

## **OIL ANALYSIS REPORT**

Sample Rating Trend



Machine Id

# MERCEDES-BENZ VF-84

Component Gasoline Engine

#### Fluid HIGH PERFORMANCE LUBRICANTS HDEO 5W40 (10 QTS)

### DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor.

#### 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 Number       Client Info       MPL008243       HPL008243       HPL008243       HPL008244       H=         Sample Date       Client Info       04 Mar 2024       12 Jan 2024          Oll Age       hrs       Client Info       10137       7.00          Oll Anged       hrs       Client Info       Changed       No Changed          CONTAMINATION       method       >4.0       <1.0           CONTAMINATION       WC Method       >4.0       <1.0           Goya       WC Method       >0.2       NEG       NEG          Water       WC Method       >0.0       <1.0          Gycol       WC Method       >150       6       8          KeAR METALS       method       Innit/base       Current       history1          Kromium       ppm       ASTM D5185       >150       0           Kromium       ppm       ASTM D5185       >20       0           Silver       ppm       ASTM D5185       >50       0           Silver	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         130137         7780            Oil Age         hrs         Client Info         10137         0            Oil Changed         Client Info         Changed         Not Changed            Sample Status         Imit/base         current         History1         History2           Fuel         WC Method         >4.0         <1.0            Water         Imit/base         current         History1            Water         WC Method         >0.2         NEG            Otionum         ppm         ASTM D5185m         >10         0            Nickel         ppm         ASTM D5185m         >20         0             Auminum         ppm         ASTM D5185m         >20         0	Sample Number		Client Info		HPL008243	HPL008204	
Oil Age         hrs         Client Info         10137         0            Oil Changed         Client Info         Changed         Not Changed            Sample Status         Imit/base         current         History1         History2           CONTAMINATION         method         imit/base         current         History1         History2           Fuel         WC Method         >0.2         NEG         NEG            Water         WC Method         >0.2         NEG         NEG            WEAR METALS         method         Imit/base         current         History1         History2           Iron         ppm         ASTM D5185m         >50         0         <1            Nickel         ppm         ASTM D5185m         >50         0         1            Auminum         ppm         ASTM D5185m         >20         0         0            Auminum         ppm         ASTM D5185m         >10         1             Auminum         ppm         ASTM D5185m         10         1             Aumotinum         pp	Sample Date		Client Info		04 Mar 2024	12 Jan 2024	
Oil Changed Sample Status         Client info         Changed NORMAL         Not Changd NORMAL	Machine Age	hrs	Client Info		130137	7780	
Sample Status         NORMAL         NORMAL         NORMAL	Oil Age	hrs	Client Info		10137	0	
CONTAMINATION       method       limit/base       current       history1       history2         Fuel       WC Method       >4.0       <1.0       <1.0          Water       WC Method       >0.2       NEG          Glycol       WC Method       >0.2       NEG          WEAR METALS       method       limit/base       current       history1       history2         Iron       ppm       ASTM D5185m       >50       0       <1          Nickel       ppm       ASTM D5185m       >20       0       0          Nickel       ppm       ASTM D5185m       >20       0       0          Silver       ppm       ASTM D5185m       >20       0       14       13          Copper       ppm       ASTM D5185m       >10       10       10          Cadmium       ppm       ASTM D5185m       >10       11           Vanadium       ppm       ASTM D5185m       21       1           Cadmium       ppm       ASTM D5185m       21       1	Oil Changed		Client Info		Changed	Not Changd	
Fuel         WC Method         >4.0         <1.0	Sample Status				NORMAL	NORMAL	
Water         WC Method         >0.2         NEG         NEG            Glycol         WC Method         NEG         NEG            WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5165m         >150         6         8            Nickel         ppm         ASTM D5165m         >5         0         <1            Silver         ppm         ASTM D5165m         >5         0         <1            Silver         ppm         ASTM D5165m         >20         0             Aluminum         ppm         ASTM D5165m         >50         0         1            Silver         ppm         ASTM D5165m         >50         0         1            Copper         ppm         ASTM D5165m         >10         10             Vanadium         ppm         ASTM D5165m         <50         0         0            Astm D5165m         >10         <1	CONTAMINATION	٧	method	limit/base	current	history1	history2
Water         WC Method         >0.2         NEG         NEG            Glycol         WC Method         NEG         NEG            WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5165m         >150         6         8            Nickel         ppm         ASTM D5165m         >5         0         <1            Silver         ppm         ASTM D5165m         >5         0         <1            Silver         ppm         ASTM D5165m         >20         0             Aluminum         ppm         ASTM D5165m         >50         0         1            Silver         ppm         ASTM D5165m         >50         0         1            Copper         ppm         ASTM D5165m         >10         10             Vanadium         ppm         ASTM D5165m         <50         0         0            Astm D5165m         >10         <1	Fuel		WC Method	>4.0	<1.0	<1.0	
Glycol         WC Method         NEG         NEG            WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >15.0         6         8            Nickel         ppm         ASTM D5185m         >20         0         0            Nickel         ppm         ASTM D5185m         >5         0             Aluminum         ppm         ASTM D5185m         >2         0         0            Aluminum         ppm         ASTM D5185m         >40         14         13            Lead         ppm         ASTM D5185m         >10         10            Copper         ppm         ASTM D5185m         10         10            Vanadium         ppm         ASTM D5185m         <11            Cadmium         ppm         ASTM D5185m         S0         0         0            Manganese         ppm         ASTM D5185m         S86         101             Manganesium         ppm<				>0.2			
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >150         6         8					NEG		
Iron         ppm         ASTM D5185m         >150         6         8            Chromium         ppm         ASTM D5185m         >20         0         0            Nickel         ppm         ASTM D5185m         >5         0         <1            Titanium         ppm         ASTM D5185m         >20         0         0            Silver         ppm         ASTM D5185m         >20         0         0            Aluminum         ppm         ASTM D5185m         >20         0         14         13            Lead         ppm         ASTM D5185m         >50         0         1             Copper         ppm         ASTM D5185m         >10         <1         1             Cadmium         ppm         ASTM D5185m         >10         <1         1             ADDITIVES         method         Imit/base         current         history1         history2           Boron         ppm         ASTM D5185m         86         101            Marganesium         ppm <th>-</th> <th></th> <th>method</th> <th>limit/base</th> <th>current</th> <th>historv1</th> <th>historv2</th>	-		method	limit/base	current	historv1	historv2
Chromium         ppm         ASTM D5185m         >20         0         0            Nickel         ppm         ASTM D5185m         >5         0         <1            Titanium         ppm         ASTM D5185m         >2         0         0            Silver         ppm         ASTM D5185m         >2         0         0            Aluminum         ppm         ASTM D5185m         >2         0         0            Copper         ppm         ASTM D5185m         >40         14         13            Copper         ppm         ASTM D5185m         >10         1             Cadmium         ppm         ASTM D5185m         >10         <1         1            Cadmium         ppm         ASTM D5185m         0         0             ADDITIVES         method         Imit/base         current         history1         history2           Boron         ppm         ASTM D5185m         866         101            Molydenum         ppm         ASTM D5185m         580         598		nom					
Nickel         ppm         ASTM D5185m         >5         0         <1	-						
Titanium         ppm         ASTM D5185m         >2         0         0            Silver         ppm         ASTM D5185m         >2         0         0            Aluminum         ppm         ASTM D5185m         >40         14         13            Lead         ppm         ASTM D5185m         >50         0         1            Copper         ppm         ASTM D5185m         >10         10            Yanadium         ppm         ASTM D5185m         >10         <1         1            Vanadium         ppm         ASTM D5185m         >10         <1         1            Vanadium         ppm         ASTM D5185m         <10         <1         1            Cadmium         ppm         ASTM D5185m         0         0             Boron         ppm         ASTM D5185m         86         101             Barium         ppm         ASTM D5185m         898         904             Magaeseum         ppm         ASTM D5185m         580         598 <th></th> <th></th> <th></th> <th></th> <th>-</th> <th></th> <th></th>					-		
Silver         ppm         ASTM D5185m         >2         0         0            Aluminum         ppm         ASTM D5185m         >40         14         13            Lead         ppm         ASTM D5185m         >50         0         1            Copper         ppm         ASTM D5185m         >10         <1         10            Tin         ppm         ASTM D5185m         >10         <1         1            Cadmium         ppm         ASTM D5185m         >10         <1             Cadmium         ppm         ASTM D5185m         >10         <1             Cadmium         ppm         ASTM D5185m         0         0             ADDITVES         method         imit/base         current         history1         history2           Boron         ppm         ASTM D5185m         86         101            Marganese         ppm         ASTM D5185m         898         904            Marganesium         ppm         ASTM D5185m         580         598 <th></th> <th></th> <th></th> <th><i>ن در</i></th> <th>-</th> <th></th> <th></th>				<i>ن در</i>	-		
Aluminum         ppm         ASTM D5185m         >40         14         13            Lead         ppm         ASTM D5185m         >50         0         1            Copper         ppm         ASTM D5185m         >10         10            Tin         ppm         ASTM D5185m         >10         <1         1            Vanadium         ppm         ASTM D5185m         >10         <1         1            Cadmium         ppm         ASTM D5185m         0         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         86         101            Barium         ppm         ASTM D5185m         2         1            Maganese         ppm         ASTM D5185m         580         598            Magnesium         ppm         ASTM D5185m         580         598            Calcium         ppm         ASTM D5185m         2448         2522            Sulfur         ppm </th <th></th> <th></th> <th></th> <th>&gt;2</th> <th>-</th> <th></th> <th></th>				>2	-		
Lead         ppm         ASTM D5185m         >50         0         1            Copper         ppm         ASTM D5185m         >155         10         10            Tin         ppm         ASTM D5185m         >10         <1         1            Vanadium         ppm         ASTM D5185m         0         0            Cadmium         ppm         ASTM D5185m         0         0            ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         86         101            Molybdenum         ppm         ASTM D5185m         2         1            Marganese         ppm         ASTM D5185m         2         1            Marganese         ppm         ASTM D5185m         580         598            Marganese         ppm         ASTM D5185m         2448         2522            Phosphorus         ppm         ASTM D5185m         20         916         988            Sulfur         ppm         AS					-		
Copper         ppm         ASTM D5185m         >155         10         10            Tin         ppm         ASTM D5185m         >10         <1         1            Vanadium         ppm         ASTM D5185m         >10         <1         1            Cadmium         ppm         ASTM D5185m         0         0            ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         86         101            Barium         ppm         ASTM D5185m         898         904            Maganese         ppm         ASTM D5185m         898         904            Magnesium         ppm         ASTM D5185m         580         598            Calcium         ppm         ASTM D5185m         580         598            Suffur         ppm         ASTM D5185m         580         598            Suffur         ppm         ASTM D5185m         580         598            Suffur         ppm         ASTM D5185m							
Tin         ppm         ASTM D5185m         >10         <1					-		
Vanadium         ppm         ASTM D5185m         <1					-		
Cadmium         ppm         ASTM D5185m         0         0            ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         86         101            Barium         ppm         ASTM D5185m         898         904            Molybdenum         ppm         ASTM D5185m         898         904            Magnesium         ppm         ASTM D5185m         898         904            Magnesium         ppm         ASTM D5185m         580         598            Calcium         ppm         ASTM D5185m         580         598            Calcium         ppm         ASTM D5185m         580         598            Zinc         ppm         ASTM D5185m         7778         855            Sulfur         ppm         ASTM D5185m         30         11         12            Sodium         ppm         ASTM D5185m         >30         11         12            Sodium         ppm         ASTM D5185m         >20<				>10			
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         86         101            Barium         ppm         ASTM D5185m         2         1            Barium         ppm         ASTM D5185m         898         904            Molybdenum         ppm         ASTM D5185m         898         904            Magnesium         ppm         ASTM D5185m         580         598            Calcium         ppm         ASTM D5185m         580         598            Calcium         ppm         ASTM D5185m         778         855            Zinc         ppm         ASTM D5185m         916         988            Sulfur         ppm         ASTM D5185m         >30         11         12            Sodium         ppm         ASTM D5185m         >400         4         3            Sodium         ppm         ASTM D5185m         >20         0         2            INFRA-RED         method         limit/base <t< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>							
Boron         ppm         ASTM D5185m         86         101            Barium         ppm         ASTM D5185m         2         1            Molybdenum         ppm         ASTM D5185m         898         904            Manganese         ppm         ASTM D5185m         898         904            Magnesium         ppm         ASTM D5185m          <1         <1            Magnesium         ppm         ASTM D5185m          <2448         2522            Calcium         ppm         ASTM D5185m         778         855             Phosphorus         ppm         ASTM D5185m         7778         855             Sulfur         ppm         ASTM D5185m         916         988             Sulfur         ppm         ASTM D5185m         >30         11         12            Sodium         ppm         ASTM D5185m         >400         4         3            NFRA-RED         method         limit/base         current         history1         history2		ррш				-	
Barium         ppm         ASTM D5185m         2         1            Molybdenum         ppm         ASTM D5185m         898         904            Manganese         ppm         ASTM D5185m         <1         <1         <1            Magnesium         ppm         ASTM D5185m         580         598            Calcium         ppm         ASTM D5185m         580         598            Calcium         ppm         ASTM D5185m         580         598            Calcium         ppm         ASTM D5185m         7778         855            Zinc         ppm         ASTM D5185m         916         988            Sulfur         ppm         ASTM D5185m         916         988            Sulfur         ppm         ASTM D5185m         6116         7372            Sulfur         ppm         ASTM D5185m         >30         11         12            Sodium         ppm         ASTM D5185m         >400         4         3            Sodium         ppm         ASTM D5185m	ADDITIVES		method	limit/base	current		history2
Molybdenum         ppm         ASTM D5185m         898         904            Manganese         ppm         ASTM D5185m         <1         <1            Magnesium         ppm         ASTM D5185m         580         598            Calcium         ppm         ASTM D5185m         580         598            Calcium         ppm         ASTM D5185m         24488         2522            Phosphorus         ppm         ASTM D5185m         778         855            Zinc         ppm         ASTM D5185m         916         988            Sulfur         ppm         ASTM D5185m         6116         7372            Solicon         ppm         ASTM D5185m         >30         11         12            Sodium         ppm         ASTM D5185m         >400         4         3            Sodium         ppm         ASTM D5185m         >20         0         2            INFRA-RED         method         imit/base         current         history1         history2           Soot %         %         *ASTM D	Boron	ppm	ASTM D5185m				
Manganese         ppm         ASTM D5185m         <1	Barium	ppm	ASTM D5185m		2		
Magnesium         ppm         ASTM D5185m         580         598            Calcium         ppm         ASTM D5185m         2448         2522            Phosphorus         ppm         ASTM D5185m         778         855            Zinc         ppm         ASTM D5185m         916         988            Sulfur         ppm         ASTM D5185m         6116         7372            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         11         12            Sodium         ppm         ASTM D5185m         >400         4         3            Potassium         ppm         ASTM D5185m         >20         0         2            INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         16.2         18.5            Nitration         Abs/.m         *ASTM D7415         >30         43.9         49.6	,	ppm				904	
Calcium         ppm         ASTM D5185m         2448         2522            Phosphorus         ppm         ASTM D5185m         778         855            Zinc         ppm         ASTM D5185m         916         988            Sulfur         ppm         ASTM D5185m         916         777         988            Sulfur         ppm         ASTM D5185m         916         988             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         11         12            Sodium         ppm         ASTM D5185m         >400         4         3            Sodium         ppm         ASTM D5185m         >20         0         2            INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         16.2         18.5            Sulfation         Abs/.mm         *ASTM D7415         >30         43.9         49.6         <	-	ppm	ASTM D5185m				
Phosphorus         ppm         ASTM D5185m         778         855            Zinc         ppm         ASTM D5185m         916         988            Sulfur         ppm         ASTM D5185m         6116         7372            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         11         12            Sodium         ppm         ASTM D5185m         >400         4         3            Sodium         ppm         ASTM D5185m         >400         4         3            Potassium         ppm         ASTM D5185m         >20         0         2            INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         16.2         18.5            Nitration         Abs/.mm         *ASTM D7415         >30         43.9         49.6            FLUID DEGRADATION         method         limit/base         current         history1	•	ppm					
Zinc         ppm         ASTM D5185m         916         988            Sulfur         ppm         ASTM D5185m         6116         7372            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         11         12            Sodium         ppm         ASTM D5185m         >400         4         3            Sodium         ppm         ASTM D5185m         >400         4         3            Sodium         ppm         ASTM D5185m         >20         0         2            INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         16.2         18.5            Nitration         Abs/cm         *ASTM D7415         >30         43.9         49.6            FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         37.5 <th></th> <th>ppm</th> <th>ASTM D5185m</th> <th></th> <th>2448</th> <th></th> <th></th>		ppm	ASTM D5185m		2448		
SulfurppmASTM D5185m61167372CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>301112SodiumppmASTM D5185m>40043PotassiumppmASTM D5185m>2002INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D78440.20.1NitrationAbs/cm*ASTM D7624>2016.218.5SulfationAbs/lim*ASTM D7415>3043.949.6FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/lim*ASTM D7414>2537.543.3							
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>301112SodiumppmASTM D5185m>40043PotassiumppmASTM D5185m>2002INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D78440.20.1NitrationAbs/cm*ASTM D7624>2016.218.5SulfationAbs/limm*ASTM D7415>3043.949.6FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.imm*ASTM D7414>2537.543.3		ppm	ASTM D5185m		916	988	
Silicon         ppm         ASTM D5185m         >30         11         12            Sodium         ppm         ASTM D5185m         >400         4         3            Potassium         ppm         ASTM D5185m         >20         0         2            INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0.2         0.1            Nitration         Abs/cm         *ASTM D7624         >20         16.2         18.5            Sulfation         Abs/.1mm         *ASTM D7415         >30         43.9         49.6            FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         37.5         43.3			ASTM D5185m		6116	7372	
Sodium         ppm         ASTM D5185m         >400         4         3            Potassium         ppm         ASTM D5185m         >20         0         2            INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0.2         0.1            Nitration         Abs/cm         *ASTM D7624         >20         16.2         18.5            Sulfation         Abs/.1mm         *ASTM D7415         >30         43.9         49.6            FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         37.5         43.3	CONTAMINANTS		method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         0         2            INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0.2         0.1            Nitration         Abs/cm         *ASTM D7624         >20         16.2         18.5            Sulfation         Abs/.1mm         *ASTM D7415         >30         43.9         49.6            FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         37.5         43.3		ppm		>30			
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0.2         0.1            Nitration         Abs/cm         *ASTM D7624         >20         16.2         18.5            Sulfation         Abs/.1mm         *ASTM D7415         >30         43.9         49.6            FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         37.5         43.3	Sodium	ppm	ASTM D5185m	>400	4		
Soot %         %         *ASTM D7844         0.2         0.1            Nitration         Abs/cm         *ASTM D7624         >20         16.2         18.5            Sulfation         Abs/.1mm         *ASTM D7415         >30         43.9         49.6            FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         37.5         43.3	Potassium	ppm	ASTM D5185m	>20	0	2	
Nitration         Abs/cm         *ASTM D7624         >20         16.2         18.5            Sulfation         Abs/.1mm         *ASTM D7415         >30         43.9         49.6            FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         37.5         43.3	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         43.9         49.6            FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         37.5         43.3		%					
FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     37.5     43.3	Nitration	Abs/cm	*ASTM D7624	>20		18.5	
Oxidation Abs/.1mm *ASTM D7414 >25 37.5 43.3	Sulfation	Abs/.1mm	*ASTM D7415	>30	43.9	49.6	
	FLUID DEGRADA	TION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	37.5	43.3	
	Base Number (BN)	mg KOH/g	ASTM D2896			7.22	

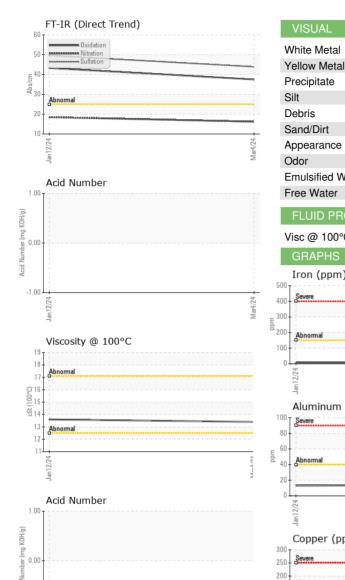


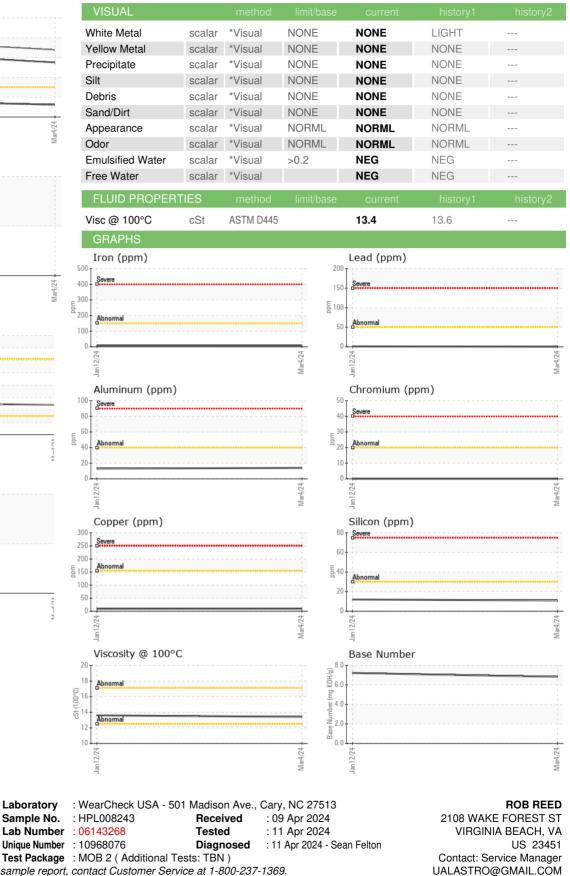
Acid Nui

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# **OIL ANALYSIS REPORT**





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.

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Laboratory

Sample No.

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

Report Id: ROBVIR [WUSCAR] 06143268 (Generated: 04/11/2024 19:06:55) Rev: 1

Certificate 12367

Contact/Location: Service Manager - ROBVIR

T:

F: