

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id

LAKEWOOD (S/N 2038218)

Component Natural Gas Engine Fluid

{not provided} (--- GAL)

DIAGNOSIS

Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor. Please specify the brand, type, and viscosity of the oil on your next sample.

A Wear

The copper level is abnormal. All other component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

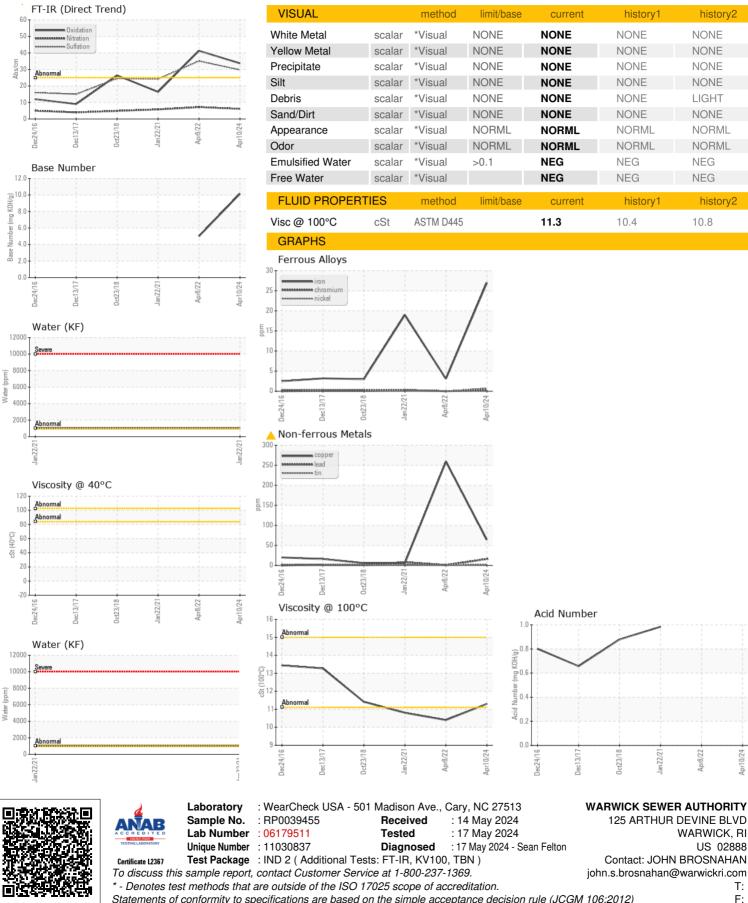
Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Date Image Client Info 10 Apr 2024 08 Apr 2022 22 Jan 2021 Machine Age hrs Client Info 351 347 338 Oil Age hrs Client Info 0 0 0 Oil Changed Client Info N/A N/A N/A N/A Sample Status Client Info N/A MA N/A N/A N/A WEAR METALS method Imit/base current history1 history2 Iron ppm ASTM 05185m >50 27 3 19 Chromium ppm ASTM 05185m >50 21 0 <1 Nickel ppm ASTM 05185m >30 0 <1 16 Lead ppm ASTM 05185m >30 16 <1 8 Copper ppm ASTM 05185m >30 16 <1 0 Vanadium ppm ASTM 05185m 36 64 259 6 </th <th>SAMPLE INFORM</th> <th>ATION</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	SAMPLE INFORM	ATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 351 347 338 Oil Age hrs Client Info 0 0 0 Sample Status Client Info N/A N/A N/A N/A WEAR METALS method limit/base current history1 history2 ron ppm ASTM D5185n >50 27 3 19 Chromium ppm ASTM D5185n >50 27 3 19 Chromium ppm ASTM D5185n >50 27 3 19 Silver ppm ASTM D5185n >50 21 0 <1 Silver ppm ASTM D5185n >30 16 <1 8 Copper ppm ASTM D5185n >4 2 <1 2 Antimony ppm ASTM D5185n <4 2 <1 2 Antimony ppm ASTM D5185n <4 1 0 0 V	Sample Number		Client Info		RP0039455	RP0025683	RP0016535
Oil Age hrs Client Info 0 0 0 Oil Changed Client Info N/A N/A N/A N/A Sample Status n nethod limit/base current history2 Iron ppm ASTM 05185m >50 27 3 19 Chromium ppm ASTM 05185m >4 <1 0 <1 Nickel ppm ASTM 05185m >3 0 <1 <1 Silver ppm ASTM 05185m >3 0 <1 <1 Aduminum ppm ASTM 05185m >3 0 <1 <1 Aduminum ppm ASTM 05185m >3 0 <1 <1 Lead ppm ASTM 05185m >3 0 <1 <1 Artimony ppm ASTM 05185m >3 16 <1 2 Artimony ppm ASTM 05185m >4 2 <1 2 Artimony ppm ASTM 05185m <1 0 0 Cadmium ppm ASTM 05185m <1 0 0 ASTM 05185m <1 0 0 0 ASTM 05185m<	Sample Date		Client Info		10 Apr 2024	08 Apr 2022	22 Jan 2021
Oil ChangedClient InfoN/AN/AN/AN/ASample StatusImage StatusImage StatusImage StatusNormalABNORMALABNORMALNORMALWEAR METALSmethodImage StatusImage StatusSolo27319KronppmASTM D5185m>5027319ChromiumppmASTM D5185m>2<10<1NickelppmASTM D5185m>2<10<1SilverppmASTM D5185m>30<1<1SilverppmASTM D5185m>3016<18CopperppmASTM D5185m>3016<18CopperppmASTM D5185m<42<12AntimonyppmASTM D5185m<1000ADDITIVESmethodImit/basecurrenthistory1history2BoronppmASTM D5185m853100ADDITIVESmethodImit/basecurrenthistory110MagnesiumppmASTM D5185m311919ColdenumppmASTM D5185m311919ColdenumppmASTM D5185m329667332BariumppmASTM D5185m311919ColdenumppmASTM D5185m311919ColdenumppmASTM D5185m329667332	Machine Age	hrs	Client Info		351	347	338
Sample Status method limit/base current history1 history2 Iron ppm ASTM D5185m >50 27 3 19 Chromium ppm ASTM D5185m >4 <1 0 <1 Nickel ppm ASTM D5185m >2 <1 0 <1 Silver ppm ASTM D5185m >2 <1 0 <1 Aluminum ppm ASTM D5185m >3 0 <1 <1 Aluminum ppm ASTM D5185m >3 0 <1 <1 <6 Lead ppm ASTM D5185m >30 16 <1 2 <1 2 Antimony ppm ASTM D5185m >30 16 <1 2 <1 2 Antimony ppm ASTM D5185m <1 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Oil Age	hrs	Client Info		0	0	0
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >50 27 3 19 Chromium ppm ASTM D5185m >4 <1 0 <1 Nickel ppm ASTM D5185m >2 <1 0 <1 Silver ppm ASTM D5185m >3 0 <1 <1 Aluminum ppm ASTM D5185m >3 0 <1 <1 Aluminum ppm ASTM D5185m >3 1 6 <1 8 Copper ppm ASTM D5185m >4 2 <1 2 Antimony ppm ASTM D5185m >4 2 <1 0 0 Addium ppm ASTM D5185m <53 10 0 0 Codedmium ppm ASTM D5185m <1 0 0 0 Magnaese ppm ASTM D5185m 329 <td>Oil Changed</td> <td></td> <td>Client Info</td> <td></td> <th>N/A</th> <td>N/A</td> <td>N/A</td>	Oil Changed		Client Info		N/A	N/A	N/A
Iron ppm ASTM D5185m >50 27 3 19 Chromium ppm ASTM D5185m >4 <1 0 <1 Nickel ppm ASTM D5185m >2 <1 0 <1 Silver ppm ASTM D5185m >2 <1 0 <1 Silver ppm ASTM D5185m >3 0 <1 <1 Aluminum ppm ASTM D5185m >3 0 <1 <1 Aluminum ppm ASTM D5185m >30 16 <1 8 Copper ppm ASTM D5185m >4 2 <1 0 0 Vanadium ppm ASTM D5185m <1 0 0 0 Astmony ppm ASTM D5185m <1 0 0 0 Vanadium ppm ASTM D5185m <1 0 0 0 Cadmium ppm ASTM D5185m <1 0	Sample Status				ABNORMAL	ABNORMAL	NORMAL
Chromium ppm ASTM D5185m >4 <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >2 <1	Iron	ppm	ASTM D5185m	>50	27	3	19
Titanium ppm ASTM D5185m <1	Chromium	ppm	ASTM D5185m	>4	<1	0	<1
Silver ppm ASTM D5185m >3 0 <1	Nickel	ppm	ASTM D5185m	>2	<1	0	<1
Aluminum ppm ASTM D5185m >9 3 1 6 Lead ppm ASTM D5185m >30 16 <1 8 Copper ppm ASTM D5185m >35 64 259 6 Tin ppm ASTM D5185m >4 2 <1 2 Antimony ppm ASTM D5185m 0 Vanadium pm ASTM D5185m <1 0 0 Cadmium ppm ASTM D5185m <1 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m <1 0 0 0 Magnese ppm ASTM D5185m <11 0 0 0 Magnesium ppm ASTM D5185m <11 0 0 0 Colacium ppm ASTM D5185m 311 9 19 19 Calcium <td< th=""><td>Titanium</td><td>ppm</td><td>ASTM D5185m</td><td></td><th><1</th><td>0</td><td><1</td></td<>	Titanium	ppm	ASTM D5185m		<1	0	<1
Lead ppm ASTM D5185m >30 16 <1	Silver	ppm	ASTM D5185m	>3	0	<1	<1
Copper ppm ASTM D5185m >35 64 259 6 Tin ppm ASTM D5185m >4 2 <1 2 Antimony ppm ASTM D5185m 0 0 Vanadium ppm ASTM D5185m <1 0 0 Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 8 53 10 Magnese ppm ASTM D5185m 60 11 3 Magnesium ppm ASTM D5185m 2 <1 2 Magnesium ppm ASTM D5185m 311 9 19 Calcium ppm ASTM D5185m 3229 667 3322 Zinc ppm ASTM D5185m 3229 667 3322 Silicon ppm ASTM D5185m >20 2 1<	Aluminum	ppm	ASTM D5185m	>9	3	1	6
Tin ppm ASTM D5185m >4 2 <1	Lead	ppm	ASTM D5185m	>30	16	<1	8
Tin ppm ASTM D5185m >4 2 <1	Copper	ppm	ASTM D5185m	>35	<u> </u>	A 259	6
Vanadium ppm ASTM D5185m <1	Tin	ppm	ASTM D5185m	>4	2	<1	2
Cadmium ppm ASTM D5185m <1	Antimony	ppm	ASTM D5185m				0
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 8 53 10 Barium ppm ASTM D5185m 60 11 3 Manganese ppm ASTM D5185m 60 11 3 Manganese ppm ASTM D5185m 2 <1 2 Magnesium ppm ASTM D5185m 311 9 19 Calcium ppm ASTM D5185m 329 667 332 Zinc ppm ASTM D5185m 329 667 332 Zinc ppm ASTM D5185m 329 667 332 Silicon ppm ASTM D5185m 388 468 377 Sodium ppm ASTM D5185m >+100 16 4 16 Sodium ppm ASTM D5185m >20 2 1 2 Water % ASTM D6304 >0.1 NEG <td< th=""><td>Vanadium</td><td>ppm</td><td>ASTM D5185m</td><td></td><th><1</th><td>0</td><td>0</td></td<>	Vanadium	ppm	ASTM D5185m		<1	0	0
Boron ppm ASTM D5185m 8 53 10 Barium ppm ASTM D5185m <1 0 0 Molybdenum ppm ASTM D5185m 60 11 3 Manganese ppm ASTM D5185m 60 11 3 Magnesium ppm ASTM D5185m 2 <1 2 Magnesium ppm ASTM D5185m 311 9 19 Calcium ppm ASTM D5185m 329 667 332 Zinc ppm ASTM D5185m 388 468 377 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+100 16 4 16 Sodium ppm ASTM D5185m >20 2 1 2 Water % ASTM D6304 >0.1 NEG 0.101 ppm Water pp ASTM D7624 >20 6.1	Cadmium	ppm	ASTM D5185m		<1	0	0
Barium ppm ASTM D5185m <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 11 3 Manganese ppm ASTM D5185m 2 <1 2 Magnesium ppm ASTM D5185m 311 9 19 Calcium ppm ASTM D5185m 32614 1638 2919 Phosphorus ppm ASTM D5185m 329 667 332 Zinc ppm ASTM D5185m 388 468 377 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+100 16 4 16 Sodium ppm ASTM D5185m >20 2 1 2 Water % ASTM D5185m >20 2 1 2 Water ppm ASTM D5185m >20 2 1 101 INFRA-RED method limit/base current history1 history2 Soot % % <td< th=""><td>Boron</td><td>ppm</td><td>ASTM D5185m</td><td></td><th>8</th><td>53</td><td>10</td></td<>	Boron	ppm	ASTM D5185m		8	53	10
Manganese ppm ASTM D5185m 2 <1	Barium	ppm	ASTM D5185m		<1	0	0
Magnesium ppm ASTM D5185m 311 9 19 Calcium ppm ASTM D5185m 2614 1638 2919 Phosphorus ppm ASTM D5185m 329 667 332 Zinc ppm ASTM D5185m 388 468 377 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+100 16 4 16 Sodium ppm ASTM D5185m >+100 16 4 16 Sodium ppm ASTM D5185m >20 2 1 2 Water % ASTM D6304 >0.1 NEG 0.101 ppm Water ppm ASTM D7844 0.1 0.1 0.1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 0.1 Nitration Abs	Molybdenum	ppm	ASTM D5185m		60	11	3
Calcium ppm ASTM D5185m 2614 1638 2919 Phosphorus ppm ASTM D5185m 329 667 332 Zinc ppm ASTM D5185m 388 468 377 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+100 16 4 16 Sodium ppm ASTM D5185m >+100 16 4 16 Sodium ppm ASTM D5185m >+100 16 4 16 Sodium ppm ASTM D5185m >20 2 1 2 Water % ASTM D6304 >0.1 NEG 0.101 ppm Water ppm ASTM D7844 0.1 0.1 0.1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 0.1 Nitration </th <td>Manganese</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <th>2</th> <td><1</td> <td>2</td>	Manganese	ppm	ASTM D5185m		2	<1	2
Phosphorus ppm ASTM D5185m 329 667 332 Zinc ppm ASTM D5185m 388 468 377 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+100 16 4 16 Sodium ppm ASTM D5185m >+100 16 4 16 Sodium ppm ASTM D5185m >+100 16 4 16 Sodium ppm ASTM D5185m >20 2 1 2 Water % ASTM D6304 >0.1 NEG NEG 0.101 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/.mm *ASTM D7415 >30 29.7 35.1 24.2 FLUID DEGRADATION method limit/base current history1 <thistor< th=""><td>Magnesium</td><td>ppm</td><td>ASTM D5185m</td><td></td><th>311</th><td>9</td><td>19</td></thistor<>	Magnesium	ppm	ASTM D5185m		311	9	19
Zinc ppm ASTM D5185m 388 468 377 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+100 16 4 16 Sodium ppm ASTM D5185m >+100 16 4 16 Sodium ppm ASTM D5185m >20 2 1 2 Potassium ppm ASTM D5185m >20 2 1 2 Water % ASTM D6304 >0.1 NEG NEG 0.101 ppm Water ppm ASTM D6304 >1000 1010 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 6.1 7.2 5.8 Sulfation Abs/.tmm *ASTM D7415 >30 29.7 35.1 24.2 FLUID DEGRADATION method limit/base current <td>Calcium</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <th>2614</th> <td>1638</td> <td>2919</td>	Calcium	ppm	ASTM D5185m		2614	1638	2919
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+100 16 4 16 Sodium ppm ASTM D5185m >+100 16 4 16 Sodium ppm ASTM D5185m >20 2 1 2 Potassium ppm ASTM D5185m >20 2 1 2 Water % ASTM D6304 >0.1 NEG NEG 0.101 ppm Water ppm ASTM D6304 >1000 1010 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 6.1 7.2 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 29.7 35.1 24.2 FLUID DEGRADATION method limit/base curr	Phosphorus	ppm	ASTM D5185m		329	667	332
Silicon ppm ASTM D5185m >+100 16 4 16 Sodium ppm ASTM D5185m >20 5 0 5 Potassium ppm ASTM D5185m >20 2 1 2 Water % ASTM D6304 >0.1 NEG NEG 0.101 ppm Water ppm ASTM D6304 >1000 1010 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/.cm *ASTM D7624 >20 6.1 7.2 5.8 Sulfation Abs/.tmm *ASTM D7415 >30 29.7 35.1 24.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.tmm *ASTM D7414 >25 33.7 41.3 16.4 Acid Number (AN) mg KOH/g ASTM D8045 </th <td>Zinc</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <th>388</th> <td>468</td> <td>377</td>	Zinc	ppm	ASTM D5185m		388	468	377
Sodium ppm ASTM D5185m 5 0 5 Potassium ppm ASTM D5185m >20 2 1 2 Water % ASTM D6304 >0.1 NEG NEG 0.101 ppm Water ppm ASTM D6304 >1000 1010 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 6.1 7.2 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 29.7 35.1 24.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 33.7 41.3 16.4 Acid Number (AN) mg KOH/g ASTM D8045 0.984	CONTAMINANTS		method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 2 1 2 Water % ASTM D6304 >0.1 NEG NEG 0.101 ppm Water ppm ASTM D6304 >1000 1010 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 6.1 7.2 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 29.7 35.1 24.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 33.7 41.3 16.4 Acid Number (AN) mg KOH/g ASTM D8045 0.984	Silicon	ppm	ASTM D5185m	>+100	16	4	16
Water % ASTM D6304 >0.1 NEG NEG 0.101 ppm Water ppm ASTM D6304 >1000 1010 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 6.1 7.2 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 29.7 35.1 24.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 33.7 41.3 16.4 Acid Number (AN) mg KOH/g ASTM D8045 0.984	Sodium	ppm	ASTM D5185m		5	0	5
ppm Water ppm ASTM D6304 >1000 1010 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 6.1 7.2 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 29.7 35.1 24.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 33.7 41.3 16.4 Acid Number (AN) mg KOH/g ASTM D8045 0.984	Potassium	ppm	ASTM D5185m	>20	2	1	2
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 6.1 7.2 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 29.7 35.1 24.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 33.7 41.3 16.4 Acid Number (AN) mg KOH/g ASTM D8045 0.984	Water	%	ASTM D6304	>0.1	NEG	NEG	0.101
Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 6.1 7.2 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 29.7 35.1 24.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 33.7 41.3 16.4 Acid Number (AN) mg KOH/g ASTM D8045 0.984	ppm Water	ppm	ASTM D6304	>1000			1010
Nitration Abs/cm *ASTM D7624 >20 6.1 7.2 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 29.7 35.1 24.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 33.7 41.3 16.4 Acid Number (AN) mg KOH/g ASTM D8045 0.984	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 29.7 35.1 24.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 33.7 41.3 16.4 Acid Number (AN) mg KOH/g ASTM D8045 0.984	Soot %	%	*ASTM D7844		0.1	0.1	0.1
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 33.7 41.3 16.4 Acid Number (AN) mg KOH/g ASTM D8045 0.984	Nitration	Abs/cm	*ASTM D7624	>20	6.1	7.2	5.8
Oxidation Abs/.1mm *ASTM D7414 >25 33.7 41.3 16.4 Acid Number (AN) mg KOH/g ASTM D8045 0.984	Sulfation	Abs/.1mm	*ASTM D7415	>30	29.7	35.1	24.2
Acid Number (AN) mg KOH/g ASTM D8045 0.984	FLUID DEGRADA	TION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	33.7	41.3	16.4
	Acid Number (AN)	mg KOH/g	ASTM D8045				0.984
	Base Number (BN)	mg KOH/g	ASTM D2896		10.14	5.01	



OIL ANALYSIS REPORT



Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Report Id: WARWARRI [WUSCAR] 06179511 (Generated: 05/17/2024 10:08:54) Rev: 1

Contact/Location: JOHN BROSNAHAN - WARWARRI

10/24