Oil Age	mls	Client Info		0	0	0
CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0	Oil Changed		Client Info		Changed	N/A	N/A
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
Water Glycol WC Method 90.2 NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 7 10 4 Chromium ppm ASTM D5185m >20 <1	CONTAMINATION	٧	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>5	<1.0	<1.0	<1.0
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 7 10 4 Chromium ppm ASTM D5185m >20 <1 <1 <1 Nickel ppm ASTM D5185m >20 <1 <1 <1 Titanium ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >20 2 2 3 Lead ppm ASTM D5185m >20 2 2 3 Lead ppm ASTM D5185m >20 2 2 3 Lead ppm ASTM D5185m >15 <1 <1 <1 Copper ppm ASTM D5185m 0 0 <1 0 Vanadium ppm ASTM D5185m 0 0 <1 0 Cadmium ppm ASTM D5185m 10 1 0	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	7	10	4
Titanium ppm ASTM D5185m 1 <1	Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Silver	Nickel	ppm	ASTM D5185m	>4	<1	<1	<1
Aluminum ppm ASTM D5185m >20 2 2 3 Lead ppm ASTM D5185m >40 0 <1 <1 Copper ppm ASTM D5185m >330 <1 1 <1 Tin ppm ASTM D5185m >15 <1 <1 0 Vanadium ppm ASTM D5185m 0 0 <1 0 Cadmium ppm ASTM D5185m 0 <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 10 1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 100 1 0 0 <	Titanium	ppm	ASTM D5185m		1	<1	<1
Lead ppm ASTM D5185m >40 0 <1	Silver	ppm	ASTM D5185m	>3	0		_
Copper ppm ASTM D5185m >330 <1	Aluminum	ppm	ASTM D5185m	>20	2	2	3
Tin ppm ASTM D5185m >15 <1	Lead	ppm	ASTM D5185m	>40	0	<1	<1
Vanadium ppm ASTM D5185m 0 0 <1	Copper	ppm	ASTM D5185m	>330	<1	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 98 89 105 Barium ppm ASTM D5185m 10 1 0 0 Molybdenum ppm ASTM D5185m 100 58 77 75 Manganese ppm ASTM D5185m 0 <1 <1 Magnesium ppm ASTM D5185m 450 278 230 281 Calcium ppm ASTM D5185m 3000 1301 1541 1622 Phosphorus ppm ASTM D5185m 3000 1301 1541 1622 Phosphorus ppm ASTM D5185m 1350 932 1127 1227 Sulfur ppm ASTM D5185m 4250 2618 3177 3211 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m	Vanadium	ppm	ASTM D5185m		0	0	<1
Boron ppm ASTM D5185m 250 98 89 105 Barium ppm ASTM D5185m 10 1 0 0 Molybdenum ppm ASTM D5185m 100 58 77 75 Manganese ppm ASTM D5185m 0 <1	Cadmium	ppm	ASTM D5185m		0	<1	0
Barium ppm ASTM D5185m 10 1 0 0 Molybdenum ppm ASTM D5185m 100 58 77 75 Manganese ppm ASTM D5185m 0 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 100 58 77 75 Manganese ppm ASTM D5185m 0 <1	Boron	ppm	ASTM D5185m	250	98	89	105
Manganese ppm ASTM D5185m 0 <1	Barium	ppm	ASTM D5185m		1	0	0
Magnesium ppm ASTM D5185m 450 278 230 281 Calcium ppm ASTM D5185m 3000 1301 1541 1622 Phosphorus ppm ASTM D5185m 1150 790 914 976 Zinc ppm ASTM D5185m 1350 932 1127 1227 Sulfur ppm ASTM D5185m 4250 2618 3177 3211 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 11 8 Sodium ppm ASTM D5185m >158 5 3 6 Potassium ppm ASTM D5185m >20 1 2 1 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7624 >20 8.8 9.3 9.2 Sulfation Abs/.1mm *ASTM D7415 >30	•	ppm	ASTM D5185m	100			
Calcium ppm ASTM D5185m 3000 1301 1541 1622 Phosphorus ppm ASTM D5185m 1150 790 914 976 Zinc ppm ASTM D5185m 1350 932 1127 1227 Sulfur ppm ASTM D5185m 4250 2618 3177 3211 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 11 8 Sodium ppm ASTM D5185m >158 5 3 6 Potassium ppm ASTM D5185m >20 1 2 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/.1mm *ASTM D7415 >30 21.0 21.5 21.2 FLUID DEGRADATION method<	-	ppm	ASTM D5185m		0		
Phosphorus ppm ASTM D5185m 1150 790 914 976 Zinc ppm ASTM D5185m 1350 932 1127 1227 Sulfur ppm ASTM D5185m 4250 2618 3177 3211 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 11 8 Sodium ppm ASTM D5185m >158 5 3 6 Potassium ppm ASTM D5185m >20 1 2 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 8.8 9.3 9.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.0 21.5 21.2 FLUID DEGRADATION method	Magnesium	ppm	ASTM D5185m		_		
Zinc ppm ASTM D5185m 1350 932 1127 1227 Sulfur ppm ASTM D5185m 4250 2618 3177 3211 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 11 8 Sodium ppm ASTM D5185m >158 5 3 6 Potassium ppm ASTM D5185m >20 1 2 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 8.8 9.3 9.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.0 21.5 21.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation A		ppm					
Sulfur ppm ASTM D5185m 4250 2618 3177 3211 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 11 8 Sodium ppm ASTM D5185m >158 5 3 6 Potassium ppm ASTM D5185m >20 1 2 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 8.8 9.3 9.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.0 21.5 21.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.0 18.1 17.5							
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 11 8 Sodium ppm ASTM D5185m >158 5 3 6 Potassium ppm ASTM D5185m >20 1 2 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 8.8 9.3 9.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.0 21.5 21.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.0 18.1 17.5	-						
Silicon ppm ASTM D5185m >25 7 11 8 Sodium ppm ASTM D5185m >158 5 3 6 Potassium ppm ASTM D5185m >20 1 2 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 8.8 9.3 9.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.0 21.5 21.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.0 18.1 17.5			ASTM D5185m	4250	2618	3177	3211
Sodium ppm ASTM D5185m >158 5 3 6 Potassium ppm ASTM D5185m >20 1 2 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 8.8 9.3 9.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.0 21.5 21.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.0 18.1 17.5			method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 1 2 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 8.8 9.3 9.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.0 21.5 21.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.0 18.1 17.5							
INFRA-RED		ppm		>158	5	3	
Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 8.8 9.3 9.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.0 21.5 21.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.0 18.1 17.5	Potassium	ppm	ASTM D5185m	>20	1	2	1
Nitration Abs/cm *ASTM D7624 >20 8.8 9.3 9.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.0 21.5 21.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.0 18.1 17.5	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 21.0 21.5 21.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.0 18.1 17.5	Soot %						
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.0 18.1 17.5	Nitration	Abs/cm	*ASTM D7624	>20	8.8	9.3	
Oxidation Abs/.1mm *ASTM D7414 >25 18.0 18.1 17.5	Sulfation	Abs/.1mm	*ASTM D7415	>30	21.0	21.5	21.2
	FLUID DEGRADA	TION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 8.5 6.5 5.5 6.3	Oxidation	Abs/.1mm	*ASTM D7414	>25	18.0	18.1	17.5
	Base Number (BN)	mg KOH/g	ASTM D2896	8.5	6.5	5.5	6.3



OIL ANALYSIS REPORT



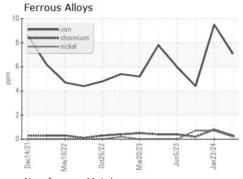


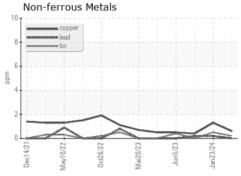


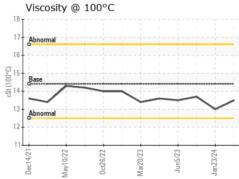
VISUAL		method				history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	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

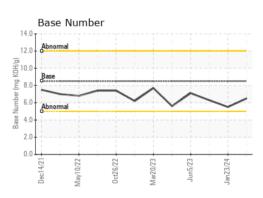
FLUID PROPER	RTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	14.4	13.5	13.0	13.7

GRAPHS













Certificate 12367

Sample No.

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Lab Number : 06148463 Unique Number : 10978541 Test Package : FLEET

: HRE0000125

Received **Tested**

: 15 Apr 2024 : 16 Apr 2024

Diagnosed : 16 Apr 2024 - Wes Davis

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

TOWN OF CHAPEL HILL

6900 MILLHOUSE RD

CHAPEL HILL, NC

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)