

## **OIL ANALYSIS REPORT**



Machine Id

### 141538 Component Diesel Engine Fluid LIEBHERR MOTOROIL 10W-40 (--- GAL)

#### DIAGNOSIS

#### A Recommendation

Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

#### A Wear

Moderate concentration of visible metal present. All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil.

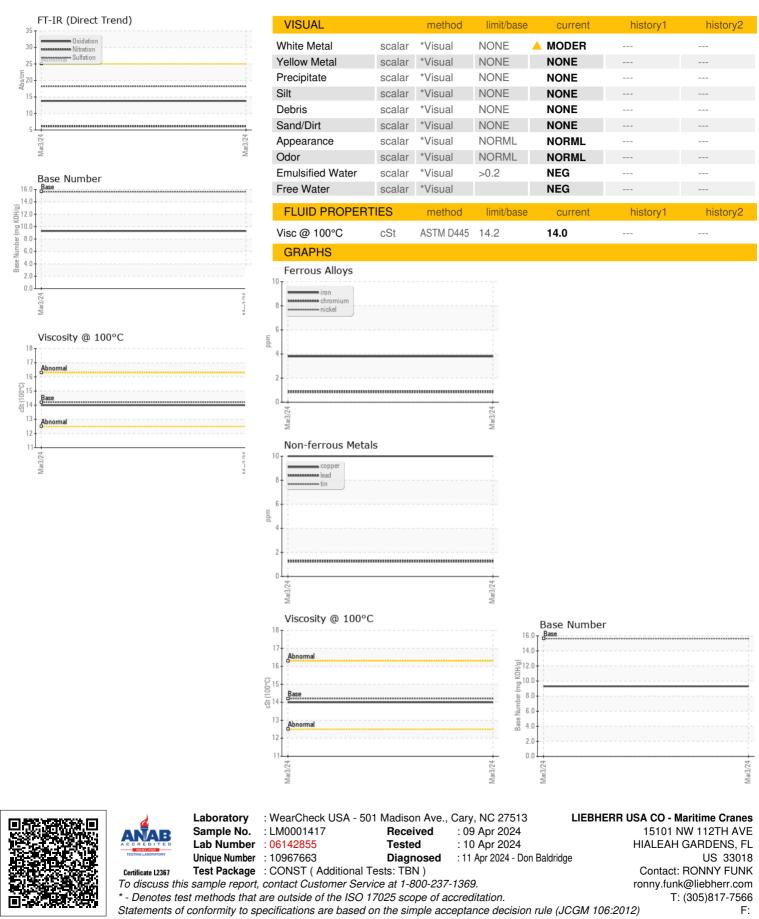
#### Fluid Condition

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

SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Sample Number		Client Info		LM0001417		
Sample Date		Client Info		03 Mar 2024		
Machine Age	hrs	Client Info		13245		
Oil Age	hrs	Client Info		0		
Oil Changed		Client Info		Changed		
Sample Status				ABNORMAL		
CONTAMINATION	N	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0		
Water		WC Method	>0.2	NEG		
Glycol		WC Method		NEG		
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	4		
Chromium	ppm	ASTM D5185m	>5	<1		
Nickel	ppm	ASTM D5185m	>5	<1		
Titanium	ppm	ASTM D5185m		<1		
Silver	ppm	ASTM D5185m	>3	0		
Aluminum	ppm	ASTM D5185m	>15	2		
Lead	ppm	ASTM D5185m	>30	1		
Copper	ppm	ASTM D5185m	>125	10		
Tin	ppm	ASTM D5185m	>5	1		
Vanadium	ppm	ASTM D5185m		<1		
Cadmium	ppm	ASTM D5185m		<1		
Cadmium ADDITIVES	ppm	ASTM D5185m method	limit/base	<1 current	 history1	 history2
	ppm ppm		limit/base		 history1 	
ADDITIVES		method		current		history2
ADDITIVES Boron	ppm	method ASTM D5185m	245	current 0		history2
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	245 0	current 0 <1		history2 
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	245 0 0	current 0 <1 54		history2  
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	245 0 0 <1	current 0 <1 54 <1		history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	245 0 0 <1 36	Current 0 <1 54 <1 843		history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm ppm	methodASTM D5185mASTM D5185mASTM D5185mASTM D5185mASTM D5185mASTM D5185m	245 0 0 <1 36 4401	Current 0 <1 54 <1 843 1162	  	history2
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	245 0 0 <1 36 4401 1067	Current 0 <1 54 <1 843 1162 1051	   	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	245 0 0 <1 36 4401 1067 1183	current           0           <1           54           <1           843           1162           1051           1224	   	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	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	245 0 <1 36 4401 1067 1183 2591 limit/base	Current 0 <1 54 <1 843 1162 1051 1224 3468		history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	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	245 0 <1 36 4401 1067 1183 2591 limit/base	current         0         <1         54         <1         843         1162         1051         1224         3468         current		history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Chosphorus Zinc Sulfur CONTAMINANTS Silicon	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	245 0 0 <1 36 4401 1067 1183 2591 <b>limit/base</b> >60	current           0           <1           54           <1           843           1162           1051           1224           3468           current           5	     history1	history2 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	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 ASTM D5185m	245 0 0 <1 36 4401 1067 1183 2591 <b>limit/base</b> >60	current         0         <1         54         <1         843         1162         1051         1224         3468         current         5         4	      history1	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	245 0 0 <1 36 4401 1067 1183 2591 limit/base >60 >20	current         0         <1         54         <1         843         1162         1051         1224         3468         current         5         4         2         current         0.1	     history1  	history2 history2
ADDITIVES 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	method           ASTM D5185m	245 0 0 <1 36 4401 1067 1183 2591 <b>limit/base</b> >60 >20 <b>limit/base</b>	current         0         <1         54         <1         843         1162         1051         1224         3468         current         5         4         2         current         0.1         6.1	     history1    history1	history2 history2 history2 history2
ADDITIVES 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 ppm	method           ASTM D5185m	245 0 0 <1 36 4401 1067 1183 2591 limit/base >60 >20 limit/base >3	current         0         <1         54         <1         843         1162         1051         1224         3468         current         5         4         2         current         0.1	     history1   history1	history2 history2 history2 history2
ADDITIVES 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	method           ASTM D5185m	245 0 0 <1 36 4401 1067 1183 2591 limit/base >60 \$20 limit/base >3 >20	current         0         <1         54         <1         843         1162         1051         1224         3468         current         5         4         2         current         0.1         6.1	     history1  history1  history1	history2 history2 history2 history2
ADDITIVES 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	method           ASTM D5185m           ASTM D5185m	245 0 0 <1 36 4401 1067 1183 2591 <b>Iimit/base</b> >60 \$20 <b>Iimit/base</b> >3 >20 >30	current         0         <1         54         <1         843         1162         1051         1224         3468         current         5         4         2         current         0.1         6.1         18.2	      history1  history1  history1	history2                        history2            history2            history2               history2



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