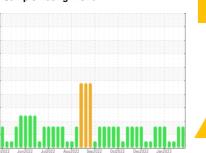


OIL ANALYSIS REPORT

Sample Rating Trend









DIAGNOSIS SAMPLE INFO

A Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor. (Customer Sample Comment: Total oil added 33 gal

Wear

All component wear rates are normal.

Contamination

Fuel content negligible. Elemental level of silicon (Si) above normal.

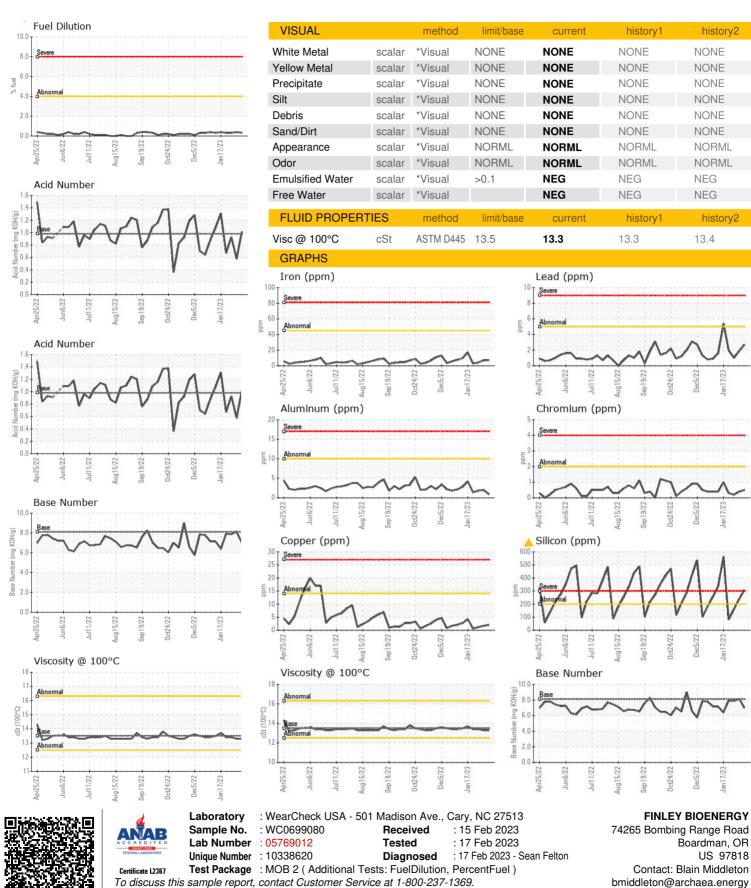
Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

SAMPLE INFORMATION method limit/base current history1 history2 Sample Number Client Info WC0699080 WC0699092 WC0699999 Sample Date Client Info 112F217 112G3 30 Jan 2023 Machine Age hrs Client Info 575 411 240 Dil Changed Client Info N/A N/A N/A N/A Sample Status Method ABNORMAL ABNORMAL ABNORMAL NCMA CONTAMINATION method limit/base current history1 history2 Water WC Method >0.1 NEG NEG NEG Glycol WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM DS1868m >45 7 7 4 Chromium ppm ASTM DS1868m >2 1 1 1 Iritianium	RON CG 40 (GAL)	r2022 Jun20	22 Jul2022 Aug2022	Sep2022 Oct2022 Dec2022 .	Jan2023	
Sample Date	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age	Sample Number		Client Info		WC0699080	WC0699002	WC0698999
Machine Age	Sample Date		Client Info		13 Feb 2023	06 Feb 2023	30 Jan 2023
Dil Changed Client Info N/A ABNORMAL ABNORMAL ABNORMAL ABNORMAL ABNORMAL ABNORMAL ABNORMAL NORMAL	•	hrs	Client Info		112217	112053	111882
ABNORMAL ABNORMAL	Oil Age	hrs	Client Info		575	411	240
ABNORMAL ABNORMAL	Oil Changed		Client Info		N/A	N/A	N/A
Water WC Method >0.1 NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >45 7 7 4 Chromium ppm ASTM D5185m >2 -1 -1 -1 Nickel ppm ASTM D5185m >2 1 1 1 1 Silver ppm ASTM D5185m >2 1 1 -1 <td></td> <td></td> <td></td> <td></td> <th>ABNORMAL</th> <td>ABNORMAL</td> <td>NORMAL</td>					ABNORMAL	ABNORMAL	NORMAL
WEAR METALS	CONTAMINATION	١	method	limit/base	current	history1	history2
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >45 7 7 4 Chromium ppm ASTM D5185m >2 -1 -1 -1 Nickel ppm ASTM D5185m >2 1 1 1 Fitanium ppm ASTM D5185m >5 0 0 0 Aluminum ppm ASTM D5185m >10 -1 2 2 Lead ppm ASTM D5185m >10 -1 2 2 Lead ppm ASTM D5185m >13 5 4 2 Copper ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Barrium ppm ASTM D5185m 0 0 0	Water		WC Method	>0.1	NEG		
Chromium	Glycol		WC Method		NEG	NEG	NEG
Description	WEAR METALS		method	limit/base	current	history1	history2
Nickel	ron	ppm	ASTM D5185m	>45	7	7	4
Description	Chromium	ppm	ASTM D5185m	>2	<1	<1	<1
Saliver	Nickel	ppm	ASTM D5185m	>2	1	1	1
Aluminum ppm ASTM D5185m >10 <1 2 2 2 2 2 2 1 2 2	Titanium	ppm	ASTM D5185m		0	<1	<1
Lead ppm ASTM D5185m >5 3 2 1 Copper ppm ASTM D5185m >14 2 2 1 Fin ppm ASTM D5185m >13 5 4 2 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Barium ppm ASTM D5185m 1 0 0 0 Molybdenum ppm ASTM D5185m 2 2 2 1 Magnesium ppm ASTM D5185m 1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	Silver	ppm	ASTM D5185m	>5	0	0	0
Copper ppm ASTM D5185m >14 2 2 1 Fin ppm ASTM D5185m >13 5 4 2 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Barium ppm ASTM D5185m 1 0 0 0 Molybdenum ppm ASTM D5185m 2 2 2 1 Manganese ppm ASTM D5185m 1 <1	Aluminum	ppm	ASTM D5185m	>10	<1	2	2
Tin	_ead	ppm	ASTM D5185m	>5	3	2	1
Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Barium ppm ASTM D5185m 1 0 0 0 Molybdenum ppm ASTM D5185m 2 2 2 1 Manganese ppm ASTM D5185m 2 2 2 1 Magnesium ppm ASTM D5185m 9 17 16 12 Calcium ppm ASTM D5185m 9 17 16 12 Calcium ppm ASTM D5185m 292 303 284 263 Zinc ppm ASTM D5185m 292 303 328 332 Silicon ppm ASTM D5185m 2575 3638 3824 3406	Copper	ppm	ASTM D5185m	>14	2	2	1
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Barium ppm ASTM D5185m 1 0 0 0 Molybdenum ppm ASTM D5185m 2 2 2 1 Manganese ppm ASTM D5185m 1 <1	Γin	ppm	ASTM D5185m	>13	5	4	2
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 0 Barium ppm ASTM D5185m 1 0 0 0 Molybdenum ppm ASTM D5185m 2 2 2 2 1 Manganese ppm ASTM D5185m 1 <1 <1 <1 <1 Magnesium ppm ASTM D5185m 9 17 16 12 Calcium ppm ASTM D5185m 2712 2966 2934 2760 Phosphorus ppm ASTM D5185m 292 303 284 263 Zinc ppm ASTM D5185m 342 359 328 332 Zinc ppm ASTM D5185m 2575 3638 3824 3406 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 ▲ 308 ▲ 239 162 CONTAMINANTS method limit/base current history1 history2 Sodium ppm ASTM D5185m >20 <1 0 1 Potassium ppm ASTM D5185m >20 <1 0 1 Fuel % ASTM D5185m >20 <1 0 0.3 INFRA-RED method limit/base current history1 history2 Soot % 'ASTM D7844 0.1 0.1 0.1 Nitration Abs/:mm 'ASTM D7415 >30 18.5 17.1 15.7 FLUID DEGRADATION method limit/base current history1 history2 Dxidation Abs/:mm 'ASTM D7415 >30 18.5 17.1 15.7 FLUID DEGRADATION method limit/base current history1 history2 Dxidation Abs/:mm 'ASTM D7414 >25 9.7 8.9 8.1 Acid Number (AN) mg KOH/g ASTM D8045 0.98 1.01 0.575 0.928	/anadium	ppm	ASTM D5185m		0	0	0
Boron ppm ASTM D5185m 0 0 0 0 0 0 0 0 0	Cadmium	ppm	ASTM D5185m		0	0	0
Barium	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 2 2 2 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 <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 <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 <1 <1 <1 <1 <1 <1 <1 <1	Boron	ppm	ASTM D5185m	0	0	0	0
Manganese ppm ASTM D5185m 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 <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 <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 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <td>Barium</td> <td>nnm</td> <td>AOTAL DELOE</td> <td></td> <th>•</th> <td></td> <td></td>	Barium	nnm	AOTAL DELOE		•		
Magnesium ppm ASTM D5185m 9 17 16 12 Calcium ppm ASTM D5185m 2712 2966 2934 2760 Phosphorus ppm ASTM D5185m 292 303 284 263 Zinc ppm ASTM D5185m 342 359 328 332 Sulfur ppm ASTM D5185m 2575 3638 3824 3406 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 308 239 162 Godium ppm ASTM D5185m >20 <1 0 1 Fuel % ASTM D5185m >20 <1 </td <td></td> <td>ppiii</td> <td>ASTM DST85M</td> <td>1</td> <th>U</th> <td>0</td> <td>0</td>		ppiii	ASTM DST85M	1	U	0	0
Calcium ppm ASTM D5185m 2712 2966 2934 2760 Phosphorus ppm ASTM D5185m 292 303 284 263 Zinc ppm ASTM D5185m 342 359 328 332 Sulfur ppm ASTM D5185m 2575 3638 3824 3406 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 308 239 162 Godium ppm ASTM D5185m >20 <1	Molybdenum						
Phosphorus ppm ASTM D5185m 292 303 284 263 Zinc ppm ASTM D5185m 342 359 328 332 Sulfur ppm ASTM D5185m 2575 3638 3824 3406 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 ▲ 308 ▲ 239 162 Sodium ppm ASTM D5185m >20 <1		ppm	ASTM D5185m	2	2	2	1
Zinc ppm ASTM D5185m 342 359 328 332 Sulfur ppm ASTM D5185m 2575 3638 3824 3406 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 308 239 162 Sodium ppm ASTM D5185m 1 <1	Manganese	ppm	ASTM D5185m ASTM D5185m	2	2 <1	2 <1	1 <1
Sulfur ppm ASTM D5185m 2575 3638 3824 3406 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 308 239 162 Sodium ppm ASTM D5185m 1 <1	Manganese Magnesium	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	2 1 9	2 <1 17	2 <1 16	1 <1 12
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 ▲ 308 ▲ 239 162 Sodium ppm ASTM D5185m 1 <1	Manganese Magnesium Calcium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 1 9 2712	2 <1 17 2966	2 <1 16 2934	1 <1 12 2760
Soliticon ppm ASTM D5185m >200 ▲ 308 ▲ 239 162 Sodium ppm ASTM D5185m 1 <1 0 Potassium ppm ASTM D5185m >20 <1 0 1 Fuel % ASTM D3524 >4.0 0.3 0.4 0.3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 4.9 4.6 4.3 Sulfation Abs/.1mm *ASTM D7415 >30 18.5 17.1 15.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 9.7 8.9 8.1 Acid Number (AN) mg KOH/g ASTM D8045 0.98 1.01 0.575 0.928	Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 1 9 2712 292	2 <1 17 2966 303	2 <1 16 2934 284	1 <1 12 2760 263
Sodium ppm ASTM D5185m 1	Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 1 9 2712 292 342	2 <1 17 2966 303 359	2 <1 16 2934 284 328	1 <1 12 2760 263 332
Potassium ppm ASTM D5185m >20 <1 0 1 Fuel % ASTM D3524 >4.0 0.3 0.4 0.3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 4.9 4.6 4.3 Sulfation Abs/.1mm *ASTM D7415 >30 18.5 17.1 15.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 9.7 8.9 8.1 Acid Number (AN) mg KOH/g ASTM D8045 0.98 1.01 0.575 0.928	Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 1 9 2712 292 342 2575	2 <1 17 2966 303 359 3638	2 <1 16 2934 284 328 3824	1 <1 12 2760 263 332 3406
Fuel % ASTM D3524 >4.0 0.3 0.4 0.3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 4.9 4.6 4.3 Sulfation Abs/.1mm *ASTM D7415 >30 18.5 17.1 15.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 9.7 8.9 8.1 Acid Number (AN) mg KOH/g ASTM D8045 0.98 1.01 0.575 0.928	Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method	2 1 9 2712 292 342 2575 limit/base	2 <1 17 2966 303 359 3638 current	2 <1 16 2934 284 328 3824 history1	1 <1 12 2760 263 332 3406 history2
INFRA-RED	Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m	2 1 9 2712 292 342 2575 limit/base	2 <1 17 2966 303 359 3638 current 308	2 <1 16 2934 284 328 3824 history1 239	1 <1 2760 263 332 3406 history2 162
Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 4.9 4.6 4.3 Sulfation Abs/.1mm *ASTM D7415 >30 18.5 17.1 15.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 9.7 8.9 8.1 Acid Number (AN) mg KOH/g ASTM D8045 0.98 1.01 0.575 0.928	Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	2 1 9 2712 292 342 2575 limit/base >200	2 <1 17 2966 303 359 3638 current 308 1	2 <1 16 2934 284 328 3824 history1 239 <1	1 <1 12 2760 263 332 3406 history2 162 0
Nitration Abs/cm *ASTM D7624 >20 4.9 4.6 4.3 Sulfation Abs/.1mm *ASTM D7415 >30 18.5 17.1 15.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 9.7 8.9 8.1 Acid Number (AN) mg KOH/g ASTM D8045 0.98 1.01 0.575 0.928	Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	2 1 9 2712 292 342 2575 limit/base >200	2 <1 17 2966 303 359 3638 current 308 1 <1	2 <1 16 2934 284 328 3824 history1 239 <1 0	1
Nitration Abs/cm *ASTM D7624 >20 4.9 4.6 4.3 Sulfation Abs/.1mm *ASTM D7415 >30 18.5 17.1 15.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 9.7 8.9 8.1 Acid Number (AN) mg KOH/g ASTM D8045 0.98 1.01 0.575 0.928	Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	2 1 9 2712 292 342 2575 limit/base >200 >4.0	2 <1 17 2966 303 359 3638 current 308 1 <1 0.3	2 <1 16 2934 284 328 3824 history1 239 <1 0 0.4	1
Sulfation Abs/.1mm *ASTM D7415 >30 18.5 17.1 15.7 FLUID DEGRADATION method limit/base current history1 history2 Dxidation Abs/.1mm *ASTM D7414 >25 9.7 8.9 8.1 Acid Number (AN) mg KOH/g ASTM D8045 0.98 1.01 0.575 0.928	Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Euel INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D3524	2 1 9 2712 292 342 2575 limit/base >200 >4.0	2 <1 17 2966 303 359 3638 current 308 1 <1 0.3 current	2 <1 16 2934 284 328 3824 history1 239 <1 0 0.4 history1	1
Oxidation Abs/.1mm *ASTM D7414 > 25 9.7 8.9 8.1 Acid Number (AN) mg KOH/g ASTM D8045 0.98 1.01 0.575 0.928	Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844	2 1 9 2712 292 342 2575 limit/base >200 >4.0 limit/base	2 <1 17 2966 303 359 3638 current 308 1 <1 0.3 current 0.1	2 <1 16 2934 284 328 3824 history1 239 <1 0 0.4 history1 0.1	1
Acid Number (AN) mg KOH/g ASTM D8045 0.98 1.01 0.575 0.928	Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D7844 *ASTM D7844	2 1 9 2712 292 342 2575 limit/base >200 >4.0 limit/base	2 <1 17 2966 303 359 3638 current 308 1 <1 0.3 current 0.1 4.9	2 <1 16 2934 284 328 3824 history1 ▲ 239 <1 0 0.4 history1 0.1 4.6	1
Acid Number (AN) mg KOH/g ASTM D8045 0.98 1.01 0.575 0.928	Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7624	2 1 9 2712 292 342 2575 limit/base >200 >4.0 limit/base >20 >30	2 <1 17 2966 303 359 3638 current ▲ 308 1 <1 0.3 current 0.1 4.9 18.5	2 <1 16 2934 284 328 3824 history1 239 <1 0 0.4 history1 0.1 4.6 17.1	1
	Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844 *ASTM D7844	2 1 9 2712 292 342 2575 limit/base >200 >4.0 limit/base >20 >30 limit/base	2	2 <1 16 2934 284 328 3824 history1 ▲ 239 <1 0 0.4 history1 4.6 17.1 history1	1
	Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA Oxidation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D78124 *ASTM D7844 *ASTM D7624 *ASTM D76125 method *ASTM D7415 method *ASTM D7414	2 1 9 2712 292 342 2575 limit/base >200 >4.0 limit/base >20 >30 limit/base	2 <1 17 2966 303 359 3638 current 308 1 <1 0.3 current 4.9 18.5 current 9.7	2 <1 16 2934 284 328 3824 history1	1



OIL ANALYSIS REPORT



* - 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)

T: (541)481-3232