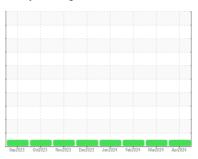


# **OIL ANALYSIS REPORT**

Sample Rating Trend







Machine Id 1902 Component Diesel Engine

**DIESEL ENGINE OIL SAE 15W30 (--- 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**

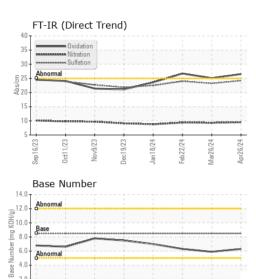
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

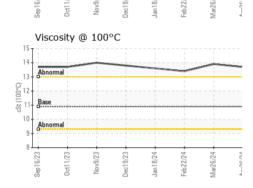
Client Info							
Client Info	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age         mls         Client Info         0         0         0           Oil Age         mls         Client Info         0         0         0           Oil Changed         Client Info         Changed NVA         NVA           Sample Status         NORMAL         NORMAL         NORMAL           CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >3.0         <1.0         <1.0         <1.0           Water         WC Method         NEG         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history2         history2           Iron         ppm         ASTM D5185m         >90         6         5         5         5           Iron         ppm         ASTM D5185m         >90         6         5         5         5           VEAR METALS         method         limit/base         current         history2         history2           Iron         ppm         ASTM D5185m         >90         6         5         5         5           Silver         ppm         ASTM	Sample Number		Client Info		WC0897920	WC0893951	WC0894018
Machine Age         mls         Client Info         0         0         0           Oil Age         mls         Client Info         0         0         0           Oil Changed         Client Info         Changed NVA         NVA           Sample Status         NORMAL         NORMAL         NORMAL           CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >3.0         <1.0	Sample Date		Client Info		26 Apr 2024	26 Mar 2024	22 Feb 2024
Client Info   Changed NORMAL   NORMAL   NORMAL   NORMAL	Machine Age	mls	Client Info			0	0
NORMAL   NORMAL   NORMAL   NORMAL	Oil Age	mls	Client Info		0	0	0
NORMAL   NORMAL   NORMAL   CONTAMINATION   method   minit/base   current   history1   history2			Client Info		Changed	N/A	N/A
Fuel					NORMAL	NORMAL	NORMAL
Water Glycol         WC Method WC Method         >0.2         NEG NEG         NEG NEG         NEG NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >90         6         5         5           Chromium         ppm         ASTM D5185m         >20         <1	CONTAMINATIO	N	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         <1         0         0           Nickel         ppm         ASTM D5185m         >2         0         0         0           Titanium         ppm         ASTM D5185m         >2         <1         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >20         2         <1         <1           Lead         ppm         ASTM D5185m         >20         2         <1         <1           Copper         ppm         ASTM D5185m         >40         <1         0         0           Copper         ppm         ASTM D5185m         >15         <1         0         <1           Vanadium         ppm         ASTM D5185m         >15         <1         0         <1           Vanadium         ppm         ASTM D5185m         <1         0         <1         0           Cadmium         ppm         ASTM D5185m         10         2         <1         0           Barium         ppm         ASTM D5185m         10         2         <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>90	6	5	5
Titanium	Chromium	ppm	ASTM D5185m	>20	<1	0	0
Silver	Nickel	ppm	ASTM D5185m	>2	0	0	0
Aluminum         ppm         ASTM D5185m         >20         2         <1         <1           Lead         ppm         ASTM D5185m         >40         <1	Titanium	ppm	ASTM D5185m	>2	<1	0	0
Lead	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper	Aluminum	ppm	ASTM D5185m	>20	2	<1	<1
Tin	Lead	ppm	ASTM D5185m	>40	<1	0	0
Vanadium         ppm         ASTM D5185m         <1         <1         0           Cadmium         ppm         ASTM D5185m         <1         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         250         0         <1         0           Barium         ppm         ASTM D5185m         10         2         <1         0           Molybdenum         ppm         ASTM D5185m         100         59         56         56           Manganese         ppm         ASTM D5185m         100         59         56         56           Manganesium         ppm         ASTM D5185m         450         862         936         999           Calcium         ppm         ASTM D5185m         3000         1086         1127         1067           Phosphorus         ppm         ASTM D5185m         1350         1141         1299         1236           Sulfur         ppm         ASTM D5185m         4250         3058         3710         3129           CONTAMINANTS         method         limit/base         current         history1	Copper	ppm	ASTM D5185m	>330	2	<1	<1
ADDITIVES	Tin	ppm	ASTM D5185m	>15	<1	0	<1
ADDITIVES	Vanadium	ppm	ASTM D5185m		<1	<1	0
Boron   ppm   ASTM D5185m   250   0   <1   0   0	Cadmium	ppm	ASTM D5185m		<1	0	0
Barium         ppm         ASTM D5185m         10         2         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         100         59         56         56           Manganese         ppm         ASTM D5185m         100         0         0           Magnesium         ppm         ASTM D5185m         450         862         936         999           Calcium         ppm         ASTM D5185m         3000         1086         1127         1067           Phosphorus         ppm         ASTM D5185m         1150         1012         1032         1039           Zinc         ppm         ASTM D5185m         1350         1141         1299         1236           Sulfur         ppm         ASTM D5185m         4250         3058         3710         3129           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         13         7         4           Sodium         ppm         ASTM D5185m         >25         0         2         3           Potassium         ppm         ASTM D5185m         >20         3         <1         <1           INFRA-RED         method         limit/base         curren	Boron	ppm	ASTM D5185m	250	0	<1	0
Manganese         ppm         ASTM D5185m         <1         0         0           Magnesium         ppm         ASTM D5185m         450         862         936         999           Calcium         ppm         ASTM D5185m         3000         1086         1127         1067           Phosphorus         ppm         ASTM D5185m         1150         1012         1032         1039           Zinc         ppm         ASTM D5185m         1350         1141         1299         1236           Sulfur         ppm         ASTM D5185m         4250         3058         3710         3129           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         13         7         4           Sodium         ppm         ASTM D5185m         >25         0         2         3           Potassium         ppm         ASTM D5185m         >25         0         2         3           Potassium         ppm         ASTM D5185m         >20         3         <1         <1           INFRA-RED         method         limit/base         current <td>Barium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>10</td> <th>2</th> <td>&lt;1</td> <td>0</td>	Barium	ppm	ASTM D5185m	10	2	<1	0
Magnesium         ppm         ASTM D5185m         450         862         936         999           Calcium         ppm         ASTM D5185m         3000         1086         1127         1067           Phosphorus         ppm         ASTM D5185m         1150         1012         1032         1039           Zinc         ppm         ASTM D5185m         1350         1141         1299         1236           Sulfur         ppm         ASTM D5185m         4250         3058         3710         3129           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         0         2         3           Sodium         ppm         ASTM D5185m         >25         0         2         3           Potassium         ppm         ASTM D5185m         >20         3         <1	Molybdenum	ppm	ASTM D5185m	100	59	56	56
Calcium         ppm         ASTM D5185m         3000         1086         1127         1067           Phosphorus         ppm         ASTM D5185m         1150         1012         1032         1039           Zinc         ppm         ASTM D5185m         1350         1141         1299         1236           Sulfur         ppm         ASTM D5185m         4250         3058         3710         3129           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         13         7         4           Sodium         ppm         ASTM D5185m         >25         0         2         3           Potassium         ppm         ASTM D5185m         >20         3         <1	Manganese	ppm	ASTM D5185m		<1	0	0
Phosphorus         ppm         ASTM D5185m         1150         1012         1032         1039           Zinc         ppm         ASTM D5185m         1350         1141         1299         1236           Sulfur         ppm         ASTM D5185m         4250         3058         3710         3129           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         13         7         4           Sodium         ppm         ASTM D5185m         >25         0         2         3           Potassium         ppm         ASTM D5185m         >20         3         <1	Magnesium	ppm	ASTM D5185m	450	862	936	999
Zinc         ppm         ASTM D5185m         1350         1141         1299         1236           Sulfur         ppm         ASTM D5185m         4250         3058         3710         3129           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         13         7         4           Sodium         ppm         ASTM D5185m         >25         0         2         3           Potassium         ppm         ASTM D5185m         >20         3         <1	Calcium	ppm	ASTM D5185m	3000	1086	1127	1067
Sulfur         ppm         ASTM D5185m         4250         3058         3710         3129           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         13         7         4           Sodium         ppm         ASTM D5185m         >25         0         2         3           Potassium         ppm         ASTM D5185m         >20         3         <1	Phosphorus	ppm	ASTM D5185m	1150	1012	1032	1039
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         13         7         4           Sodium         ppm         ASTM D5185m         >25         0         2         3           Potassium         ppm         ASTM D5185m         >20         3         <1	Zinc	ppm	ASTM D5185m	1350	1141	1299	1236
Silicon         ppm         ASTM D5185m         >25         13         7         4           Sodium         ppm         ASTM D5185m         >25         0         2         3           Potassium         ppm         ASTM D5185m         >20         3         <1         <1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.3         0.3         0.3           Nitration         Abs/cm         *ASTM D7624         >20         9.5         9.3         9.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         24.2         23.2         24.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         26.5         25.1         26.7	Sulfur	ppm	ASTM D5185m	4250	3058	3710	3129
Sodium         ppm         ASTM D5185m         >25         0         2         3           Potassium         ppm         ASTM D5185m         >20         3         <1	CONTAMINANTS	3	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         3         <1	Silicon	ppm	ASTM D5185m	>25	13	7	4
INFRA-RED	Sodium	ppm	ASTM D5185m	>25	0	2	3
Soot %         %         *ASTM D7844 >6         0.3         0.3         0.3           Nitration         Abs/cm         *ASTM D7624 >20         9.5         9.3         9.4           Sulfation         Abs/.1mm         *ASTM D7415 >30         24.2         23.2         24.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         26.5         25.1         26.7	Potassium	ppm	ASTM D5185m	>20	3	<1	<1
Nitration         Abs/cm         *ASTM D7624         >20         9.5         9.3         9.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         24.2         23.2         24.0           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         26.5         25.1         26.7	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         24.2         23.2         24.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         26.5         25.1         26.7	Soot %	%	*ASTM D7844	>6	0.3	0.3	0.3
FLUID DEGRADATION method limit/base current history1 history2  Oxidation Abs/.1mm *ASTM D7414 >25 26.5 25.1 26.7	Nitration	Abs/cm	*ASTM D7624	>20	9.5	9.3	9.4
Oxidation	Sulfation	Abs/.1mm	*ASTM D7415	>30	24.2	23.2	24.0
	FLUID DEGRADA	ATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	26.5	25.1	26.7
	Base Number (BN)	mg KOH/g			6.3	5.9	6.3



2.0 0.0

## **OIL ANALYSIS REPORT**



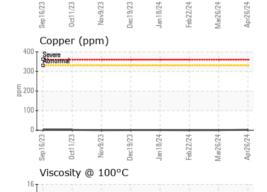


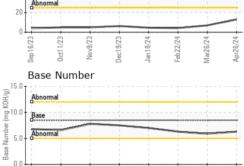
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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 met		method	limit/base	current	history1	history2

Silicon (ppm)

0ct11/23

Visc @ 100°C	cSt	ASTM D445	10.9	13.7	13.9	13.4	
GRAPHS							
Iron (ppm)				Lead (ppm	)		
200 Severe				80 Severe			
150				60 Abnormal			
100 - Abnormal		*************************		40 Abnormal			
50				20			
Sep16/23 -	Dec19/23 - Jan18/24 -	Feb22/24	Apr26/24	Sep16/23 _	Nov9/23 Dec19/23	Feb22/24	
Aluminum (ppm) Chromium (ppm)							
Severe				Severe			
= 30				E 30			









Certificate 12367

Sample No.

Lab Number : 06176798

: WC0897920 Unique Number : 11022851

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received **Tested** Diagnosed

: 13 May 2024 : 14 May 2024

: 14 May 2024 - Wes Davis

US 27701 Contact: Robert Iosiniecki Robert.losiniecki@ratpdev.com

**GO DURHAM - RAPT** 

DURHAM, NC

1903 FAYETTEVILLE ST

Test Package : MOB 1 ( Additional Tests: TBN ) 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)

T:

F: