

## **COOLANT REPORT**

## Sample Rating Trend

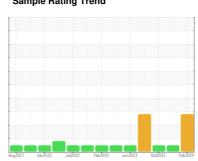
### **OFF SPEC**

Martinsville

# [Martinsville] 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.

#### Corrosion

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

#### Contaminants

There is no indication of any contamination in the coolant.

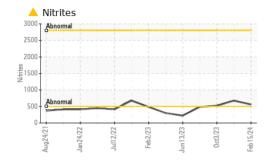
#### Coolant Condition

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

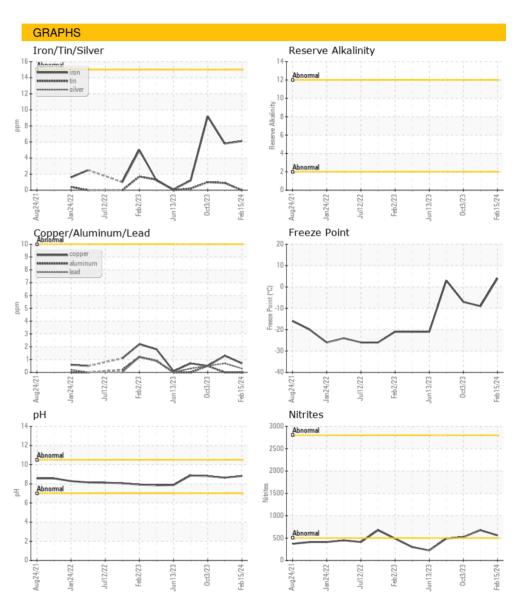
SAMPLE INFORMATION         method         limit/base         current         history2         history2           Sample Number         Client Info         WC0805451         WC0845972         WC0769053           Sample Date         Client Info         15 Feb 2024         27 Nov 2023         03 Oct 2023           Machine Age         hrs         Client Info         18719         18719         17533           Oil Changed         Client Info         N/A         N/A         N/A         Not Changd           Sample Status         MARGINAL         NORMAL         NORMAL         NORMAL           PHYSICAL TEST RESULTS         method         limit/base         current         history1         history2           Glycol Type         FT-IR			Aug2021	Jan2022 Jul2022	Feb2023 Jun2023 0ct2023	Feb2024		
Sample Date         Client Info         15 Feb 2024         27 Nov 2023         03 Oct 2023           Machine Age         hrs         Client Info         18719         18719         17533           Oil Age         hrs         Client Info         16703         18719         201           Oil Changed         Client Info         N/A         N/A         Not Changd           Sample Status         MARGINAL         NORMAL         NORMAL           PHYSICAL TEST RESULTS         method         limit/base         current         history1         history2           Glycol Type         FT-IR               Specific Gravity         "ASTM D1287"         8.81         8.64         8.80           Nitrites         ppm         AP-053:2009         560         676         524           Reserve Alkalinity         Scale 0:20" "ASTM D121"               Percezing Point         °F         ASTM D3321         4         -9         -7           Total Dissolved Solids         223.5         250.0         267.5           Carboxylate         method         limit/base         current         history1 <td< th=""><th>SAMPLE INFORM</th><th>MATION</th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></td<>	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2	
Machine Age         hrs         Client Info         18719         18719         17533           Oil Age         hrs         Client Info         16703         18719         201           Oil Changed         Client Info         N/A         N/A         NA         Not Changd           Sample Status         MARGINAL         NORMAL         NORMAL         NORMAL         NORMAL           PHYSICAL TEST RESULTS         method         limit/base         current         history1         history2           Glycol Type         FT-IR               Specific Gravity         YaSTM D1287         8.81         8.64         8.80           Nitrites         ppm         AP-053:2009         560         676         524           Reserve Alkalinity         Scale 0:20         YaSTM D1121               Percerentage Glycol         % ASTM D3321         4         -9         -7         7         Total Dissolved Solids         223.5         250.0         267.5         5         4         -9         -7         Total Dissolved Solids         223.5         250.0         267.5         5         4         1         -9	Sample Number		Client Info		WC0805451	WC0845972	WC0769053	
Oil Age         hrs         Client Info         16703         18719         201           Oil Changed Sample Status         Client Info         N/A         N/A         N/A Not Changed           PHYSICAL TEST RESULTS         method         limit/base         current         history1         history2           Glycol Type         FT-IR              Specific Gravity         'ASTM D1287         8.81         8.64         8.80           Nitrites         ppm         AP-053:2009         560         676         524           Reserve Alkalinity         Scale 0:20         'ASTM D1121              Percentage Glycol         %         ASTM D3321         4         -9         -7         -7           Total Dissolved Solids         223.5         250.0         267.5         267.5         -7           Carboxylate         Fail         fail         fail         fail         fail         fail         fail           CORROSION INHIBITORS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D6130         0         3	Sample Date		Client Info		15 Feb 2024	27 Nov 2023	03 Oct 2023	
Oil Changed Sample Status         Client Info         N/A         N/A         N/A         Not Changed NORMAL           PHYSICAL TEST RESULTS method         limit/base         current         history1         history2           Glycol Type         FT-IR              Specific Gravity         'ASTM D1287         8.81         8.64         8.80           Nitrites         ppm         AP-053:2009         560         676         524           Reserve Alkalinity         °F         ASTM D1121              Percentage Glycol         %         ASTM D3321         4         -9         -7           Total Dissolved Solids         223.5         250.0         267.5           Carboxylate         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D6130         0         32         6         -1           Phosphorus         ppm         ASTM D6130         0         43         1         0           Boron         ppm         ASTM D6130         0         43         1         0           Molybdenum         ppm         ASTM D6130	Machine Age	hrs	Client Info		18719	18719	17533	
MARGINAL   NORMAL   NORMAL	Oil Age	hrs	Client Info		16703	18719	201	
PHYSICAL TEST RESULTS method limit/base current history1 history2           Glycol Type         FT-IR               Scale 0-10         ASTM D1298         1.041         1.052         1.051         pph         ASTM D1287         8.81         8.64         8.80         Nitrites         ppm         AP-053;2009         560         676         524         ASTM D1287         8.81         8.64         8.80         Nitrites         ppm         AP-053;2009         560         676         524         ASTM D6130         30.7         38.3         37.8         FERDITARION CONTROL CONT	Oil Changed		Client Info		N/A	N/A	Not Changd	
Specific Gravity   "ASTM D1298   1.041   1.052   1.051     ph	Sample Status				MARGINAL	NORMAL	NORMAL	
Specific Gravity         'ASTM D1298         1.041         1.052         1.051           pH         Scale 0-14         ASTM D1287         8.81         8.64         8.80           Nitrites         ppm         AP-053:2009         560         676         524           Reserve Alkalinity         Scale 0-20         'ASTM D1121              Percentage Glycol         %         ASTM D3321         ▲ 30.7         38.3         37.8           Freezing Point         °F         ASTM D3321         ▲ 9-         -7           Total Dissolved Solids         223.5         250.0         267.5           Carboxylate         fail         fail         fail           CORROSION INHIBITORS method         limit/base         current         history1         history2           Silicon         ppm         ASTM D6130         0         32         6         <1	PHYSICAL TEST R	ESULTS	method	limit/base	current	history1	history2	
Description   Scale 0-14   ASTM D1287   Sele 0-20   Sele 0-20	Glycol Type		FT-IR					
pH         Scale 0-14 ASTM D1287         8.81 B.64         8.80 Nitrites           Nitrites         ppm         AP-053:2009         560 676         524           Reserve Alkalinity         Scale 0-20 *ASTM D1121	Specific Gravity		*ASTM D1298		1.041	1.052	1.051	
Reserve Alkalinity         Scale 0-20         "ASTM D1121"		Scale 0-14	ASTM D1287		8.81	8.64	8.80	
Percentage Glycol         %         ASTM D3321         ▲ 30.7         38.3         37.8           Freezing Point         °F         ASTM D3321         4         -9         -7           Total Dissolved Solids         223.5         250.0         267.5           Carboxylate         fail         fail         fail           CORROSION INHIBITORS method limit/base current history1         history2           Silicon         ppm         ASTM D6130         0         32         6         <1	Nitrites	ppm	AP-053:2009		560	676	524	
Percentage Glycol         %         ASTM D3321         ▲ 30.7         38.3         37.8           Freezing Point         °F         ASTM D3321         4         -9         -7           Total Dissolved Solids         223.5         250.0         267.5           Carboxylate         fail         fail         fail           CORROSION INHIBITORS method limit/base current history1         history2           Silicon ppm ASTM D6130 0 32 6         <1			*ASTM D1121					
Freezing Point	-	%	ASTM D3321		<b>4</b> 30.7	38.3	37.8	
Total Dissolved Solids		°F			4	-9	-7	
CORROSION INHIBITORS   method   limit/base   current   history1   history2	Total Dissolved Solids				223.5	250.0	267.5	
Silicon   ppm   ASTM D6130   0   32   6	Carboxylate				fail	fail	fail	
Phosphorus         ppm         ASTM D6130         0         4         1           Boron         ppm         ASTM D6130         0         43         1         0           Molybdenum         ppm         ASTM D6130         950         344         422         555           CORROSION         method         limit/base         current         history1         history2           Iron         ppm         ASTM D6130         >15         6         6         9           Aluminum         ppm         ASTM D6130         >10         0         0         <1           Copper         ppm         ASTM D6130         >10         <1         1         <1           Lead         ppm         ASTM D6130         >10         <1         <1         <1           Tin         ppm         ASTM D6130         >10         <1         1         <1           Zinc         ppm         ASTM D6130         0         <1         1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Chlorine         ppm         ASTM D6130         2655         2882         3648 <th>CORROSION INHI</th> <th>BITORS</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	CORROSION INHI	BITORS	method	limit/base	current	history1	history2	
Boron	Silicon	ppm	ASTM D6130	0	32	6	<1	
Molybdenum         ppm         ASTM D6130         950         344         422         555           CORROSION         method         limit/base         current         history1         history2           Iron         ppm         ASTM D6130         >15         6         6         9           Aluminum         ppm         ASTM D6130         >10         0         0         <1	<td>Phosphorus</td> <td>ppm</td> <td>ASTM D6130</td> <td>0</td> <td>0</td> <td>4</td> <td>1</td>	Phosphorus	ppm	ASTM D6130	0	0	4	1
CORROSION         method         limit/base         current         history1         history2           Iron         ppm         ASTM D6130         >15         6         6         9           Aluminum         ppm         ASTM D6130         >10         0         0         <1	Boron	ppm	ASTM D6130	0	43	1	0	
Iron         ppm         ASTM D6130         >15         6         6         9           Aluminum         ppm         ASTM D6130         >10         0         0         <1           Copper         ppm         ASTM D6130         >10         <1         1         <1           Lead         ppm         ASTM D6130         >10         <1         <1         <1           Tin         ppm         ASTM D6130         >10         0         <1         1           Zinc         ppm         ASTM D6130         0         <1         0           CONTAMINANTS         method         limit/base         current         history1         history2           Chlorine         ppm         ASTM D6130         21         15         11           CARRIER SALTS         method         limit/base         current         history1         history2           Sodium         ppm         ASTM D6130         112         64         <1           SCALE POTENTIAL         method         limit/base         current         history1         history2           Calcium         ppm         ASTM D6130         14         5         2	Molybdenum	ppm	ASTM D6130	950	344	422	555	
Aluminum         ppm         ASTM D6130         >10         0         <1           Copper         ppm         ASTM D6130         >10         <1	CORROSION		method	limit/base	current	history1	history2	
Copper         ppm         ASTM D6130         >10         <1         1         <1           Lead         ppm         ASTM D6130         >10         <1	Iron	ppm	ASTM D6130	>15	6	6	9	
Lead         ppm         ASTM D6130         >10         <1         <1         <1           Tin         ppm         ASTM D6130         >10         0         <1	Aluminum	ppm	ASTM D6130	>10	0	0	<1	
Tin         ppm         ASTM D6130         >10         0         <1         1           Zinc         ppm         ASTM D6130         0         <1         0           CONTAMINANTS         method         limit/base         current         history1         history2           Chlorine         ppm         ASTM D6130         21         15         11           CARRIER SALTS         method         limit/base         current         history1         history2           Sodium         ppm         ASTM D6130         2655         2882         3648           Potassium         ppm         ASTM D6130         112         64         <1	Copper	ppm	ASTM D6130	>10	<1	1	<1	
Zinc         ppm         ASTM D6130         0         <1         0           CONTAMINANTS         method         limit/base         current         history1         history2           Chlorine         ppm         ASTM D6130         21         15         11           CARRIER SALTS         method         limit/base         current         history1         history2           Sodium         ppm         ASTM D6130         2655         2882         3648           Potassium         ppm         ASTM D6130         112         64         <1	Lead	ppm	ASTM D6130	>10	<1	<1	<1	
CONTAMINANTS         method         limit/base         current         history1         history2           Chlorine         ppm         ASTM D6130         21         15         11           CARRIER SALTS         method         limit/base         current         history1         history2           Sodium         ppm         ASTM D6130         2655         2882         3648           Potassium         ppm         ASTM D6130         112         64         <1	Tin	ppm	ASTM D6130	>10	0	<1	1	
Chlorine         ppm         ASTM D6130         21         15         11           CARRIER SALTS         method         limit/base         current         history1         history2           Sodium         ppm         ASTM D6130         2655         2882         3648           Potassium         ppm         ASTM D6130         112         64         <1	Zinc	ppm	ASTM D6130		0	<1	0	
CARRIER SALTS         method         limit/base         current         history1         history2           Sodium         ppm         ASTM D6130         2655         2882         3648           Potassium         ppm         ASTM D6130         112         64         <1	CONTAMINANTS		method	limit/base	current	history1	history2	
Sodium         ppm         ASTM D6130         2655         2882         3648           Potassium         ppm         ASTM D6130         112         64         <1           SCALE POTENTIAL         method         limit/base         current         history1         history2           Calcium         ppm         ASTM D6130         14         5         2	Chlorine	ppm	ASTM D6130		21	15	11	
Potassium         ppm         ASTM D6130         112         64         <1           SCALE POTENTIAL         method         limit/base         current         history1         history2           Calcium         ppm         ASTM D6130         14         5         2	CARRIER SALTS		method	limit/base	current	history1	history2	
Potassium         ppm         ASTM D6130         112         64         <1           SCALE POTENTIAL         method         limit/base         current         history1         history2           Calcium         ppm         ASTM D6130         14         5         2	Sodium	ppm	ASTM D6130		2655	2882	3648	
Calcium         ppm         ASTM D6130         14         5         2								
pp 1 1 1 1 1	SCALE POTENTIA	AL	method	limit/base	current	history1	history2	
	Calcium	ppm	ASTM D6130		14	5	2	
	Magnesium	ppm	ASTM D6130		4	4	<1	



## **COOLANT REPORT**



VISUAL	method	limit/base	current	history1	history2
Coolant Color	*Visual		Red	Red	Red
Coolant Appearance	*Visual	Clear	normal	normal	normal
Color					
Bottom					





Laboratory Sample No. Unique Number : 10937024

Lab Number : 06122873

: WC0805451

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

: 19 Mar 2024 : 22 Mar 2024 Diagnosed

: 22 Mar 2024 - Jonathan Hester

MARATHON PETROLEUM CO. 101 12TH ST

CATLETTSBURG, KY US 41169

Test Package : COOL- ( Additional Tests: BoilingPoint, COOL, GlycolType, ICP, KF ) To discuss this sample report, contact Customer Service at 1-800-237-1369.

Contact: CORY GUMBERT cagumbert@marathonpetroleum.com

\* - 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: (606)585-3950 F: x: