

## Machine Id **527073 FREIGHTLINER COLUMBIA 120** Component **Diesel Engine** Fluid **PETRO CANADA DURON SHP 15W40 (--- GAL)**

## RECOMMENDATION

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.

W	ΈΔ	R

All component wear rates are normal.

$\sim$	MINA	NI

Elemental level of silicon (Si) above normal indicating ingress of seal material. Light fuel dilution occurring.

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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.

Test   UOM   Method   Limit/An   Current   History1   History2     Sample Number   Client Info   I4 Nov 2023       Sample Date   Client Info   I4 Nov 2023       Oil Age   hrs   Client Info   600       Oil Age   hrs   Client Info   600       Filter Age   hrs   Client Info   Changed       Sample Status   Client Info   Changed        Sample Status   ASTM D5185m   >50   3       Iron   ppm   ASTM D5185m   >50   3       Silver   ppm   ASTM D5185m   >30   4       Aluminum   ppm   ASTM D5185m   >30   4       Silver   ppm   ASTM D5185m   >30   4						 
Sample Date   Client Info   14 Nov 2023      Machine Age   hrs   Client Info   600      Oil Age   hrs   Client Info   600      Oil Age   hrs   Client Info   600      Oil Changed   Client Info   Changed       Filter Age   hr   Client Info   Changed      Sample Status   Client Info   Changed       Iron   ppm   ASTM D5185m   Sa   3       Nickel   ppm   ASTM D5185m   >5   3       Silver   ppm   ASTM D5185m   >30   3       Silver   ppm   ASTM D5185m   >30   3		UOM		Limit/Abn		
Machine Age   hrs   Client Info   0       Oil Age   hrs   Client Info   600       Filter Age   hrs   Client Info   Changed       Filter Changed   Client Info   Changed        Sample Status   Client Info   Changed        Iron   ppm   ASTM D5185m   >80   29       Chromium   ppm   ASTM D5185m   >20       Silver   ppm   ASTM D5185m   >30   3       Aluminum   ppm   ASTM D5185m   >30   3       Vanadium   ppm   ASTM D5185m   >10       Vanadium   ppm   ASTM D5185m   >20       Vanadium   ppm   ASTM D5185m   >20       Vellow Metal <t< th=""><th></th><th></th><th></th><th></th><th></th><th></th></t<>						
Oil Age   hrs   Client Info   600       Filter Age   hrs   Client Info   Changed       Oil Changed   Client Info   Changed        Sample Status   Client Info   Changed        Iron   ppm   ASTM D5185m   >80   29       Chromium   ppm   ASTM D5185m   >2   0       Nickel   ppm   ASTM D5185m   >3   0       Aluminum   ppm   ASTM D5185m   >3   0       Lead   ppm   ASTM D5185m   >30   4       Vanadium   ppm   ASTM D5185m   >10       Vanadium   ppm   ASTM D5185m   >20   6       Vanadium   ppm   ASTM D5185m   >20   6		la va				
Filter Age   hrs   Client Info   600       Gil Changed   Client Info   Changed       Sample Status   Client Info   Changed       Sample Status   ABNORMAL       Iron   ppm   ASTM D5185m  S   3      Iron   ppm   ASTM D5185m  S   3      Nickel   ppm   ASTM D5185m  S   3       Titanium   ppm   ASTM D5185m    0       Aluminum   ppm   ASTM D5185m    0       Aluminum   ppm   ASTM D5185m    0       Vanadium   ppm   ASTM D5185m	•	-			-	
Oil Changed   Client Info   Changed      Filter Changed   Client Info   Changed      Sample Status   ABNORMAL       Iron   ppm   ASTM D5185m   >80   29       Nickel   ppm   ASTM D5185m   >5   3       Silver   ppm   ASTM D5185m   >3   0       Silver   ppm   ASTM D5185m   >30   3       Aluminum   ppm   ASTM D5185m   >30   4       Vanadium   ppm   ASTM D5185m   >30   4       Vanadium   ppm   ASTM D5185m   >0        Vanadium   ppm   ASTM D5185m   >20   6       Vanadium   ppm   ASTM D5185m   >20   6       Vanadium   ppm	•					
Filter Changed Sample Status   Client Info   Changed ABNORMAL      Iron   ppm   ASTM D5185m   >80   29      Iron   ppm   ASTM D5185m   >20       Nickel   ppm   ASTM D5185m   >2   0       Silver   ppm   ASTM D5185m   >3   0       Aluminum   ppm   ASTM D5185m   >3   0       Lead   ppm   ASTM D5185m   >30   4       Vanadium   ppm   ASTM D5185m   >50   0       Veltow Metal   scalar   "Visual   NONE   NONE       Veltow Metal   scalar   "Visual   NONE   NONE       Silicon   ppm   ASTM D5185m   >20   AST       Yellow Metal   scalar   "Visual   NONE <th>0</th> <th>hrs</th> <th></th> <th></th> <th></th> <th></th>	0	hrs				
Sample Status   ABNORMAL      Iron   ppm   ASTM DS185m<>80   29      Chromium   ppm   ASTM DS185m<>2   0      Nickel   ppm   ASTM DS185m<>2   0      Silver   ppm   ASTM DS185m<>30   1      Silver   ppm   ASTM DS185m<>30   4      Lead   ppm   ASTM DS185m<>30   4      Copper   ppm   ASTM DS185m<>50   6      Vanadium   ppm   ASTM DS185m<>50   0      Vanadium   ppm   ASTM DS185m<>50   0      Yellow Metal   scalar   *Visual   NONE      Suifacion   ppm   ASTM D5185m<>20   6	-				Ű	
Iron   ppm   ASTM D5185m< >80   29       Chromium   ppm   ASTM D5185m   >2   0       Nickel   ppm   ASTM D5185m   >2   0       Titanium   ppm   ASTM D5185m   >3   0       Aluminum   ppm   ASTM D5185m   >30   3       Lead   ppm   ASTM D5185m   >30   4       Vanadium   ppm   ASTM D5185m   >5   0       Vanadium   ppm   ASTM D5185m   >5   0       Vanadium   ppm   ASTM D5185m   >20   6       Vanadium   ppm   ASTM D5185m   >20   6       Vellow Metal   scalar   'Visual   NONE   NONE       Silicon   ppm   ASTM D5185m	Ū		Client Info		0	
Chromium   ppm   ASTM D5185m   >5   3       Nickel   ppm   ASTM D5185m   >2   0       Titanium   ppm   ASTM D5185m   >30   1       Silver   ppm   ASTM D5185m   >30   3       Alumnum   ppm   ASTM D5185m   >30   4       Copper   ppm   ASTM D5185m   >30   4       Vanadium   ppm   ASTM D5185m   >50   0       Vanadium   ppm   ASTM D5185m   >50   0       Vanadium   ppm   ASTM D5185m   >20   6       Veltow Metal   scalar   *Visual   NONE        Silicon   ppm   ASTM D5185m   >20   6       Fuel   %   ASTM D5185m   >20<	Sample Status				ABNORMAL	 
Nickel   ppm   ASTM D5185m       Titanium   ppm   ASTM D5185m       Silver   ppm   ASTM D5185m       Aluminum   ppm   ASTM D5185m       Lead   ppm   ASTM D5185m       Copper   ppm   ASTM D5185m       Vanadium   ppm   ASTM D5185m       Vanadium   ppm   ASTM D5185m       Vanadium   ppm   ASTM D5185m	Iron	ppm	ASTM D5185m	>80	29	 
Titanium   ppm   ASTM D5185m   I       Silver   ppm   ASTM D5185m   >30   3       Aluminum   ppm   ASTM D5185m   >30   3       Lead   ppm   ASTM D5185m   >30   4       Copper   ppm   ASTM D5185m   >50   0       Vanadium   ppm   ASTM D5185m   >50   0       Vanadium   ppm   ASTM D5185m   >50   0       Vanadium   ppm   ASTM D5185m   >20   6       Valace   scalar   *Visual   NONE        Glycol   WC Method   50.2   NEG       Glycol   WC Method   NO.2   NEG       Sot %   %   *ASTM D7184   >3   0.3	Chromium	ppm	ASTM D5185m	>5	3	 
Silver   pr   ASTM D5185m   >30   3       Aluminum   ppm   ASTM D5185m   >30   3       Lead   ppm   ASTM D5185m   >30   4       Copper   ppm   ASTM D5185m   >50   0       Vanadium   ppm   ASTM D5185m   >50   0       White Metal   scalar   *Visual   NONE   NONE       Vanadium   ppm   ASTM D5185m   >20   6       White Metal   scalar   *Visual   NONE   NONE       Solicon   ppm   ASTM D5185m<>20   6        Fuel   %   ASTM D5185m<>20   AC   9.9       Solicon   ppm   ASTM D7184   >3   0.3       Solo %   %   '	Nickel	ppm	ASTM D5185m	>2	0	 
Aluminum   ppm   ASTM D5185m   >30   3       Lead   ppm   ASTM D5185m   >30   4       Copper   ppm   ASTM D5185m   >150   6       Vanadium   ppm   ASTM D5185m   >5   0       Vanadium   ppm   ASTM D5185m   >5   0       Vanadium   ppm   ASTM D5185m   >20   6       Yellow Metal   scalar   *Visual   NONE   NONE       Solicon   ppm   ASTM D5185m   >20   6       Fuel   %   ASTM D5185m   >20   6       Vater   WC Method   >0.2   NEG       Glycol   WC Method   >30   21.4       Sot %   %   YASTM D7624   >30   21.4 </th <th>Titanium</th> <th>ppm</th> <th>ASTM D5185m</th> <th></th> <th>1</th> <th> </th>	Titanium	ppm	ASTM D5185m		1	 
Aluminum   ppm   ASTM D5185m   >30   3       Lead   ppm   ASTM D5185m   >30   4       Copper   ppm   ASTM D5185m   >150   6       Vanadium   ppm   ASTM D5185m   >5   0       White Metal   scalar   *Visual   NONE   NONE       Yellow Metal   scalar   *Visual   NONE   NONE       Silicon   ppm   ASTM D5185m<>20   6        Vater   WC Method   >0.2   NEG        Glycol   WC Method   >0.2   NEG        Soot %   %   YaSTM D7624   >20   9.6       Sulfation   Abs/Imm   YASTM D7624   >20   9.6       Sulfation   Abs/Imm <th>Silver</th> <th>ppm</th> <th>ASTM D5185m</th> <th>&gt;3</th> <th>0</th> <th> </th>	Silver	ppm	ASTM D5185m	>3	0	 
Lead   ppm   ASTM D5185m   >30   4       Copper   ppm   ASTM D5185m   >150   6       Vanadium   ppm   ASTM D5185m   >5   0       White Metal   scalar   *Visual   NONE   NONE       Yellow Metal   scalar   *Visual   NONE   NONE       Silicon   ppm   ASTM D5185m   >20   6       Potassium   ppm   ASTM D5185m   >20   6       Water   WC Method   >0.2   NEG       Glycol   WC Method   >0.3       Sot %   %   YASTM D7624   >20   9.6      Sulfation   Abs/tmm   YASTM D7624   >30   21.4       Sod %   % YaSTM D7624   >30   21.4	Aluminum		ASTM D5185m	>30	3	 
Copper   ppm   ASTM D5185m   >150   6       Tin   ppm   ASTM D5185m   >5   0       Vanadium   ppm   ASTM D5185m   >5   0       White Metal   scalar   'Visual   NONE   NONE       Yellow Metal   scalar   'Visual   NONE   NONE       Silicon   ppm   ASTM D5185m   >20   6       Potassium   ppm   ASTM D5185m   >20   6       Water   WC Method   >0.2   NEG        Glycol   WC Method   >0.2   NEG        Soot %   %   'ASTM D7624   >20   9.6       Sulfation   Abs/rm< "ASTM D7614   >30   21.4       Soot %   %   'ASTM D7624	Lead		ASTM D5185m	>30	4	 
Tin   ppm   ASTM D5185m   >5   0       Vanadium   ppm   ASTM D5185m   0       White Metal   scalar   *Visual   NONE   NONE      Yellow Metal   scalar   *Visual   NONE       Silicon   ppm   ASTM D5185m<>20   ▲ 27       Potassium   ppm   ASTM D5185m<>20   6       Water   WC Method   0.2   NEG       Glycol   WC Method   0.2   NEG       Sott %   %   *ASTM D7844<>3   0.3       Sulfation   Abs/rm< *ASTM D7624<>20   9.6       Sulfation   Abs/rm< *ASTM D7624<>20   9.6       Sulfation   Abs/rm< *ASTM D7624<>20   9.6       Sulfation   Abs/rm   *ASTM D7624<>20   9.6	Copper		ASTM D5185m	>150	6	 
Vanadium   ppm   ASTM D5185m   0       White Metal   scalar   *Visual   NONE   NONE       Yellow Metal   scalar   *Visual   NONE   NONE       Silicon   ppm   ASTM D5185m   >20   6       Potassium   ppm   ASTM D5185m   >20   6       Fuel   %   ASTM D5185m   >20   6       Glycol   WC Method   >0.2   NEG        Soot %   %   *ASTM D7624   >20   9.6       Sulfation   Abs/cm< *ASTM D7624   >20   9.6       Sulfation   Abs/itmm< *ASTM D7624   >20   9.6       Sulfation   Abs/itmm *ASTM D7624   >20   9.6       Sodium/Ditt   scalar   *Visual   NONE					0	 
White Metal   scalar   *Visual   NONE       Yellow Metal   scalar   *Visual   NONE   NONE       Silicon   ppm   ASTM D5185m   >20   A   27       Potassium   ppm   ASTM D5185m   >20   6       Fuel   %   ASTM D5185m   >20   A   29       Glycol   WC Method   >0.2   NEG        Soot %   %   'ASTM D7624   >20   9.6       Sulfation   Abs/cm< 'Visual   NONE        Sodiu/Dirt   scalar< 'Visual   NORE					-	 
Yellow Metal   scalar   *Visual   NONE       Silicon   ppm   ASTM D5185m<>20   ▲   27       Potassium   ppm   ASTM D5185m<>20   6       Fuel   %   ASTM D5185m<>20   ▲   2.9       Water   WC Method   >0.2   NEG        Glycol   WC Method   >0.2   NEG        Soot %   %   *ASTM D7844<>3   0.3        Sulfation   Abs/tmm<*ASTM D7824<>20   9.6        Sulfation   Abs/tmm<*ASTM D7814<>30   21.4        Sulfation   Abs/tmm<*ASTM D7814   >30   21.4       Sand/Dirt   scalar<*Visual   NONE   NORME       Appearance   scalar<*Visual   NORM   NORML				NONE	-	 
Silicon ppm ASTM D5185m< >20 ▲ 27     Potassium ppm ASTM D5185m< >20 6     Fuel % ASTM D5185m< >20 6     Water WC Method >0.2 NEG     Glycol WC Method >0.2 NEG     Soot % % 'ASTM D7844 >3 0.3     Soot % % 'ASTM D7624 >20 9.6     Sulfation Abs/.tmm<'ASTM D715 >30 21.4     Sulfation Abs/.tmm<'ASTM D7415 >30 21.4     Sulfation Abs/.tmm<'ASTM D7415 >30 21.4     Sulfation scalar<'Visual NONE NONE     Sand/Dirt scalar<'Visual NORM NORML     Appearance scalar<'Visual NORM NORML    Gdor scal						 
Potassium   ppm   ASTM D5185m   >20   6      Fuel   %   ASTM D3524   >5   ▲ 2.9      Water   WC Method   >0.2   NEG      Glycol   WC Method   >0.2   NEG      Soot %   %   *ASTM D7844   >3   0.3      Nitration   Abs/.mm   *ASTM D7624   >20   9.6      Sulfation   Abs/.mm   *ASTM D7624   >20   9.6						 
Fuel   %   ASTM D3524   >5   ▲ 2.9      Water   WC Method   >0.2   NEG      Glycol   WC Method   >0.2   NEG      Soot %   %   *ASTM D7844   >3   0.3      Nitration   Abs/cm   *ASTM D7624   >20   9.6       Sulfation   Abs/.1mm   *ASTM D7624   >20   9.6   NONE      Sulfation   scalar   *Visual   NONE   NORE       Gand/Dirt   scalar   *Visual   NORM   NORM	Silicon	ppm	ASTM D5185m	>20	<b>4</b> 27	 
Water   WC Method   >0.2   NEG      Glycol   WC Method   NEG       Soot %   %   *ASTM D7844   >3   0.3       Nitration   Abs/cm   *ASTM D7844   >3   0.3       Sulfation   Abs/cm   *ASTM D7624   >20   9.6       Sulfation   Abs/.mm   *ASTM D7618   >30   21.4       Sulfation   scalar   *Visual   NONE   NORE       Appearance   scalar   *Visual   NORML   NORML       Glycon   scalar   *Visual   NORM <t< th=""><th>Potassium</th><th>ppm</th><th>ASTM D5185m</th><th>&gt;20</th><th>6</th><th> </th></t<>	Potassium	ppm	ASTM D5185m	>20	6	 
Glycol   WC Method   NEG      Soot %   %   *ASTM D7844   >3   0.3      Nitration   Abs/cm   *ASTM D7624   >20   9.6      Sulfation   Scalar   *Visual   NONE       Debris   scalar   *Visual   NORM   NORML       Appearance   scalar   *Visual   NORM   NORML       Odor   scalar   *Visual   NORM   NORML       Borion   ppm   ASTM D5185m	Fuel	%	ASTM D3524	>5	<b>2</b> .9	 
Soot %   %   *ASTM D7844   >3   0.3       Nitration   Abs/cm   *ASTM D7624   >20   9.6       Sulfation   Abs/cm   *ASTM D7624   >20   9.6       Sulfation   Abs/cm   *ASTM D7415   >30   21.4       Silt   scalar   *Visual   NONE   NONE       Debris   scalar   *Visual   NONE   NONE       Sand/Dirt   scalar   *Visual   NOR   NORML       Appearance   scalar   *Visual   NOR   NORML       Odor   scalar   *Visual   >0.2   NEG       Boron   ppm   ASTM D5185m   0   10       Barium   ppm   ASTM D5185m   0   0       Maganesium   ppm	Water		WC Method	>0.2	NEG	 
Nitration   Abs/cm   *ASTM D7624   >20   9.6       Sulfation   Abs/.1mm   *ASTM D7624   >30   21.4       Silt   scalar   *Visual   NONE   NONE       Debris   scalar   *Visual   NONE   NONE       Sand/Dirt   scalar   *Visual   NONE   NONE       Appearance   scalar   *Visual   NORM   NORML       Odor   scalar   *Visual   NORM   NORML       Godor   scalar   *Visual   NOR   NORML       Odor   scalar   *Visual   >0.2   NEG       Boron   ppm   ASTM D5185m   0   10       Barium   ppm   ASTM D5185m   0   0       Magnesium   ppm	Glycol		WC Method		NEG	 
Sulfation   Abs/.1mm   *ASTM D7415   >30   21.4       Silt   scalar   *Visual   NONE   NONE       Debris   scalar   *Visual   NONE   NONE       Sand/Dirt   scalar   *Visual   NONE   NONE       Appearance   scalar   *Visual   NORM   NORML       Odor   scalar   *Visual   NORM   NORML       Odor   scalar   *Visual   NORM   NORML       Godor   scalar   *Visual   >0.2   NEG       Boron   ppm   ASTM D5185m   0   10       Barium   ppm   ASTM D5185m   0   <1       Magnesium   ppm   ASTM D5185m   1010   1185       Magnesium   ppm	Soot %	%	*ASTM D7844	>3	0.3	 
Siltscalar*VisualNONENONEDebrisscalar*VisualNONENONESand/Dirtscalar*VisualNONENONEAppearancescalar*VisualNORMNORMLOdorscalar*VisualNORMLNORMLOdorscalar*VisualNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGSodiumppmASTM D5185m010BoronppmASTM D5185m010BariumppmASTM D5185m0<MolybdenumppmASTM D5185m00MagnesiumppmASTM D5185m10101185CalciumppmASTM D5185m11501293PhosphorusppmASTM D5185m12701637SulfurppmASTM D5185m20604843OxidationAbs/.1mm*ASTM D28969.88.6	Nitration	Abs/cm	*ASTM D7624	>20	9.6	 
Debrisscalar*VisualNONENONESand/Dirtscalar*VisualNONENONEAppearancescalar*VisualNORMLNORMLOdorscalar*VisualNORMLNORMLCdorscalar*VisualNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGSodiumppmASTM D5185m010BoronppmASTM D5185m0<1BariumppmASTM D5185m06080MolybdenumppmASTM D5185m00MagnesiumppmASTM D5185m10101185CalciumppmASTM D5185m10701428PhosphorusppmASTM D5185m12701637SulfurppmASTM D5185m12701637SulfurppmASTM D5185m20604843OxidationAbs/.1mm*ASTM D28969.88.6	Sulfation	Abs/.1mm	*ASTM D7415	>30	21.4	 
Sand/Dirtscalar*VisualNONENONEAppearancescalar*VisualNORMLNORMLOdorscalar*VisualNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGSodiumppmASTM D5185m010BoronppmASTM D5185m010BariumppmASTM D5185m0<1MolybdenumppmASTM D5185m000MagneseppmASTM D5185m01011185CalciumppmASTM D5185m10701428PhosphorusppmASTM D5185m12701637SulfurppmASTM D5185m20604843DxidationAbs/.1mm*ASTM D28969.88.6	Silt	scalar	*Visual	NONE	NONE	 
Appearance   scalar   *Visual   NORML   NORML      Odor   scalar   *Visual   NORML   NORML       Emulsified Water   scalar   *Visual   NORML   NORML       Sodium   ppm   ASTM D5185m   S        Boron   ppm   ASTM D5185m   0   10       Barium   ppm   ASTM D5185m   0   <1       Molybdenum   ppm   ASTM D5185m   0   80       Magnesium   ppm   ASTM D5185m   1010   1185       Phosphorus   ppm   ASTM D5185m   1070   1428       Zinc   ppm   ASTM D5185m   1270   1637       Sulfur   ppm   ASTM D5185m   1270   1637       Sulfur   ppm   A	Debris	scalar	*Visual	NONE	NONE	 
Appearance   scalar   *Visual   NORML   NORML       Odor   scalar   *Visual   NORML   NORML       Emulsified Water   scalar   *Visual   >0.2   NEG       Sodium   ppm   ASTM D5185m   0   10       Boron   ppm   ASTM D5185m   0   10       Barium   ppm   ASTM D5185m   0   <1       Molybdenum   ppm   ASTM D5185m   0   <1       Magnesium   ppm   ASTM D5185m   1010   1185       Phosphorus   ppm   ASTM D5185m   1070   1428       Zinc   ppm   ASTM D5185m   1270   1637       Sulfur   ppm   ASTM D5185m   1270   1637       Oxidation   Ab	Sand/Dirt	scalar	*Visual	NONE	NONE	 
Odor   scalar   *Visual   NORML   NORML      Emulsified Water   scalar   *Visual   >0.2   NEG      Sodium   ppm   ASTM D5185m   3       Boron   ppm   ASTM D5185m   0   10       Barium   ppm   ASTM D5185m   0   <1       Molybdenum   ppm   ASTM D5185m   0   <1       Manganese   ppm   ASTM D5185m   0   0       Magnesium   ppm   ASTM D5185m   1010   1185       Phosphorus   ppm   ASTM D5185m   1070   1428       Zinc   ppm   ASTM D5185m   1270   1637       Sulfur   ppm   ASTM D5185m   1270   1637       Sulfur   ppm   ASTM D5185m   2060   4843 <th>Appearance</th> <th>scalar</th> <th></th> <th>NORML</th> <th>NORML</th> <th> </th>	Appearance	scalar		NORML	NORML	 
Emulsified Water   scalar   *Visual   >0.2   NEG      Sodium   ppm   ASTM D5185m   3       Boron   ppm   ASTM D5185m   0   10       Barium   ppm   ASTM D5185m   0   <1       Molybdenum   ppm   ASTM D5185m   0   <1       Manganese   ppm   ASTM D5185m   0   0       Magnesium   ppm   ASTM D5185m   1010   1185       Calcium   ppm   ASTM D5185m   1070   1428       Phosphorus   ppm   ASTM D5185m   1150   1293       Sulfur   ppm   ASTM D5185m   1270   1637       Sulfur   ppm   ASTM D5185m   2060   4843       Oxidation   Abs/.1mm   *ASTM D2896					-	 
Sodium   ppm   ASTM D5185m   3      Boron   ppm   ASTM D5185m   0   10      Barium   ppm   ASTM D5185m   0   <11      Barium   ppm   ASTM D5185m   0   <11      Molybdenum   ppm   ASTM D5185m   60   80      Manganese   ppm   ASTM D5185m   0   0      Magnesium   ppm   ASTM D5185m   1010   1185      Calcium   ppm   ASTM D5185m   1070   1428       Phosphorus   ppm   ASTM D5185m   1070   1428       Zinc   ppm   ASTM D5185m   1150   1293       Sulfur   ppm   ASTM D5185m   1270   1637       Sulfur   ppm   ASTM D5185m   2060   4843       Oxidation   Abs/.1mm *A	Emulsified Water	scalar		>0.2	NEG	 
Boron   ppm   ASTM D5185m   0   10      Barium   ppm   ASTM D5185m   0   <1      Molybdenum   ppm   ASTM D5185m   0   <1      Molybdenum   ppm   ASTM D5185m   0   <1      Manganese   ppm   ASTM D5185m   00   0      Magnesium   ppm   ASTM D5185m   1010   1185      Calcium   ppm   ASTM D5185m   1070   1428       Phosphorus   ppm   ASTM D5185m   1150   1293       Zinc   ppm   ASTM D5185m   1270   1637       Sulfur   ppm   ASTM D5185m   2060   4843       Oxidation   Abs/.1mm   *ASTM D2896   9.8   8.6						 
Barium   ppm   ASTM D5185m   0   <1	_				-	 
Molybdenum   ppm   ASTM D5185m   60   80       Manganese   ppm   ASTM D5185m   0   0       Magnesium   ppm   ASTM D5185m   1010   1185       Calcium   ppm   ASTM D5185m   1010   1428       Phosphorus   ppm   ASTM D5185m   1070   1428       Zinc   ppm   ASTM D5185m   1150   1293       Sulfur   ppm   ASTM D5185m   1270   1637       Oxidation   Abs/.1mm   *ASTM D5185m   2060   4843       Base Number (BN)   mg KOHg   ASTM D2896   9.8   8.6		ppm		0		 
Manganese   ppm   ASTM D5185m   0   0       Magnesium   ppm   ASTM D5185m   1010   1185       Calcium   ppm   ASTM D5185m   1070   1428       Phosphorus   ppm   ASTM D5185m   1150   1293       Zinc   ppm   ASTM D5185m   1270   1637       Sulfur   ppm   ASTM D5185m   2060   4843       Oxidation   Abs/.1mm   *ASTM D7414   >25   18.6       Base Number (BN)   mg KOHg   ASTM D2896   9.8   8.6						 
Magnesium   ppm   ASTM D5185m   1010   1185       Calcium   ppm   ASTM D5185m   1070   1428       Phosphorus   ppm   ASTM D5185m   1150   1293       Zinc   ppm   ASTM D5185m   1270   1637       Sulfur   ppm   ASTM D5185m   2060   4843       Oxidation   Abs/.1mm   *ASTM D7414   >25   18.6       Base Number (BN)   mg KOH/g   ASTM D2896   9.8   8.6		ppm			80	 
Calcium   ppm   ASTM D5185m   1070   1428       Phosphorus   ppm   ASTM D5185m   1150   1293       Zinc   ppm   ASTM D5185m   1270   1637       Sulfur   ppm   ASTM D5185m   2060   4843       Oxidation   Abs/.1mm   *ASTM D7414   >25   18.6       Base Number (BN)   mg KOHg   ASTM D2896   9.8   8.6		ppm				 
Phosphorus   ppm   ASTM D5185m   1150   1293       Zinc   ppm   ASTM D5185m   1270   1637       Sulfur   ppm   ASTM D5185m   2060   4843       Oxidation   Abs/.1mm   *ASTM D7414   >25   18.6       Base Number (BN)   mg KOH/g   ASTM D2896   9.8   8.6	-	ppm	ASTM D5185m	1010		 
Zinc   ppm   ASTM D5185m   1270   1637       Sulfur   ppm   ASTM D5185m   2060   4843       Oxidation   Abs/.1mm   *ASTM D7414   >25   18.6       Base Number (BN)   mg KOHg   ASTM D2896   9.8   8.6		ppm				 
Sulfur   ppm   ASTM D5185m   2060   4843       Oxidation   Abs/.1mm   *ASTM D7414   >25   18.6       Base Number (BN)   mg KOH/g   ASTM D2896   9.8   8.6	Phosphorus	ppm	ASTM D5185m	1150	1293	 
Oxidation   Abs/.1mm   *ASTM D7414   >25   18.6      Base Number (BN)   mg KOH/g   ASTM D2896   9.8   8.6	Zinc	ppm	ASTM D5185m	1270	1637	 
Base Number (BN)   mg KOH/g   ASTM D2896   9.8   8.6	Sulfur	ppm	ASTM D5185m	2060	4843	 
	Oxidation	Abs/.1mm	*ASTM D7414	>25	18.6	 
Visc @ 100°C cSt ASTM D445 15.4 12.3	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.6	 
	Visc @ 100°C	cSt	ASTM D445	15.4	12.3	 



