

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id **240** Component **Diesel Engine** Fluid **ESSO XD-3 EXTRA 15W40 (--- GAL)**

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

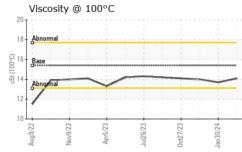
Fluid Condition

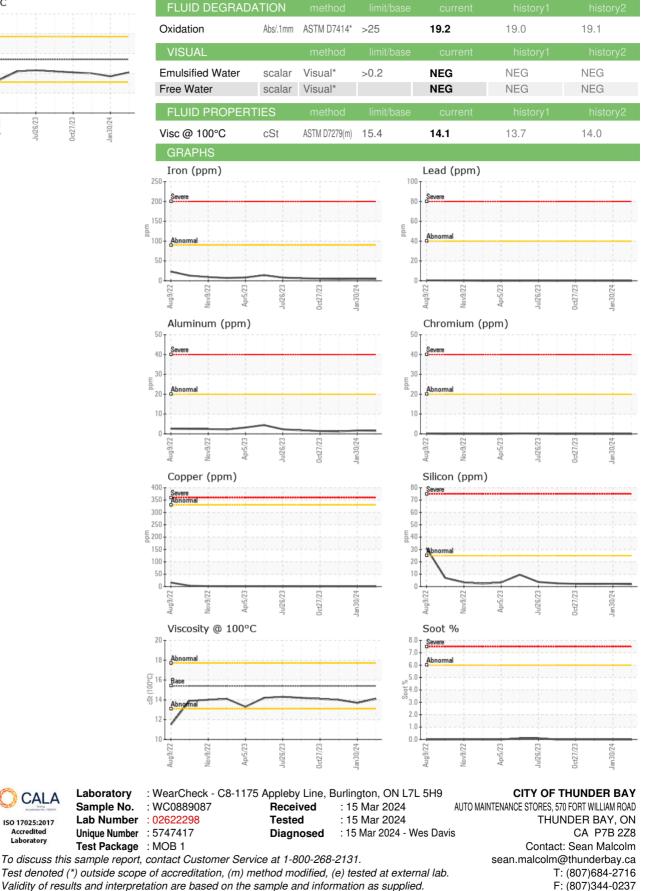
The condition of the oil is acceptable for the time in service.

SAMPLE INFORMATION method limit/base current history1 history2 Sample Date Client Info 08 Mar 2024 30 Jan 2024 07 Dec 2023 Machine Age hrs Client Info 0 0 0 Oil Age hrs Client Info 0 0 0 Oil Changed Client Info 0 0 0 0 Sample Status Client Info 0 0 0 0 CONTAMINATION method Imit/base current history1 history2 Fuel WC Method >3.0 <1.0 <1.0 <1.0 WEAR WC Method >0.2 NEG NEG NEG Verant WC Method >0 5 5 4 Chromium ppm ASTU D51600 >20 0 0 0 Titanium ppm ASTU D51600 >2 0 <1 1 Pum ASTU D51600 S 5			Aug2022	Nov2U22 Apr2U23	Jul2023 Oct2023	Jan 2024	
Sample Date Client Info 08 Mar 2024 30 Jan 2024 07 Dec 2023 Machine Age hrs Client Info 0 0 0 Oil Age hrs Client Info 8771 9838 9062 Coll Changed Client Info Changed Changed Changed Changed Changed Sample Status Client Info Barne NORMAL NORMAL NORMAL NORMAL CONTAMINATION method imit/base current History1 History2 Fuel WC Method >3.0 <1.0	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 0 0 0 Oil Age hrs Client Info 8771 9838 9062 Oil Changed Client Info Changed Clion	Sample Number		Client Info		WC0889087	WC0889157	WC0866594
Oil Age hrs Client Info 8771 9838 9062 Oil Changed Client Info Changed Changed Changed Changed Changed Changed Changed NORMAL NORMAL <t< th=""><th>Sample Date</th><th></th><th>Client Info</th><th></th><th>08 Mar 2024</th><th>30 Jan 2024</th><th>07 Dec 2023</th></t<>	Sample Date		Client Info		08 Mar 2024	30 Jan 2024	07 Dec 2023
Oil Changed Sample Status Client Info Changed NORMAL Changed NORMAL Changed NORMAL Changed NORMAL Changed NORMAL Changed NORMAL CONTAMINATION method imit/base current history1 history2 Fuel WC Method >0.2 NEG NEG NEG Water WC Method >0.2 NEG NEG NEG WEAR METALS method imit/base current history1 history2 Iron ppm ASTM05185(m) >20 0 0 0 Nickel ppm ASTM05185(m) >20 0 0 0 Silver ppm ASTM05185(m) >20 0 0 0 Silver ppm ASTM05185(m) >20 0 0 0 Copper ppm ASTM05185(m) >20 0 0 0 Cadmium ppm ASTM05185(m) >10 0 0 0 Cadmium ppm AS	Machine Age	hrs	Client Info		0	0	0
Sample Status NORMAL NORMAL NORMAL NORMAL NORMAL CONTAMINATION method imit/base current history1 history2 Fuel WC Method >3.0 <1.0 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG Glycol WC Method >0.2 NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185(m) >20 0 0 0 Nickel ppm ASTM D5185(m) >2 0 0 0 Sliver ppm ASTM D5185(m) >20 2 1 1 Lead ppm ASTM D5185(m) >20 0 0 0 Copper ppm ASTM D5185(m) >330 <1 <1 1 Tin< ppm ASTM D5185(m) 0 0 0 0	Oil Age	hrs	Client Info		8771	9838	9062
CONTAMINATION method limit/base current history1 history2 Fuel WC Method >3.0 <1.0 <1.0 <1.0 <1.0 <1.0 Glycol WC Method >0.2 NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185(m) >20 0 0 0 Nickel ppm ASTM D5185(m) >20 0 0 0 Silver ppm ASTM D5185(m) >20 0 0 0 Lead ppm ASTM D5185(m) >20 2 2 1 1 Lead ppm ASTM D5185(m) >20 2 2 1 1 Lead ppm ASTM D5185(m) >300 <1 <1 <1 1 Lead ppm ASTM D5185(m) 0 0 0 0 Vanadium ppm </th <th>Oil Changed</th> <th></th> <th>Client Info</th> <th></th> <th>Changed</th> <th>Changed</th> <th>Changed</th>	Oil Changed		Client Info		Changed	Changed	Changed
Fuel WC Method >3.0 <1.0	Sample Status				NORMAL	NORMAL	NORMAL
Water WC Method >0.2 NEG NEG NEG NEG Glycol WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5165(m) >20 0 0 0 Nickel ppm ASTM D5165(m) >2 0 0 0 Silver ppm ASTM D5165(m) >2 0 0 0 Aluminum ppm ASTM D5165(m) >20 2 2 1 1 Lead ppm ASTM D5165(m) >20 2 2 1 1 Lead ppm ASTM D5165(m) >10 0 0 0 Antimony ppm ASTM D5165(m) >15 0 0 0 Antimony ppm ASTM D5165(m) 0 0 0 0 Cadmium pm ASTM D5165(m) 0 0 <th>CONTAMINATION</th> <th>J</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	CONTAMINATION	J	method	limit/base	current	history1	history2
Glycol WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTMD5185(m) >90 5 5 4 Chromium ppm ASTMD5185(m) >20 0 0 0 Nickel ppm ASTMD5185(m) >22 0 0 0 Silver ppm ASTMD5185(m) >22 0 0 0 Lead ppm ASTMD5185(m) >20 2 2 1 1 Lead ppm ASTMD5185(m) >20 0 0 0 Antimony ppm ASTMD5185(m) >15 0 0 0 Vanadium ppm ASTMD5185(m) 0 0 0 0 Adminum ppm ASTMD5185(m) 0 0 0 0 Adminum ppm ASTMD5185(m) 119 117 122	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM 05165(m) >90 5 5 4 Chromium ppm ASTM 05165(m) >20 0 0 0 Nickel ppm ASTM 05165(m) >2 0 <1 0 Titanium ppm ASTM 05165(m) >2 0 0 0 Aluminum ppm ASTM 05165(m) >2 0 0 0 Lead ppm ASTM 05165(m) >10 0 0 0 Copper ppm ASTM 05165(m) >15 0 0 0 Vanadium ppm ASTM 05165(m) 0 0 0 0 Vanadium ppm ASTM 05165(m) 0 0 0 0 Cadmium ppm ASTM 05165(m) 0 0 0 0 Cadmium ppm ASTM 05165(m) 0 0 0<	Water		WC Method	>0.2	NEG	NEG	NEG
Iron ppm ASTM D5185(m) >90 5 5 4 Chromium ppm ASTM D5185(m) >20 0 0 0 Nickel ppm ASTM D5185(m) >2 0 <1	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185(m) >20 0 0 0 Nickel ppm ASTM D5185(m) >2 0 <1 0 Silver ppm ASTM D5185(m) >2 0 0 <1 Aluminum ppm ASTM D5185(m) >2 0 0 <1 Lead ppm ASTM D5185(m) >20 2 2 1 Lead ppm ASTM D5185(m) >20 0 0 0 Copper ppm ASTM D5185(m) >330 <1 <1 <1 <1 Tin ppm ASTM D5185(m) >15 0 0 0 0 Vanadium ppm ASTM D5185(m) 0 0 0 0 0 Cadmium ppm ASTM D5185(m) 0 0 <1 1 <1 Boron ppm ASTM D5185(m) 119 117 122 1 1 <1 1 <td< th=""><th>WEAR METALS</th><th></th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></td<>	WEAR METALS		method	limit/base	current	history1	history2
Nickel ppm ASTM D5185(m) >2 0 <1	Iron	ppm	ASTM D5185(m)	>90	5	5	4
Titanium ppm ASTM D5165(m) >2 0 0 0 Silver ppm ASTM D5165(m) >2 0 0 <1 Aluminum ppm ASTM D5165(m) >20 2 2 1 Lead ppm ASTM D5165(m) >40 0 0 0 Copper ppm ASTM D5165(m) >330 <1 <1 <1 Tin ppm ASTM D5165(m) >15 0 0 0 Antimony ppm ASTM D5165(m) >15 0 0 0 Vanadium ppm ASTM D5165(m) 0 0 0 0 Cadmium ppm ASTM D5165(m) 0 0 0 0 Cadmium ppm ASTM D5165(m) 119 117 122 Barium ppm ASTM D5165(m) 0 0 0 0 Magnesium ppm ASTM D5165(m) 3780 2212 2136	Chromium	ppm	ASTM D5185(m)	>20	0	0	0
Silver ppm ASTM D5185(m) >2 0 0 <1	Nickel	ppm	ASTM D5185(m)	>2	0	<1	0
Aluminum ppm ASTM D5185(m) >20 2 2 1 Lead ppm ASTM D5185(m) >40 0 0 0 Copper ppm ASTM D5185(m) >330 <1 <1 <1 Tin ppm ASTM D5185(m) >15 0 0 0 Antimony ppm ASTM D5185(m) 0 0 0 0 Vanadium ppm ASTM D5185(m) 0 0 0 0 Stimum ppm ASTM D5185(m) 0 0 0 0 Cadmium ppm ASTM D5185(m) 0 0 0 0 ADDITIVES method Imit/base current history1 history2 Boron ppm ASTM D5185(m) 119 117 122 Barium ppm ASTM D5185(m) 0 0 0 Manganese ppm ASTM D5185(m) 370 211 1 13	Titanium	ppm	ASTM D5185(m)	>2	0	0	0
Lead ppm ASTM D5185(m) >40 0 0 0 Copper ppm ASTM D5185(m) >330 <1 <1 <1 Tin ppm ASTM D5185(m) >15 0 0 0 Antimony ppm ASTM D5185(m) 0 0 0 0 Vanadium ppm ASTM D5185(m) 0 0 0 0 Beryllium ppm ASTM D5185(m) 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 119 117 122 Barium ppm ASTM D5185(m) <1 <1 <1 Manganese ppm ASTM D5185(m) <14 21 13 Calcium ppm ASTM D5185(m) 3780 2212 2136 2161 Phosphorus ppm ASTM D5185(m) 1370 967 959 948	Silver	ppm	ASTM D5185(m)	>2	0	0	<1
Copper ppm ASTM D5185(m) >330 <1	Aluminum	ppm	ASTM D5185(m)	>20	2	2	1
Tin ppm ASTM D5188(m) >15 0 0 0 Antimony ppm ASTM D5188(m) 0 0 0 0 Vanadium ppm ASTM D5188(m) 0 0 0 0 Beryllium ppm ASTM D5188(m) 0 0 0 0 Cadmium ppm ASTM D5188(m) 0 0 0 0 ADDITIVES method limi/base current history1 history2 Boron ppm ASTM D5188(m) 119 117 122 Barium ppm ASTM D5188(m) 0 0 0 0 Molybdenum ppm ASTM D5188(m) 14 21 13 Calcium ppm ASTM D5188(m) 1370 967 959 948 Zinc ppm ASTM D5188(m) 1500 1133 1122 1168 Sulfur ppm ASTM D5188(m) 20 133 22 2	Lead	ppm	ASTM D5185(m)	>40	0	0	0
Antimony ppm ASTM D5188(m) 0 0 0 Vanadium ppm ASTM D5188(m) 0 0 0 Beryllium ppm ASTM D5188(m) 0 0 0 Cadmium ppm ASTM D5188(m) 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5188(m) 119 117 122 Barium ppm ASTM D5188(m) 0 0 <1 Molybdenum ppm ASTM D5188(m) <11 1 <1 Magnesium ppm ASTM D5188(m) 0 0 0 0 Magnesium ppm ASTM D5188(m) 14 21 13 2161 Phosphorus ppm ASTM D5188(m) 1370 967 959 948 Zinc ppm ASTM D5188(m) 1300 3006 3025 2901 Lithium ppm <t< th=""><th>Copper</th><th>ppm</th><th>ASTM D5185(m)</th><th>>330</th><th><1</th><th><1</th><th><1</th></t<>	Copper	ppm	ASTM D5185(m)	>330	<1	<1	<1
Vanadium ppm ASTM D5185(m) 0 0 0 Beryllium ppm ASTM D5185(m) 0 0 0 Cadmium ppm ASTM D5185(m) 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 119 117 122 Barium ppm ASTM D5185(m) 0 0 <1 Molybdenum ppm ASTM D5185(m) 0 0 <1 Magnesese ppm ASTM D5185(m) 41 1 <1 Magnesium ppm ASTM D5185(m) 3780 2212 2136 2161 Phosphorus ppm ASTM D5185(m) 1370 967 959 948 Zinc ppm ASTM D5185(m) 3800 3006 3025 2901 Lithium ppm ASTM D5185(m) >25 2 2 2 Sodium ppm	Tin	ppm	ASTM D5185(m)	>15	0	0	0
Beryllium ppm ASTM D5185(m) 0 0 0 Cadmium ppm ASTM D5185(m) 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 119 117 122 Barium ppm ASTM D5185(m) 0 0 <11	Antimony	ppm	ASTM D5185(m)		0	0	0
Cadmium ppm ASTM D5185(m) 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 119 117 122 Barium ppm ASTM D5185(m) 0 0 0 <11	Vanadium	ppm	ASTM D5185(m)		0	0	0
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 119 117 122 Barium ppm ASTM D5185(m) 0 0 <1 Molybdenum ppm ASTM D5185(m) <1 1 <1 Manganese ppm ASTM D5185(m) <1 1 <1 Manganese ppm ASTM D5185(m) 14 21 13 Calcium ppm ASTM D5185(m) 144 21 13 Calcium ppm ASTM D5185(m) 1370 967 959 948 Zinc ppm ASTM D5185(m) 1370 967 959 948 Zinc ppm ASTM D5185(m) 1370 967 959 948 Sulfur ppm ASTM D5185(m) 1370 967 959 948 Sulfur ppm ASTM D5185(m) 130 1122 1168 Sulfur ppm <th>Beryllium</th> <th>ppm</th> <th>ASTM D5185(m)</th> <th></th> <th>0</th> <th>0</th> <th>0</th>	Beryllium	ppm	ASTM D5185(m)		0	0	0
Boron ppm ASTM D5185(m) 119 117 122 Barium ppm ASTM D5185(m) 0 0 <11	Cadmium	ppm	ASTM D5185(m)		0	0	0
Barium ppm ASTM D5185(m) 0 0 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185(m) <1	Boron	ppm	ASTM D5185(m)		119	117	122
Manganese ppm ASTM D5185(m) 0 0 0 Magnesium ppm ASTM D5185(m) 14 21 13 Calcium ppm ASTM D5185(m) 14 21 13 Calcium ppm ASTM D5185(m) 3780 2212 2136 2161 Phosphorus ppm ASTM D5185(m) 1370 967 959 948 Zinc ppm ASTM D5185(m) 1370 967 959 948 Zinc ppm ASTM D5185(m) 1500 1133 1122 1168 Sulfur ppm ASTM D5185(m) 3800 3006 3025 2901 Lithium ppm ASTM D5185(m) 3800 3006 3025 2901 Silicon ppm ASTM D5185(m) >25 2 2 2 Sodium ppm ASTM D5185(m) >192 2 2 2 Potassium ppm ASTM D5185(m) >20 7	Barium	ppm	ASTM D5185(m)		0	0	<1
Magnesium ppm ASTM D5185(m) 14 21 13 Calcium ppm ASTM D5185(m) 3780 2212 2136 2161 Phosphorus ppm ASTM D5185(m) 1370 967 959 948 Zinc ppm ASTM D5185(m) 1370 967 959 948 Zinc ppm ASTM D5185(m) 1500 1133 1122 1168 Sulfur ppm ASTM D5185(m) 3800 3006 3025 2901 Lithium ppm ASTM D5185(m) 3800 3006 3025 2901 Lithium ppm ASTM D5185(m) 3800 3006 3025 2901 Lithium ppm ASTM D5185(m) >25 2 2 2 Solicon ppm ASTM D5185(m) >25 2 2 2 Potassium ppm ASTM D5185(m) >20 7 6 5 INFRA-RED method limit/base </th <th>Molybdenum</th> <th>ppm</th> <th>ASTM D5185(m)</th> <th></th> <th><1</th> <th>1</th> <th><1</th>	Molybdenum	ppm	ASTM D5185(m)		<1	1	<1
Calcium ppm ASTM D5185(m) 3780 2212 2136 2161 Phosphorus ppm ASTM D5185(m) 1370 967 959 948 Zinc ppm ASTM D5185(m) 1370 967 959 948 Zinc ppm ASTM D5185(m) 1500 1133 1122 1168 Sulfur ppm ASTM D5185(m) 3800 3006 3025 2901 Lithium ppm ASTM D5185(m) 3800 3006 3025 2901 Silicon ppm ASTM D5185(m) >25 2 2 2 Solium ppm ASTM D5185(m) >25 2 2 2 Potassium ppm ASTM D5185(m) >192 2 2 2 NFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >6 0 0 0 Nitration Abs/cm ASTM D7624*<	Manganese	ppm	ASTM D5185(m)		0	0	0
Phosphorus ppm ASTM D5185(m) 1370 967 959 948 Zinc ppm ASTM D5185(m) 1500 1133 1122 1168 Sulfur ppm ASTM D5185(m) 1500 1133 3025 2901 Lithium ppm ASTM D5185(m) 3800 3006 3025 2901 Lithium ppm ASTM D5185(m) current history1 history2 Silicon ppm ASTM D5185(m) >25 2 2 2 Sodium ppm ASTM D5185(m) >192 2 2 2 Potassium ppm ASTM D5185(m) >20 7 6 5 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >6 0 0 0 Nitration Abs/cm ASTM D7624* >20 8.5 8.4 8.4	Magnesium	ppm	ASTM D5185(m)		14	21	13
Zinc ppm ASTM D5185(m) 1500 1133 1122 1168 Sulfur ppm ASTM D5185(m) 3800 3006 3025 2901 Lithium ppm ASTM D5185(m) 3800 3006 3025 2901 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >25 2 2 2 Sodium ppm ASTM D5185(m) >192 2 2 2 Potassium ppm ASTM D5185(m) >20 7 6 5 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >6 0 0 0 Nitration Abs/cm ASTM D7624* >20 8.5 8.4 8.4		ppm		3780	2212	2136	2161
Sulfur ppm ASTM D5185(m) 3800 3006 3025 2901 Lithium ppm ASTM D5185(m) 3800 3006 3025 2901 Lithium ppm ASTM D5185(m) <1 <1 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >25 2 2 2 Sodium ppm ASTM D5185(m) >192 2 2 2 Potassium ppm ASTM D5185(m) >20 7 6 5 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >6 0 0 0 Nitration Abs/cm ASTM D7624* >20 8.5 8.4 8.4	Phosphorus	ppm	ASTM D5185(m)	1370	967	959	948
LithiumppmASTM D5185(m)<1		ppm	()	1500			
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >25 2 2 2 Sodium ppm ASTM D5185(m) >192 2 2 2 Potassium ppm ASTM D5185(m) >20 7 6 5 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >6 0 0 0 Nitration Abs/cm ASTM D7624* >20 8.5 8.4 8.4		ppm	ASTM D5185(m)	3800	3006	3025	2901
Silicon ppm ASTM D5185(m) >25 2 2 2 Sodium ppm ASTM D5185(m) >192 2 2 2 2 Potassium ppm ASTM D5185(m) >20 7 6 5 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >6 0 0 0 Nitration Abs/cm ASTM D7624* >20 8.5 8.4 8.4	Lithium	ppm	ASTM D5185(m)		<1	<1	<1
Sodium ppm ASTM D5185(m) >192 2 2 2 2 Potassium ppm ASTM D5185(m) >20 7 6 5 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >6 0 0 0 Nitration Abs/cm ASTM D7624* >20 8.5 8.4 8.4	CONTAMINANTS		method	limit/base	current	history1	history2
Potassium ppm ASTM D5185(m) >20 7 6 5 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* >6 0 0 0 Nitration Abs/cm ASTM D7624* >20 8.5 8.4 8.4	Silicon	ppm	ASTM D5185(m)	>25			
INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%ASTM D7844*>6000NitrationAbs/cmASTM D7624*>208.58.48.4	Sodium	ppm	ASTM D5185(m)	>192	2		2
Soot % % ASTM D7844* >6 0 0 0 Nitration Abs/cm ASTM D7624* >20 8.5 8.4 8.4	Potassium	ppm	ASTM D5185(m)	>20	7	6	5
Nitration Abs/cm ASTM D7624* >20 8.5 8.4 8.4	INFRA-RED		method	limit/base	current	history1	history2
	Soot %	%	ASTM D7844*	>6	0	0	0
Sulfation Abs/.1mm ASTM D7415* >30 22.4 22.1	Nitration	Abs/cm	ASTM D7624*	>20	8.5	8.4	8.4
	Sulfation	Abs/.1mm	ASTM D7415*	>30	22.4	22.4	22.1



OIL ANALYSIS REPORT





CALA

ISO 17025:2017 Accredited Laboratory

Contact/Location: Sean Malcolm - CITTHU