

OIL ANALYSIS REPORT

Sample Rating Trend



INTERNATIONAL 5012909

Diesel Engine

VALVOLINE 15W40 (--- GAL)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Wear

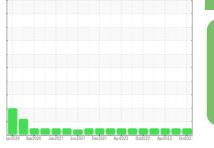
All component wear rates are normal.

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.

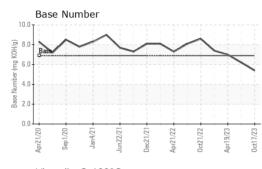


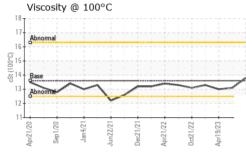


SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Sample Number		Client Info		IL0034266	IL05911767	IL05832368
Sample Date		Client Info		17 Oct 2023	12 Jul 2023	19 Apr 2023
Machine Age	mls	Client Info		256673	225900	209321
Oil Age	mls	Client Info		0	0	0
Oil Changed		Client Info		Changed	N/A	N/A
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATIO	N	method	limit/base	current	history1	history2
Fuel	N	WC Method	>5	<1.0	<1.0	<1.0
Glycol		WC Method	20	NEG	NEG	NEG
,				ITEG		
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m		40	19	12
Chromium	ppm	ASTM D5185m	>20	2	<1	0
Nickel	ppm	ASTM D5185m	>4	<1	0	0
Titanium	ppm	ASTM D5185m		0	<1	0
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>20	5	6	4
Lead	ppm	ASTM D5185m	>40	0	0	0
Copper	ppm	ASTM D5185m	>330	2	2	0
Tin	ppm	ASTM D5185m	>15	0	<1	0
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		<1	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 39	current 18	history1 45	history2 102
	ppm ppm					
Boron		ASTM D5185m	39	18	45	102
Boron Barium	ppm	ASTM D5185m ASTM D5185m ASTM D5185m	39 1	18 <1	45 0	102 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	39 1 49	18 <1 77	45 0 77	102 0 71
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	39 1 49 1	18 <1 77 0	45 0 77 <1	102 0 71 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	39 1 49 1 616	18 <1 77 0 737	45 0 77 <1 604	102 0 71 <1 732
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	39 1 49 1 616 1554	18 <1 77 0 737 1408	45 0 77 <1 604 1310	102 0 71 <1 732 1401
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	39 1 49 1 616 1554 899	18 <1 77 0 737 1408 855	45 0 77 <1 604 1310 766	102 0 71 <1 732 1401 859
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	39 1 49 1 616 1554 899 1069	18 <1 77 0 737 1408 855 1079	45 0 77 <1 604 1310 766 988	102 0 71 <1 732 1401 859 1115
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	39 1 49 1 616 1554 899 1069 2624 Limit/base	18 <1 77 0 737 1408 855 1079 2942	45 0 77 <1 604 1310 766 988 2498	102 0 71 <1 732 1401 859 1115 3058
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	39 1 49 1 616 1554 899 1069 2624 Limit/base	18 <1 77 0 737 1408 855 1079 2942 current	45 0 77 <1 604 1310 766 988 2498 history1	102 0 71 <1 732 1401 859 1115 3058 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m	39 1 49 1 616 1554 899 1069 2624 limit/base >25	18 <1 77 0 737 1408 855 1079 2942 current 10	45 0 77 <1 604 1310 766 988 2498 history1 6	102 0 71 <1 732 1401 859 1115 3058 history2 5
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m	39 1 49 1 616 1554 899 1069 2624 limit/base >25	18 <1 77 0 737 1408 855 1079 2942 current 10 0	45 0 777 <1 604 1310 766 988 2498 2498 history1 6 2	102 0 71 <1 732 1401 859 1115 3058 history2 5 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	39 1 49 1 616 1554 899 1069 2624 2624 2624 25 25 20 20 1000 2000	18 <1 77 0 737 1408 855 1079 2942 current 10 0 6	45 0 777 <1 604 1310 766 988 2498 2498 history1 6 2 5 5	102 0 71 <1 732 1401 859 1115 3058 history2 5 2 1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	39 1 49 1 616 1554 899 1069 2624 2624 2624 25 >25 >20 20 limit/base >3	18 <1 77 0 737 1408 855 1079 2942 <u>current</u> 10 0 6 <u>current</u>	45 0 777 604 1310 766 988 2498 history1 6 2 5 history1 0.6	102 0 71 <1 732 1401 859 1115 3058 history2 5 2 2 1 history2 0.4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	39 1 49 1 616 1554 899 1069 2624 2624 2624 25 >25 >20 20 limit/base >3	18 <1 77 0 737 1408 855 1079 2942 current 10 0 6 Current	45 0 777 <1 604 1310 766 988 2498 2498 history1 6 2 5 5	102 0 71 <1 732 1401 859 1115 3058 history2 5 2 2 1 1 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	39 1 49 1 616 1554 899 1069 2624 2624 2624 20 2624 20 20 20 1 imit/base >20	18 <1 77 0 737 1408 855 1079 2942 <i>current</i> 10 0 6 <i>current</i> 1 1	45 0 777 <1 604 1310 766 988 2498 history1 6 2 5 history1 0.6 11.3	102 0 71 <1 732 1401 859 1115 3058 history2 5 2 1 1 history2 0.4 9.8
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844	39 1 49 1 616 1554 899 1069 2624 imit/base >25 imit/base >3 >20 >30 imit/base	18 <1 77 0 737 1408 855 1079 2942 Current 10 0 6 Current 1 1 14.2 28.8	45 0 777 <1 604 1310 766 988 2498 history1 6 2 5 <u>history1</u> 0.6 11.3 23.1	102 0 71 <1 732 1401 859 1115 3058 history2 5 2 1 5 2 1 history2 0.4 9.8 21.2 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	39 1 49 1 616 1554 899 1069 2624 imit/base >25 imit/base >3 >20 >30 imit/base	18 <1 77 0 737 1408 855 1079 2942 <u>current</u> 10 0 6 <u>current</u> 1 1 14.2 28.8	45 0 777 <1 604 1310 766 988 2498 history1 6 2 5 5 history1 0.6 11.3 23.1	102 0 71 <1 732 1401 859 1115 3058 history2 5 2 1 history2 0.4 9.8 21.2



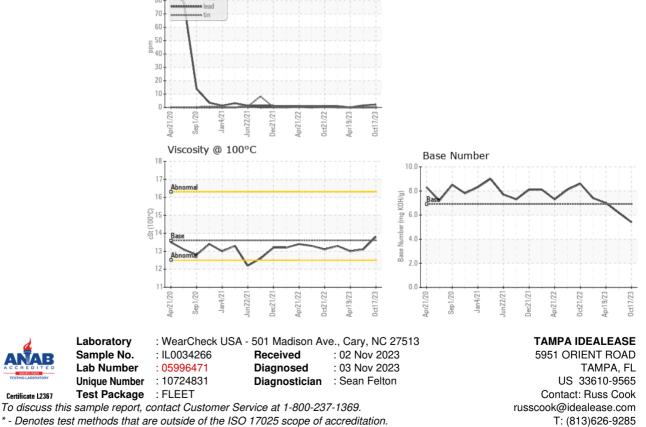
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VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*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 PROPERT	TIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	13.6	13.8	13.1	13.0
GRAPHS						

Ferrous Alloys 70 60 50 40 30 20 10 Π. Sep1/20 Apr21/20 Jan4/21 Apr19/23 0ct17/23 Oct21/22 Jec21/2 Apr 21/25 Non-ferrous Metals 90 80 lead



* - 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)

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Certificate L2367