

OIL ANALYSIS REPORT

Sample Rating Trend

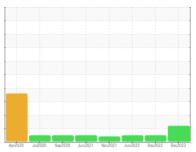
DEGRADATION

INTERNATIONAL 8017418

Component

Diesel Engine

VALVOLINE 15W40 (--- GAL)



DIAGNOSIS

Recommendation

Oil and filter change at the time of sampling has been noted. 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.

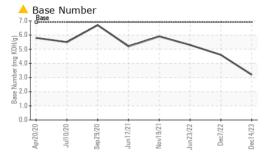
Fluid Condition

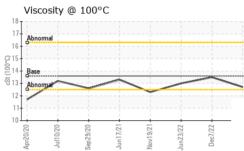
The BN level is low. The condition of the oil is acceptable for the time in service.

Client Info	Agr2020 Jul2020 Sep2020 Jun2021 Nev2021 Jun2022 Dev2022 Dev2023							
Client Info	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2	
Machine Age mls Client Info	Sample Number		Client Info		IL0034275	IL05715693	IL05597811	
Oil Age mls Client Info Changed N/A	Sample Date		Client Info		14 Dec 2023	07 Dec 2022	23 Jun 2022	
Colient Info	Machine Age	mls	Client Info		403861	326301	279587	
ABNORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2	Oil Age	mls	Client Info		0	0	0	
Fuel	Oil Changed		Client Info		Changed	N/A	N/A	
Fuel	Sample Status				ABNORMAL	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 >100 42 34 53 Chromium ppm ASTM D5185m >4 <1 0 0 Nickel ppm ASTM D5185m >4 <1 0 0 Titanium ppm ASTM D5185m >4 <1 0 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	CONTAMINATION	J	method	limit/base	current	history1	history2	
Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 42 34 53 Chromium ppm ASTM D5185m >20 2 2 3 Nickel ppm ASTM D5185m >4 <1	Fuel		WC Method	>5	<1.0	<1.0	<1.0	
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 42 34 53 Chromium ppm ASTM D5185m >20 2 2 3 Nickel ppm ASTM D5185m >4 <1 0 0 Titanium ppm ASTM D5185m 30 <1 <1 <1 Silver ppm ASTM D5185m >20 6 5 7 Lead ppm ASTM D5185m >40 7 12 10 Copper ppm ASTM D5185m >330 1 1 1 Antimony ppm ASTM D5185m >15 2 1 1 Antimony ppm ASTM D5185m <-1 0 0 0 Cadmium ppm ASTM D5185m <-1 0 0 0 Boron ppm ASTM D5185m 1 0 0	Water		WC Method	>0.2	NEG	NEG	NEG	
Iron	Glycol		WC Method		NEG	NEG	NEG	
Chromium ppm ASTM D5185m >20 2 2 3 Nickel ppm ASTM D5185m >4 <1 0 0 Titanium ppm ASTM D5185m >4 <1 0 0 Silver ppm ASTM D5185m >3 0 <1 <1 Aluminum ppm ASTM D5185m >30 0 <1 <1 Aluminum ppm ASTM D5185m >40 7 12 10 Capper ppm ASTM D5185m >40 7 12 10 Copper ppm ASTM D5185m >15 2 1 1 1 Vanadium ppm ASTM D5185m -1 0 0 0 0 Cadmium ppm ASTM D5185m -1 0 0 0 0 0 Barium ppm ASTM D5185m 1 0 0 0 0 0 0 0	WEAR METALS		method	limit/base	current	history1	history2	
Nickel	Iron	ppm	ASTM D5185m	>100	42	34	53	
STIM D5185m STIM D5185m	Chromium	ppm	ASTM D5185m	>20	2	2	3	
Silver	Nickel	ppm	ASTM D5185m	>4	<1	0	0	
Aluminum	Titanium	ppm	ASTM D5185m		<1	<1	<1	
Lead	Silver	ppm	ASTM D5185m	>3				
Copper ppm ASTM D5185m >330 1 1 1 Tin ppm ASTM D5185m >15 2 1 1 Antimony ppm ASTM D5185m Vanadium ppm ASTM D5185m <1 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 39 25 12 20 Barium ppm ASTM D5185m 1 0 0 0 Molybdenum ppm ASTM D5185m 49 88 66 72 Manganese ppm ASTM D5185m 1 -1 -1 -1 1 1 Calcium ppm ASTM D5185m 1 -1 -1 -1 1 1 Phosphorus ppm ASTM D5185m 154 1485<	Aluminum	ppm	ASTM D5185m	>20	6	5	7	
Tin ppm ASTM D5185m >15 2 1 1 1 Antimony ppm ASTM D5185m Vanadium ppm ASTM D5185m Cadmium ppm ASTM D5185m ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 1 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 1 0 0 0 0 Molybdenum ppm ASTM D5185m 1 0 0 0 0 Molybdenum ppm ASTM D5185m 1 Manganese ppm ASTM D5185m 1 Manganese ppm ASTM D5185m 1 Manganesium ppm ASTM D5185m 1 1 1 1 Magnesium ppm ASTM D5185m 1554 1485 1331 1307 Phosphorus ppm ASTM D5185m 899 991 798 736 Zinc ppm ASTM D5185m 2624 3084 2934 2807 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m 265 7 7 7 6 Sodium ppm ASTM D5185m 2 2 1 2 Potassium ppm ASTM D5185m 20 5 1 8 INFRA-RED method limit/base current history1 history2 Soot % % "ASTM D7844 3 0.6 0.8 0.7 Nitration Abs/:nm "ASTM D7615 30 29.6 30.7 29.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/:nm "ASTM D7414 25 27.8 30.1 28.6	Lead	ppm	ASTM D5185m	>40	7	12	10	
Antimony	Copper	ppm	ASTM D5185m	>330		1		
Vanadium	Tin	ppm	ASTM D5185m	>15		1	1	
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 39 25 12 20 Barium ppm ASTM D5185m 1 0 0 0 Molybdenum ppm ASTM D5185m 49 88 66 72 Manganese ppm ASTM D5185m 1 <1 <1 1 Magnesium ppm ASTM D5185m 616 621 730 724 Calcium ppm ASTM D5185m 1554 1485 1331 1307 Phosphorus ppm ASTM D5185m 899 991 798 736 Zinc ppm ASTM D5185m 2624 3084 2934 2807 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 5	Antimony	ppm						
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 39 25 12 20 Barium ppm ASTM D5185m 1 0 0 0 Molybdenum ppm ASTM D5185m 49 88 66 72 Manganese ppm ASTM D5185m 49 88 66 72 Manganesium ppm ASTM D5185m 1 <1		ppm						
Boron		ppm	ASTM D5185m		0	0	0	
Barium ppm ASTM D5185m 1 0 0 0 Molybdenum ppm ASTM D5185m 49 88 66 72 Manganese ppm ASTM D5185m 1 <1	ADDITIVES		method	limit/base	current	history1	history2	
Molybdenum ppm ASTM D5185m 49 88 66 72 Manganese ppm ASTM D5185m 1 <1	Boron	ppm	ASTM D5185m	39	25	12	20	
Manganese ppm ASTM D5185m 1 <1	Barium	ppm	ASTM D5185m	1	0	0	0	
Magnesium ppm ASTM D5185m 616 621 730 724 Calcium ppm ASTM D5185m 1554 1485 1331 1307 Phosphorus ppm ASTM D5185m 899 991 798 736 Zinc ppm ASTM D5185m 1069 1266 1029 935 Sulfur ppm ASTM D5185m 2624 3084 2934 2807 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 7 6 Sodium ppm ASTM D5185m 2 1 2 Potassium ppm ASTM D5185m >20 5 <1 8 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.6 0.8 0.7 Nitration Abs/cm *ASTM D7415 >30	Molybdenum	ppm	ASTM D5185m	49	88	66	72	
Calcium ppm ASTM D5185m 1554 1485 1331 1307 Phosphorus ppm ASTM D5185m 899 991 798 736 Zinc ppm ASTM D5185m 1069 1266 1029 935 Sulfur ppm ASTM D5185m 2624 3084 2934 2807 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 7 6 Sodium ppm ASTM D5185m 2 1 2 Potassium ppm ASTM D5185m >20 5 <1 8 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.6 0.8 0.7 Nitration Abs/cm *ASTM D7415 >30 29.6 30.7 29.2 FLUID DEGRADATION method limit/ba	Manganese	ppm	ASTM D5185m	1	<1		1	
Phosphorus ppm ASTM D5185m 899 991 798 736 Zinc ppm ASTM D5185m 1069 1266 1029 935 Sulfur ppm ASTM D5185m 2624 3084 2934 2807 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 7 6 Sodium ppm ASTM D5185m >20 5 <1 8 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.6 0.8 0.7 Nitration Abs/cm *ASTM D7624 >20 11.0 13.8 14.6 Sulfation Abs/.1mm *ASTM D7415 >30 29.6 30.7 29.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm	Magnesium	ppm			-			
Zinc ppm ASTM D5185m 1069 1266 1029 935 Sulfur ppm ASTM D5185m 2624 3084 2934 2807 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 7 6 Sodium ppm ASTM D5185m 2 1 2 Potassium ppm ASTM D5185m >20 5 <1 8 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.6 0.8 0.7 Nitration Abs/cm *ASTM D7624 >20 11.0 13.8 14.6 Sulfation Abs/.1mm *ASTM D7415 >30 29.6 30.7 29.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414		ppm						
Sulfur ppm ASTM D5185m 2624 3084 2934 2807 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 7 6 Sodium ppm ASTM D5185m 2 1 2 Potassium ppm ASTM D5185m >20 5 <1 8 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.6 0.8 0.7 Nitration Abs/cm *ASTM D7624 >20 11.0 13.8 14.6 Sulfation Abs/.1mm *ASTM D7415 >30 29.6 30.7 29.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 27.8 30.1 28.6	•	ppm						
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 7 6 Sodium ppm ASTM D5185m 2 1 2 Potassium ppm ASTM D5185m >20 5 <1 8 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.6 0.8 0.7 Nitration Abs/cm *ASTM D7624 >20 11.0 13.8 14.6 Sulfation Abs/.1mm *ASTM D7415 >30 29.6 30.7 29.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 27.8 30.1 28.6	-							
Silicon ppm ASTM D5185m >25 7 7 6 Sodium ppm ASTM D5185m 2 1 2 Potassium ppm ASTM D5185m >20 5 <1			ASTM D5185m		3084			
Sodium ppm ASTM D5185m 2 1 2 Potassium ppm ASTM D5185m >20 5 <1	CONTAMINANTS		method	limit/base				
Potassium ppm ASTM D5185m >20 5 <1	Silicon			>25				
INFRA-RED	Sodium	ppm						
Soot % % *ASTM D7844 >3 0.6 0.8 0.7 Nitration Abs/cm *ASTM D7624 >20 11.0 13.8 14.6 Sulfation Abs/.1mm *ASTM D7415 >30 29.6 30.7 29.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 27.8 30.1 28.6	Potassium	ppm	ASTM D5185m	>20	5	<1	8	
Nitration Abs/cm *ASTM D7624 >20 11.0 13.8 14.6 Sulfation Abs/.1mm *ASTM D7415 >30 29.6 30.7 29.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 27.8 30.1 28.6	INFRA-RED		method	limit/base	current	history1	history2	
Sulfation Abs/.1mm *ASTM D7415 >30 29.6 30.7 29.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 27.8 30.1 28.6	Soot %	%	*ASTM D7844	>3	0.6	0.8	0.7	
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 27.8 30.1 28.6	Nitration	Abs/cm	*ASTM D7624	>20	11.0	13.8	14.6	
Oxidation	Sulfation	Abs/.1mm	*ASTM D7415	>30	29.6	30.7	29.2	
	FLUID DEGRADA	TION	method	limit/base	current	history1	history2	
Base Number (BN) mg KOH/g ASTM D2896 6.9 ▲ 3.2 4.6 5.3	Oxidation	Abs/.1mm	*ASTM D7414	>25	27.8	30.1	28.6	
	Base Number (BN)	mg KOH/g	ASTM D2896	6.9	△ 3.2	4.6	5.3	



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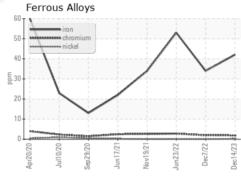


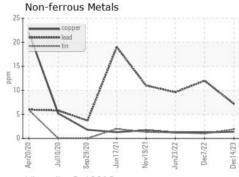


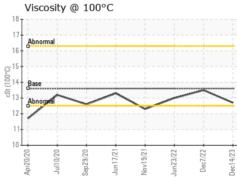
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

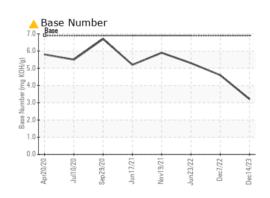
FLUID PROPER	RIIES	method	ilmit/base	current	nistory i	nistory2
Visc @ 100°C	cSt	ASTM D445	13.6	12.7	13.5	13.0

GRAPHS













Laboratory Sample No. Lab Number Unique Number : 10830341

: IL0034275 : 06058959

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Recieved : 12 Jan 2024 Diagnosed : 15 Jan 2024

Diagnostician : Don Baldridge

Test Package : FLEET Certificate L2367 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) TAMPA IDEALEASE 5951 ORIENT ROAD

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