

Machine Id



RECOMMENDATION

## VOLVO EC300EL 314178

Diesel Engine

## VOLVO ULTRA DIESEL ENGINE OIL 15W40 VDS-3 (--- GAL)

No corrective action is recommended at this time. Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

Sample NumberClient InfoVCP436829VCP437752VCSample DateClient Info12 Jul 202411 Apr 202424Machine AgehrsClient Info2843234233Oil AgehrsClient Info0033Filter AgehrsClient Info000Oil ChangedClient InfoChangedChangedChangedFilter ChangedClient InfoChangedChangedChangedFilter ChangedClient InfoChangedChangedChangedSample StatusClient InfoABNORMALABNORMALABIronppmASTM D5185m>100918ChromiumppmASTM D5185m>1001NickelppmASTM D5185m>100<1SilverppmASTM D5185m>200	
Perform       Sample Date       Client Info       12 Jul 2024       11 Apr 2024       24         Machine Age       hrs       Client Info       0       0       33         Oil Age       hrs       Client Info       0       0       03         Filter Age       hrs       Client Info       0       0       0       0         Oil Changed       Client Info       Changed	listory2
Sample Date         Client Info         12 Jul 2024         11 Apr 2024         23           Machine Age         hrs         Client Info         0         0         33           Oil Age         hrs         Client Info         0         0         0         0           Filter Age         hrs         Client Info         Changed	CP350797
Oil Age         hrs         Client Info         0         0         33           Filter Age         hrs         Client Info         Changed	4 Feb 2022
Filter Age Oll ChangedhrsClient Info0000Oll ChangedClient InfoChanged ChangedChanged ChangedChanged ChangedCh Ch ABNORMALABIronppmASTM D5185m>100CCTTT <th>36</th>	36
Oil Changed         Client Info         Changed         Change <thc< th=""><th>36</th></thc<>	36
Filter Changed Sample Status         Client Info         Changed ABNORMAL         Changed ABNORMAL         Changed ABNORMAL         Changed ABNORMAL         ABNORMAL         AB           Iron         ppm         ASTM D5185m         >100         9         18         Intermediate         ABNORMAL         AB           Nickel         ppm         ASTM D5185m         >10         0         1         Intermediate         Intermediat         Intermediate         Interme	
Sample Status         ABNORMAL         ACTIONAL         ACTIONAL	hanged
Iron         ppm         ASTM D5185m         >100         9         18           Chromium         ppm         ASTM D5185m         >10         <1         1           Nickel         ppm         ASTM D5185m         >10         0         <1         1           Titanium         ppm         ASTM D5185m         >20         0         <1         1           Silver         ppm         ASTM D5185m         >20         0         1         2         ▲           Lead         ppm         ASTM D5185m         >10         ▲         12         ▲         12         ▲           Vanadium         ppm         ASTM D5185m         >10         0         <1         4         0           Vanadium         ppm         ASTM D5185m         >10         0         <1         4         0         1	hanged
Chromium         ppm         ASTM D5185m         >10         <1	BNORMAL
Chromium         ppm         ASTM D5185m         >10         <1	
Nickel         ppm         ASTM D5185m         >10         0         1           Titanium         ppm         ASTM D5185m         0         <1         I           Silver         ppm         ASTM D5185m         >2         0         0         12         12         12           Lead         ppm         ASTM D5185m         >20         0         1         12         12         1           Lead         ppm         ASTM D5185m         >20         0         1         12         12         1           Lead         ppm         ASTM D5185m         >20         0         1         10         2           Vanadium         ppm         ASTM D5185m         >10         0         2         1 <th>23</th>	23
Titanium       ppm       ASTM D5185m       0       <1         Silver       ppm       ASTM D5185m       >2       0       0         Aluminum       ppm       ASTM D5185m       >20       0       12       ▲	3
Silver         ppm         ASTM D5185m         >22         0         0           Aluminum         ppm         ASTM D5185m         >10         12         12         12         12           Lead         ppm         ASTM D5185m         >20         0         1         1           Copper         ppm         ASTM D5185m         >10         0         2         1         4         1 <th>5</th>	5
Aluminum         ppm         ASTM D5185m         >10         A         12         A         12         A           Lead         ppm         ASTM D5185m         >20         0         1         1           Copper         ppm         ASTM D5185m         >15         <1         4         1           Tin         ppm         ASTM D5185m         >10         0         2         1           White Metal         scalar         *Visual         NONE         NONE         NONE         10           Yellow Metal         scalar         *Visual         NONE         NONE         NONE         NONE         10           Fuel         wC Method         >6.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0<	<1
LeadppmASTM D5185m>2001CopperppmASTM D5185m>15<14TinppmASTM D5185m>1002VanadiumppmASTM D5185m0<1MONEWhite Metalscalar*VisualNONENONENONEYellow Metalscalar*VisualNONENONENONESiliconppmASTM D5185m>2089PotassiumppmASTM D5185m>202919FuelWC Method>6.0<1.0<1.0WaterWC Method>0.1NEGNEGGiycolWC Method>0.1NEGNEGSoot %%*ASTM D7624>207.59.0SulfationAbs/rm*ASTM D7624>207.59.0SulfationAbs/rm*ASTM D7624>207.59.0SulfationAbs/rm*VisualNONENONENONEDebrisscalar*VisualNORENONENONESand/Dirtscalar*VisualNORENORENOREAppearancescalar*VisualNORENORENORECdorscalar*VisualNORENORMLNORMLDebrisscalar*VisualNORENORMLNORMLAgneancescalar*VisualNORENORMLNORMLBoronppmASTM D5185m0.0<10Mang	1
Copper TinppmASTM D5185m>15<1	37
TinppmASTM D5185m>1002VanadiumppmASTM D5185m0<1IWhite Metalscalar*VisualNONENONENONEYellow Metalscalar*VisualNONENONENONESiliconppmASTM D5185m>2089PotassiumppmASTM D5185m>202919FuelWC Method>6.0<1.0<1.0WaterUWC Method>0.1NEGNEGGlycolWC Method>0.1NEGNEGSoot %%*ASTM D7844>30.20.2NitrationAbs/cm*ASTM D7624>207.59.0SulfationAbs/cm*VisualNONENONENONEDebrisscalar*VisualNONENONENONESand/Dirtscalar*VisualNORENONENONEAppearancescalar*VisualNORLNORMLNORMLOdorscalar*VisualNORLNORMLNORMLCodorscalar*VisualNORNORMLNORMLBoronppmASTM D5185m0.0<10ManganeseppmASTM D5185m0.0<1<1ManganeseppmASTM D5185m0.0<1<1ManganeseppmASTM D5185m205539631CalciumppmASTM D5185m205717461846Phosphorus	3
Vanadium         ppm         ASTM D5185m         0         <1	11
White Metal         scalar         *Visual         NONE         NONE         NONE           Yellow Metal         scalar         *Visual         NONE         NONE         NONE           Silicon         ppm         ASTM D5185m         >20         8         9           Potassium         ppm         ASTM D5185m         >20         29         19           Fuel         WC Method         >6.0         <1.0         <1.0           Water         WC Method         >0.1         NEG         NEG           Glycol         WC Method         >0.1         NEG         NEG           Soot %         %         *ASTM D7844         >3         0.2         0.2           Nitration         Abs/:mm< *ASTM D7624         >20         7.5         9.0           Sulfation         Abs/:mm< *ASTM D7644         >30         21.9         21.1           Silt         scalar         *Visual         NONE         NONE         NONE           Debris         scalar         *Visual         NONE         NONE         NONE           Appearance         scalar         *Visual         NORM         NORML         NORML           Odor         scalar         *Visual	2
Yellow Metalscalar*VisualNONENONESiliconppmASTM D5185m>2089PotassiumppmASTM D5185m>202919FuelWC Method>6.0<1.0<1.0WaterWC Method>0.1NEGNEGGlycolWC Method>0.1NEGNEGSoot %%*ASTM D7844>30.20.2NitrationAbs/cm*ASTM D7624>207.59.0SulfationAbs/cm*ASTM D715>3021.921.1Siltscalar*VisualNONENONENONEDebrisscalar*VisualNONENONENONESand/Dirtscalar*VisualNORMNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLDebrisscalar*VisualNORMLNORMLNORMLAppearancescalar*VisualNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLBoronppmASTM D5185m2.52828BariumppmASTM D5185m0.0<10MolybdenumppmASTM D5185m0.0<1<1MaganeseppmASTM D5185m2.539631CalciumppmASTM D5185m2.539361050Zinc <t< th=""><th>0</th></t<>	0
Silicon         ppm         ASTM D5185m         >20         8         9           Potassium         ppm         ASTM D5185m         >20         29         19         0           Fuel         WC Method         >6.0         <1.0         <1.0         <1.0           Water         WC Method         >0.1         NEG         NEG         0.2         0.1         0.2	NONE
Potassium         ppm         ASTM D5185m         >20         29         19           Fuel         WC Method         >6.0         <1.0         <1.0           Water         WC Method         >0.1         NEG         NEG           Glycol         WC Method         >0.1         NEG         NEG           Soot %         %         *ASTM D7844         >3         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         7.5         9.0           Sulfation         Abs/cm         *ASTM D7645         >30         21.9         21.1           Silt         scalar         *Visual         NONE         NONE         NONE           Debris         scalar         *Visual         NONE         NONE         NONE           Sand/Dirt         scalar         *Visual         NOR         NORML         NORML           Appearance         scalar         *Visual         NOR         NORML         NORML           Godor         scalar         *Visual         NOR         NORML         NORML           Manganese         ppm         ASTM D5185m         0.0         <1         0           Molybdenum         ppm </th <th>NONE</th>	NONE
Potassium         ppm         ASTM D5185m         >20         29         19           Fuel         WC Method         >6.0         <1.0         <1.0           Water         WC Method         >0.1         NEG         NEG           Glycol         WC Method         >0.1         NEG         NEG           Soot %         %         *ASTM D7844         >3         0.2         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         7.5         9.0         0           Sulfation         Abs/cm         *ASTM D7644         >30         21.9         21.1         1           Silt         scalar         *Visual         NONE         NONE         NONE         NONE           Debris         scalar         *Visual         NONE         NONE         NONE         NONE           Sand/Dirt         scalar         *Visual         NOR         NORML         NORML         NORML           Appearance         scalar         *Visual         NORM         NORML         NORML         NORML           Boron         ppm         ASTM D5185m         0.0         <1         0           Molybdenum         ppm	
Fuel       WC Method       >6.0       <1.0       <1.0         Water       WC Method       >0.1       NEG       NEG         Glycol       WC Method       >3       0.2       0.2       0.2         Nitration       Abs/cm       *ASTM D7844       >3       0.2       0.2       0.2         Nitration       Abs/cm       *ASTM D7624       >20       7.5       9.0       1         Sulfation       Abs/imm       *ASTM D7415       >30       21.9       21.1       1         Silt       scalar       *Visual       NONE       NONE       NONE       1         Debris       scalar       *Visual       NONE       NONE       NONE       1         Sand/Dirt       scalar       *Visual       NORM       NORML       NORML       1         Appearance       scalar       *Visual       NORM       NORML       NORML       1         Odor       scalar       *Visual       NORM       NORML       NORML       1         Barium       ppm       ASTM D5185m       2.5       28       28       28         Barium       ppm       ASTM D5185m       0.0       <1       0       1	17
WaterWC Method>0.1NEGNEGGlycolWC MethodNEGNEGSoot %%*ASTM D7844>30.20.2NitrationAbs/cm*ASTM D7624>207.59.0SulfationAbs/1mm*ASTM D7415>3021.921.1Siltscalar*VisualNONENONENONEDebrisscalar*VisualNONENONENONESand/Dirtscalar*VisualNONENONENONEAppearancescalar*VisualNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLBoronppmASTM D5185m2.52828BariumppmASTM D5185m0.0<1<1MagneseppmASTM D5185m0.74054MagnesiumppmASTM D5185m205717461846PhosphorusppmASTM D5185m205717461846PhosphorusppmASTM D5185m205717461846PhosphorusppmASTM D5185m122310921243SulfurppmASTM D5185m122310921243	10
GlycolWC MethodNEGNEGSoot %%*ASTM D7844>30.20.2NitrationAbs/cm*ASTM D7624>207.59.0SulfationAbs/tmm*ASTM D7624>2021.921.1Siltscalar*VisualNONENONENONEDebrisscalar*VisualNONENONENONESand/Dirtscalar*VisualNONENONENONEAppearancescalar*VisualNORMNORMLNORMLOdorscalar*VisualNORMNORMLNORMLOdorscalar*VisualNORMNORMLNORMLBoronppmASTM D5185m2.52828BariumppmASTM D5185m0.0<10MolybdenumppmASTM D5185m0.0<1<1MagnesiumppmASTM D5185m205717461846PhosphorusppmASTM D5185m205717461846PhosphorusppmASTM D5185m122310921243SulfurppmASTM D5185m122310921243	<1.0
Soot %%*ASTM D7844>30.20.2NitrationAbs/cm*ASTM D7624>207.59.0SulfationAbs/1mm*ASTM D7415>3021.921.1Siltscalar*VisualNONENONENONEDebrisscalar*VisualNONENONENONESand/Dirtscalar*VisualNONENONENONEAppearancescalar*VisualNORMNORMLNORMLOdorscalar*VisualNORMNORMLNORMLOdorscalar*VisualNORMNORMLNORMLEmulsified Waterscalar*Visual>0.1NEGNEGBoronppmASTM D5185m2.5282828BariumppmASTM D5185m0.0<10MalganeseppmASTM D5185m0.0<1<1MagnesiumppmASTM D5185m205717461846PhosphorusppmASTM D5185m205717461846PhosphorusppmASTM D5185m122310921243SulfurppmASTM D5185m122310921243	NEG
NitrationAbs/cm*ASTM D7624>207.59.0SulfationAbs/.1mm*ASTM D7415>3021.921.1ISiltscalar*VisualNONENONENONEDebrisscalar*VisualNONENONENONESand/Dirtscalar*VisualNONENONENONEAppearancescalar*VisualNORMNORMLNORMLOdorscalar*VisualNORMNORMLNORMLCodorscalar*VisualNORMNORMLNORMLEmulsified Waterscalar*Visual>0.1NEGNEGBoronppmASTM D5185m2.5282810BariumppmASTM D5185m0.0<1010MolybdenumppmASTM D5185m0.0<1<11MagnesiumppmASTM D5185m205717461846PhosphorusppmASTM D5185m205717461846PhosphorusppmASTM D5185m122310921243SulfurppmASTM D5185m122310921243	NEG
SulfationAbs/.1mm*ASTM D7415>3021.921.1Siltscalar*VisualNONENONENONEDebrisscalar*VisualNONENONENONESand/Dirtscalar*VisualNONENONENONEAppearancescalar*VisualNORMNORMLNORMLOdorscalar*VisualNORMNORMLNORMLEmulsified Waterscalar*VisualNORNORMLNORMLBoronppmASTM D5185m2.5282810BariumppmASTM D5185m0.0<101MagnesiumppmASTM D5185m0.0<101MagnesiumppmASTM D5185m2.55396311CalciumppmASTM D5185m2057174618466PhosphorusppmASTM D5185m93610501ZincppmASTM D5185m122310921243SulfurppmASTM D5185m407932373324	0.1
Siltscalar*VisualNONENONENONEDebrisscalar*VisualNONENONENONESand/Dirtscalar*VisualNONENONENONEAppearancescalar*VisualNORMNORMLNORMLOdorscalar*VisualNORMNORMLNORMLEmulsified Waterscalar*VisualNORMNORMLNORMLBoronppmASTM D5185m2.52828BariumppmASTM D5185m0.0<10MolybdenumppmASTM D5185m0.7400544MagnesiumppmASTM D5185m205717461846PhosphorusppmASTM D5185m205717461846ZincppmASTM D5185m122310921243SulfurppmASTM D5185m122333241	7.4
Debrisscalar*VisualNONENONENONESand/Dirtscalar*VisualNONENONENONEAppearancescalar*VisualNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLEmulsified Waterscalar*VisualNORMNORMLNORMLBoronppmASTM D5185m2.52828BariumppmASTM D5185m0.0<10MolybdenumppmASTM D5185m0.7400544ManganeseppmASTM D5185m2.5539631CalciumppmASTM D5185m205717461846PhosphorusppmASTM D5185m205710921243ZincppmASTM D5185m122310921243SulfurppmASTM D5185m407932373324	17.6
Sand/Dirtscalar*VisualNONENONENONEAppearancescalar*VisualNORMNORMLNORMLNORMLNORMLOdorscalar*VisualNORMNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.1NEGNEGISodiumppmASTM D5185m.310IBoronppmASTM D5185m0.0<10IBariumppmASTM D5185m0.0<10IMolybdenumppmASTM D5185m0.0<1<1IMagnesiumppmASTM D5185m0.0<1<1ICalciumppmASTM D5185m205717461846IPhosphorusppmASTM D5185m9361050IIZincppmASTM D5185m122310921243ISulfurppmASTM D5185m407932373324I	NONE
Appearancescalar*VisualNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.1NEGNEGEmulsified Waterscalar*Visual>0.1NEGNEGSodiumppmASTM D5185mS310BoronppmASTM D5185m0.0<10BariumppmASTM D5185m0.0<10MolybdenumppmASTM D5185m0.0<1<1MaganeseppmASTM D5185m0.0<1<1CalciumppmASTM D5185m205717461846PhosphorusppmASTM D5185m9361050<123ZincppmASTM D5185m122310921243SulfurppmASTM D5185m407932373324	NONE
Odorscalar*VisualNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.1NEGNEGSodiumppmASTM D5185m2.52828BoronppmASTM D5185m2.52828BariumppmASTM D5185m0.0<10MolybdenumppmASTM D5185m0.0<154ManganeseppmASTM D5185m0.0<1<1CalciumppmASTM D5185m205717461846PhosphorusppmASTM D5185m9359361050ZincppmASTM D5185m122310921243SulfurppmASTM D5185m407932373324	NONE
Emulsified Waterscalar*Visual>0.1NEGNEGSodiumppmASTM D5185m310BoronppmASTM D5185m2.52828BariumppmASTM D5185m0.0<10MolybdenumppmASTM D5185m0.740054ManganeseppmASTM D5185m0.0<1<1MagnesiumppmASTM D5185m205717461846PhosphorusppmASTM D5185m9359361050<1ZincppmASTM D5185m122310921243SulfurppmASTM D5185m407932373324	NORML
Sodium         ppm         ASTM D5185m         3         10           Boron         ppm         ASTM D5185m         2.5         28         28         28           Barium         ppm         ASTM D5185m         0.0         <1         0           Molybdenum         ppm         ASTM D5185m         0.7         40         54         2           Manganese         ppm         ASTM D5185m         0.0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         0.0         <1         <1         <1           Calcium         ppm         ASTM D5185m         256         539         631         <1           Phosphorus         ppm         ASTM D5185m         2057         1746         1846           Phosphorus         ppm         ASTM D5185m         935         936         1050           Zinc         ppm         ASTM D5185m         1223         1092         1243           Sulfur         ppm         ASTM D5185m         4079         3237         3324	NORML
Boron         ppm         ASTM D5185m         2.5         28         28           Barium         ppm         ASTM D5185m         0.0         <1         0           Molybdenum         ppm         ASTM D5185m         0.0         <1         0           Manganese         ppm         ASTM D5185m         0.0         <1         <1           Magnesium         ppm         ASTM D5185m         0.0         <1         <1           Calcium         ppm         ASTM D5185m         256         539         631            Phosphorus         ppm         ASTM D5185m         2057         1746         1846           Phosphorus         ppm         ASTM D5185m         935         936         1050           Zinc         ppm         ASTM D5185m         1223         1092         1243           Sulfur         ppm         ASTM D5185m         4079         3237         3324	NEG
Boron         ppm         ASTM D5185m         2.5         28         28           Barium         ppm         ASTM D5185m         0.0         <1         0           Molybdenum         ppm         ASTM D5185m         0.0         <1         0           Manganese         ppm         ASTM D5185m         0.0         <1         <1           Magnesium         ppm         ASTM D5185m         0.0         <1         <1           Calcium         ppm         ASTM D5185m         256         539         631            Phosphorus         ppm         ASTM D5185m         2057         1746         1846           Phosphorus         ppm         ASTM D5185m         935         936         1050           Zinc         ppm         ASTM D5185m         1223         1092         1243           Sulfur         ppm         ASTM D5185m         4079         3237         3324	0
Barium         ppm         ASTM D5185m         0.0         <1	3
Barum         ppm         ASTM D5185m         0.0         <1	10
Manganese         ppm         ASTM D5185m         0.0         <1	0
Magnesium         ppm         ASTM D5185m         256         539         631           Calcium         ppm         ASTM D5185m         2057         1746         1846           Phosphorus         ppm         ASTM D5185m         935         936         1050           Zinc         ppm         ASTM D5185m         1223         1092         1243           Sulfur         ppm         ASTM D5185m         4079         3237         3324	2
Calcium         ppm         ASTM D5185m         2057         1746         1846           Phosphorus         ppm         ASTM D5185m         935         936         1050           Zinc         ppm         ASTM D5185m         1223         1092         1243           Sulfur         ppm         ASTM D5185m         4079         3237         3324	3
Phosphorus         ppm         ASTM D5185m         935         936         1050           Zinc         ppm         ASTM D5185m         1223         1092         1243           Sulfur         ppm         ASTM D5185m         4079         3237         3324	289
Zinc         ppm         ASTM D5185m         1223         1092         1243           Sulfur         ppm         ASTM D5185m         4079         3237         3324	2094
Sulfur         ppm         ASTM D5185m         4079         3237         3324	1043
	1156
Oxidation Abs/.1mm *ASTM D7414 > 25 20.2 20.2	4722
	10.5
Base Number (BN)         mg KOH/g         ASTM D2896         10         10.3         9.2	8.1

ASTM D445 15.0

Visc @ 100°C cSt

WEAR

The aluminum level is abnormal. All other component wear rates are normal.

## CONTAMINATION

There is no indication of any contamination in the oil.

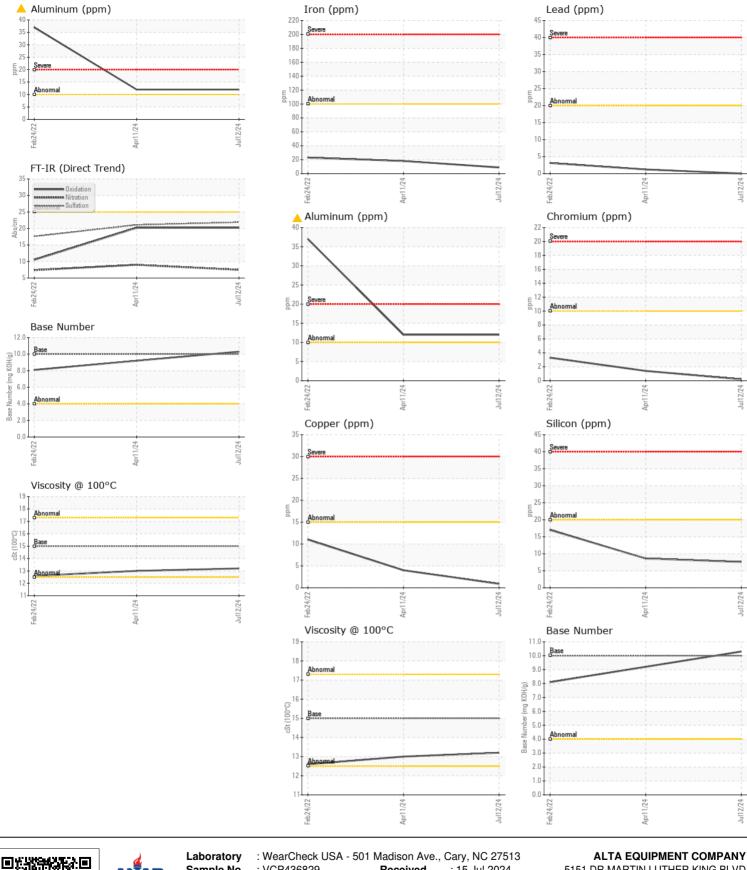
## **FLUID CONDITION**

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

13.0

12.6

13.2



Sample No. : VCP436829 Received 5151 DR MARTIN LUTHER KING BLVD : 15 Jul 2024 Lab Number : 06235443 Tested FORT MYERS, FL : 15 Jul 2024 Unique Number : 11124277 Diagnosed : 15 Jul 2024 - Sean Felton US 33905 Test Package : MOB 1 (Additional Tests: TBN) Contact: TODD LARK Certificate L2367 To discuss this sample report, contact Customer Service at 1-800-237-1369. tlark@altaequipfl.com \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation. T: Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012) F: (239)481-3302

Contact/Location: TODD LARK - VOLVO0090 Page 2 of 2