

## **OIL ANALYSIS REPORT**

Sample Rating Trend





Machine Id 722016-305155 Component

Diesel Engine Fluid MFA 15W40 (--- GAL)

## DIAGNOSIS

### Recommendation

Resample at the next service interval to monitor.

## Wear

Metal levels are typical for a new component breaking in.

### Contamination

There is no indication of any contamination in the oil.

#### Fluid Condition

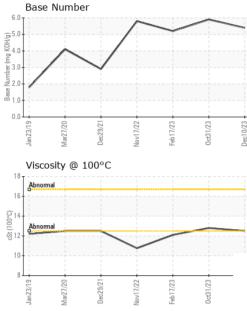
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Jan2019 Mar2020 Dec2021 Nev2022 Feb2023 Dec2023											
SAMPLE INFOR	MATION	method	limit/base	current	history1	history2					
Sample Number		Client Info		GFL0046095	GFL0046121	GFL0039527					
Sample Date		Client Info		10 Dec 2023	31 Oct 2023	17 Feb 2023					
Machine Age	hrs	Client Info		450	0	450					
Oil Age	hrs	Client Info		0	250	0					
Oil Changed		Client Info		Not Changd	Not Changd	Changed					
Sample Status				NORMAL	NORMAL	ATTENTION					
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	26	23	18					
Chromium	ppm	ASTM D5185m	>20	<1	<1	0					
Nickel	ppm	ASTM D5185m	>5	12	12	12					
Titanium	ppm	ASTM D5185m	>2	0	<1	0					
Silver	ppm	ASTM D5185m	>2	0	<1	0					
Aluminum	ppm	ASTM D5185m	>20	2	2	<1					
Lead	ppm	ASTM D5185m	>40	<1	<1	<1					
Copper	ppm	ASTM D5185m	>330	8	8	49					
Tin	ppm	ASTM D5185m	>15	0	1	1					
Vanadium	ppm	ASTM D5185m		0	<1	0					
Cadmium	ppm	ASTM D5185m		0	<1	0					
ADDITIVES		method	limit/base	current	history1	history2					
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 0	history1 1	history2 2					
	ppm ppm		limit/base								
Boron		ASTM D5185m	limit/base	0	1	2					
Boron Barium Molybdenum	ppm	ASTM D5185m ASTM D5185m	limit/base	0 0	1 <1	2 0					
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	0 0 58	1 <1 60	2 0 57					
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	0 0 58 <1	1 <1 60 <1	2 0 57 1					
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	0 0 58 <1 869	1 <1 60 <1 848	2 0 57 1 736					
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	0 0 58 <1 869 863	1 <1 60 <1 848 1071	2 0 57 1 736 1227					
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	limit/base	0 0 58 <1 869 863 831	1 <1 60 <1 848 1071 928	2 0 57 1 736 1227 779					
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	0 0 58 <1 869 863 831 1026 2541	1 <1 60 <1 848 1071 928 1165	2 0 57 1 736 1227 779 1085					
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b>	limit/base	0 0 58 <1 869 863 831 1026 2541 current 11	1 <1 60 <1 848 1071 928 1165 2835 history1 11	2 0 57 1 736 1227 779 1085 2556 history2 18					
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	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	limit/base	0 0 58 <1 869 863 831 1026 2541 current	1 <1 60 <1 848 1071 928 1165 2835 history1	2 0 57 1 736 1227 779 1085 2556 history2					
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b>	limit/base >25	0 0 58 <1 869 863 831 1026 2541 current 11	1 <1 60 <1 848 1071 928 1165 2835 history1 11	2 0 57 1 736 1227 779 1085 2556 history2 18					
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	limit/base >25	0 0 58 <1 869 863 831 1026 2541 current 11 5 0	1 <1 60 <1 848 1071 928 1165 2835 history1 11 2 2 2 history1	2 0 57 1 736 1227 779 1085 2556 history2 18 3 2 2					
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base >25 >20	0 0 58 <1 869 863 831 1026 2541 current 11 5 0	1 <1 60 <1 848 1071 928 1165 2835 history1 11 2 2 2	2 0 57 1 736 1227 779 1085 2556 history2 18 3 2					
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base >25 >20 limit/base >4	0 0 58 <1 869 863 831 1026 2541 <i>current</i> 11 5 0 <i>current</i>	1 <1 60 <1 848 1071 928 1165 2835 history1 11 2 2 2 history1	2 0 57 1 736 1227 779 1085 2556 history2 18 3 2 2					
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 ppm	ASTM D5185m ASTM D5185m	limit/base >25 >20 limit/base >4	0 0 58 <1 869 863 831 1026 2541 <i>current</i> 11 5 0 <i>current</i> 0.5	1 <1 60 <1 848 1071 928 1165 2835 history1 11 2 2 2 history1 0.4	2 0 57 1 736 1227 779 1085 2556 history2 18 3 2 2 history2 0.3					
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	ASTM D5185m ASTM D5185m	limit/base >25 >20 limit/base >4 >20	0 0 58 <1 869 863 831 1026 2541 <b>current</b> 11 5 0 <b>current</b> 0.5 11.4 23.0	1 <1 60 <1 848 1071 928 1165 2835 history1 11 2 2 2 history1 0.4 10.3	2 0 57 1 736 1227 779 1085 2556 history2 18 3 2 2 history2 0.3 10.4					
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	ASTM D5185m ASTM D5185m	limit/base >25 >20 limit/base >4 >20 >30 limit/base	0 0 58 <1 869 863 831 1026 2541 <b>current</b> 11 5 0 <b>current</b> 0.5 11.4 23.0	1 <1 60 <1 848 1071 928 1165 2835 history1 11 2 2 2 history1 0.4 10.3 22.3	2 0 57 1 736 1227 779 1085 2556 history2 18 3 2 2 history2 0.3 10.4 21.6					
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	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	limit/base >25 >20 limit/base >4 >20 >30 limit/base	0 0 58 <1 869 863 831 1026 2541 <i>Current</i> 11 5 0 <i>Current</i> 0.5 11.4 23.0	1 <1 60 <1 848 1071 928 1165 2835 history1 11 2 2 2 history1 0.4 10.3 22.3 history1	2 0 57 1 736 1227 779 1085 2556 history2 18 3 2 18 3 2 history2 0.3 10.4 21.6 history2					



# **OIL ANALYSIS REPORT**

VISUAL



· · / · · · · · · · · · · · · · · · · ·	Addition and the state		*) /:	NONE	NONE	NONE	NIGNIE
	White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
r	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
	Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
	Silt		*Visual	NONE	NONE	NONE	NONE
	Debris	scalar	*Visual	NONE	NONE	NONE	NONE
· · · · · · · · · · · · · · · · · · ·	Sand/Dirt		*Visual	NONE	NONE	NONE	NONE
Nov17/22 Feb17/23 Oct31/23 Dec10/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Nor Dee Dee	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		12.5	12.8	▲ 12.1
	GRAPHS						
	Ferrous Alloys						
Nov17/22 - Feb17/23 - Oct31/23 -	60 - chromium						
Novi 0 ct	50						
	E 40	$\sim$					
	₫ <sub>30</sub>						
	20		-				
	10		·····				
	0	Stat L C . L D . L D . L D . L D . L D . L D . L D . L D . L D . L D . L D . D .					
	Jan23/19 - Mar27/20 -	7/22 -	7/23+	0/23 -			
	Jan 23/19 Mar 27/20 Dec 29/21	Nov17/22	Feb17/23 0ct31/23	Dec10/23			
	Non-ferrous Meta	ls					
	140 T						
	120 - copper lead	A					
	100 -	/					
	_ 80-	$/ \land$					
	E 60	/ \	$\mathbf{A}$				
	40						
	20						
		22	23	23 +			
	Jan 23/19 Mar27/20 Dec29/21	Nov17/22	Feb 17/23 Oct3 1/23	Dec10/23			
	⇒ ≥ □ Viscosity @ 100°C		ű O	ă			
	18 <sub>T</sub>	• ,			Base Number		
	17 - Abnormal			6.0		$\sim$	$\wedge$
	16-			5.0			
	_15			(B/H0, 6,0- 9.0- 8 gase 8 g		/	
	00 14- 53 <sup>13</sup> Abnormal			Bm			
			-				
	12	$\sim$		 ₽ 88 82.0-	/		
	11-	$\sim$		1.0			
	10			0.0-			
	0		23 -	/23	8/19 - 1/20 - 9/21 -	1/22 -	1/23 -
	3/21	/22					
	Jan 23/19	Nov17/22	Feb 17/23 Oct3 1/23	Dec10/23	Jan 23/19 Mar 27/20 Dec 29/21	Vov17/22	Feb17/23 0ct31/23
Laboratory		_		_		_	
Laboratory Sample No.	: WearCheck USA - { : GFL0046095	501 Madis Received	son Ave., Ca 1 : 11 [	ry, NC 27513 Dec 2023		onmental - 834 -	Chillicothe Haulin
Sample No. Lab Number	: WearCheck USA - { : GFL0046095 : 06030176	501 Madis Received Diagnose	son Ave., Ca I : 11 [ ed : 12 [	ry, NC 27513 Dec 2023 Dec 2023		onmental - 834 -	<b>Chillicothe Haulin</b> D1 Mitchell Roa Chillicothe, M0
Sample No. Lab Number Unique Number	: WearCheck USA - 5 : GFL0046095 : 06030176 - : 10779967	501 Madis Received	son Ave., Ca I : 11 [ ed : 12 [	ry, NC 27513 Dec 2023		onmental - 834 - 2(	<b>Chillicothe Haulin</b> D1 Mitchell Roa Chillicothe, M0 US 6460
Sample No. Lab Number	: WearCheck USA - { : GFL0046095 : 06030176 : 10779967 : FLEET	501 Madis Received Diagnose Diagnost	son Ave., Ca 1 : 11 [ ed : 12 [ ician : Wes	ry, NC 27513 Dec 2023 Dec 2023 s Davis		onmental - 834 - 20 Contact	<b>Chillicothe Haulin</b> D1 Mitchell Roa Chillicothe, M

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

Contact/Location: Terry McKiddy - GFL834