

OIL ANALYSIS REPORT

Sample Rating Trend





Machine Id 460 Component **Diesel Engine**

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

Recommendation

Resample at the next service interval to monitor. Please specify the brand, type, and viscosity of the oil on your next sample.

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

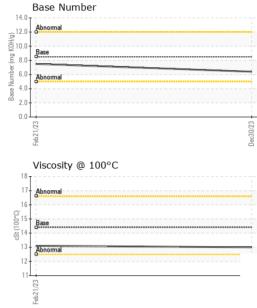
Fluid Condition

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/bass current history1 history2	SAE 15W40 (G	AL)		Feb 2023	Dec2023		
Sample Date	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 5743 4131 Oil Age hrs Client Info 1612 0 Oil Changed Client Info Changed Changed Sample Status NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >3.0 <1.0	Sample Number		Client Info		WC0847894	WC0760010	
Oil Age hrs Client Info 1612 0	Sample Date		Client Info		30 Dec 2023	21 Feb 2023	
Oil Changed Sample Status Client Info MoRMAL Changed NORMAL Changed NORMAL	Machine Age	hrs	Client Info		5743	4131	
CONTAMINATION	Oil Age	hrs	Client Info		1612	0	
CONTAMINATION method limit/base current history1 history2 Fuel WC Method >3.0 <1.0	Oil Changed		Client Info		Changed	Changed	
Fuel	Sample Status				NORMAL	NORMAL	
Water Glycol WC Method >0.2 NEG NEG	CONTAMINATION	V	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	
WEAR METALS method limit/base current history2 Iron ppm ASTM D5185m >120 17 13 Chromium ppm ASTM D5185m >20 <1	Water		WC Method	>0.2	NEG	NEG	
Iron	Glycol		WC Method		NEG	NEG	
Chromium ppm ASTM D5185m >20 <1 <1 Nickel ppm ASTM D5185m >5 <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>120	17	13	
Titanium ppm ASTM D5185m >2 0 0 Silver ppm ASTM D5185m >2 0 0 Aluminum ppm ASTM D5185m >20 2 1 Lead ppm ASTM D5185m >40 1 0 Copper ppm ASTM D5185m >330 4 8 Tin ppm ASTM D5185m >10 0 0 Vanadium ppm ASTM D5185m 0 0 Cadmium ppm ASTM D5185m 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 25 6 4 ADDITIVES method limit/base current history1 history2 ADDITIVES method limit/base current history1 history2 <	Chromium	ppm	ASTM D5185m	>20	<1	<1	
Silver ppm ASTM D5185m >2 0 0 Aluminum ppm ASTM D5185m >20 2 1 Lead ppm ASTM D5185m >40 1 0 Copper ppm ASTM D5185m >330 4 8 Tin ppm ASTM D5185m >15 1 <1 Vanadium ppm ASTM D5185m 0 0 Cadmium ppm ASTM D5185m 0 0 Cadmium ppm ASTM D5185m 250 6 4 Boron ppm ASTM D5185m 250 6 4 Barium ppm ASTM D5185m 10 0 0 Molybdenum ppm ASTM D5185m 10 63 60 Magnesium ppm ASTM D5185m 450 875 858 <	Nickel	ppm	ASTM D5185m	>5	<1	0	
Aluminum	Titanium	ppm	ASTM D5185m	>2	0	0	
Lead ppm ASTM D5185m >40 1 0	Silver	ppm	ASTM D5185m	>2	0	0	
Copper ppm ASTM D5185m >330 4 8 Tin ppm ASTM D5185m >15 1 <1	Aluminum	ppm	ASTM D5185m	>20	2	1	
Tin ppm ASTM D5185m >15 1 <1 Vanadium ppm ASTM D5185m 0 0 Cadmium ppm ASTM D5185m 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 250 6 4 Barium ppm ASTM D5185m 10 0 0 Molybdenum ppm ASTM D5185m 100 63 60 Manganese ppm ASTM D5185m 100 63 60 Magnesium ppm ASTM D5185m 450 875 858 Calcium ppm ASTM D5185m 3000 1126 1112 Phosphorus ppm ASTM D5185m 1350 1212 1108 Sulfur ppm ASTM D5185m 25 4 4	Lead	ppm	ASTM D5185m	>40	1	0	
Vanadium ppm ASTM D5185m 0 0 Cadmium ppm ASTM D5185m 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 250 6 4 Barium ppm ASTM D5185m 10 0 0 Molybdenum ppm ASTM D5185m 100 63 60 Magnesium ppm ASTM D5185m 100 63 60 Magnesium ppm ASTM D5185m 100 875 858 Calcium ppm ASTM D5185m 3000 1126 1112 Phosphorus ppm ASTM D5185m 1350 1212 1108 Sulfur ppm ASTM D5185m 250 2821 3266 CONTAMINANTS method limit/base current <th< td=""><td>Copper</td><td>ppm</td><td>ASTM D5185m</td><td>>330</td><th>4</th><td>8</td><td></td></th<>	Copper	ppm	ASTM D5185m	>330	4	8	
Cadmium ppm ASTM D5185m 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 250 6 4 Barium ppm ASTM D5185m 10 0 0 Molybdenum ppm ASTM D5185m 100 63 60 Magnesium ppm ASTM D5185m 100 63 60 Magnesium ppm ASTM D5185m 450 875 858 Calcium ppm ASTM D5185m 3000 1126 1112 Phosphorus ppm ASTM D5185m 1350 1212 1108 Sulfur ppm ASTM D5185m 1350 1212 1108 Sulfur ppm ASTM D5185m >25 4 4 Sodium	Tin	ppm	ASTM D5185m	>15	1	<1	
Boron	Vanadium	ppm	ASTM D5185m		0	0	
Boron ppm ASTM D5185m 250 6	Cadmium	ppm	ASTM D5185m		0	0	
Barium ppm ASTM D5185m 10 0 0 Molybdenum ppm ASTM D5185m 100 63 60 Manganese ppm ASTM D5185m <1 <1 Magnesium ppm ASTM D5185m 450 875 858 Calcium ppm ASTM D5185m 3000 1126 11112 Phosphorus ppm ASTM D5185m 1350 1212 1108 Zinc ppm ASTM D5185m 4250 2821 3266 Sulfur ppm ASTM D5185m >25 4 4 Sodium ppm ASTM D5185m >25 4 4 Sodium ppm ASTM D5185m >20 8 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 9.8	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 100 63 60 Manganese ppm ASTM D5185m <1	Boron	ppm	ASTM D5185m	250	6	4	
Manganese ppm ASTM D5185m <1 <1 Magnesium ppm ASTM D5185m 450 875 858 Calcium ppm ASTM D5185m 3000 1126 1112 Phosphorus ppm ASTM D5185m 1150 998 909 Zinc ppm ASTM D5185m 1350 1212 1108 Sulfur ppm ASTM D5185m 4250 2821 3266 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 Sodium ppm ASTM D5185m >158 8 3 Potassium ppm ASTM D5185m >20 8 <1	Barium	ppm	ASTM D5185m	10	0	0	
Magnesium ppm ASTM D5185m 450 875 858 Calcium ppm ASTM D5185m 3000 1126 1112 Phosphorus ppm ASTM D5185m 1150 998 909 Zinc ppm ASTM D5185m 1350 1212 1108 Sulfur ppm ASTM D5185m 4250 2821 3266 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 Sodium ppm ASTM D5185m >158 8 3 Potassium ppm ASTM D5185m >20 8 <1	Molybdenum	ppm	ASTM D5185m	100	63	60	
Calcium ppm ASTM D5185m 3000 1126 1112 Phosphorus ppm ASTM D5185m 1150 998 909 Zinc ppm ASTM D5185m 1350 1212 1108 Sulfur ppm ASTM D5185m 4250 2821 3266 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 Sodium ppm ASTM D5185m >158 8 3 Potassium ppm ASTM D5185m >20 8 <1	Manganese	ppm	ASTM D5185m		<1		
Phosphorus ppm ASTM D5185m 1150 998 909 Zinc ppm ASTM D5185m 1350 1212 1108 Sulfur ppm ASTM D5185m 4250 2821 3266 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 Sodium ppm ASTM D5185m >158 8 3 Potassium ppm ASTM D5185m >20 8 <1	Magnesium	ppm					
Zinc ppm ASTM D5185m 1350 1212 1108 Sulfur ppm ASTM D5185m 4250 2821 3266 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 Sodium ppm ASTM D5185m >158 8 3 Potassium ppm ASTM D5185m >20 8 <1	Calcium	ppm	ASTM D5185m	3000		1112	
Sulfur ppm ASTM D5185m 4250 2821 3266 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 Sodium ppm ASTM D5185m >158 8 3 Potassium ppm ASTM D5185m >20 8 <1	Phosphorus	ppm		1150	998		
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 4 Sodium ppm ASTM D5185m >158 8 3 Potassium ppm ASTM D5185m >20 8 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 9.8 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 21.8 20.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.2 15.0		ppm					
Silicon ppm ASTM D5185m >25 4 4 Sodium ppm ASTM D5185m >158 8 3 Potassium ppm ASTM D5185m >20 8 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 9.8 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 21.8 20.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.2 15.0	Sulfur	ppm	ASTM D5185m	4250	2821	3266	
Sodium ppm ASTM D5185m >158 8 3 Potassium ppm ASTM D5185m >20 8 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 9.8 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 21.8 20.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.2 15.0	CONTAMINANTS	;	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 8 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 9.8 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 21.8 20.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.2 15.0							
INFRA-RED		ppm		>158			
Soot % % *ASTM D7844 >4 0.5 0.4 Nitration Abs/cm *ASTM D7624 >20 9.8 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 21.8 20.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.2 15.0	Potassium	ppm	ASTM D5185m	>20	8	<1	
Nitration Abs/cm *ASTM D7624 >20 9.8 8.7 Sulfation Abs/.1mm *ASTM D7415 >30 21.8 20.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.2 15.0	INFRA-RED		method	limit/base	current		history2
Sulfation Abs/.1mm *ASTM D7415 >30 21.8 20.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.2 15.0							
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.2 15.0		Abs/cm		>20			
Oxidation	Sulfation	Abs/.1mm	*ASTM D7415	>30	21.8	20.0	
	FLUID DEGRADA	TION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 8.5 6.4 7.5	Oxidation	Abs/.1mm	*ASTM D7414	>25	18.2	15.0	
	Base Number (BN)	mg KOH/g	ASTM D2896	8.5	6.4	7.5	



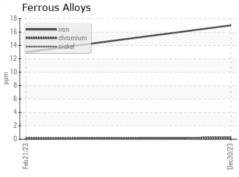
OIL ANALYSIS REPORT



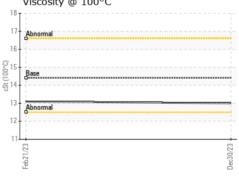
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	
Precipitate	scalar	*Visual	NONE	NONE	NONE	
Silt	scalar	*Visual	NONE	NONE	NONE	
Debris	scalar	*Visual	NONE	NONE	NONE	
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	
Appearance	scalar	*Visual	NORML	NORML	NORML	
Odor	scalar	*Visual	NORML	NORML	NORML	
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	
Free Water	scalar	*Visual		NEG	NEG	
FLUID DDODEDT					111	1

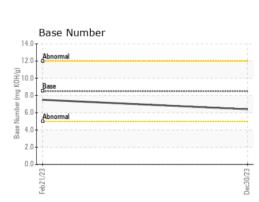
I LOID I NOI LI	TILO	memou			HISTOLAL	HISTOLYZ
Visc @ 100°C	cSt	ASTM D445	14.4	13.0	13.1	

GRAPHS



	Non-ferrous Metals	
	T:	
	copper	
	- management Edd	
mdd		_
	+	
	.+	
	Feb 21/23	Jec30/23
	eb2	8
	_	
	Viscosity @ 100°C	







Laboratory Sample No. Lab Number Unique Number : 10834800

: 06063418

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : WC0847894

Recieved Diagnosed

: 17 Jan 2024 : 18 Jan 2024

Diagnostician : Wes Davis

Chambersburg, PA

Contact: Service Manager

Apple Valley Waste - Chambersburg Location

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.

Test Package : CONST (Additional Tests: TBN)

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

5436 Sunset Pike

US 17202

T:

F: