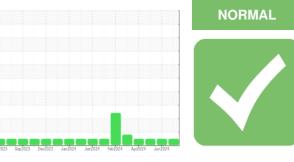


OIL ANALYSIS REPORT

Sample Rating Trend



(413UA) Machine Id 813012 Component Diesel Engine Fluid

Area

DIESEL ENGINE OIL SAE 40 (--- GAL)

DIAGNOSIS Recommendation

Resample at the next service interval to monitor. 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 INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0122018	GFL0116585	GFL0116609
Sample Date		Client Info		25 Jun 2024	03 Jun 2024	26 Apr 2024
Machine Age	hrs	Client Info		4392	4233	3973
Oil Age	hrs	Client Info		159	3896	3829
Oil Changed		Client Info		Not Changd	Changed	Not Changd
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>120	5	11	8
Chromium	ppm	ASTM D5185m	>20	ر <1	<1	<1
Nickel	ppm	ASTM D5185m	>5	1	5	4
Titanium	ppm	ASTM D5185m		<1	0	<1
Silver	ppm	ASTM D5185m	>2	0	<1	0
Aluminum	ppm	ASTM D5185m	>20	4	2	2
Lead	ppm	ASTM D5185m	>40	<1	0	<1
Copper	ppm	ASTM D5185m	>330	1	2	2
Tin	ppm	ASTM D5185m	>15	<1	1	<1
Vanadium	ppm	ASTM D5185m		<1	0	<1
A						
Cadmium	ppm	ASTM D5185m		<1	0	0
ADDITIVES	ppm	ASTM D5185m method	limit/base	<1 current	0 history1	0 history2
			limit/base 250		-	-
ADDITIVES	ppm	method		current	history1	history2
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185m	250	current 20	history1 11	history2 13
ADDITIVES Boron	ppm	method ASTM D5185m ASTM D5185m	250 10	current 20 <1	history1 11 <1	history2 13 0
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	250 10	current 20 <1 56	history1 11 <1 63	history2 13 0 59
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100	current 20 <1 56 <1	history1 11 <1 63 1	history2 13 0 59 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450	current 20 <1 56 <1 937	history1 11 <1 63 1 927	history2 13 0 59 <1 902
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000	current 20 <1 56 <1 937 1163	history1 11 <1 63 1 927 1136	history2 13 0 59 <1 902 1112
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150	current 20 <1 56 <1 937 1163 1039	history1 11 <1 63 1 927 1136 1078	history2 13 0 59 <1 902 1112 1006
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350	current 20 <1 56 <1 937 1163 1039 1269	history1 11 <1 63 1 927 1136 1078 1239	history2 13 0 59 <1 902 1112 1006 1212
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base	current 20 <1 56 <1 937 1163 1039 1269 3398	history1 11 <1 63 1 927 1136 1078 1239 3252	history2 13 0 59 <1 902 1112 1006 1212 3115
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base	current 20 <1 56 <1 937 1163 1039 1269 3398 current	history1 11 <1 63 1 927 1136 1078 1239 3252 history1	history2 13 0 59 <1 902 1112 1006 1212 3115 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base	current 20 <1 56 <1 937 1163 1039 1269 3398 current 6	history1 11 <1 63 1 927 1136 1078 1239 3252 history1 4	history2 13 0 59 <1 902 1112 1006 1212 3115 history2 4
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >216	current 20 <1 56 <1 937 1163 1039 1269 3398 current 6 5	history1 11 <1 63 1 927 1136 1078 1239 3252 history1 4 2	history2 13 0 59 <1 902 1112 1006 1212 3115 history2 4 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >216 >20	current 20 <1 56 <1 937 1163 1039 1269 3398 current 6 5 5	history1 11 <1 63 1 927 1136 1078 1239 3252 history1 4 2 2	history2 13 0 59 <1 902 1112 1006 1212 3115 history2 4 <1 2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm TS	method ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >216 >216 >216 >20 limit/base	current 20 <1 56 <1 937 1163 1039 1269 3398 current 6 5 5 current	history1 11 <1 63 1 927 1136 1078 1239 3252 history1 4 2 2 history1	history2 13 0 59 <1 902 1112 1006 1212 3115 history2 4 <1 2 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	method ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >216 >216 >216 >20 limit/base	current 20 <1 56 <1 937 1163 1039 1269 3398 current 6 5 5 current 0.2	history1 11 <1 63 1 927 1136 1078 1239 3252 history1 4 2 history1 0.6	history2 13 0 59 <1 902 1112 1006 1212 3115 history2 4 <1 2 history2 0 0 0.3
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	250 10 100 450 3000 1150 1350 4250 iimit/base >25 >216 >216 >20 iimit/base	current 20 <1 56 <1 937 1163 1039 1269 3398 current 6 5 5 current 0.2 5.9	history1 11 <1 63 1 927 1136 1078 1239 3252 history1 4 2 history1 0.6 8.3	history2 13 0 59 <1 902 1112 1006 1212 3115 history2 4 <1 2 history2 0 6.6
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 imit/base >25 >216 >20 imit/base >4 >20	current 20 <1 56 <1 937 1163 1039 1269 3398 current 6 5 current 0.2 5.9 18.5	history1 11 <1 63 1 927 1136 1078 1239 3252 history1 4 2 history1 0.6 8.3 19.6	history2 13 0 59 <1 902 1112 1006 1212 3115 history2 4 <1 2 history2 0.3 6.6 18.7



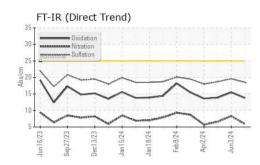
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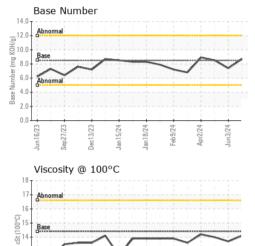
Jun16/23

Sep27/23

Dec13/23

OIL ANALYSIS REPORT





Feb9/24

Jan 18/24

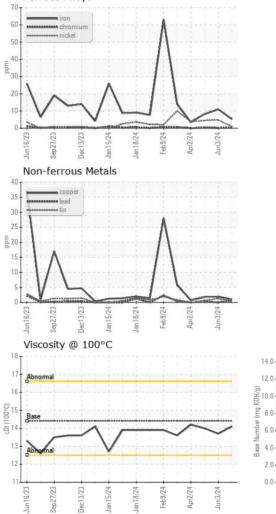
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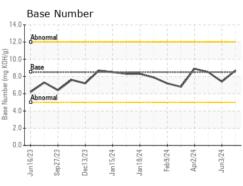
Apr2/24

Jun3/24 -

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 PROPE	RTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.4	14.1	13.7	14.0
GRAPHS						

Ferrous Alloys





Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 GFL Environmental - 652 - Fredericksburg Hauling Sample No. : GFL0122018 Received : 27 Jun 2024 10954 Houser Drive Lab Number : 06222183 Tested : 28 Jun 2024 Fredericksburg, VA Unique Number : 11100380 Diagnosed : 28 Jun 2024 - Wes Davis US 22408 Test Package : FLEET Contact: TECHNICIAN ACCOUNT Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369. catherine.anastasio@wearcheck.com * - Denotes test methods that are outside of the ISO 17025 scope of accreditation. T: F:

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

Report Id: GFL652 [WUSCAR] 06222183 (Generated: 06/28/2024 13:32:41) Rev: 1

Submitted By: TECHNICIAN ACCOUNT

Page 2 of 2