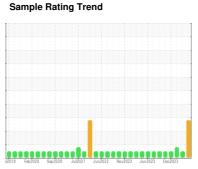


COOLANT REPORT

Kentucky [Kentucky] Coolant - Starboard Main Engine (Jacket)

Component Coolant

CATERPILLAR ELC (--- GAL)





DIAGNOSIS

Recommendation

We recommend that you perform a partial drain and top off with straight antifreeze to increase level of glycol. (Customer Sample Comment: Tyson Bias)

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

Contaminants

There is no indication of any contamination in the coolant.

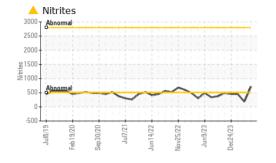
Coolant Condition

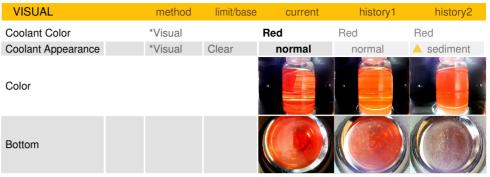
Carboxylate test failed. The glycol level is lower than acceptable. The nitrite level is acceptable. The pH level of this fluid is within the acceptable limits.

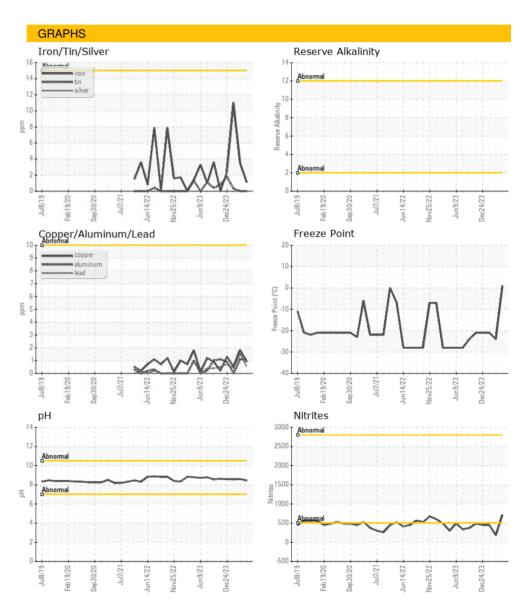
SAMPLE INFORMATION method limit/base current history1 history2 Sample Number Client Info WC0874826 WC0859929 WC00845759 Sample Date Client Info 0 12937 0 Oil Age hrs Client Info 0 12937 0 Oil Age hrs Client Info N/A N/A N/A N/A Oil Changed Client Info N/A N/A N/A N/A N/A Sample Status Babonal ABNORMAL ABNORMAL ABNORMAL ABNORMAL ABNORMAL PHYSICAL TEST RESULTS method limit/base current history1 history2 Glycol Type FT-IR			il2019 Feb20	20 Sep2020 Jul2021	Jun2022 Nov2022 Jun2023	Dec2023	
Sample Date Client Info 16 Mar 2024 16 Feb 2024 20 Jan 2024 Machine Age hrs Client Info 0 12937 0 Oil Age hrs Client Info 0 12937 0 Oil Changed Client Info N/A N/A N/A Sample Status Image: Client Info N/A N/A N/A ABNORMAL NORMAL ABNORMAL PHYSICAL TEST RESULTS method limit/base current history1 history2 Glycol Type FT-IR Specific Gravity "ASTM D1287" 8.44 8.60 8.57 Nitrites ppm AFM D613287 8.44 8.60 8.57 Nitrites ppm AFM D613281 Reserve Alkalinity % Dept 3 ASTM D61321 32.8 45.3 44.9 Freezing Point "F ASTM D3321 1 -24	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 0 12937 0 Oil Age hrs Client Info 0 12937 0 Oil Changed Client Info N/A N/A N/A Sample Status NORMAL ABNORMAL NORMAL ABNORMAL PHYSICAL TEST RESULTS method limit/base current history1 history2 Glycol Type FT-IR Specific Gravity "ASTM D1287" 8.44 8.60 8.57 Nitrites ppm AP-053:2009 712 184 448 Reserve Alkalinity Scale 23" "ASTM D1212"	Sample Number		Client Info		WC0874826	WC0859929	WC0845759
Oil Age hrs Client Info N/A N/A N/A N/A Sample Status Client Info N/A N/A N/A N/A PHYSICAL TEST RESULTS method limit/base current history1 history2 Glycol Type FT-IR Specific Gravity 14STM D1287 8.44 1.061 1.060 PH Scale 044 ASTM D1287 8.44 8.60 8.57 Nitrites ppm AP-053:2009 712 184 448 Reserve Alkalinity Scale 0:20 *ASTM D1211 Percentage Glycol % ASTM D3321 1 -24 -21 -24 -21 Total Dissolved Solids STAT D61321 1 -24 -21 -21 -24 -21 -24 -21 -24 -21 -24 -21 -24 -21 -24 -21 -24 -21 -24 -21 -24 -21 </td <td>Sample Date</td> <td></td> <td>Client Info</td> <td></td> <th>16 Mar 2024</th> <td>16 Feb 2024</td> <td>20 Jan 2024</td>	Sample Date		Client Info		16 Mar 2024	16 Feb 2024	20 Jan 2024
Oil Changed Sample Status Client Info N/A N/A N/A N/A N/A N/A Sample Status N/A ABNORMAL ABNO	Machine Age	hrs	Client Info		0	12937	0
ABNORMAL NORMAL ABNORMAL PABORY ABNORMAL Mistory2 Mistory2 Mistory2 Mistory2 Mistory2 Mistory2 Mistory2 Mistory2 Mistory2 Mistory3 Mistory3 Mistory3 Mistory3 Mistory3 Mistory3 Mistory4 Mistory4 <td>Oil Age</td> <td>hrs</td> <td>Client Info</td> <td></td> <th>0</th> <td>12937</td> <td>0</td>	Oil Age	hrs	Client Info		0	12937	0
PHYSICAL TEST RESULTS method limit/base current history1 history2 Glycol Type FT-IR Specific Gravity 1x4STM D1298 1.044 1.061 1.060 pH Scale 0.14 ASTM D1287 8.44 8.60 8.57 Nitrites ppm AP-053.2009 712 184 448 Reserve Alkalinity Scale 0.20 *ASTM D1211 Percentage Glycol % ASTM D3321 1 -24 -21 Total Dissolved Solids 221.5 243.5 305.0 Carboxylate fail fail fail fail CORROSION INHIBITORS method limit/base current history1 history2 Silicon ppm ASTM D6130 0 0 0 0 Boron ppm ASTM D6130 0 13 5 2 Molybdenum ppm ASTM D6130 0 13 4 11	Oil Changed		Client Info		N/A	N/A	N/A
Specific Gravity	Sample Status				ABNORMAL	NORMAL	ABNORMAL
Specific Gravity Scale 0-14 ASTM D1298 1.044 1.061 1.060 Nitrites ppm AP-053:2009 712 184 448 448 ASTM D1287 ASTM D1287 Nitrites ppm AP-053:2009 712 184 448 ASTM D1121 -	PHYSICAL TEST R	ESULTS	method	limit/base	current	history1	history2
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pH Scale 0-14 ASTM D1287 8.44 8.60 8.57 Nitrites ppm AP-053:2009 712 184 448 Reserve Alkalinity Scale 0-20 *ASTM D1121 Percentage Glycol % ASTM D3321 ▲ 32.8 45.3 44.9 Freezing Point °F ASTM D3321 1 -24 -21 -21 Total Dissolved Solids Carboxylate 4 astm D3321 1 -24 -21 -21 Carboxylate F astm D3321 1 -24 -21 -21 Carboxylate stall fail fail fail fail CORROSION INHIBITORS method limit/base current history1 history2 Silicon ppm ASTM D6130 0 10 6 8 Phosphorus ppm ASTM D6130 0 13 5 2 Silicon ppm ASTM D6130 0 13 5 2			*ASTM D1298		1.044	1.061	1.060
Reserve Alkalinity Scale 0.20 *ASTM D1121 <		Scale 0-14	ASTM D1287		8.44	8.60	8.57
Percentage Glycol % ASTM D3321 ▲ 32.8 45.3 44.9 Freezing Point °F ASTM D3321 1 -24 -21 Total Dissolved Solids Carboxylate fail fail fail fail CORROSION INHIBITORS method limit/base current history1 history2 Silicon ppm ASTM D6130 0 10 6 8 Phosphorus ppm ASTM D6130 0 0 0 0 Boron ppm ASTM D6130 0 13 5 2 Molybdenum ppm ASTM D6130 950 441 487 551 CORROSION method limit/base current history1 history2 Iron ppm ASTM D6130 >10 1 1	Nitrites	ppm	AP-053:2009		712	184	448
Percentage Glycol % ASTM D3321 ▲ 32.8 45.3 44.9 Freezing Point °F ASTM D3321 1 -24 -21 Total Dissolved Solids Carboxylate 221.5 243.5 305.0 Carboxylate fail fail fail CORROSION INHIBITORS method limit/base current history1 history2 Silicon ppm ASTM D6130 0 0 0 0 Boron ppm ASTM D6130 0 0 0 0 Boron ppm ASTM D6130 950 441 487 551 CORROSION method limit/base current history1 history2 Iron ppm ASTM D6130 >15 1 4 11 Aluminum ppm ASTM D6130 >10 <1	Reserve Alkalinity		*ASTM D1121				
Freezing Point	Percentage Glycol	%	ASTM D3321		A 32.8	45.3	44.9
Carboxylate fail fail fail fail CORROSION INHIBITORS method limit/base current history1 history2 Silicon ppm ASTM D6130 0 10 6 8 Phosphorus ppm ASTM D6130 0 0 0 0 Boron ppm ASTM D6130 0 13 5 2 Molybdenum ppm ASTM D6130 950 441 487 551 CORROSION method limit/base current history1 history2 Iron ppm ASTM D6130 >15 1 4 11 Aluminum ppm ASTM D6130 >10 1 1 0 Copper ppm ASTM D6130 >10 <1		°F	ASTM D3321		1	-24	-21
CORROSION INHIBITORS method limit/base current history1 history2 Silicon ppm ASTM D6130 0 10 6 8 Phosphorus ppm ASTM D6130 0 0 0 0 Boron ppm ASTM D6130 0 13 5 2 Molybdenum ppm ASTM D6130 950 441 487 551 CORROSION method limit/base current history1 history2 Iron ppm ASTM D6130 >15 1 4 11 Aluminum ppm ASTM D6130 >10 1 1 0 Copper ppm ASTM D6130 >10 <1	Total Dissolved Solids				221.5	243.5	305.0
Silicon ppm ASTM D6130 0 10 6 8 Phosphorus ppm ASTM D6130 0 0 0 0 Boron ppm ASTM D6130 0 13 5 2 Molybdenum ppm ASTM D6130 950 441 487 551 CORROSION method limit/base current history1 history2 Iron ppm ASTM D6130 >15 1 4 11 Aluminum ppm ASTM D6130 >10 1 1 0 Copper ppm ASTM D6130 >10 <1	Carboxylate				fail	fail	fail
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Boron	Silicon	ppm	ASTM D6130	0	10	6	8
Molybdenum ppm ASTM D6130 950 441 487 551 CORROSION method limit/base current history1 history2 Iron ppm ASTM D6130 >15 1 4 11 Aluminum ppm ASTM D6130 >10 1 1 0 Copper ppm ASTM D6130 >10 <1							



COOLANT REPORT











Report Id: MARCAT [WUSCAR] 06131272 (Generated: 04/02/2024 09:54:55) Rev: 1

Laboratory Sample No. Unique Number: 10950737

: WC0874826 Lab Number : 06131272

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received

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

: 27 Mar 2024 **Tested** Diagnosed

: 02 Apr 2024 : 02 Apr 2024 - Jonathan Hester MARATHON PETROLEUM CO.

101 12TH ST CATLETTSBURG, KY US 41169

Test Package : COOL- (Additional Tests: BoilingPoint, COOL, GlycolType, ICP, KF) Contact: CORY GUMBERT cagumbert@marathonpetroleum.com

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.

T: (606)585-3950 F: x: