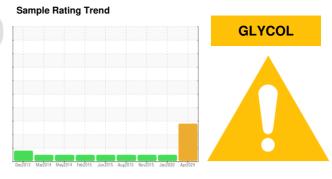


## **OIL ANALYSIS REPORT**





VOLVO A35F 10333 Component Diesel Engine

DIESEL ENGINE OIL SAE 15W40 (--- GAL)

Sample Date     Client Info     15 Apr 2024     02 Jan 2020     25 Nov 201       Nachine Age     hrs     Client Info     19165     0     4940       Oil Age     hrs     Client Info     19165     0     4940       Sample Status     Imit Chase     current     NIA     Changed     N/A       Sample Status     Imit Chase     current     Nistory1     Nistory1     Nistory1       Water     WC Method     >0.2     NEG     NCG     NCG       Ton     ppm     ASTM 0565m     >200     8     13     4       Chromium     ppm     ASTM 0565m     >20     <1     <1     0     <1       Titanium     ppm     ASTM 0565m     >20     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     <1     1     <1     <1     <			ATION					
Sample Date     Client Info     15 Apr 2024     02 Jan 2020     25 Nov 201       Nachine Age     hrs     Client Info     19165     0     4940       Oil Age     hrs     Client Info     19165     0     4940       Sample Status     Imit Dase     Current     NIAA     Changed       ABNORMAL     NORMAL     NORMAL     NORMAL     NORMAL       Vater     WC Method     >0.2     NEG     NEG     NEG       Water     WC Method     >0.2     NEG     NEG     NEG       Iron     ppm     ASTM 0565m     >200     8     13     4       Chromium     ppm     ASTM 0565m     >200     1     <1     0     0       Silver     ppm     ASTM 0565m     >20     1     <1     0     0       Lead     ppm     ASTM 0565m     >20     1     <1     <1     1     <1     0     0     0     0     0     0     0     0     0     0     0			ATION		limit/base			
H. Oli and Die too     Machine Age Die too     hrs     Client Info     19165     0.     4940       Did Changed     Nrage     Client Info     B00     0     0       Sample Status     Client Info     Changed     N/A     Changed       CONTAMINATION     rethod     Imitbase     current     History1     History1       Water     WC Method     >0.2     NEG     NEG     NEG       Tron     ppm     ASTM 05185m     >200     <1								VCP182477
s been oli Age     Ins     Client Info     15 UD     0     4-9-0       oli Age     Ins     Client Info     600     0     0       oli Age     Ins     Client Info     Kolo     0     0       Sample Status     Image     Client Info     ABNORMAL     NORMAL     NORMAL       CONTAMINATION     method     Imit/base     current     history1     history1       water     WC Method     >0.2     NEG     NEG     NEG       Iron     ppm     ASTM05165m     >200     8     13     4       Nickel     ppm     ASTM05165m     >200     8     13     4       Nickel     ppm     ASTM05165m     >20     <1						-		
Oli Arge     Oli Arge     Oli Arge     Oli Arge     Oli Arge     A	s boon	•						
Sample Status     Method     MBNORMAL     NORMAL     NORMAL       CONTAMINATION     method     limit/base     current     history1     history1       Water     WC Method     >.0.2     NEG     NEG     NEG       Iron     ppm     ASTM 05185m     >20.0     8     13.3     4       Chromium     ppm     ASTM 05185m     >20.0     8     13.3     4       Chromium     ppm     ASTM 05185m     >20.0     8     13.4     1       Nickel     ppm     ASTM 05185m     >20.0     8     13.4     1       Silver     ppm     ASTM 05185m     >20.0     1     0     0       Aluminum     ppm     ASTM 05185m     >20.0     1     -1     1       Copper     ppm     ASTM 05185m     >20.0     1     -1     1       Cadmium     ppm     ASTM 05185m     20.0     -1     0     0       Copper     ppm     ASTM 05185m     20.0     -1     1     1 </td <td>ole to Oli</td> <td>•</td> <td>hrs</td> <td></td> <td></td> <th></th> <td></td> <td>÷</td>	ole to Oli	•	hrs					÷
Arb. Fuel   CONTAMINATION method limit/base current history1 history1   Water WC Method >0.2 NEG NEG NEG   WEAR METALS method limit/base current history1 history1   Tron ppm ASTM D5165m >200 8 13 4   Tron ppm ASTM D5165m >200 8 13 4   Tron ppm ASTM D5165m >200 <1	Oil	-		Client Info		-		
Water     WC Method     >0.2     NEG     NEG     NEG       VEAR METALS     method     limit/base     current     history1     history1       Iron     ppm     ASTM D5185m     >200     8     13     4       Tron     ppm     ASTM D5185m     >200     <1	Sa	imple Status				ABNORMAL	NORMAL	NORMAL
Matrix     Weak Metra Lis     method     limit/base     current     history1     history1       iron     ppm     ASTM D5185m     >20     8     13     4       irbe BN result remaining in     fron     ppm     ASTM D5185m     >20     <1	C		l	method	limit/base	current	history1	history2
WEAR METALSmethodlimit/basecurrenthistory1history1Ironppm $ASTM D5185m$ >2008134Ironppm $ASTM D5185m$ >20<1		ater		WC Method	>0.2	NEG	NEG	NEG
The BN result remaining in     Chromium     ppm     ASTM D5185m     >20     <1     <1     <1       Nickel     ppm     ASTM D5185m     >10     <1	V	VEAR METALS		method	limit/base	current	history1	history2
nickel     ppm     ASTM D5185m     >10     <1     0     <1       Titanium     ppm     ASTM D5185m     >2     <1	Iro	n	ppm	ASTM D5185m	>200	8	13	4
Initialization     ppm     ASTM D5185m     >10     <1     0     0       Silver     ppm     ASTM D5185m     >30     4     5     2       Lead     ppm     ASTM D5185m     >40     2     <1	he BN result Ch	nromium	ppm	ASTM D5185m	>20	<1	<1	<1
Silver   ppm   ASTM D5185m   >2   <1   0   0     Aluminum   ppm   ASTM D5185m   >40   2   <1	remaining in Nic	ckel	ppm	ASTM D5185m	>10	<1	0	<1
Aluminum     ppm     ASTM D5185m     >30     4     5     2       Lead     ppm     ASTM D5185m     >40     2     <1	Tita	anium	ppm	ASTM D5185m		<1	0	0
Lead   ppm   ASTM D5185m   >40   2   <1	Sil	ver	ppm	ASTM D5185m	>2	<1	0	0
Copper     ppm     ASTM D5185m     >20     1     <1     <1       Tin     ppm     ASTM D5185m     >20     <1	Alu	uminum	ppm	ASTM D5185m	>30	4	5	2
Tin     ppm     ASTM D5185m     >20     <1     <1     <1       Antimony     ppm     ASTM D5185m      0     0     0       Vanadium     ppm     ASTM D5185m      0     0     0       Cadmium     ppm     ASTM D5185m     -     -1     0     0       ADDITIVES     method     limit/base     current     history1     history1       Boron     ppm     ASTM D5185m     10     0     0     0       Molybdenum     ppm     ASTM D5185m     100     114     118     65       Magnesium     ppm     ASTM D5185m     450     456     493     422       Calcium     ppm     ASTM D5185m     3000     1677     1572     1273       Phosphorus     ppm     ASTM D5185m     1350     1101     850     952       Sulfur     ppm     ASTM D5185m     20     9     6     4       Sodium     ppm     ASTM D5185m     >20 <t< td=""><td>Lea</td><td>ad</td><td>ppm</td><td>ASTM D5185m</td><td>&gt;40</td><th>2</th><td>&lt;1</td><td>&lt;1</td></t<>	Lea	ad	ppm	ASTM D5185m	>40	2	<1	<1
Antimony     ppm     ASTM D5185m      0     0       Vanadium     ppm     ASTM D5185m     <1	Co	opper	ppm	ASTM D5185m	>20	1	<1	<1
Vanadium     ppm     ASTM D5185m     <1     0     0       Cadmium     ppm     ASTM D5185m     <1     0     0       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     250     46     362     267       Barium     ppm     ASTM D5185m     10     0     0     0     0       Molybdenum     ppm     ASTM D5185m     100     114     118     65       Manganese     ppm     ASTM D5185m     100     1677     1572     1273       Phosphorus     ppm     ASTM D5185m     1350     1101     850     952       Sulfur     ppm     ASTM D5185m     1350     1101     850     952       Sulfur     ppm     ASTM D5185m     20     9     6     4       Sodium     ppm     ASTM D5185m     20     9     6     4       Sodium     ppm     ASTM D5185m     20     94	Tir	า	ppm	ASTM D5185m	>20	<1	<1	<1
Cadmium     ppm     ASTM D5185m     <1     0     0       ADDITIVES     method     limit/base     current     history1     history1       Boron     ppm     ASTM D5185m     250     46     362     267       Barium     ppm     ASTM D5185m     10     0     0     0       Molybdenum     ppm     ASTM D5185m     100     114     118     65       Manganese     ppm     ASTM D5185m     450     456     493     422       Calcium     ppm     ASTM D5185m     3000     1677     1572     1273       Phosphorus     ppm     ASTM D5185m     1350     1101     850     952       Sulfur     ppm     ASTM D5185m     1250     3297     3558     3645       CONTAMINANTS     method     limit/base     current     history1     history1       Silicon     ppm     ASTM D5185m     >20     9     6     4       Sodium     ppm     ASTM D5185m     >20	An	ntimony	ppm	ASTM D5185m			0	0
ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     250     46     362     267       Barium     ppm     ASTM D5185m     10     0     0     0       Molybdenum     ppm     ASTM D5185m     100     114     118     65       Manganese     ppm     ASTM D5185m     100     456     493     422       Calcium     ppm     ASTM D5185m     3000     1677     1572     1273       Phosphorus     ppm     ASTM D5185m     1150     961     774     889       Zinc     ppm     ASTM D5185m     1250     3297     3558     3645       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >20     9     6     4       Sodium     ppm     ASTM D5185m     >20     94     <1	Va	anadium	ppm	ASTM D5185m		<1	0	0
Boron     ppm     ASTM D5185m     250     46     362     267       Barium     ppm     ASTM D5185m     10     0     0     0       Molybdenum     ppm     ASTM D5185m     100     114     118     65       Manganese     ppm     ASTM D5185m     100     114     118     65       Magnesium     ppm     ASTM D5185m     450     456     493     422       Calcium     ppm     ASTM D5185m     450     456     493     422       Calcium     ppm     ASTM D5185m     3000     1677     1572     1273       Phosphorus     ppm     ASTM D5185m     1150     961     774     889       Zinc     ppm     ASTM D5185m     1350     1101     850     952       Sulfur     ppm     ASTM D5185m     20     3297     3558     3645       CONTAMINANTS     method     limit/base     current     history1     history2       Sulfur     ppm     ASTM D5185m	Ca	admium	ppm	ASTM D5185m		<1	0	0
Barium     ppm     ASTM D5185m     10     0     0     0       Molybdenum     ppm     ASTM D5185m     100     114     118     65       Maganese     ppm     ASTM D5185m     100     114     118     65       Magnesium     ppm     ASTM D5185m     450     456     493     422       Calcium     ppm     ASTM D5185m     3000     1677     1572     1273       Phosphorus     ppm     ASTM D5185m     1150     961     774     889       Zinc     ppm     ASTM D5185m     1350     1101     850     952       Sulfur     ppm     ASTM D5185m     1250     3297     3558     3645       CONTAMINANTS     method     limit/base     current     history1     history1       Silicon     ppm     ASTM D5185m     >20     9     6     4       Sodium     ppm     ASTM D5185m     >20     94     <1	Д	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum     ppm     ASTM D5185m     100     114     118     65       Manganese     ppm     ASTM D5185m     0     0     <1     <1       Magnesium     ppm     ASTM D5185m     450     456     493     422       Calcium     ppm     ASTM D5185m     3000     1677     1572     1273       Phosphorus     ppm     ASTM D5185m     1150     961     774     889       Zinc     ppm     ASTM D5185m     1350     1101     850     952       Sulfur     ppm     ASTM D5185m     4250     3297     3558     3645       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >20     9     6     4       Sodium     ppm     ASTM D5185m     >20     94     <1     1       Fuel     %     ASTM D524     >3.0     0.5     <1.0     <1.0       Mota     imit/base     current	Во	oron	ppm	ASTM D5185m	250	46	362	267
Marganese     ppm     ASTM D5185m     0     <1     <1       Magnesium     ppm     ASTM D5185m     450     456     493     422       Calcium     ppm     ASTM D5185m     3000     1677     1572     1273       Phosphorus     ppm     ASTM D5185m     1150     961     774     889       Zinc     ppm     ASTM D5185m     1350     1101     850     952       Sulfur     ppm     ASTM D5185m     1350     1101     850     952       Sulfur     ppm     ASTM D5185m     4250     3297     3558     3645       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >20     9     6     4       Sodium     ppm     ASTM D5185m     >20     94     <1	Ba	arium	ppm	ASTM D5185m	10	0	0	0
Magnesium   ppm   ASTM D5185m   450   456   493   422     Calcium   ppm   ASTM D5185m   3000   1677   1572   1273     Phosphorus   ppm   ASTM D5185m   1150   961   774   889     Zinc   ppm   ASTM D5185m   1350   1101   850   952     Sulfur   ppm   ASTM D5185m   4250   3297   3558   3645     CONTAMINANTS   method   limit/base   current   history1   history2     Silicon   ppm   ASTM D5185m   >20   9   6   4     Sodium   ppm   ASTM D5185m   >20   94   <1	Mc	olybdenum	ppm	ASTM D5185m	100	114	118	65
Calcium   ppm   ASTM D5185m   3000   1677   1572   1273     Phosphorus   ppm   ASTM D5185m   1150   961   774   889     Zinc   ppm   ASTM D5185m   1350   1101   850   952     Sulfur   ppm   ASTM D5185m   4250   3297   3558   3645     CONTAMINANTS   method   limit/base   current   history1   history1     Silicon   ppm   ASTM D5185m   >20   9   6   4     Sodium   ppm   ASTM D5185m   >20   9   6   4     Sodium   ppm   ASTM D5185m   >20   94   <1	Ma	anganese	ppm	ASTM D5185m		0	<1	<1
Phosphorus   ppm   ASTM D5185m   1150   961   774   889     Zinc   ppm   ASTM D5185m   1350   1101   850   952     Sulfur   ppm   ASTM D5185m   4250   3297   3558   3645     CONTAMINANTS   method   limit/base   current   history1   history2     Silicon   ppm   ASTM D5185m   >20   9   6   4     Sodium   ppm   ASTM D5185m   >20   9   6   4     Potassium   ppm   ASTM D5185m   >20   94   <10   110     Fuel   %   ASTM D5185m   >20   94   <10   <10   <10     Glycol   %   *ASTM D5185m   >20   94   <10   <10   <10     Glycol   %   *ASTM D5185m   >20   94   <10   <10   <10     Glycol   %   *ASTM D5185m   >20   MEG   NEG   NEG   NEG     INFRA-RED   method   limit/base   current   history1   0.2   0.2 <	Ma	agnesium	ppm	ASTM D5185m	450	456	493	422
Zinc   ppm   ASTM D5185m   1350   1101   850   952     Sulfur   ppm   ASTM D5185m   4250   3297   3558   3645     CONTAMINANTS   method   limit/base   current   history1   history2     Silicon   ppm   ASTM D5185m   >20   9   6   4     Sodium   ppm   ASTM D5185m   >20   9   6   4     Sodium   ppm   ASTM D5185m   >20   9   6   4     Sodium   ppm   ASTM D5185m   >20   94   <1	Ca	alcium	ppm	ASTM D5185m	3000	1677	1572	1273
SulfurppmASTM D5185m4250329735583645CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>20964SodiumppmASTM D5185m>15851831PotassiumppmASTM D5185m>2094<1	Ph	nosphorus	ppm	ASTM D5185m	1150	961	774	889
CONTAMINANTSmethodlimit/basecurrenthistory1history1SiliconppmASTM D5185m>20964SodiumppmASTM D5185m>15851831PotassiumppmASTM D5185m>2094<1	Zir	าต	ppm	ASTM D5185m	1350	1101	850	952
Silicon   ppm   ASTM D5185m   >20   9   6   4     Sodium   ppm   ASTM D5185m   >158   518   3   1     Potassium   ppm   ASTM D5185m   >20   94   <1   1     Fuel   %   ASTM D3524   >3.0   0.5   <1.0   <1.0     Glycol   %   *ASTM D2982   NEG   NEG   NEG     INFRA-RED   method   limit/base   current   history1   history2     Soot %   %   *ASTM D7624   >20   7.9   5.3   4.     Sulfation   Abs/.1mm   *ASTM D7415   >30   22.6   19.5   14.     FLUID DEGRADATION   method   limit/base   current   history1   history2     Oxidation   Abs/.1mm   *ASTM D7414   >25   20.1   14   10.	Su	llfur	ppm	ASTM D5185m	4250	3297	3558	3645
SodiumppmASTM D5185m>158 $\checkmark$ 51831PotassiumppmASTM D5185m>20 $\checkmark$ 94<1	C	CONTAMINANTS		method	limit/base	current	history1	history2
Potassium   ppm   ASTM D5185m   >20   94   <1   1     Fuel   %   ASTM D3524   >3.0   0.5   <1.0   <1.0     Glycol   %   *ASTM D2982   NEG   NEG   NEG   NEG     INFRA-RED   method   limit/base   current   history1   history2     Soot %   %   *ASTM D7844   >3   0.2   0.1   0.2     Nitration   Abs/cm   *ASTM D7624   >20   7.9   5.3   4.     Sulfation   Abs/.1mm   *ASTM D7415   >30   22.6   19.5   14.     FLUID DEGRADATION   method   limit/base   current   history1   history2     Oxidation   Abs/.1mm   *ASTM D7414   >25   20.1   14   10.	Sil	licon	ppm	ASTM D5185m	>20	9	6	4
Fuel     %     ASTM D3524     >3.0     0.5     <1.0     <1.0       Glycol     %     *ASTM D2982     NEG     NEG     NEG     NEG       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     0.2     0.1     0.2       Nitration     Abs/cm     *ASTM D7624     >20     7.9     5.3     4.       Sulfation     Abs/.1mm     *ASTM D7415     >30     22.6     19.5     14.       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     20.1     14     10.	So	odium	ppm	ASTM D5185m	>158	<u> </u>	3	1
Glycol%*ASTM D2982NEGNEGNEGINFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>30.20.10.2NitrationAbs/cm*ASTM D7624>207.95.34.SulfationAbs/.1mm*ASTM D7415>3022.619.514.FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2520.11410.	Po	otassium	ppm	ASTM D5185m	>20	<mark>/</mark> 94		1
INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     0.2     0.1     0.2       Nitration     Abs/cm     *ASTM D7624     >20     7.9     5.3     4.       Sulfation     Abs/lmm     *ASTM D7614     >30     22.6     19.5     14.       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/lmm     *ASTM D7414     >25     20.1     14     10.	Fu	iel	%	ASTM D3524	>3.0	0.5	<1.0	<1.0
Soot %     %     *ASTM D7844     >3     0.2     0.1     0.2       Nitration     Abs/cm     *ASTM D7624     >20     7.9     5.3     4.       Sulfation     Abs/.1mm     *ASTM D7415     >30     22.6     19.5     14.       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     20.1     14     10.	Gly	ycol	%	*ASTM D2982		NEG	NEG	NEG
Nitration     Abs/cm     *ASTM D7624     >20     7.9     5.3     4.       Sulfation     Abs/.1mm     *ASTM D7415     >30     22.6     19.5     14.       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     20.1     14     10.	II	NFRA-RED		method	limit/base	current	history1	history2
Nitration     Abs/cm     *ASTM D7624     >20     7.9     5.3     4.       Sulfation     Abs/.1mm     *ASTM D7415     >30     22.6     19.5     14.       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     20.1     14     10.	So	oot %	%	*ASTM D7844	>3	0.2	0.1	0.2
SulfationAbs/.1mm*ASTM D7415>3022.619.514.FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2520.11410.			Abs/cm	*ASTM D7624	>20			
Oxidation     Abs/.1mm     *ASTM D7414     >25     20.1     14     10.								
	F	LUID DEGRADA	TION	method	limit/base	current	history1	history2
	Ox	kidation	Abs/.1mm	*ASTM D7414	>25	20.1	14	10.
						11.4		

### DIAGNOSIS

#### Recommendation

We advise that you check for the source of the coolant leak. Check for low coolant level. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

### Wear

All component wear rates are normal.

#### Contamination

Sodium and/or potassium levels are high. Fuel content negligible.

#### Fluid Condition

The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil.

Submitted By: Service - Alex Anderson



# **OIL ANALYSIS REPORT**

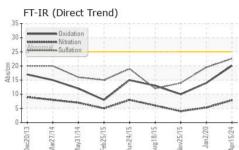
VISUAL

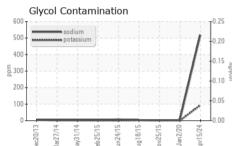
White Metal

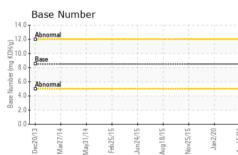
Yellow Metal

Precipitate

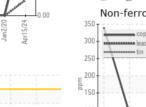












Unique Number : 10989418







scalar

scalar

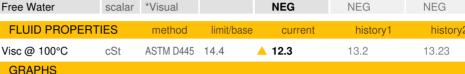
scalar

method

\*Visual

\*Visual

\*Visua



limit/base

NONE

NONE

NONE

current

NONE

NONE

NONE

NONE

NONE

NONE

NORML

NORML

NEG

history1

LIGHT

NONE

NONE

NONE

NONE

NONE

NORML

NORML

NFG

history2

NONE

NONE

NONE

NONE

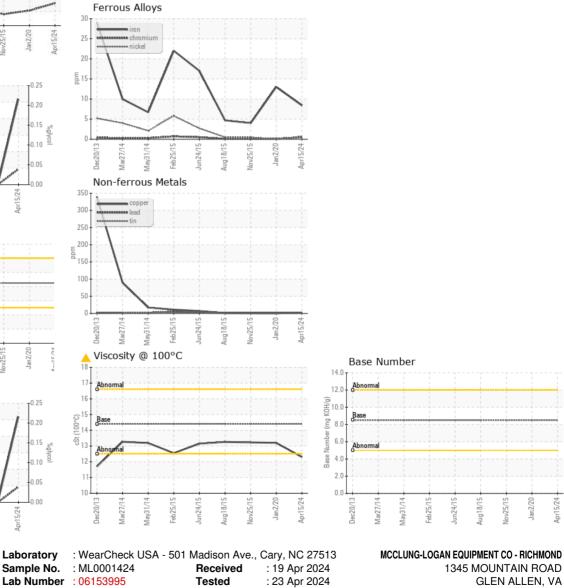
NONE

NONE

NORML

NORML

NEG



: 23 Apr 2024 - Jonathan Hester



Test Package : CONST (Additional Tests: FuelDilution, Glycol, PercentFuel, TBN) Contact: KYLE RATLIFFE Certificate 12367 KRATLIFFE@MCCLUNG-LOGAN.COM 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)

Diagnosed

Report Id: VOLVO8882 [WUSCAR] 06153995 (Generated: 04/24/2024 09:17:00) Rev: 1

Submitted By: Service - Alex Anderson

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F: (804)266-1611

US 23060

T: