

#### Machine Id **1562** Component **Diesel Engine** Fluid **DIESEL ENGINE OIL SAE 15W40 (--- QTS)**

# RECOMMENDATION

We advise that you check the fuel injection system. We recommend that you drain the oil and perform a filter service on this component if not already done. We recommend an early resample to monitor this condition.

### **WEAR**

All component wear rates are normal.

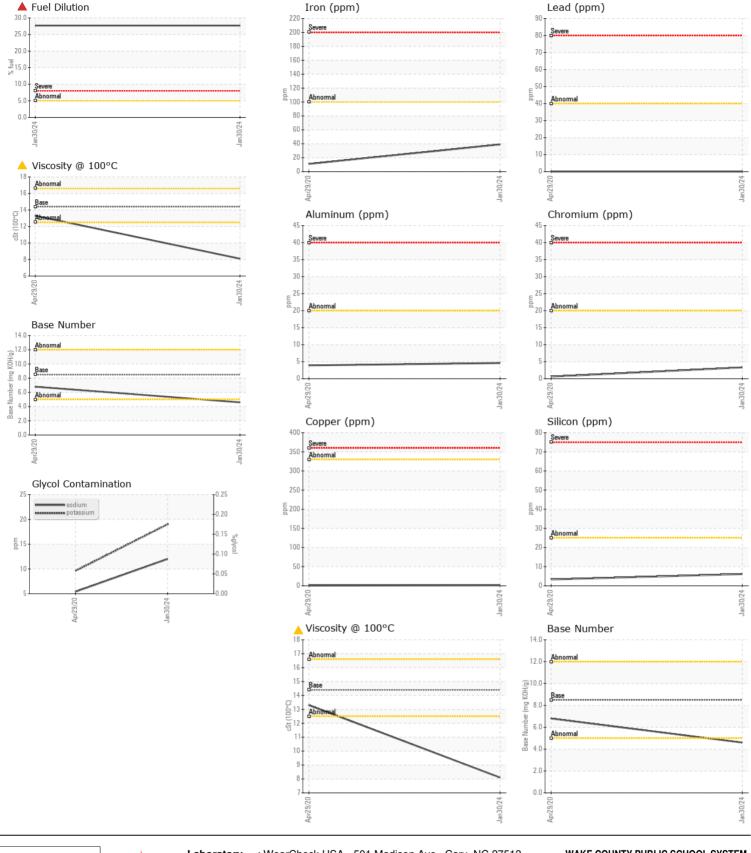
# CONTAMINATION

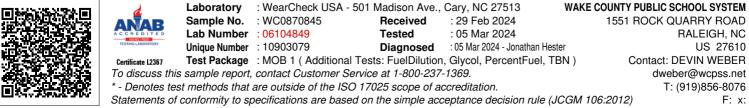
There is a high amount of fuel present in the oil.

### **FLUID CONDITION**

Fuel is present in the oil and is lowering the viscosity. The BN result indicates that there is suitable alkalinity remaining in the oil. The oil is no longer serviceable due to the presence of contaminants.

TestUOMMethodLimit/AmCurrentHistory1History2Sample NumberClient Info30 Jan 202429 Apr 2020Sample DateClient Info0 Jan 202429 Apr 2020Machine AgemitsClient Info00Oil AgemitsClient Info00Filter AgemitsClient InfoNot ChangdNot ChangdOil ChangedClient InfoNot ChangdNot ChangdSample StatusSEVERENORMALIronppmASTM D5185m>203<11NickelppmASTM D5185m>4<10SilverppmASTM D5185m>300AluminumppmASTM D5185m>3300AluminumppmASTM D5185m>3302<1VanadumppmASTM D5185m>332<1VanadumppmASTM D5185m>2010VanadumppmASTM D5185m>201910VanadumppmASTM D5185m>201910VanadumppmASTM D5185m>201910VanadumppmASTM D5185m>201910SiltorppmASTM D5185m>201910Siltor					$\frown$		
Sample DateClient Info30 Jan 202429 Apr 2020Machine AgemisClient Info00Oil AgemisClient Info00Filter AgemisClient InfoNot ChangdNot ChangdOil ChangedClient InfoNot ChangdNot ChangdFilter AgemisClient InfoNot ChangdNot ChangdGhomiumppmASTM D5165m>-1003911IronppmASTM D5165m>-203<1NickelppmASTM D5165m>-203<1NickelppmASTM D5165m>-2054SilverppmASTM D5165m>-3300SilverppmASTM D5165m>-302<1CopperppmASTM D5165m>-15<10VanadumppmASTM D5165m>-15<10Watescalar"VisualNONENONENONENONESiliconppmASTM D5165m>-201910VaterwC Method>-2NEGNORESiliconppmASTM D5165m>2012.811.5SuitationAbs/rm'NASTM D5165m>2012.811.5SuitationAbs/rm'NASTM D5165m<	Test	UOM	Method	Limit/Abn	Current	History1	History2
Machine Age  mis  Client Info  184177  160532     Oil Age  mis  Client Info  0  0     Filter Age  mis  Client Info  Not Change  Not Change     Oil Changed  Client Info  Not Change  Not Change     Sample Status  SEVERE  NORMAL     Iron  ppm  ASTM D5185m  >20  3  <1     Nickel  ppm  ASTM D5185m  >20  3  <1     Nickel  ppm  ASTM D5185m  >20  3  <1     Aluminum  ppm  ASTM D5185m  >20  5  4     In  ppm  ASTM D5185m  >20  0      Vanadium  ppm  ASTM D5185m  >21  0     Vanadium  ppm  ASTM D5185m  >25  6  3     Vanadium  ppm  AS	Sample Number		Client Info		WC0870845	WC0447028	
Oil Age  mls  Client Info  0  0     Filter Age  mls  Client Info  Not Changed  Not Changed     Gil Changed  Client Info  Not Changed  Not Changed     Filter Changed  Client Info  Not Changed  Not Changed     Sample Status  SEVERE  NORMAL      Chromium  ppm  ASTM D5185m  >20  3  <1     Nickel  ppm  ASTM D5185m  >20  3  <1     Silver  ppm  ASTM D5185m  >3  0  <1     Lead  ppm  ASTM D5185m  >330  2  <1     Vanadum  ppm  ASTM D5185m  >330  2  <1     Vanadum  ppm  ASTM D5185m  >25  6  3     Veltow Metal  scalar  'Visual  NONE  NONE  NONE	Sample Date		Client Info		30 Jan 2024	29 Apr 2020	
Filter Age  mis  Client Info  Not Changd     Oil Changed  Client Info  Not Changd   Not Changd     Sample Status  SEVER  Not Changd   Not Changd     Iron  ppm  ASTM D5185n  >100  39  11     Chromium  ppm  ASTM D5185n  >20  3  <1     Nickel  ppm  ASTM D5185n  >20  3  <1     Silver  ppm  ASTM D5185n  >20  5  4     Aluminum  ppm  ASTM D5185n  >30  0     Vanadium  ppm  ASTM D5185n  >40  0     Vanadium  ppm  ASTM D5185n  >10  0     Vanadium  ppm  ASTM D5185n  >25  6  3     Vanadium  ppm  ASTM D5185n  >25  6  3	Machine Age	mls	Client Info		184177	160532	
Oil Changed  Client Info  Not Changed  Not Changed     Filter Changed  Client Info  Not Changed   Not Changed     Sample Status  SEVERE  Not Changed   Not Changed     Iron  ppm  ASTM D5185m  >20  3  <1     Nickel  ppm  ASTM D5185m  >20  3  <1     Silver  ppm  ASTM D5185m  >20  5  4     Aluminum  ppm  ASTM D5185m  >20  5  4     Vanadium  ppm  ASTM D5185m  >20  5  4     Vanadum  ppm  ASTM D5185m  >15  <1  0     Vanadum  ppm  ASTM D5185m  >20  19  10     Vanadum  ppm  ASTM D5185m  >20  19  10     Vanadum  ppm  ASTM D5185m  >20  19	Oil Age	mls	Client Info		0	0	
Filter Changed Sample Status  Client Into  Not Change SEVERE  Not Change Not Change  Not Change	Filter Age	mls	Client Info		0	0	
Sample Status  SEVERE  NORMAL     Iron  ppm  ASTM D5185m<>100  39  11     Chromium  ppm  ASTM D5185m<>20  3  <1     Nickel  ppm  ASTM D5185m<>4  <1  0     Silver  ppm  ASTM D5185m<>3  0  0     Silver  ppm  ASTM D5185m<>20  5  4     Lead  ppm  ASTM D5185m<>20  5  4     Copper  ppm  ASTM D5185m<>30  2  <1     Vanadium  ppm  ASTM D5185m<>15  <1  0     Vanadium  ppm  ASTM D5185m<>20  19  10     Yellow Metal  scalar  *Visual  NONE  NONE  NONE     Silicon  ppm  ASTM D5185m<>25  6  3      Suilicon  ppm  ASTM D5185m<>220  NEG  NEG	Oil Changed		Client Info		Not Changd	Not Changd	
Iron  ppm  ASTM D5185m  >100  39  111     Chromium  ppm  ASTM D5185m  >20  3  <1     Nickel  ppm  ASTM D5185m  >4  <1  0     Titanium  ppm  ASTM D5185m  >3  0  0     Silver  ppm  ASTM D5185m  >30  0  0     Copper  ppm  ASTM D5185m  >20  5  4     Vanadium  ppm  ASTM D5185m  >20  0  0     Vanadium  ppm  ASTM D5185m  >10  0     Vanadium  ppm  ASTM D5185m  >25  6  3     Vanadium  ppm  ASTM D5185m  >20  19  10     Vellow Metal  scalar  *Visual  NONE  NONE  NONE     Silicon  ppm  ASTM D745  >30  22.3	Filter Changed		Client Info		Not Changd	Not Changd	
Chromium  ppm  ASTM D5185m  >20  3  <1	Sample Status				SEVERE	NORMAL	
Chromium  ppm  ASTM D5185m  >20  3  <1							
Nickel  ppm  ASTM D5185m  >4  <1							
Titanium  ppm  ASTM D5185m  O  <1		ppm			-		
Silver  ppm  ASTM D5185m  >3  0  0     Aluminum  ppm  ASTM D5185m  >20  5  4     Lead  ppm  ASTM D5185m  >20  5  4     Copper  ppm  ASTM D5185m  >330  2  <1		ppm		>4		÷	
Aluminum  ppm  ASTM D5185m  >20  5  4     Lead  ppm  ASTM D5185m  >40  0  0     Copper  ppm  ASTM D5185m  >330  2  <1     Tin  ppm  ASTM D5185m  >15  <1  0     Vanadium  ppm  ASTM D5185m  >15  <1  0     Vanadium  ppm  ASTM D5185m  >15  <1  0     Vanadium  ppm  ASTM D5185m  >25  6  3     Yellow Metal  scalar  *Visual  NONE  NONE  NONE     Silicon  ppm  ASTM D5185m  >20  19  10     Fuel  %  ASTM D5185m  >20  NEG  NEG     Water  WC Method  >0.2  NEG  NEG     Silt  scalar  *Visual  NONE  NONE		ppm	ASTM D5185m		0	<1	
Lead  ppm  ASTM D5185m  >40  0  0     Copper  ppm  ASTM D5185m  >330  2  <1     Tin  ppm  ASTM D5185m  >15  <1  0     Vanadium  ppm  ASTM D5185m  0  0     White Metal  scalar  *Visual  NONE  NONE  NONE     Yellow Metal  scalar  *Visual  NONE  NONE      Silicon  ppm  ASTM D5185m  >20  19  10     Fuel  %  ASTM D5185m  >20  19  10     Water  WC Method  >0.2  NEG  NEG     Glycol  %  *ASTM D7624  >20  12.8  11.5     Soit %  %  *ASTM D7624  >20  12.8  11.4     Sulfation  Abs/(rm  *ASTM D7624  >20  12.8					-		
Copper  ppm  ASTM D5185m  >330  2  <1		ppm			-		
Tin  ppm  ASTM D5185m  >15  <1					-		
Vanadium  ppm  ASTM D5185m  0  0     White Metal  scalar  *Visual  NONE  NONE  NONE     Yellow Metal  scalar  *Visual  NONE  NONE  NONE     Silicon  ppm  ASTM D5185m  >25  6  3     Potassium  ppm  ASTM D5185m  >20  19  10     Fuel  %  ASTM D5185m  >20  19  10     Water  WC Method  >0.2  NEG  NEG   Glycol  %  *ASTM D7824  >3  0.6  0.4     Soot %  %  *ASTM D7624  >20  12.8  11.5     Sulfation  Abs/tmm  *ASTM D715  >30  22.3  21.4     Sulfation  Abs/tmm  *ASTM D715  >30  22.3  21.4     Debris  scalar  *Visual  NONE  NONE					_		
White Metal  scalar  *Visual  NONE  NONE  NONE  NONE     Yellow Metal  scalar  *Visual  NONE  NONE  NONE     Silicon  ppm  ASTM D5185m  >20  19  10     Potassium  ppm  ASTM D5185m  >20  19  10     Fuel  %  ASTM D5185m  >20  NEG  NEG     Glycol  %  *ASTM D2982  NEG  NEG      Soot %  %  *ASTM D7624  >30  0.6  0.4     Sulfation  Abs/.tmm  *ASTM D7612  >30  22.3  21.4     Sulfation  Abs/.tmm  *ASTM D715  >30  22.3  21.4     Sadr/Dirt  scalar  *Visual  NONE  NONE  NONE     Debris  scalar  *Visual  NORE  NORML  NORML     Appear				>15			
Yellow Metal  scalar  *Visual  NONE  NONE     Silicon  ppm  ASTM D5185m<>25  6  3     Potassium  ppm  ASTM D5185m<>20  19  10     Fuel  %  ASTM D5185m<>20  19  10     Water  WC Method  >0.2  NEG  NEG     Glycol  %  *ASTM D7844  >3  0.6  0.4     Soot %  %  *ASTM D7844  >3  0.6  0.4     Sulfation  Abs/cm  *ASTM D7844  >3  0.6  0.4     Sulfation  Abs/cm  *ASTM D7624  >20  12.8  11.5     Sulfation  Abs/cm  *ASTM D7814  >30  22.3  21.4     Debris  scalar  *Visual  NONE  NONE      Appearance  scalar  *Visual  NORML  NORML  NORML					-	-	
Silicon  ppm  ASTM D5185m  >25  6  3     Potassium  ppm  ASTM D5185m  >20  19  10     Fuel  %  ASTM D5185m  >20  19  10     Water  WC Method  >0.2  NEG  NEG     Glycol  %  *ASTM D2982  NEG  NEG     Soot %  %  *ASTM D7624  >20  12.8  11.5     Sulfation  Abs/.mm< *ASTM D7612  >30  22.3  21.4     Sulfation  Abs/.1mm<*ASTM D7615  >30  22.3  21.4     Debris  scalar  *Visual  NONE  NONE  NONE     Appearance  scalar  *Visual  NORM  NORML  NORML     Appearance  scalar  *Visual  NORML  NORML  NORML     Modybdenum  ppm  ASTM D5185m  10  0					-		
Potassium  ppm  ASTM D5185m  >20  19  10     Fuel  %  ASTM D3524  >5  ▲ 27.7  <1.0     Water  WC Method  >0.2  NEG  NEG     Glycol  %  *ASTM D2982  NEG  NEG     Soot %  %  *ASTM D7644  >3  0.6  0.4     Soot %  %  *ASTM D7624  >20  12.8  11.5     Sulfation  Abs/.tm  *ASTM D7624  >20  12.8  11.5     Sulfation  Abs/.tm  *ASTM D7624  >20  12.8  11.5     Sulfation  Abs/.tm  *ASTM D715  >30  22.3  21.4     Silt  scalar  *Visual  NONE  NONE  NONE     Sand/Dirt  scalar  *Visual  NORM  NORML  NORML     Appearance  scalar  *Visual  NO	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	
Potassium  ppm  ASTM D5185m  >20  19  10     Fuel  %  ASTM D3524  >5  ▲ 27.7  <1.0     Water  WC Method  >0.2  NEG  NEG     Glycol  %  *ASTM D2982  NEG  NEG     Soot %  %  *ASTM D7644  >3  0.6  0.4     Soot %  %  *ASTM D7624  >20  12.8  11.5     Sulfation  Abs/.tm  *ASTM D7624  >20  12.8  11.5     Sulfation  Abs/.tm  *ASTM D7624  >20  12.8  11.5     Sulfation  Abs/.tm  *ASTM D715  >30  22.3  21.4     Silt  scalar  *Visual  NONE  NONE  NONE     Sand/Dirt  scalar  *Visual  NORM  NORML  NORML     Appearance  scalar  *Visual  NO	Silicon	nom	ASTM DE195m	×25	6	3	
Fuel  %  ASTM D3524  >5  ▲ 27.7  <1.0					-		
Water  WC Method  >0.2  NEG  NEG     Glycol  %  *ASTM D2982  NEG  NEG     Soot %  %  *ASTM D7844  >3  0.6  0.4     Nitration  Abs/cm  *ASTM D7624  >20  12.8  11.5     Sulfation  Abs/cm  *ASTM D7612  >20  12.8  11.5     Sulfation  Abs/cm  *ASTM D7612  >20  12.8  11.5     Sulfation  Abs/cm  *ASTM D7612  >20  12.8  11.5     Sulfation  Abs/cm  *ASTM D7115  >30  22.3  21.4     Sulfation  scalar  *Visual  NONE  NONE   NONE     Sand/Dirt  scalar  *Visual  NORM  NORML  NORML     Appearance  scalar  *Visual  NORM  NORML  NORML     Odor  scalar							
Glycol  %  *ASTM D2982  NEG  NEG     Soot %  %  *ASTM D7844  >3  0.6  0.4     Nitration  Abs/cm  *ASTM D7624  >20  12.8  11.5     Sulfation  Abs/cm  *ASTM D7624  >20  12.8  11.5     Sulfation  Abs/cm  *ASTM D7624  >20  12.8  11.5     Sulfation  Abs/cm  *ASTM D7415  >30  22.3  21.4     Sulfation  Abs/cm  *Visual  NONE  NONE  NONE     Debris  scalar  *Visual  NONE  NONE  NONE     Appearance  scalar  *Visual  NORML  NORML  NORML     Odor  scalar  *Visual  NORML  NORML  NORML     Emulsified Water  scalar  *Visual  >0.2  NEG  NEG     Sodium  ppm <th></th> <th>70</th> <th></th> <th></th> <th></th> <th></th> <th></th>		70					
Soot %  %  *ASTM D7844  >3  0.6  0.4     Nitration  Abs/cm  *ASTM D7624  >20  12.8  11.5     Sulfation  Abs/cm  *ASTM D7624  >20  22.3  21.4     Silt  scalar  *Visual  NONE  NONE  NONE     Debris  scalar  *Visual  NONE  NONE  NONE     Sand/Dirt  scalar  *Visual  NOR  NORE  NORE     Appearance  scalar  *Visual  NORML  NORML  NORML     Godor  scalar  *Visual  NORML  NORML  NORML     Godor  scalar  *Visual  >0.2  NEG      Sodium  ppm  ASTM D5185m  250  28  39     Boron  ppm  ASTM D5185m  10  0      Molybdenum  ppm		%		20.2			
Nitration  Abs/cm  *ASTM D7624  >20  12.8  11.5     Sulfation  Abs/lmm  *ASTM D7615  >30  22.3  21.4     Silt  scalar  *Visual  NONE  NONE  NONE     Debris  scalar  *Visual  NONE  NONE  NONE     Sand/Dirt  scalar  *Visual  NONE  NONE  NONE     Appearance  scalar  *Visual  NORML  NORML  NORML     Odor  scalar  *Visual  NORML  NORML  NORML     Emulsified Water  scalar  *Visual  >0.2  NEG  NEG     Sodium  ppm  ASTM D5185m  250  28  39     Boron  ppm  ASTM D5185m  10  0  0     Molybdenum  ppm  ASTM D5185m  100  58  811     Maganese <t< th=""><th>,</th><th></th><th></th><th>~3</th><th></th><th></th><th></th></t<>	,			~3			
SulfationAbs/.tmm*ASTM D7415>3022.321.4Siltscalar*VisualNONENONENONEDebrisscalar*VisualNONENONENONESand/Dirtscalar*VisualNONENONENONEAppearancescalar*VisualNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGSodiumppmASTM D5185m2502839BoronppmASTM D5185m1000MolybdenumppmASTM D5185m10058811MagnesiumppmASTM D5185m30014182161PhosphorusppmASTM D5185m1150742953ZincppmASTM D5185m13508501067SulfurppmASTM D5185m13508501067SulfurppmASTM D5185m425026642888OxidationAbs/.tmm*ASTM D28968.54.66.8		/ -					
Siltscalar*VisualNONENONENONEDebrisscalar*VisualNONENONENONESand/Dirtscalar*VisualNONENONENONEAppearancescalar*VisualNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGSodiumppmASTM D5185m>158125BoronppmASTM D5185m2502839BariumppmASTM D5185m1000MalganeseppmASTM D5185m10058811MagnesiumppmASTM D5185m30014182161PhosphorusppmASTM D5185m1150742953ZincppmASTM D5185m13508501067SulfurppmASTM D5185m135026642888OxidationAbs/.1mm*ASTM D5185m425026642888Base Number (BN)mg KOH/gASTM D28968.54.66.8					-		
Debrisscalar*VisualNONENONENONESand/Dirtscalar*VisualNONENONENONEAppearancescalar*VisualNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGSodiumppmASTM D5185m>158125BoronppmASTM D5185m2502839BariumppmASTM D5185m1000MolybdenumppmASTM D5185m1005881MagnesiumppmASTM D5185m300014182161PhosphorusppmASTM D5185m1150742953ZincppmASTM D5185m13508501067SulfurppmASTM D5185m425026642888OxidationAbs/.1mm*ASTM D7141>2524.518.1Base Number (BN)mg KOH/gASTM D28968.54.66.8							
Sand/Dirtscalar*VisualNONENONENONENONEAppearancescalar*VisualNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGSodiumppmASTM D5185m>158125BoronppmASTM D5185m2502839BariumppmASTM D5185m1000MolybdenumppmASTM D5185m1005881MagnesiumppmASTM D5185m30014182161PhosphorusppmASTM D5185m13508501067ZincppmASTM D5185m13508501067SulfurppmASTM D5185m425026642888OxidationAbs/.1mm*ASTM D7141>2524.518.1Base Number (BN)mg KOH/gASTM D28968.54.66.8					-		
Appearance  scalar  *Visual  NORML  NORML  NORML  NORML     Odor  scalar  *Visual  NORML  NORML  NORML  NORML     Emulsified Water  scalar  *Visual  >0.2  NEG  NEG     Sodium  ppm  ASTM D5185m  >158  12  5     Boron  ppm  ASTM D5185m  250  28  39     Barium  ppm  ASTM D5185m  10  0  0     Molybdenum  ppm  ASTM D5185m  100  58  81     Magnesium  ppm  ASTM D5185m  100  58  81     Magnesium  ppm  ASTM D5185m  3000  1418  2161     Phosphorus  ppm  ASTM D5185m  1350  850  1067     Sulfur  ppm  ASTM D5185m  4250  2664  2888					_		
Odor  scalar  *Visual  NORML  NORML  NORML  NORML  NORML  NORML  NORML     Emulsified Water  scalar  *Visual  >0.2  NEG  NEG     Sodium  ppm  ASTM D5185m  >158  12  5     Boron  ppm  ASTM D5185m  250  28  39     Barium  ppm  ASTM D5185m  10  0  0     Molybdenum  ppm  ASTM D5185m  100  58  81     Manganese  ppm  ASTM D5185m  100  58  81     Magnesium  ppm  ASTM D5185m  3000  1418  2161     Phosphorus  ppm  ASTM D5185m  1350  850  1067     Sulfur  ppm  ASTM D5185m  4250  2664  2888     Oxidation  Abs/.1mm  *ASTM D7414  >25  24.5  18.1<							
Emulsified Water  scalar  *Visual  >0.2  NEG  NEG     Sodium  ppm  ASTM D5185m  >158  12  5     Boron  ppm  ASTM D5185m  250  28  39     Barium  ppm  ASTM D5185m  10  0  0     Molybdenum  ppm  ASTM D5185m  100  58  81     Manganese  ppm  ASTM D5185m  100  58  81     Magnesium  ppm  ASTM D5185m  450  33  30     Calcium  ppm  ASTM D5185m  3000  1418  2161     Phosphorus  ppm  ASTM D5185m  1150  742  953     Sulfur  ppm  ASTM D5185m  4250  2664  2888     Oxidation  Abs/.1mm<*ASTM D7414  >25  24.5  18.1     Base Number (BN)  mg KOH/g					-		
Boron  ppm  ASTM D5185m  250  28  39     Barium  ppm  ASTM D5185m  10  0  0     Molybdenum  ppm  ASTM D5185m  10  0  0     Manganese  ppm  ASTM D5185m  100  58  81     Magnesium  ppm  ASTM D5185m  0  <1     Magnesium  ppm  ASTM D5185m  450  33  30     Calcium  ppm  ASTM D5185m  3000  1418  2161     Phosphorus  ppm  ASTM D5185m  1150  742  953     Zinc  ppm  ASTM D5185m  1350  850  1067     Sulfur  ppm  ASTM D5185m  4250  2664  2888     Oxidation  Abs/.1mm<*ASTM D7414<>25  24.5  18.1     Base Number (BN)  mg KOH/g  ASTM D2896  8.5	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	
Boron  ppm  ASTM D5185m  250  28  39     Barium  ppm  ASTM D5185m  10  0  0     Molybdenum  ppm  ASTM D5185m  10  0  0     Manganese  ppm  ASTM D5185m  100  58  81     Magnesium  ppm  ASTM D5185m  0  <1     Magnesium  ppm  ASTM D5185m  450  33  30     Calcium  ppm  ASTM D5185m  3000  1418  2161     Phosphorus  ppm  ASTM D5185m  1150  742  953     Zinc  ppm  ASTM D5185m  1350  850  1067     Sulfur  ppm  ASTM D5185m  4250  2664  2888     Oxidation  Abs/.1mm<*ASTM D7414<>25  24.5  18.1     Base Number (BN)  mg KOH/g  ASTM D2896  8.5							
Barium  ppm  ASTM D5185m  10  0  0     Molybdenum  ppm  ASTM D5185m  100  58  81     Manganese  ppm  ASTM D5185m  100  58  81     Magnesium  ppm  ASTM D5185m  450  33  30     Calcium  ppm  ASTM D5185m  3000  1418  2161     Phosphorus  ppm  ASTM D5185m  1150  742  953     Zinc  ppm  ASTM D5185m  1350  850  1067     Sulfur  ppm  ASTM D5185m  4250  2664  2888     Oxidation  Abs/.1mm  *ASTM D7414  >25  24.5  18.1     Base Number (BN)  mg KOH/g  ASTM D2896  8.5  4.6  6.8	Sodium	ppm	ASTM D5185m	>158	12	5	
Molybdenum  ppm  ASTM D5185m  100  58  81     Manganese  ppm  ASTM D5185m  0  <1     Magnesium  ppm  ASTM D5185m  450  33  30     Calcium  ppm  ASTM D5185m  3000  1418  2161     Phosphorus  ppm  ASTM D5185m  1150  742  953     Zinc  ppm  ASTM D5185m  1350  850  1067     Sulfur  ppm  ASTM D5185m  4250  2664  2888     Oxidation  Abs/.1mm  *ASTM D7414  >25  24.5  18.1     Base Number (BN)  mg KOH/g  ASTM D2896  8.5  4.6  6.8	Boron	ppm	ASTM D5185m	250	28	39	
Manganese  ppm  ASTM D5185m  0  <1	Barium	ppm	ASTM D5185m	10	0	0	
Magnesium  ppm  ASTM D5185m  450  33  30     Calcium  ppm  ASTM D5185m  3000  1418  2161     Phosphorus  ppm  ASTM D5185m  1150  742  953     Zinc  ppm  ASTM D5185m  1350  850  1067     Sulfur  ppm  ASTM D5185m  4250  2664  2888     Oxidation  Abs/.1mm  *ASTM D7414  >25  24.5  18.1     Base Number (BN)  mg KOH/g  ASTM D2896  8.5  4.6  6.8	Molybdenum	ppm	ASTM D5185m	100	58	81	
Calcium  ppm  ASTM D5185m  3000  1418  2161     Phosphorus  ppm  ASTM D5185m  1150  742  953     Zinc  ppm  ASTM D5185m  1350  850  1067     Sulfur  ppm  ASTM D5185m  4250  2664  2888     Oxidation  Abs/.1mm  *ASTM D7414  >25  24.5  18.1     Base Number (BN)  mg KOH/g  ASTM D2896  8.5  4.6  6.8	-	ppm			0	<1	
Phosphorus  ppm  ASTM D5185m  1150  742  953     Zinc  ppm  ASTM D5185m  1350  850  1067     Sulfur  ppm  ASTM D5185m  4250  2664  2888     Oxidation  Abs/.1mm  *ASTM D7414  >25  24.5  18.1     Base Number (BN)  mg KOH/g  ASTM D2896  8.5  4.6  6.8	Magnesium	ppm	ASTM D5185m	450	33	30	
Zinc  ppm  ASTM D5185m  1350  850  1067     Sulfur  ppm  ASTM D5185m  4250  2664  2888     Oxidation  Abs/.1mm  *ASTM D7414  >25  24.5  18.1     Base Number (BN)  mg KOH/g  ASTM D2896  8.5  4.6  6.8		ppm					
Sulfur  ppm  ASTM D5185m  4250  2664  2888     Oxidation  Abs/.1mm  *ASTM D7414  >25  24.5  18.1     Base Number (BN)  mg KOH/g  ASTM D2896  8.5  4.6  6.8	Phosphorus	ppm	ASTM D5185m	1150	742	953	
Oxidation  Abs/.1mm  *ASTM D7414  >25  24.5  18.1     Base Number (BN)  mg KOH/g  ASTM D2896  8.5  4.6  6.8		ppm	ASTM D5185m	1350	850	1067	
Base Number (BN)  mg KOH/g  ASTM D2896  8.5  4.6  6.8	Sulfur		ASTM D5185m	4250	2664	2888	
	Oxidation	Abs/.1mm	*ASTM D7414	>25		18.1	
Visc@100°C cSt ASTM D445 14.4 🔶 8.1 / 13.3	Base Number (BN)	mg KOH/g	ASTM D2896	8.5	4.6	6.8	
	Visc @ 100°C	cSt	ASTM D445	14.4	<mark>▲ 8.1</mark>	13.3	





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