## **OIL ANALYSIS REPORT**

### WERRLEIR 22-2783 VOLVO PENTA 7011381413 - STARBOARD DIESEL ENGINE

Sample No: VPA045838

Oil Type: VOLVO ULTRA DIESEL ENGINE OIL 15W40 VDS-3

Sample Date         06 Dec 2023         14 Dec 2022             Valachine Hours         973         867             Sil Hours         130         830             Dil Changed         Changed         N/A             Dil Component               OIL CONDITION               Sase Number (BN)         mg KOH/g         9.2         11.0             CONTAMINATION                Water         %         0.5         0.2             Signanti (PA)         %         55         50             Signanti (PA)         %         55         55             Signanti (PA)         %         55              Signanti (PA)         %         55              Signanti (PA)         %         55	Sample Number		VPA045838	VPA031136	 
Machine Hours         973         867             Di Hours         130         830             Di Changed         Changed         NORMAL         NORMAL            OL CONDITION              OL CONDITION              Area         99.2         11.0             Di dation (PA)         %         59         58             CONTAMINATION               Viration (PA)         %         55         55             Viration (PA)         %         55         55             Viration (PA)         %         55         55             Sidefation (PA)         %         55              Sidefation (PA)         %         55              Sidefation (PA)         %         55              Sidefation (PA)         %         55					
Dil Hours       130       830           Dil Changed       Changed       N/A           Gample Status       NORMAL       NORMAL           OIL CONDITION            Ages Number (BN)       mg KOH/g       9.2       11.0           Datidation (PA)       %       59       58           CONTAMINATION       ****            Water       %       NEG       NEG           Vitration (PA)       %       55       50           Vitration (PA)       %       55       55           Vitration (PA)       %       55       55           Vitration (PA)       %       10       <1.0					 
Dil Changed         N/A             Gample Status         NORMAL         NORMAL             OIL CONDITION              Arise @ 100°C         cSt         12.8         13.3             Sase Number (BN)         mg KOH/g         9.2         111.0             Did cation (PA)         %         59         58             CONTAMINATION               Water         %         NEG         NEG             Vitration (PA)         %         55         55             Solot %         %         10         -1.0             Silufation (PA)         %         55         55             Solot %          10              Silufation (PA)         %         55         55             Solot %          10             Solot %         <	Oil Hours				 
Normal         Normal             OIL CONDITION              Visc @ 100°C         cSt         12.8         13.3             Sase Number (BN)         mg KOH/g         9.2         11.0             Dxidation (PA)         %         59         58             CONTAMINATION               Water         %         NEG         NEG             Vitration (PA)         %         55         55             Silforin         ppm         6         5             Vitration (PA)         %         S5         55             Silforin         ppm         6         5             Vitration (PA)         %         S5              Silforin         ppm         6              Silforin         ppm         1         -10 <t< th=""><th></th><th></th><th></th><th></th><th> </th></t<>					 
Aisc @ 100°C       cSt       112.8       13.3           Base Number (BN)       mg KOH/g       9.2       11.0           Dxidation (PA)       %       59       58           CONTAMINATION	Sample Status		-		 
Aisc @ 100°C       cSt       112.8       13.3           Base Number (BN)       mg KOH/g       9.2       11.0           Dxidation (PA)       %       59       58           CONTAMINATION	OIL CONDITION				
Base Number (BN)         mg KOH/g         9.2         11.0             Dxidation (PA)         %         59         58             CONTAMINATION		cSt	12.8	13 3	 
Daxidation (PA)         %         59         58             CONTAMINATION           Water         %         NEG         NEG             Solot %         0.5         0.2             Solot %         %         0.5         50             Sulfation (PA)         %         55         55             Sulfation (PA)         %         S5         55             Sulfation (PA)         %         NEG         NEG             Solot %         NEG         NEG              Silcon         pm         6         5              Soldium         ppm         0         0              Soldium         ppm         7         3              WEAR METALS           0              Kuminum         ppm         1         0					 
CONTAMINATION           Water         %         NEG             Soot %         %         0.5         0.2             Soot %         %         0.5         50             Sulfation (PA)         %         55         55             Silfation (PA)         %         S5         55             Silfation (PA)         %         <1.0	Oxidation (PA)				
Water         %         NEG         NEG            Soot %         %         0.5         0.2             Soot %         %         55         50             Sulfation (PA)         %         55         55             Sold (PA)         %         NEG         NEG             Sile (PA)         %         NEG         NEG             Sold (PA)         %         1.0              Sile (PA)         %         1.0              Sold (PA)         pp         6         5             Sold (PA)         pp         6         5             Sold (PA)         pp         0         0             Sold (PA)         pp         33         7             Soper         pp         33         7             Sold (PA)         pp         1         1 <tr< td=""><td></td><td></td><td></td><td></td><td></td></tr<>					
Soot %         %         0.5         0.2             Vitration (PA)         %         55         50             Sild ation (PA)         %         55         55             Sild ation (PA)         %         NEG         NEG             Sild ation (PA)         %         <1.0		%	NEG	NEG	 
Nitration (PA)         %         55         50             Sulfation (PA)         %         S5         55             Sulfation (PA)         %         NEG         NEG             Sulfation (PA)         %         NEG         NEG             Sulfation (PA)         %         <1.0					
Sulfation (PA)         %         55         55             Slycol         %         NEG         NEG             Sulfation (PA)         %         <1.0					
Slycol         %         NEG         NEG             Fuel         %         <1.0					 
Yuel         %         <1.0         <1.0             Silicon         ppm         6         5             Sodium         ppm         0         0             Potassium         ppm         2         2             WEAR METALS               Too         ppm         7         3             Copper         ppm         33         7             Lead         ppm         1         0             Numinum         ppm         1         1             Nolydenum         ppm         55         56             Silver         ppm         0              Maganese         ppm         41         0             ADDITIVES               Aganesium         ppm         1132         1228					 
Silicon       ppm       6       5           Sodium       ppm       0       0           Potassium       ppm       2       2           WEAR METALS             Sopper       ppm       7       3           Copper       ppm       33       7           Lead       ppm       1       0           Numinum       ppm       1       -1           Nolybdenum       ppm       55       56           Nickel       ppm       1       0           Nickel       ppm       1       0           Nickel       ppm       1       0           Nickel       ppm       1       0           Nanganese       ppm       <1	Fuel				 
Sodium         ppm         0         0             Potassium         ppm         2         2             WEAR METALS               Copper         ppm         7         3             Copper         ppm         33         7             Lead         ppm         <1	Silicon				 
Portassium         ppm         2             WEAR METALS              Copper         ppm         7         3             Copper         ppm         33         7             Lead         ppm         133         7             Lead         ppm         1         0             Aluminum         ppm         1         1             Aluminum         ppm         1         0             Molybdenum         ppm         55         56             Vickel         ppm         1         0             Vickel         ppm         0         <            Magnese         ppm         0         0             ADDITIVES               Magnesium         ppm         1132         1228             Magnesium         ppm         1190 <t< td=""><td>Sodium</td><td></td><td></td><td></td><td> </td></t<>	Sodium				 
ron         ppm         7         3             Copper         ppm         33         7             Lead         ppm         <1         0             Lead         ppm         1         <1             Nime         ppm         1         <1             Aluminum         ppm         1         0             Aluminum         ppm         1         0             Aluminum         ppm         <1         0             Molybdenum         ppm         <1         0             Molybdenum         ppm         <1         0             Vickel         ppm         11         0             Viskel         ppm         132         1228             Anadium         ppm         1132         1228             Magnesium         ppm         1190         1232	Potassium		2	2	 
ron         ppm         7         3             Copper         ppm         33         7             Lead         ppm         <1         0             Lead         ppm         1         <1             Nime         ppm         1         <1             Aluminum         ppm         1         0             Aluminum         ppm         1         0             Aluminum         ppm         <1         0             Molybdenum         ppm         <1         0             Molybdenum         ppm         <1         0             Vickel         ppm         11         0             Viskel         ppm         132         1228             Anadium         ppm         1132         1228             Magnesium         ppm         1190         1232	WEAR METALS				
Copper       ppm       33       7           Lead       ppm       <1	Iron	ppm	7	3	 
in       ppm       <1					 
Tin       ppm       1           Aluminum       ppm       1           Aluminum       ppm       1       0          Chromium       ppm       <1				_	 
Aluminum       ppm       1           Chromium       ppm       <1	Tin				 
Lhromium       ppm       <1	Aluminum				 
Molybdenum       ppm       55       56          Nickel       ppm       1       0          Titanium       ppm       <1	Chromium				 
Nickel       ppm       1       0           Titanium       ppm       <1					 
Titanium       ppm       <1	Nickel				 
Silver       ppm       0       <1	Titanium				 
Manganese         ppm         <1         <1             /anadium         ppm         0         0             ADDITIVES               Calcium         ppm         1132         1228             Magnesium         ppm         849         848             Zinc         ppm         1190         1232             Phosphorus         ppm         995         1068             Barium         ppm         11         0	Silver				 
ADDITIVES           Calcium         ppm         1132         1228             Magnesium         ppm         849         848             Zinc         ppm         1190         1232             Phosphorus         ppm         995         1068             Barium         ppm         11         0	Manganese		■<1	< 1	 
ADDITIVES           Calcium         ppm         1132         1228             Magnesium         ppm         849         848             Zinc         ppm         1190         1232             Phosphorus         ppm         995         1068             Barium         ppm         11         0	Vanadium	ppm	0	0	 
Calcium         ppm         1132         1228             Magnesium         ppm         849         848             Zinc         ppm         1190         1232             Phosphorus         ppm         995         1068             Barium         ppm         11         0	ADDITIVES				
Magnesium         ppm         849         848             Zinc         ppm         1190         1232             Phosphorus         ppm         995         1068             Barium         ppm         11         0	Calcium	maa	1132	1228	 
Zinc         ppm         1190         1232             Phosphorus         ppm         995         1068             Barium         ppm         11         0					 
Phosphorus         ppm         995         1068             Barium         ppm         11         0	Zinc		_		
Barium ppm <b>11</b> 0					
	Barium				 
	Boron				 

#### **Outstanding Marine**

VOLVO PENTA

PO Box 274 GALENA, MD US 21635 Contact: Ronda Bolinger rlwb@verizon.net T: F<sup>.</sup>

#### Diagnosis

Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the oil. 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.

 Unique No:
 10782820

 Signed:
 Don Baldridge

 Report Date:
 15 Dec 2023

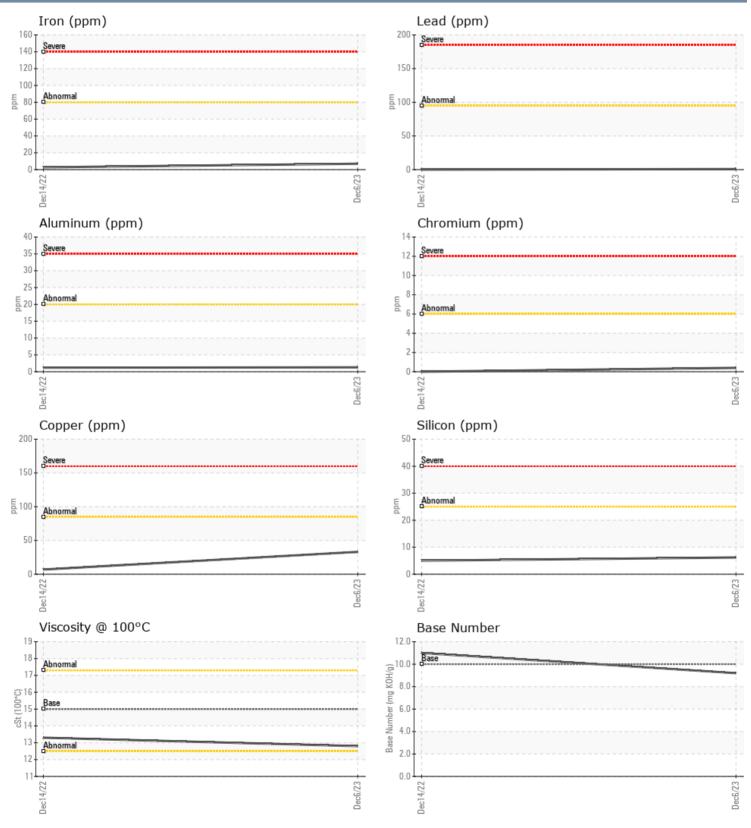
Contact/Location: Ronda Bolinger - VP153685

VP153685

# **OIL ANALYSIS REPORT**



#### GRAPHS



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