## **OIL ANALYSIS REPORT**

## NADINE URCIUOLI KALLSEN-2300563 VOLVO PENTA 7008494609 - STARBOARD DIESEL ENGINE

Sample No: VPA055951

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

Sample Date         15 Nov 2023             File         Heinut           Machine Hours         457            53 AN RAI           Oil Changed         Changed            53 AN RAI           Sample Status         ABNORMAL            Contact           OIL CONDITION             Contact           OX CONTAC         SS            Contact           Oxidation (PA)         %         55            Diagn           OXidation (PA)         %         52            Diagn           Nitration (PA)         %         42            monito           Solt %         0.2                Solt %         0.2                Solt %         0.2	Sample Number		VPA055951	 	
Machine Hours       457           Sam       PAI         Oil Hours       457           Sam RAI         Sample Status       ABNORMAL          Same RAI       US 9420         Sample Status       ABNORMAL          SerVice       T: *       *         Visc @ 100°C       CSt       13.6          Diagn         Oxidation (PA)       %       50          Diagn         Oxidation (PA)       %       52          Diagn         Soot %       %       0.2          monito         Soot %       %       0.2          monito         Soot %       %       10.2          monito         Solation (PA)       %       52          indicati         Solation (PA)       %       51          indicati       indicati <t< th=""><th></th><th></th><th>15 Nov 2023</th><th> </th><th> Helmuts Mari</th></t<>			15 Nov 2023	 	 Helmuts Mari
Oli Holi's         AP	-		457	 	 619 Canal Stre
Changed         Changed         ran         ran         ran         Contact: SERVICE           CIL CONDITION         III. CONDITION         IIII. CONDITION         IIII. CONDITION	Oil Hours		457	 	 SAN RAFAEL, O
Sample Status         ABNORMAL            Contact           OIL CONDITION             F.x:         F.x:         F.x:         F.x:         F.x:         F.x:         F.x:         F.x:         F.x:         Diagn         Oil and samplin         Sample Status            Diagn         Oil and samplin         Sample Status         No	Oil Changed		Changed	 	 US 94901-354
OIL CONDITION       T: x: E: x:         Visc @ 100°C       cSt       113.6          Page       Diage         Dxidation (PA)       %       55          Diage	-		-	 	 Contact: NAD SERVICE@HE
Visc @ 100°C       cSt       113.6            Base Number (BN)       ng KOH/g       10.2           Diand         CONTAMINATION       s55           Diand       Samplin         Water       %       NEG           another       absomptin         Nitration (PA)       %       42           absomptin       acceptai       acceptai       acc	OIL CONDITION				T: x:
Base Number (BN)         mg KOH/g         10.2             Dian           CONTAMINATION         %         55             Oil and samplin at the monthlow samplin at the monthlo	Visc @ 100°C	cSt	13.6	 	 F: x:
Daxidation (PA)         %         55            Diagn offind sampling           CONTAMINATION         Water         %         NEG            association abnorm           Soot %         %         0.2            abnorm         abn				 	 
CONTAMINATION         Oil and samplin at the n amonto of the oil.         Oil and samplin at the n amonto of the oil.         Samplin at the non-the oil.         Samplin at the	. ,			 	 Diagnosis
Water         %         NEG           monitod monitod abnorm           Soot %         %         0.2            monitod abnorm           Soot %         %         42            monitod abnorm           Sulfation (PA)         %         42            indicati           Sycol         %         NEG            indicati           Sycol         %         NEG            indicati           Sycol         %         NEG            indicati           Sycol         %         NEG             indicati           Sycol         %         NEG              accepta           Sodium         ppm         1                Coper         ppm         10                Sodpiunum         pm <td></td> <td></td> <td></td> <td></td> <td>Oil and filter</td>					Oil and filter
Water         %         NEG            monitod abnorm           Soot %         %         0.2            abnorm           Sulfation (PA)         %         42            retes ar           Sulfation (PA)         %         52            retes ar           Glycol         %         NEG            the oil,           Sulfation (PA)         %         <1.0	CONTAMINATION				sampling has
Soot %       %       0.2          above         Nitration (PA)       %       42          rates ar         Sulfation (PA)       %       52          rates ar         Slufetion (PA)       %       NEG          indicatii         Slufetion (PA)       %       NEG          indicatii         Slufetion (PA)       %       NEG          indicatii         Slufetion (PA)       %       <1.0	Water	%	NEG	 	 at the next se monitor.The a
Nitration (PA)       %       42          rates ar indicating indindicating indicatind indicating indicating indicatind indicating					 abnormal. All
Sulfation (PA)         %         52             indicati the oil.           Slycol         %         NEG             the oil.           Sulfation (PA)         %         <1.0				 	 rates are nor
Glycol       %       NEG         the oil.         Fuel       %       <1.0				 	 indication of
Fuel         %         <1.0           there is is in the o is acceptal solution         ppm         11           acceptal solution         ppm         5          acceptal solution         acceptal solution         acceptal solution         there is is in the o is in the o is acceptal solution         acceptal solution <td></td> <td></td> <td></td> <td></td> <td> the oil. The B</td>					 the oil. The B
Silicon         ppm         11            accepta           Sodium         ppm         5            accepta           Potassium         ppm         1            accepta           WEAR METALS                 Iron         ppm         25                Copper         ppm         10               Lead         ppm         1               Aluminum         ppm         62               Molydenum         ppm         0               Silver         ppm         0               Silver         ppm         0               Anodium         ppm         0				 	 there is suital
Sodium         ppm         5               Potassium         ppm         1               WEAR METALS                Iron         ppm         25               Copper         ppm         10               Lead         ppm         0               Aluminum         ppm         0               Aluminum         ppm         1               Aluminum         ppm         0               Molybdenum         ppm         0               Nickel         ppm         0               Magnaese         ppm         0               Magnesium					in the oil. The
Potassium         ppm         1              WEAR METALS         Vertice					acceptable fo
WEAR METALS         Iron       ppm       25            Copper       ppm       10            Lead       ppm       <1					
Iron       ppm       25            Copper       ppm       10            Lead       ppm       <1			_		
Copper         ppm         10               Lead         ppm         <1	WEAR METALS				
Lead       ppm       <1	Iron	ppm		 	
Tin       ppm       0            Aluminum       ppm       49            Chromium       ppm       1            Molybdenum       ppm       62            Nickel       ppm       0            Silver       ppm       0            Manganese       ppm       <1		ppm	<b>10</b>	 	
Aluminum       ppm       49           Chromium       ppm       1           Molybdenum       ppm       62           Nickel       ppm       1           Titanium       ppm       0           Silver       ppm       0           Manganese       ppm       <1		ppm		 	
Chromium       ppm       1           Molybdenum       ppm       62           Nickel       ppm       1           Titanium       ppm       0           Silver       ppm       0           Manganese       ppm       <1		ppm		 	
Molybdenumppm62Nickelppm1Titaniumppm0Silverppm0Manganeseppm<1		ppm		 	
Nickel         ppm         1              Titanium         ppm         0              Silver         ppm         0              Manganese         ppm              Vanadium         ppm         0              ADDITIVES               Magnesium         ppm         1075              Magnesium         ppm         1019              Phosphorus         ppm         1002              Barium         ppm         0		ppm	—	 	
Titanium       ppm       0           Silver       ppm       0           Manganese       ppm       <1		ppm	62	 	
Silver       ppm       0           Manganese       ppm       <1		ppm	_	 	
Manganese         ppm         <1             Vanadium         ppm         0              ADDITIVES               Calcium         ppm         1075              Magnesium         ppm         1019              Zinc         ppm         1354              Phosphorus         ppm         1002              Barium         ppm         0		ppm		 	
Vanadiumppm0ADDITIVESCalciumppm1075Magnesiumppm1019Zincppm1354Phosphorusppm1002Bariumppm0		ppm	0	 	
ADDITIVES         Calcium       ppm       1075           Magnesium       ppm       1019           Zinc       ppm       1354           Phosphorus       ppm       1002           Barium       ppm       0				 	
Calcium       ppm       1075           Magnesium       ppm       1019           Zinc       ppm       1354           Phosphorus       ppm       1002           Barium       ppm       0	Vanadium	ppm	0	 	
Magnesium         ppm         1019              Zinc         ppm         1354              Phosphorus         ppm         1002              Barium         ppm         0	ADDITIVES				
Zinc         ppm         1354              Phosphorus         ppm         1002              Barium         ppm         0	Calcium	ppm	1075	 	
Phosphorus         ppm         1002              Barium         ppm         0	Magnesium	ppm	<b>1019</b>	 	
Barium ppm <b>0</b>	Zinc	ppm		 	
	Phosphorus	ppm	<b>1002</b>	 	
	Barium	ppm	0	 	
Boron ppm C<1 Depot:	Boron	ppm	□<1	 	 Depot:

Helmuts Marine Service 519 Canal Street 5AN RAFAEL, CA JS 94901-3545 Contact: NADINE URCIUOLI 5ERVICE@HELMUTSMARINE.COM T: x:

Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.The aluminum level is abnormal. All other 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.

 Depot:
 VP152741

 Unique No:
 10762478

 Signed:
 Doug Bogart

 Report Date:
 28 Nov 2023

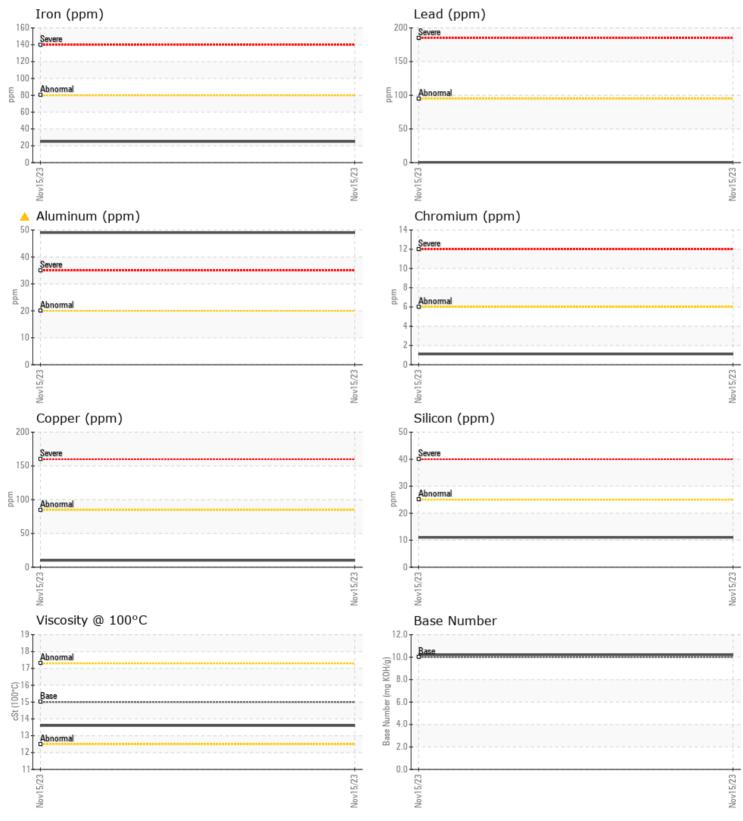
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Contact/Location: NADINE URCIUOLI - VP152741

## **OIL ANALYSIS REPORT**



## GRAPHS



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