

COOLANT REPORT

Area Machine Id Coolant - Port Main Engine (Aftercooler) Coolant Fluid CATERPILLAR ELC (--- GAL)

DIAGNOSIS

Recommendation

No corrective action is recommended at this time. The fluid is suitable for further service.

Corrosion

All metal levels are normal indicating no corrosion in the cooling system.

Contaminants

There is no indication of any contamination in the coolant.

Coolant Condition

Carboxylate test failed. Glycol and nitrite levels are acceptable. The pH level of this fluid is within the acceptable limits.

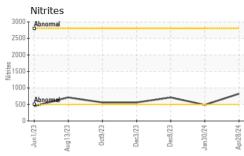
SAMPLE INFORMATIONmethodlimit/basecurrenthistory1history2Sample NumberClient Info28 Apr 202430 Jan 202480 Dec 2023Machine AgehrsClient Info95000Oil AgehrsClient Info95000Oil AgehrsClient Info95000Oil AgehrsClient InfoN/AN/AN/ASample StatusImil/basecurrenthistory1history2Glycol TypeFT-IRSpecific GravityYASTM D12878.398.609.011NitritesppmAP-053:2009824488712Percentage Glycol%ASTM D12878.398.609.011NitritesppmAP-053:2009824488712Percentage Glycol%ASTM D1281Percentage Glycol%ASTM D321-24-9-13Total Dissolved SolidsImit/basecurrenthistory1history2SiliconppmASTM D61300000PhosphorusppmASTM D613000-12BoronppmASTM D613000-1-1PhosphorusppmASTM D6130-100-1-1IconppmASTM D6130-100-1-1CorrectionppmASTM D6130-100-			Jun2023	Aug2023 Oct2023	Dec2023 Dec2023 Jan2024	Apr2024	
Sample Date Client Info 28 Apr 2024 30 Jan 2024 08 Dec 2023 Machine Age hrs Client Info 950 39417 38606 Oil Age hrs Client Info 950 0 0 0 Oil Changed Client Info N/A N/A N/A N/A Sample Status Imil/base current history1 history2 Glycol Type FT-IR Specific Gravity 'ASTM D1287 8.39 8.60 9.01 Nitrites ppm AP-0532009 824 488 712 Reserve Alkalinity Scale 0.41 ASTM D1287 45.2 38.4 40.6 Freezing Point °F ASTM D3321 45.2 38.4 40.6 Freezing Point °F ASTM D3321 273.0 243.0 242.0 Carboxylate fail fail fail fail fail CORROSION INHIBITORS method imil/base current <th>SAMPLE INFORM</th> <th>IATION</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Machine AgehrsClient Info9503941738606Oil AgehrsClient Info95000Oil ChangedClient InfoN/AN/AN/ASample StatusIImilibasecurrenthistory1history2Glycol TypeFT-IRSpecific GravityYASTM D12878.398.609.01NitritesppmAP-053:2009824488712Reserve AlkalinityScde 0:0'ASTM D12878.398.609.01NitritesppmAP-053:2009824488712Reserve AlkalinityScde 0:0'ASTM D12878.398.609.01Percentage Glycol%ASTM D32145.238.440.6Freezing Point°FASTM D3321-24-9-13Total Dissolved SolidsImilibasecurrenthistory1history2SiliconppmASTM D613002<14PhosphorusppmASTM D61300000MolybdenumppmASTM D6130950667494519CORROSIONmethodimil/basecurrenthistory1history2IronppmASTM D6130>100<1<<1CORROSIONppmASTM D6130>100<1<<1CorrentppmASTM D6130>100<1<<1Correntppm <td< th=""><th>Sample Number</th><th></th><th>Client Info</th><th></th><th>WC0874766</th><th>WC0804840</th><th>WC0859791</th></td<>	Sample Number		Client Info		WC0874766	WC0804840	WC0859791
Oil Age hrs Client Info 950 0 0 Oil Changed Client Info N/A N/A N/A N/A Sample Status Imit/base current history1 ABNORMAL PHYSICAL TEST RESULTS method imit/base current history1 history2 Glycol Type FT-IR Spedific Gravity ASTM D1287 8.39 8.60 9.01 1.055 pH Scale014 ASTM D1287 8.39 8.60 9.01 Reserve Alkalinity Scale020 'ASTM D1321 Precentage Glycol % ASTM D3321 45.2 38.4 40.6 Freezing Point °F ASTM D3321 -24 -9 -13 Total Dissolved Solids Imit/base current history1 history2 Silicon ppm ASTM D6130 0 0 -1 2	Sample Date		Client Info		28 Apr 2024	30 Jan 2024	08 Dec 2023
Oil Changed Sample StatusClient InfoN/AN/AN/ASample StatusClient InfoNORMALNORMALABNORMALPHYSICAL TEST RESULTSmethodimil/basecurrenthistory1history2Glycol TypeFT-IRSpecific Gravity'ASTM D12881.0611.0521.055pHScale014ASTM D12878.398.609.01NitritesppmAP.053:2009824488712Reserve AlkalinityScale02'ASTM D1321Percentage Glycol%ASTM D032145.238.440.6Freezing Point°FASTM D0321-24-9-13Total Dissolved SolidsfailfailfailCORROSION INHUBITORSmethodimit/basecurrenthistory1history2SiliconppmASTM D613000<12SoronppmASTM D61300000MolybdenumppmASTM D6130950667494519CORROSIONmethodimit/basecurrenthistory1history2IronppmASTM D6130>100<1<1CopperppmASTM D6130100<1<1LopperppmASTM D613010000ColopperppmASTM D61301001<1Ir	Machine Age	hrs	Client Info		950	39417	38606
Sample Status Image Status NORMAL NORMAL ABNORMAL PHYSICAL TEST RESULTS method imit/base current history1 history2 Glycol Type FT-IR Specific Gravity 'ASTM D128 1.061 1.052 1.055 pH Scale014 ASTM D1287 8.39 8.60 9.01 Nitrites ppm AP-053:2009 824 488 712 Reserve Alkalinity Scale020 'ASTM D1281 Percentage Glycol % ASTM D3221 -24 -9 -13 Total Dissolved Solids Imit/base current history1 history2 Carboxylate Fail fail fail fail fail Dissolved Solids ppm ASTM D6130 0 2 -1 4 Phosphorus ppm ASTM D6130 0 0 -1 2 Soron ppm ASTM D61	Oil Age	hrs	Client Info		950	0	0
PHYSICAL TEST RESULTS method limit/base current history1 history2 Glycol Type FT-IR Specific Gravity 'ASTM D1298 1.061 1.052 1.055 pH Scale 0.14 ASTM D1287 8.39 8.60 9.01 Nitrites ppm AP-053.2009 824 488 712 Reserve Alkalinity Scale 0.20 'ASTM D1287 Percentage Glycol % ASTM D321 45.2 38.4 40.6 Freezing Point °F ASTM D321 -24 -9 -13 Total Dissolved Solids	Oil Changed		Client Info		N/A	N/A	N/A
Glycol Type FT-IR Specific Gravity 'ASTM D1298 1.061 1.052 1.055 pH Scale 0.14 ASTM D1287 8.39 8.60 9.01 Nitrites ppm AP-058:2009 824 488 712 Reserve Alkalinity Scale 0.20 'ASTM D121 Percentage Glycol % ASTM D3321 45.2 38.4 40.6 Freezing Point °F ASTM D3321 424 -9 -13 Total Dissolved Solids Second 243.0 242.0 fail fail fail CORROSION INHIBITORS method Imit/base current history1 history2 Silicon ppm ASTM D6130 0 Q -1 2 Soron ppm ASTM D6130 0 Q -1 2 CORROSION method limit/base current history1 history2 Iron ppm ASTM D6130	Sample Status				NORMAL	NORMAL	ABNORMAL
Specific Gravity 'ASTM D1298 1.061 1.052 1.055 pH Scale 0.14 ASTM D1287 8.39 8.60 9.01 Nitrites ppm AP-053:2009 824 488 712 Reserve Alkalinity Scale 0.20 'ASTM D121 Percentage Glycol % ASTM D3321 45.2 38.4 40.6 Freezing Point °F ASTM D3321 -24 -9 -13 Total Dissolved Solids	PHYSICAL TEST R	ESULTS	method	limit/base	current	history1	history2
pH Scale 0-14 ASTM D1287 8.39 8.60 9.01 Nitrites ppm AP-053:2009 824 488 712 Reserve Alkalinity Scale 0:20 'ASTM D1121 Percentage Glycol % ASTM D3321 45.2 38.4 40.6 Freezing Point °F ASTM D3321 -24 -9 -13 Total Dissolved Solids	Glycol Type		FT-IR				
Nitrites ppm AP-053:2009 824 488 712 Reserve Alkalinity Scale 0.20 'ASTM D1121 Percentage Glycol % ASTM D3321 45.2 38.4 40.6 Freezing Point °F ASTM D3321 -24 -9 -13 Total Dissolved Solids 2773.0 243.0 242.0 Carboxylate fail fail fail fail CORROSION INHIBITORS method limit/base current history1 history2 Silicon ppm ASTM D6130 0 2 <1 4 Phosphorus ppm ASTM D6130 0 0 0 0 Boron ppm ASTM D6130 950 667 494 519 CORROSION method limit/base current history1 history2 Iron ppm ASTM D6130 >10 0 <1 1 Copper	Specific Gravity		*ASTM D1298		1.061	1.052	1.055
Reserve Alkalinity Scale 0.20 *ASTM D1121 Percentage Glycol % ASTM D3321 45.2 38.4 40.6 Freezing Point °F ASTM D3321 -24 -9 -13 Total Dissolved Solids 273.0 243.0 242.0 Carboxylate fail fail fail fail CORROSION INHIBITORS method limit/base current history1 history2 Silicon ppm ASTM D6130 0 0 <1 2 Boron ppm ASTM D6130 0 0 0 0 0 CORROSION ppm ASTM D6130 0 0 0 0 0 Boron ppm ASTM D6130 0 0 0 0 0 CORROSION method limit/base current history1 history2 Iron ppm ASTM D6130 >10 0 <1 1 Lead	рН	Scale 0-14	ASTM D1287		8.39	8.60	9.01
Percentage Glycol % ASTM D3321 45.2 38.4 40.6 Freezing Point °F ASTM D3321 -24 -9 -13 Total Dissolved Solids 273.0 243.0 242.0 Carboxylate fail fail fail fail CORROSION INHIBITORS method limit/base current history1 history2 Silicon ppm ASTM D6130 0 2 <1 4 Phosphorus ppm ASTM D6130 0 0 0 0 Boron ppm ASTM D6130 0 0 0 0 0 CORROSION ppm ASTM D6130 950 6677 494 519 Cons ppm ASTM D6130 >10 0 <1 <1 Copper ppm ASTM D6130 >10 0 <1 <1 Lead ppm ASTM D6130 >10 0 <1 1 Zinc ppm	Nitrites	ppm	AP-053:2009		824	488	712
Freezing Point °F ASTM D3321 -24 -9 -13 Total Dissolved Solids Image: Solids 273.0 243.0 242.0 Carboxylate fail fail fail fail fail CORROSION INHIBITORS method limit/base current history1 history2 Silicon ppm ASTM D6130 0 2 <1 4 Phosphorus ppm ASTM D6130 0 0 0 1 2 Boron ppm ASTM D6130 0 0 0 0 0 Molybdenum ppm ASTM D6130 950 667 494 519 CORROSION method limit/base current history1 history2 Iron ppm ASTM D6130 >10 0 <1 <1 Copper ppm ASTM D6130 >10 0 <1 <1 Lead ppm ASTM D6130 >10 0 0 </th <th>Reserve Alkalinity</th> <th>Scale 0-20</th> <th>*ASTM D1121</th> <th></th> <th></th> <th></th> <th></th>	Reserve Alkalinity	Scale 0-20	*ASTM D1121				
Total Dissolved Solids Image: Correct science	Percentage Glycol	%	ASTM D3321		45.2	38.4	40.6
Carboxylate fail	Freezing Point	°F	ASTM D3321		-24	-9	-13
CORROSION INHIBITORSmethodlimit/basecurrenthistory1history2SiliconppmASTM D613002<14PhosphorusppmASTM D613000<12BoronppmASTM D61300000MolybdenumppmASTM D6130950667494519CORROSIONmethodlimit/basecurrenthistory1history2IronppmASTM D6130>15088AluminumppmASTM D6130>100<1<1CopperppmASTM D6130>100<1<1LeadppmASTM D6130>100<1<1TinppmASTM D6130>100000CONTAMINANTSmethodlimit/basecurrenthistory1history2ChlorineppmASTM D6130978CARRIER SALTSmethodlimit/basecurrenthistory1history2SodiumppmASTM D6130403231713248PotassiumppmASTM D61301485SCALE POTENTI-Lmethodlimit/basecurrenthistory1history2CalciumppmASTM D61306522	Total Dissolved Solids				273.0	243.0	242.0
Silicon ppm ASTM D6130 0 2 <1	Carboxylate				fail	fail	fail
Phosphorus ppm ASTM D6130 0 0 <1	CORROSION INH	IBITORS	method	limit/base	current	history1	history2
BoronppmASTM D61300000MolybdenumppmASTM D61309506677494519CORROSIONmethodlimit/basecurrenthistory1history2IronppmASTM D6130>15088AluminumppmASTM D6130>100<1	Silicon	ppm	ASTM D6130	0	2	<1	4
MolybdenumppmASTM D6130950667494519CORROSIONmethodlimit/basecurrenthistory1history2IronppmASTM D6130>15088AluminumppmASTM D6130>100<1<1CopperppmASTM D6130>100<1<1LeadppmASTM D6130>100<1<1LeadppmASTM D6130>100<1<1ZincppmASTM D6130>10000CONTAMINANTSmethodlimit/basecurrenthistory1history2ChlorineppmASTM D6130978CARRIER SALTSmethodlimit/basecurrenthistory1history2SodiumppmASTM D6130403231713248PotassiumppmASTM D61301485SCALE POTENTIALmethodlimit/basecurrenthistory1history2CalciumppmASTM D61306522	Phosphorus	ppm	ASTM D6130	0	0	<1	2
CORROSIONmethodlimit/basecurrenthistory1history2IronppmASTM D6130>15088AluminumppmASTM D6130>100<1<1CopperppmASTM D6130>100<1<1LeadppmASTM D6130>100<1<1LeadppmASTM D6130>100<1<1TinppmASTM D6130>10001ZincppmASTM D6130>10000CONTAMINANTSmethodlimit/basecurrenthistory1history2ChlorineppmASTM D6130978CARRIER SALTSmethodlimit/basecurrenthistory13248PotassiumppmASTM D61301485SCALE POTENTIALmethodlimit/basecurrenthistory1history2CalciumppmASTM D6130652	Boron	ppm	ASTM D6130	0	0	0	0
Iron ppm ASTM D6130 >15 0 8 8 Aluminum ppm ASTM D6130 >10 0 <1 <1 Copper ppm ASTM D6130 >10 0 <1 <1 Lead ppm ASTM D6130 >10 0 <1 <1 Tin ppm ASTM D6130 >10 0 0 0 0 Zinc ppm ASTM D6130 <0 0 0 0 0 CONTAMINANTS method limit/base current history1 history2 Chlorine ppm ASTM D6130 4032 3171 3248 Potassium ppm ASTM D6130 14 8 5 <th>Molybdenum</th> <th>ppm</th> <th>ASTM D6130</th> <th>950</th> <th>667</th> <th>494</th> <th>519</th>	Molybdenum	ppm	ASTM D6130	950	667	494	519
Aluminum ppm ASTM D6130 >10 0 <1	CORROSION		method	limit/base	current	history1	history2
Copper ppm ASTM D6130 >10 0 <1	Iron	ppm		>15	0	8	8
Lead ppm ASTM D6130 >10 0 <1	Aluminum	ppm	ASTM D6130	>10	0	<1	<1
TinppmASTM D6130<>10001ZincppmASTM D61300000CONTAMINANTSmethodlimit/basecurrenthistory1history2ChlorineppmASTM D6130978CARRIER SALTSmethodlimit/basecurrenthistory1history2SodiumppmASTM D6130403231713248PotassiumppmASTM D61301485SCALE POTENTIALmethodlimit/basecurrenthistory1history2CalciumppmASTM D6130652	Copper	ppm	ASTM D6130	>10	0	<1	<1
ZincppmASTM D613000CONTAMINANTSmethodlimit/basecurrenthistory1history2ChlorineppmASTM D6130978CARRIER SALTSmethodlimit/basecurrenthistory1history2SodiumppmASTM D6130403231713248PotassiumppmASTM D61301485SCALE POTENTIALmethodlimit/basecurrenthistory1history2CalciumppmASTM D6130652	Lead	ppm	ASTM D6130	>10	0	<1	<1
CONTAMINANTSmethodlimit/basecurrenthistory1history2ChlorineppmASTM D6130978CARRIER SALTSmethodlimit/basecurrenthistory1history2SodiumppmASTM D6130403231713248PotassiumppmASTM D61301485SCALE POTENTIALmethodlimit/basecurrenthistory1history2CalciumppmASTM D6130652	Tin	ppm	ASTM D6130	>10	0	0	1
ChlorineppmASTM D6130978CARRIER SALTSmethodlimit/basecurrenthistory1history2SodiumppmASTM D6130403231713248PotassiumppmASTM D61301485SCALE POTENTIALmethodlimit/basecurrenthistory1history2CalciumppmASTM D6130652	Zinc	ppm	ASTM D6130		0	0	0
CARRIER SALTSmethodlimit/basecurrenthistory1history2SodiumppmASTM D6130403231713248PotassiumppmASTM D61301485SCALE POTENTIALmethodlimit/basecurrenthistory1history2CalciumppmASTM D6130652	CONTAMINANTS		method	limit/base	current	history1	history2
SodiumppmASTM D6130403231713248PotassiumppmASTM D61301485SCALE POTENTIALmethodlimit/basecurrenthistory1history2CalciumppmASTM D6130652	Chlorine	ppm	ASTM D6130		9	7	8
PotassiumppmASTM D61301485SCALE POTENTIALmethodlimit/basecurrenthistory1history2CalciumppmASTM D6130652	CARRIER SALTS		method	limit/base	current	history1	history2
SCALE POTENTIAL method limit/base current history1 history2 Calcium ppm ASTM D6130 6 5 2	Sodium	ppm	ASTM D6130		4032	3171	3248
Calcium ppm ASTM D6130 6 5 2	Potassium	ppm	ASTM D6130		14	8	5
	SCALE POTENTI	AL	method	limit/base	current	history1	history2
Magnesium ppm ASTM D6130 2 <1	Calcium	ppm	ASTM D6130		6	5	2
	Magnesium	ppm	ASTM D6130		2	<1	1

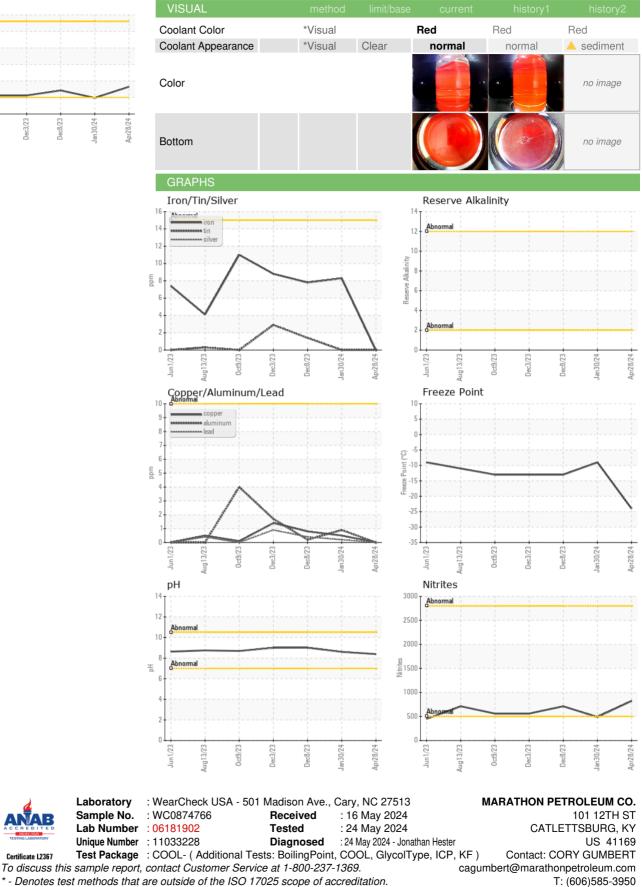
Sample Rating Trend

NORMAL



COOLANT 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) Report Id: MARCAT [WUSCAR] 06181902 (Generated: 05/24/2024 07:13:04) Rev: 1

Certificate 12367

Submitted By: M/V LOUISVILLE

Page 2 of 2

F: x: