

OIL ANALYSIS REPORT





Sample Rating Trend



DIAGNOSIS

Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor. (Customer Sample Comment: Total oil added 35 gal

Wear

All component wear rates are normal.

Contamination

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

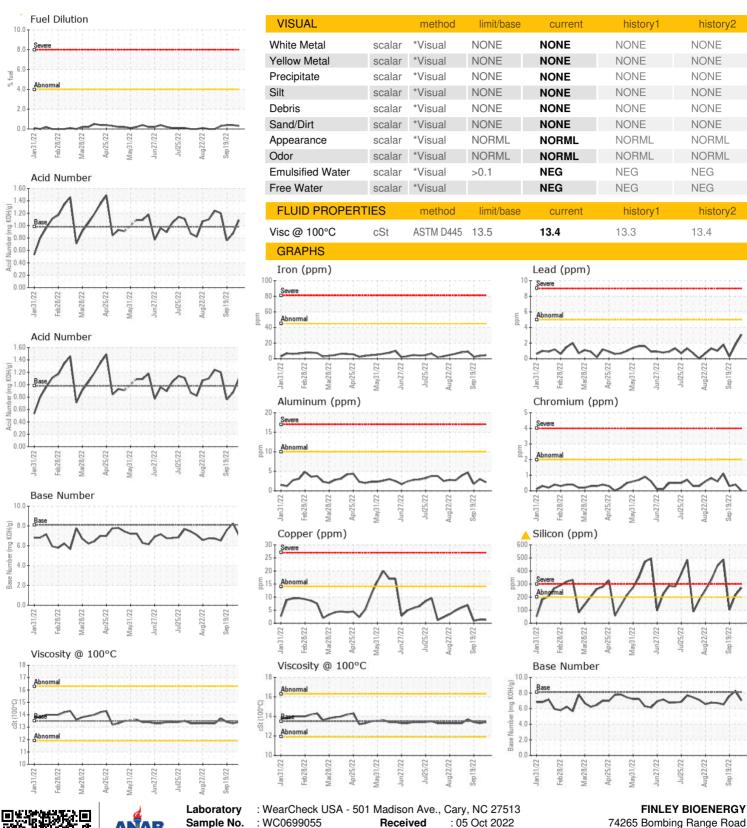
Fluid Condition

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 Date Client Info 03 Oct 2022 27 Sep 2022 19 Sep 2022 10 Sep 30	RON CG 40 (GAL)	n2022 Feb202	2 Mar2022 Apr2022 May	y2022 Jun2022 Jul2022 Aug202	2 Sep2022	
Sample Date	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age	Sample Number		Client Info		WC0699055	WC0697924	WC0697927
Dil Changed	Sample Date		Client Info		03 Oct 2022	27 Sep 2022	19 Sep 2022
Dil Changed Client Info N/A ABNORMAL ABNORMA	Machine Age	hrs	Client Info		109073	108932	108738
ABNORMAL ABNORMAL	Oil Age	hrs	Client Info		454	513	119
CONTAMINATION method limit/base current history1 history2	Oil Changed		Client Info		N/A	Not Changd	N/A
Water WC Method >0.1 NEG NEG NEG Biycol WC Method Imilibase current history1 history2 WEAR METALS method limil/base current history1 history2 Iron ppm ASTM D5185m >45 4 4 2 Chromium ppm ASTM D5185m >2 0 -1 -1 Vickel ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >10 2 3 2 Aluminum ppm ASTM D5185m >10 2 3 2 -1 Aluminum ppm ASTM D5185m >10 2 3 2 -1 Lead ppm ASTM D5185m >14 1 1 1 1 Linin ppm ASTM D5185m >13 4 3 2 -1 Approvation ppm ASTM D5185m	Sample Status				ABNORMAL	ABNORMAL	NORMAL
WEAR METALS	CONTAMINATION	V	method	limit/base	current	history1	history2
WEAR METALS method limit/base current history1 history2 ron ppm ASTM D5185m >45 4 4 2 Chromium ppm ASTM D5185m >2 0 <1	Water		WC Method	>0.1	NEG	NEG	NEG
Chromium	Glycol		WC Method		NEG	NEG	NEG
Description	WEAR METALS		method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >2 1 0 0 0 Fitanium ppm ASTM D5185m 0 0 0 0 Silver ppm ASTM D5185m 0 0 0 0 0 Aluminum ppm ASTM D5185m 0 0 0 0 0 Aluminum ppm ASTM D5185m >10 2 3 2 2 Lead ppm ASTM D5185m >10 2 3 2 2 Lead ppm ASTM D5185m >10 2 3 2 2 Lead ppm ASTM D5185m >10 2 3 2 2 Lead ppm ASTM D5185m >14 1 1 1 1 Fin ppm ASTM D5185m >14 1 1 1 1 Fin ppm ASTM D5185m 0 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 0 ADDITIVES method limit/base current history1 history2 Barium ppm ASTM D5185m 1 0 0 0 0 Barium ppm ASTM D5185m 1 0 0 0 0 Barium ppm ASTM D5185m 1 0 0 0 0 Malanganese ppm ASTM D5185m 2 3 3 1 1 1 Manganese ppm ASTM D5185m 2 1 1 1 15 12 Calcium ppm ASTM D5185m 2 1 1 1 15 12 Calcium ppm ASTM D5185m 2 2 3 3 1 1 1 1 Calcium ppm ASTM D5185m 2 2 2936 3098 2777 Phosphorus ppm ASTM D5185m 292 267 321 261 Zinc ppm ASTM D5185m 292 267 321 261 Zinc ppm ASTM D5185m 2575 3776 4240 3850 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 0 0 1 Fuel % ASTM D5185m >20 0 0 0 0 1 Fuel % ASTM D5185m >20 0 0 0 0 1 Fuel % ASTM D5185m >20 0 0 0 0 0 0 0 Fuel % ASTM D5185m >20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Iron	ppm	ASTM D5185m	>45	4	4	2
Description	Chromium	ppm	ASTM D5185m	>2	0	<1	<1
Silver	Nickel	ppm	ASTM D5185m	>2	1	0	0
Aluminum ppm ASTM D5185m >10 2 3 2 2 2 2 2 2 3 2 2	Titanium	ppm	ASTM D5185m		0	0	0
Lead ppm ASTM D5185m >5 3 2 <1 Copper ppm ASTM D5185m >14 1 1 1 Fin ppm ASTM D5185m >13 4 3 2 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 <1	Silver	ppm	ASTM D5185m		0	0	<1
Copper ppm ASTM D5185m >14 1 1 1 Fin ppm ASTM D5185m >13 4 3 2 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 <1	Aluminum	ppm	ASTM D5185m	>10	2	3	2
Fin	_ead	ppm	ASTM D5185m	>5	3	2	<1
Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 2 Barium ppm ASTM D5185m 1 0 0 0 0 Molybdenum ppm ASTM D5185m 2 3 1 1 1 Manganese ppm ASTM D5185m 9 11 15 12 Magnesium ppm ASTM D5185m 9 11 15 12 Calcium ppm ASTM D5185m 92 267 321 261 Zinc ppm ASTM D5185m 292 267 321 261 Zinc ppm ASTM D5185m 342 320 358 332 Sulfur ppm ASTM D5185m 20 271 217	Copper	ppm	ASTM D5185m	>14	1	1	1
Cadmium ppm ASTM D5185m 0 0 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 2 Barium ppm ASTM D5185m 1 0 0 0 Molybdenum ppm ASTM D5185m 2 3 1 1 Magnesium ppm ASTM D5185m 1 0 <1	Γin	ppm	ASTM D5185m	>13	4	3	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 3 1 1 Manganese ppm ASTM D5185m 1 0 0 <1 <1 Magnesium ppm ASTM D5185m 9 11 15 12 Calcium ppm ASTM D5185m 2712 2936 3098 2777 Phosphorus ppm ASTM D5185m 292 267 321 261 Zinc ppm ASTM D5185m 342 320 358 332 Sulfur ppm ASTM D5185m 2575 3776 4240 3850 CONTAMINANTS method limit/base current history1 history2 Bodium ppm ASTM D5185m >200 ▲ 271 ▲ 217 102 Bodium ppm ASTM D5185m >20 0 0 1 Fuel % ASTM D5185m >20 0 0 1 INFRA-RED method limit/base current history1 history2 Bodi Mastm D5185m >20 0 0 1 Sulfration Abs/.1mm *ASTM D7415 >30 18.6 17.9 17.5 FLUID DEGRADATION method limit/base current history1 history2 Dxidation Abs/.1mm *ASTM D7414 >25 8.9 8.7 9.4 Acid Number (AN) mg KOHg ASTM D8045 0.98 1.09 0.87 0.76	/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	<1
Barium	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 2 3 1 1 Manganese ppm ASTM D5185m 1 0 <1 <1 Magnesium ppm ASTM D5185m 9 11 15 12 Calcium ppm ASTM D5185m 2712 2936 3098 2777 Phosphorus ppm ASTM D5185m 292 267 321 261 Zinc ppm ASTM D5185m 292 267 321 261 Zinc ppm ASTM D5185m 242 320 358 332 Sulfur ppm ASTM D5185m 2575 3776 4240 3850 CONTAMINANTS method limit/base current history1 history2 Bilicon ppm ASTM D5185m >200 271 217 102 Godium ppm ASTM D5185m >20 0 0 1 Fuel % ASTM D5185m	Boron	mag	ASTM D5185m	0	0	0	2
Manganese ppm ASTM D5185m 1 0 <1 <1 Magnesium ppm ASTM D5185m 9 11 15 12 Calcium ppm ASTM D5185m 2712 2936 3098 2777 Phosphorus ppm ASTM D5185m 292 267 321 261 Zinc ppm ASTM D5185m 342 320 358 332 Zinc ppm ASTM D5185m 2575 3776 4240 3850 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 271 217 102 Godium ppm ASTM D5185m >20 0 0 1 Potassium ppm ASTM D5185m >20 0 0 1 Fuel % ASTM D5185m >20 0 0 1 Fuel % ASTM D5185m >20		1-1-					
Magnesium ppm ASTM D5185m 9 11 15 12 Calcium ppm ASTM D5185m 2712 2936 3098 2777 Phosphorus ppm ASTM D5185m 292 267 321 261 Zinc ppm ASTM D5185m 292 3267 328 332 Zinc ppm ASTM D5185m 2575 3776 4240 3850 CONTAMINANTS method limit/base current history1 history2 Sollicon ppm ASTM D5185m >200 271 217 102 Soldium ppm ASTM D5185m >20 0 0 1 Potassium ppm ASTM D5185m >20 0 0 1 Fuel % ASTM D5185m >20 0 0 1 Fuel % ASTM D5185m >20 0 0 1 Fuel % ASTM D5185m >20	Barium				0		0
Calcium ppm ASTM D5185m 2712 2936 3098 2777 Phosphorus ppm ASTM D5185m 292 267 321 261 Zinc ppm ASTM D5185m 342 320 358 332 Sulfur ppm ASTM D5185m 2575 3776 4240 3850 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 271 217 102 Sodium ppm ASTM D5185m >20 0 0 1 Potassium ppm ASTM D5185m >20 0 0 1 Fuel % ASTM D3524 >4.0 0.3 0.4 0.4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 <td></td> <td>ppm</td> <td>ASTM D5185m</td> <td>1</td> <th></th> <td>0</td> <td></td>		ppm	ASTM D5185m	1		0	
Phosphorus ppm ASTM D5185m 292 267 321 261 Zinc ppm ASTM D5185m 342 320 358 332 Sulfur ppm ASTM D5185m 2575 3776 4240 3850 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 271 102 217 102 Sodium ppm ASTM D5185m >20 0 0 1 0 0 1 0 0 1 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 0 0	Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m	1 2	3	0	1
Zinc ppm ASTM D5185m 342 320 358 332 Sulfur ppm ASTM D5185m 2575 3776 4240 3850 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 271 217 102 Sodium ppm ASTM D5185m >20 0 0 1 Potassium ppm ASTM D5185m >20 0 0 1 Fuel % ASTM D5185m >20 0 0 1 Fuel % ASTM D5185m >20 0 0 1 Fuel % ASTM D3524 >4.0 0.3 0.4 0.4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 4.8 4.7 5.0 Sulfation Abs/.1mm *ASTM D7415 >30	Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	1 2 1	3	0 1 <1	1 <1
Sulfur ppm ASTM D5185m 2575 3776 4240 3850 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 271 217 102 Sodium ppm ASTM D5185m <1	Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	1 2 1 9	3 0 11	0 1 <1 15	1 <1 12
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >200 271 217 102 Sodium ppm ASTM D5185m <1	Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	1 2 1 9 2712	3 0 11 2936	0 1 <1 15 3098	1 <1 12 2777
Silicon ppm ASTM D5185m >200 ▲ 271 ▲ 217 102	Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	1 2 1 9 2712 292	3 0 11 2936 267	0 1 <1 15 3098 321	1 <1 12 2777 261
Sodium	Barium Molybdenum 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	1 2 1 9 2712 292 342	3 0 11 2936 267 320	0 1 <1 15 3098 321 358	1 <1 12 2777 261 332
Potassium ppm ASTM D5185m >20 0 0 1 Fuel % ASTM D3524 >4.0 0.3 0.4 0.4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 4.8 4.7 5.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.6 17.9 17.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 8.9 8.7 9.4 Acid Number (AN) mg KOH/g ASTM D8045 0.98 1.09 0.87 0.76	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	1 2 1 9 2712 292 342 2575	3 0 11 2936 267 320 3776	0 1 <1 15 3098 321 358 4240	1 <1 12 2777 261 332 3850
Normal	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	1 2 1 9 2712 292 342 2575 limit/base	3 0 11 2936 267 320 3776	0 1 <1 15 3098 321 358 4240 history1	1 <1 12 2777 261 332 3850 history2
INFRA-RED	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	1 2 1 9 2712 292 342 2575 limit/base	3 0 11 2936 267 320 3776 current ▲ 271	0 1 <1 15 3098 321 358 4240 history1 ▲ 217	1 <1 12 2777 261 332 3850 history2 102
Soot %	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	1 2 1 9 2712 292 342 2575 limit/base >200	3 0 11 2936 267 320 3776 current ▲ 271	0 1 <1 15 3098 321 358 4240 history1 ▲ 217	1 <1 12 2777 261 332 3850 history2 102 0
Nitration Abs/cm *ASTM D7624 >20 4.8 4.7 5.0 Sulfation Abs/.1mm *ASTM D7615 >30 18.6 17.9 17.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 8.9 8.7 9.4 Acid Number (AN) mg KOH/g ASTM D8045 0.98 1.09 0.87 0.76	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	1 2 1 9 2712 292 342 2575 limit/base >200 >20	3 0 11 2936 267 320 3776 current ▲ 271 <1	0 1 <1 15 3098 321 358 4240 history1 ▲ 217 <1 0	1 <1 12 2777 261 332 3850 history2 102 0 1
Sulfation Abs/.1mm *ASTM D7415 >30 18.6 17.9 17.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 8.9 8.7 9.4 Acid Number (AN) mg KOH/g ASTM D8045 0.98 1.09 0.87 0.76	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	1 2 1 9 2712 292 342 2575 limit/base >200 >4.0	3 0 11 2936 267 320 3776 current ▲ 271 <1 0	0 1 <1 15 3098 321 358 4240 history1 ▲ 217 <1 0 0.4	1 <1 12 2777 261 332 3850 history2 102 0 1 0.4
Sulfation Abs/.1mm *ASTM D7415 >30 18.6 17.9 17.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 8.9 8.7 9.4 Acid Number (AN) mg KOH/g ASTM D8045 0.98 1.09 0.87 0.76	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	1 2 1 9 2712 292 342 2575 limit/base >200 >4.0	3 0 11 2936 267 320 3776 current ▲ 271 <1 0 0.3	0 1 <1 15 3098 321 358 4240 history1 ▲ 217 <1 0 0.4 history1	1 <1 12 2777 261 332 3850 history2 102 0 1 0.4 history2
Oxidation Abs/.1mm *ASTM D7414 >25 8.9 8.7 9.4 Acid Number (AN) mg KOH/g ASTM D8045 0.98 1.09 0.87 0.76	Molybdenum 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	1 2 1 9 2712 292 342 2575 limit/base >200 >4.0 limit/base	3 0 11 2936 267 320 3776	0 1 1 15 3098 321 358 4240 history1 △ 217 <1 0 0.4 history1	1
Acid Number (AN) mg KOH/g ASTM D8045 0.98 1.09 0.87 0.76	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m MEthod ASTM D5185m ASTM D7844 *ASTM D7844	1 2 1 9 2712 292 342 2575 limit/base >200	3 0 11 2936 267 320 3776 current ▲ 271 <1 0 0.3 current 0.1 4.8	0 1 <1 15 3098 321 358 4240 history1 ▲ 217 <1 0 0.4 history1 0.1 4.7	1
Acid Number (AN) mg KOH/g ASTM D8045 0.98 1.09 0.87 0.76	Molybdenum 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 Method ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D76145	1 2 1 9 2712 292 342 2575 limit/base >200 >4.0 limit/base >20 >30	3 0 11 2936 267 320 3776 current ▲ 271 <1 0 0.3 current 0.1 4.8 18.6	0 1 <1 15 3098 321 358 4240 history1 ▲ 217 <1 0 0.4 history1 0.1 4.7 17.9	1
, ,	Molybdenum 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 Method ASTM D5185m ASTM D7624 *ASTM D7624 *ASTM D7624 *ASTM D7615 method	1 2 1 9 2712 292 342 2575 limit/base >200 >4.0 limit/base >20 >30 limit/base	3 0 11 2936 267 320 3776 current ▲ 271 <1 0 0.3 current 0.1 4.8 18.6 current	0 1 <1 15 3098 321 358 4240 history1 ▲ 217 <1 0 0.4 history1 0.1 4.7 17.9 history1	1
	Molybdenum 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 D78124 *ASTM D7844 *ASTM D7844	1 2 1 9 2712 292 342 2575 limit/base >200 >4.0 limit/base >20 >30 limit/base >25	3 0 11 2936 267 320 3776 current △ 271 <1 0 0.3 current 0.1 4.8 18.6 current 8.9	0 1 <1 15 3098 321 358 4240 history1 ▲ 217 <1 0 0.4 history1 0.1 4.7 17.9 history1 8.7	1



OIL ANALYSIS REPORT







Sample No. Lab Number **Unique Number** : 10163692

: WC0699055

: 05659123

Tested

: 07 Oct 2022 Diagnosed : 07 Oct 2022 - Don Baldridge

Test Package: MOB 2 (Additional Tests: FuelDilution, PercentFuel) Certificate L2367 To discuss this sample report, contact Customer Service at 1-800-237-1369.

* - 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)

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