

OIL ANALYSIS REPORT



Machine Id **2216** Component **Diesel Engine** Fluid SHELL DELO 15W40 (--- GAL)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor. Please specify the component make and model with 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 INFORM	IATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0829095	WC0829102	
Sample Date		Client Info		25 Apr 2024	07 Jul 2023	
Machine Age	mls	Client Info		267835	159608	
Oil Age	mls	Client Info		26389	34609	
Oil Changed		Client Info		Changed	Changed	
Sample Status				NORMAL	ABNORMAL	
CONTAMINATION	N	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	1.2	
Water		WC Method	>0.2	NEG	NEG	
Glycol		WC Method		NEG	NEG	
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	13	64	
Chromium	ppm	ASTM D5185m	>20	<1	2	
Nickel	ppm	ASTM D5185m	>4	<1	<1	
Titanium	ppm	ASTM D5185m		<1	0	
Silver	ppm	ASTM D5185m	>3	0	0	
Aluminum	ppm	ASTM D5185m	>20	6	8	
Lead	ppm	ASTM D5185m	>40	3	3	
Copper	ppm	ASTM D5185m	>330	1	1	
Tin	ppm	ASTM D5185m	>15	<1	<1	
Vanadium	ppm	ASTM D5185m		<1	0	
Cadmium	ppm	ASTM D5185m		<1	0	
					0	
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base		-	history2
	ppm ppm		limit/base	current	history1	history2
Boron		ASTM D5185m	limit/base	current 169	history1 23	
Boron Barium	ppm	ASTM D5185m ASTM D5185m	limit/base	current 169 <1	history1 23 0	
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	current 169 <1 127	history1 23 0 34	
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	current 169 <1 127 <1	history1 23 0 34 <1	
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	current 169 <1 127 <1 628	history1 23 0 34 <1 203	
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	Current 169 <1 127 <1 628 1488	history1 23 0 34 <1 203 • 482	
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	Current 169 <1 127 <1 628 1488 717	history1 23 0 34 <1 203 482 221	
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	Current 169 <1 127 <1 628 1488 717 875	history1 23 0 34 <1 203 482 221 284	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	Current 169 <1 127 <1 628 1488 717 875 2833	history1 23 0 34 <1 203 482 221 284 1342	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	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	Current 169 <1 127 <1 628 1488 717 875 2833 Current	history1 23 0 34 <1 203 482 221 284 1342 history1	
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	limit/base	Current 169 <1 127 <1 628 1488 717 875 2833 current 8	history1 23 0 34 <1 203 482 221 284 1342 history1 5	 history2
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	limit/base	169 <1 127 <1 628 1488 717 875 2833 current 8 0	history1 23 0 34 <1 203 482 221 284 1342 history1 5 0	 history2
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	limit/base >25 >20	Current 169 <1 127 <1 628 1488 717 875 2833 Current 8 0 12	history1 23 0 34 <1 203 482 221 284 1342 history1 5 0 23	 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base >25 >20 limit/base	Current 169 <1 127 <1 628 1488 717 875 2833 Current 8 0 12 Current	history1 23 0 34 <1 203 482 221 284 1342 history1 5 0 23 history1	 history2 history2
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	limit/base >25 >20 limit/base >3	Current 169 <1 127 <1 628 1488 717 875 2833 current 8 0 12 current 0.3	history1 23 0 34 <1 203 482 221 284 1342 history1 5 0 23 history1 0 23	 history2 history2 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	limit/base >25 >20 limit/base >3 >20	current 169 <1 127 <1 628 1488 717 875 2833 current 8 0 12 current 0.3 10.4	history1 23 0 34 <1 203 482 221 284 1342 history1 5 0 23 history1 5 0 23 history1 0.4 8.2	 history2 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 D5185m	limit/base >25 >20 limit/base >3 >20 >30	Current 169 <1 127 <1 628 1488 717 875 2833 current 8 0 12 current 0.3 10.4 25.2	history1 23 0 34 <1 203 482 221 284 1342 bistory1 5 0 23 history1 0.4 8.2 21.8	 history2 history2 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 D7615	limit/base >25 >20 limit/base >3 >20 >30 limit/base	Current 169 <1 127 <1 628 1488 717 875 2833 Current 8 0 12 Current 0.3 10.4 25.2 Current	history1 23 0 34 <1 203 482 221 284 1342 bistory1 5 0 23 history1 0.4 8.2 21.8 history1	 history2 history2 history2 history2



40 35 30 m25 Ws/sqL Abnor

> 15 10

7.0

1.0 0.0

> 18 Abnor 16

(100°C) 12 CS Abnor

OIL ANALYSIS REPORT

T-IR (Direct Trend)		VISUAL		method	limit/base	current	history1	history2
Oxidation Nitration		White Metal	scalar	*Visual	NONE	NONE	NONE	
Sulfation		Yellow Metal	scalar	*Visual	NONE	NONE	NONE	
mal		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	
	Apr25/24 -	Appearance	scalar	*Visual	NORML	NORML	NORML	
	Apr2	Odor	scalar	*Visual	NORML	NORML	NORML	
e Number		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	
		Free Water	scalar	*Visual		NEG	NEG	
		FLUID PROPER	TIES	method	limit/base	current	history1	history2
/		Visc @ 100°C	cSt	ASTM D445		13.5	0.1	
		GRAPHS						
		Ferrous Alloys						
		70 T						
	95.04	60 - chromium						
	And	50 - nickel						
cosity @ 100°C		∈ ⁴⁰						
		8.30-						
ormal		20						
		10						
ormal								
		Jul7/23			5/24 -			
		Juľ			Apr25/24			
		Non-ferrous Meta	ls					
	E .0.4	¹⁰ T						
	Cray	8+ copper						
		sessesses tin						
		1						
		6-						
		6 E						
		0						
		0						
		E 4						
		E 4	******		\$24			
					Apr25/24			
		Viscosity @ 100°C			Ap	Base Numbe	2r	
		Viscosity @ 100°C	2		40125/24 40122/24		er	
		Viscosity @ 100°C			₹ 7.0- 6.0-		51.	
		Viscosity @ 100°C	C		₹ 7.0- 6.0-		2 r	
		Viscosity @ 100°C	C		₹ 7.0- 6.0-		2r	
		Viscosity @ 100°C	2		₹ 7.0- 6.0-		2r	
		Viscosity @ 100°C			₹ 7.0- 6.0-		er	
		Viscosity @ 100°C			dy 7.0 6.0 (0) HOX 5.0 U) Ja Quinty 4.0 80 2.0		9r	
		Viscosity @ 100°C	C		dy 7.0 (6,0 (6,0 (0,0) HOX bu) + 10 4.0 4.0 8 8 8 2.0 1.0		9 r	
		Viscosity @ 100°C	C		4 7.0 6.0 0 0 0 0 0 0 0 0 0 0 0 0 0		21	104
		Viscosity @ 100°C	C		4 7.0 6.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		21	An 95.04
		Viscosity @ 100°C			dy 7.0 (6,0 (6,0 (0,0) HOX bu) + 10 4.0 4.0 8 8 8 2.0 1.0		2r	Aor25/24
	Laboratory	Viscosity @ 100°C	01 Madisc		4 7.0 6.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		Ergon Trucking	g Inc SAL198
	Sample No.	Viscosity @ 100°C	01 Madisc Rece	ived : 1	4 7.0 6.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		Ergon Trucking	g Inc SAL19 Production Drive
	Sample No. Lab Number	Viscosity @ 100°C	01 Madisc Rece Teste	ived :1	4 7.0 6.0 0 0 0 0 0 0 0 0 0 0 0 0 0		Ergon Trucking	g Inc SAL198 Production Drive Sulphur, LA
	Sample No.	Viscosity @ 100°C Viscosity @ 100°C Viscosity @ 100°C Abnormal Control 10 Abnormal Control 10 Control 10 C	01 Madisc Rece Teste	ived :1	4 7.0 6.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		Ergon Trucking 211 F	g Inc SAL19 Production Drive

* - 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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Contact/Location: Donald Daigle - ERGSAL198 Page 2 of 2

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