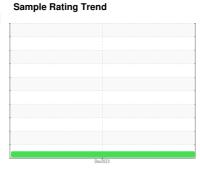


# **OIL ANALYSIS REPORT**



**NORMAL** 



# EMD 6323

Component

**Diesel Engine** 

{not provided} (--- 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.

All component wear rates are normal.

### Contamination

There is no indication of any contamination in the oil.

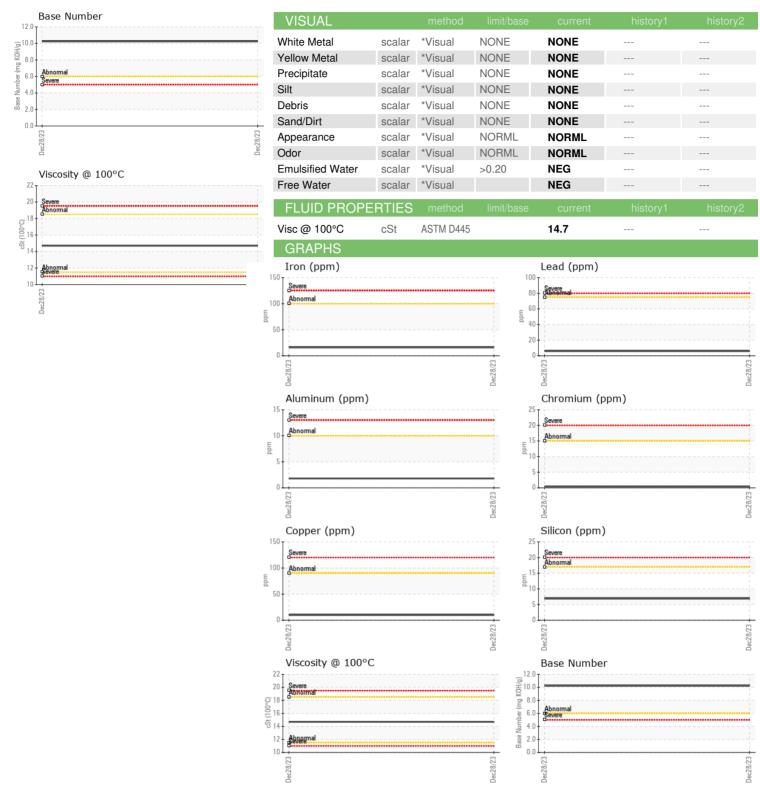
### **Fluid Condition**

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

SAMPLE INFORMATION   method   limit/base   current   history1   history2							
Sample Number   Client Info   PCA0092709       Sample Date   Client Info   28 Dec 2023       Machine Age   hrs   Client Info   0       Oil Age   hrs   Client Info   0       Oil Age   hrs   Client Info   N/A       Oil Changed   Client Info   N/A       Oil C					Dec2023		
Sample Date	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Date	Sample Number		Client Info		PCA0092709		
Oil Age         hrs         Client Info         N/A			Client Info		28 Dec 2023		
Oil Changed Sample Status         Client Info         N/A             CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >4         <1.0             Water         WC Method         >0.20         NEG             Glycol         WC Method         >0.20         NEG             WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         16             Chromium         ppm         ASTM D5185m         >15         <1             Nickel         ppm         ASTM D5185m         >5         0             Silver         ppm         ASTM D5185m         >2         0             Lead         ppm         ASTM D5185m         >75         6             Copper         ppm         ASTM D5185m         >90         10	•	hrs	Client Info		0		
CONTAMINATION	Oil Age	hrs	Client Info		0		
CONTAMINATION	Oil Changed		Client Info		N/A		
Fuel   WC Method   >4	Sample Status				NORMAL		
Water         WC Method         >0.20         NEG             Glycol         WC Method         NEG             WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         16             Chromium         ppm         ASTM D5185m         >15         <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>4	<1.0		
WEAR METALS	Water		WC Method	>0.20	NEG		
Iron	Glycol		WC Method		NEG		
Chromium	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100			
Titanium	Chromium	ppm	ASTM D5185m	>15	<1		
Silver         ppm         ASTM D5185m         >2         0             Aluminum         ppm         ASTM D5185m         >10         2             Lead         ppm         ASTM D5185m         >75         6             Copper         ppm         ASTM D5185m         >90         10             Tin         ppm         ASTM D5185m         0             Vanadium         ppm         ASTM D5185m         0             Cadmium         ppm         ASTM D5185m         0             Cadmium         ppm         ASTM D5185m         0             Boron         ppm         ASTM D5185m         0             Molybdenum         ppm         ASTM D5185m         42             Manganese         ppm         ASTM D5185m         42             Manganesium         ppm         ASTM D5185m         12             Calcium         ppm         ASTM D5185m         5	Nickel	ppm	ASTM D5185m	>5	0		
Aluminum	Titanium	ppm	ASTM D5185m		<1		
Lead	Silver	ppm	ASTM D5185m	>2	0		
Copper         ppm         ASTM D5185m         >90         10             Tin         ppm         ASTM D5185m         >30         3             Vanadium         ppm         ASTM D5185m         0             Cadmium         ppm         ASTM D5185m         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         47             Barium         ppm         ASTM D5185m         0             Molybdenum         ppm         ASTM D5185m         42             Manganese         ppm         ASTM D5185m         12             Magnesium         ppm         ASTM D5185m         3390             Calcium         ppm         ASTM D5185m         5             Phosphorus         ppm         ASTM D5185m         0             Sulfur         ppm         ASTM D5185m         >17		ppm	ASTM D5185m	>10	2		
Tin	Lead	ppm	ASTM D5185m	>75	6		
Vanadium         ppm         ASTM D5185m         0             Cadmium         ppm         ASTM D5185m         0             ADDITIVES         method         limit/base         current         history1         history2           Barium         ppm         ASTM D5185m         47             Molybdenum         ppm         ASTM D5185m         42             Manganese         ppm         ASTM D5185m         <1             Magnesium         ppm         ASTM D5185m         12             Calcium         ppm         ASTM D5185m         3390             Phosphorus         ppm         ASTM D5185m         5             Zinc         ppm         ASTM D5185m         0             Sulfur         ppm         ASTM D5185m         2521             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >17         7	Copper	ppm		>90	-		
Cadmium         ppm         ASTM D5185m         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         47             Barium         ppm         ASTM D5185m         0             Molybdenum         ppm         ASTM D5185m         42             Manganese         ppm         ASTM D5185m         12             Magnesium         ppm         ASTM D5185m         13390             Calcium         ppm         ASTM D5185m         5             Phosphorus         ppm         ASTM D5185m         0             Zinc         ppm         ASTM D5185m         2521             Sulfur         ppm         ASTM D5185m         2521             CONTAMINANTS         method         limit/base         current         history1         history2           Sodium         ppm         ASTM D5185m         >20         <				>30			
ADDITIVES	Vanadium	ppm	ASTM D5185m		-		
Boron   ppm   ASTM D5185m   Q		ppm	ASTM D5185m		0		
Barium	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         42             Manganese         ppm         ASTM D5185m         <1             Magnesium         ppm         ASTM D5185m         12             Calcium         ppm         ASTM D5185m         3390             Phosphorus         ppm         ASTM D5185m         5             Zinc         ppm         ASTM D5185m         0             Sulfur         ppm         ASTM D5185m         2521             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >17         7             Sodium         ppm         ASTM D5185m         >20         <1             Potassium         ppm         ASTM D5185m         >20         <1             INFRA-RED         method         limit/base         current         history1         history2           Soot %         *ASTM D7844 <td>Boron</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <th>47</th> <td></td> <td></td>	Boron	ppm	ASTM D5185m		47		
Manganese         ppm         ASTM D5185m         <1             Magnesium         ppm         ASTM D5185m         12             Calcium         ppm         ASTM D5185m         3390             Phosphorus         ppm         ASTM D5185m         5             Zinc         ppm         ASTM D5185m         0             Sulfur         ppm         ASTM D5185m         2521             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >17         7             Sodium         ppm         ASTM D5185m         >20         <1	Barium	ppm	ASTM D5185m		0		
Magnesium         ppm         ASTM D5185m         12             Calcium         ppm         ASTM D5185m         3390             Phosphorus         ppm         ASTM D5185m         5             Zinc         ppm         ASTM D5185m         0             Sulfur         ppm         ASTM D5185m         2521             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >17         7             Sodium         ppm         ASTM D5185m         >17         7             Potassium         ppm         ASTM D5185m         >20         <1             INFRA-RED         method         limit/base         current         history1         history2           Soot %         *ASTM D7844         >3         0.7             Nitration         Abs/.1mm         *ASTM D7415         >30         14.7             FLUID DEGRADATIO	Molybdenum	ppm	ASTM D5185m		42		
Calcium         ppm         ASTM D5185m         3390             Phosphorus         ppm         ASTM D5185m         5             Zinc         ppm         ASTM D5185m         0             Sulfur         ppm         ASTM D5185m         2521             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >17         7             Sodium         ppm         ASTM D5185m         >20         <1	Manganese	ppm	ASTM D5185m		<1		
Phosphorus         ppm         ASTM D5185m         5             Zinc         ppm         ASTM D5185m         0             Sulfur         ppm         ASTM D5185m         2521             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >17         7             Sodium         ppm         ASTM D5185m         >20         <1             Potassium         ppm         ASTM D5185m         >20         <1             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.7             Nitration         Abs/.mm         *ASTM D7415         >30         14.7             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         6.5 <td><u> </u></td> <td>ppm</td> <td></td> <td></td> <th></th> <td></td> <td></td>	<u> </u>	ppm					
Zinc         ppm         ASTM D5185m         0             Sulfur         ppm         ASTM D5185m         2521             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >17         7             Sodium         ppm         ASTM D5185m         >20         <1             Potassium         ppm         ASTM D5185m         >20         <1             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.7             Nitration         Abs/.mm         *ASTM D7624         >20         7.5             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         6.5	Calcium	ppm					
Sulfur         ppm         ASTM D5185m         2521             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >17         7             Sodium         ppm         ASTM D5185m         47             Potassium         ppm         ASTM D5185m         >20         <1		ppm					
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >17         7             Sodium         ppm         ASTM D5185m         47             Potassium         ppm         ASTM D5185m         >20         <1		ppm					
Silicon         ppm         ASTM D5185m         >17         7             Sodium         ppm         ASTM D5185m         47             Potassium         ppm         ASTM D5185m         >20         <1             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.7             Nitration         Abs/cm         *ASTM D7624         >20         7.5             Sulfation         Abs/.1mm         *ASTM D7415         >30         14.7             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         6.5			ASTM D5185m		2521		
Sodium         ppm         ASTM D5185m         47             Potassium         ppm         ASTM D5185m         >20         <1             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.7             Nitration         Abs/cm         *ASTM D7624         >20         7.5             Sulfation         Abs/.1mm         *ASTM D7415         >30         14.7             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         6.5	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         <1		• • • • • • • • • • • • • • • • • • • •		>17			
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.7             Nitration         Abs/cm         *ASTM D7624         >20         7.5             Sulfation         Abs/.1mm         *ASTM D7415         >30         14.7             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         6.5		ppm			47		
Soot %         %         *ASTM D7844         >3         0.7             Nitration         Abs/cm         *ASTM D7624         >20         7.5             Sulfation         Abs/.1mm         *ASTM D7415         >30         14.7             FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         6.5	Potassium	ppm	ASTM D5185m	>20	<1		
Nitration         Abs/cm         *ASTM D7624         >20         7.5             Sulfation         Abs/.1mm         *ASTM D7415         >30         14.7             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         6.5	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         14.7             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         6.5	Soot %	%	*ASTM D7844	>3	0.7		
FLUID DEGRADATION method limit/base current history1 history2  Oxidation Abs/.1mm *ASTM D7414 >25 6.5	Nitration	Abs/cm	*ASTM D7624	>20	7.5		
Oxidation	Sulfation	Abs/.1mm	*ASTM D7415	>30	14.7		
	FLUID DEGRAI	DATION	method	limit/base	current	history1	history2
Base Number (BN)   mg KOH/g   ASTM D2896   10.24	Oxidation	Abs/.1mm	*ASTM D7414	>25	6.5		
	Base Number (BN)	mg KOH/g	ASTM D2896		10.24		



# **OIL ANALYSIS REPORT**







Certificate L2367

Laboratory

Sample No. Lab Number Unique Number Test Package : MOB 2

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : PCA0092709 : 06053048 : 10818997

Recieved

: 05 Jan 2024 Diagnosed : 08 Jan 2024 : Sean Felton

Diagnostician

To discuss this sample report, contact Customer Service at 1-800-237-1369.

\* - 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) **HOWELL OIL COMPANY** 

808 NW 12TH ST BELLE GLADE, FL US 33430

Contact: JARED HOWELL jared@howelloil.com

T: (561)261-9378