

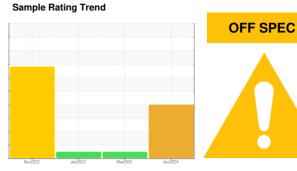
## **COOLANT REPORT**

# **Detroit**

# [Detroit] Coolant - Port Main Engine (Jacket)

Coolant

**CATERPILLAR ELC (--- GAL)** 



### **DIAGNOSIS**

#### Recommendation

We recommend drain/flush system, and refill with 50/50 antifreeze water mixture. We advise an early resample to confirm this situation.

#### Corrosion

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

### Contaminants

There is no indication of any contamination in the coolant.

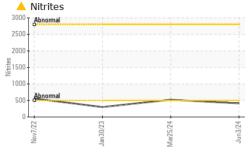
#### Coolant Condition

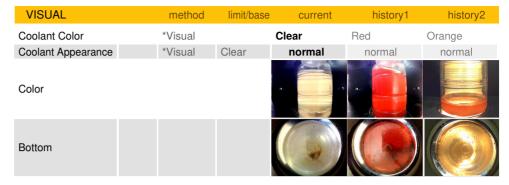
The pH is low indicating a high acidity of the fluid. The glycol level is lower than acceptable. Confirm coolant type.

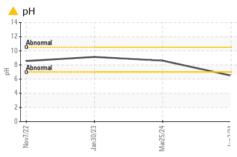
SAMPLE INFORMATION         method         limit/base         current         history1         history2           Sample Number         Client Info         WC0804769         WC0804782         WC0731924           Sample Date         Client Info         03 Jun 2024         25 Mar 2024         30 Jan 2023           Machine Age         hrs         Client Info         20920         19472         0           Oil Changed         Client Info         Not Changd         Not Changd         N/A           Sample Status         ABNORMAL         NORMAL         NORMAL           PHYSICAL TEST RESULTS         method         limit/base         current         history1         history2           Glycol Type         FT-IR                Specific Gravity         YaSTM D1287							
Sample Date         Client Info         03 Jun 2024         25 Mar 2024         30 Jan 2023           Machine Age         hrs         Client Info         20920         19472         0           Oil Age         hrs         Client Info         0         19472         0           Oil Changed         Client Info         Not Changd         NVA         NORMAL         NORMAL           PHYSICAL TEST RESULTS         method         limit/base         current         history1         history2           Glycol Type         FT-IR              Specific Gravity         "ASTM D1287"          6.50         8.60         9.13           Nitrites         ppm         AP-053-2009         412         524         300         9.13           Nitrites         ppm         AP-053-2009         412         524         300         -3         3.3         1.9         Freezing Point         °F         ASTM D3321	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         20920         19472         0           Oil Changed         hrs         Client Info         0         19472         0           Oil Changed         Client Info         Not Changd         N/A         NORMAL         NORMAL           Sample Status         ABNORMAL         NORMAL         NORMAL         NORMAL         NORMAL           PHYSICAL TEST RESULTS         method         limit/base         current         history1         history2           Glycol Type         FT-IR                Specific Gravity         *ASTM D1287         A 6.50         8.60         9.13           Nitrites         ppm         AP-053:2009         412         524         300           Reserve Alkalinity         Scale P.01         *ASTM D1211               Percentage Glycol         *A ASTM D3321         3.0         -3         3         1         6.50         8.60         9.13           Percezing Point         *F         ASTM D3321         30         -3         3         1         6.50         208.5         5         208.5         5	Sample Number		Client Info		WC0804769	WC0804782	WC0731924
Oil Age         hrs         Client Info         Not Changd ABNORMAL         Not Changd Not Changd Not Changd ABNORMAL         N/A NORMAL NORMAL           PHYSICAL TEST RESULTS method         limit/base         current         history1         history2           Glycol Type         FT-IR              Specific Gravity         *ASTM D1288         1.0000         1.048         1.043           pH         Scale 0-14         ASTM D1287         4.6.50         8.60         9.13           Nitrites         ppm         AP-053-2009         412         524         300           Reserve Alkalinity         Scale 0-120         *ASTM D1121              Percentage Glycol         %         ASTM D3321         30         -3         3         19           Freezing Point         °F         ASTM D3321         30         -3         3         16         58           Carboxylate         Fail         fail         fail         fail         fail         fail           CORROSION INHIBITORS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D6130         0	Sample Date		Client Info		03 Jun 2024	25 Mar 2024	30 Jan 2023
Oil Changed Sample Status         Client Info         Not Changd ABNORMAL         Not Changd NORMAL         N/A NORMAL           PHYSICAL TEST RESULTS method         limit/base         current         history1         history2           Glycol Type         FT-IR              Specific Gravity         'ASTM D1288         1.000         1.048         1.043           pH         Scale 0-14         ASTM D1287         6.50         8.60         9.13           Nitrites         ppm         AP-053:2009         412         524         300           Reserve Alkalinity         % ASTM D1321               Percentage Glycol         % ASTM D3321         30         -3         3         1.9           Freezing Point         °F         ASTM D3321         30         -3         3         1.9           Freezing Point         °F         ASTM D3321         30         -3         3         1.0         1.9           CORROSION INHIBITORS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D6130         0         3         16         58 <th>Machine Age</th> <th>hrs</th> <th>Client Info</th> <th></th> <th>20920</th> <th>19472</th> <th>0</th>	Machine Age	hrs	Client Info		20920	19472	0
Sample Status	Oil Age	hrs	Client Info		0	19472	0
PHYSICAL TEST RESULTS         method         limit/base         current         history1         history2           Glycol Type         FT-IR               Specific Gravity         1,48TM D1298         1.000         1.048         1.043           pH         Scale 0.14         ASTM D1287         6.50         8.60         9.13           Nitrites         ppm         AP-053.2009         412         524         300           Reserve Alkalinity         Scale 0.20         'ASTM D1211              Percentage Glycol         %         ASTM D3321         30         -3         3         1.9           Freezing Point         °F         ASTM D3321         30         -3         3         1.9           Freezing Point         °F         ASTM D3321         30         -3         3         1.0         208.5           Carboxylate         fail         fai	Oil Changed		Client Info		Not Changd	Not Changd	N/A
Specific Gravity	Sample Status				ABNORMAL	NORMAL	NORMAL
Specific Gravity         'ASTM D1298         1.000         1.048         1.043           pH         Scale 0-14         ASTM D1287         ♠ 6.50         8.60         9.13           Nitrites         ppm         AP-053:2009         412         524         300           Reserve Alkalinity         Scale 0-20         'ASTM D1121              Percentage Glycol         %         ASTM D3321         ♣ 3.7         35.1         31.9           Freezing Point         °F         ASTM D3321         ♣ 3.7         35.1         31.9           Freezing Point         °F         ASTM D3321         30         -3         3         1.9           Calposylate         43.0         266.5         208.5           Calposylate         43.0         266.5         208.5           Calposylate         ASTM D6130         0         3         16         58           Phosphorus         ppm         ASTM D6130         0         3         16         58           Phosphorus         ppm         ASTM D6130         0         0         7         23           Molybdenum         ppm         ASTM D61	PHYSICAL TEST R	ESULTS	method	limit/base	current	history1	history2
pH         Scale 0-14 ASTM D1287         ♠ 6.50         8.60         9.13           Nitrites         ppm         AP-053:2009         412         524         300           Reserve Alkalinity         Scale 0-20 "ASTM D1121"              Percentage Glycol         % ASTM D3321         3.7         35.1         31.9           Freezing Point         °F         ASTM D3321         30         -3         3           Total Dissolved Solids         43.0         266.5         208.5           Carboxylate         fail         fail         fail           CORROSION INHIBITORS method         limit/base         current         history1         history2           Silicon         ppm         ASTM D6130         0         3         16         58           Phosphorus         ppm         ASTM D6130         0         0         3         30           Boron         ppm         ASTM D6130         0         0         7         23           Molybdenum         ppm         ASTM D6130         >15         7         10         13           CORROSION         method         limit/base         cur	Glycol Type		FT-IR				
Nitrites	Specific Gravity		*ASTM D1298		1.000	1.048	1.043
Reserve Alkalinity         Scale 0-20         "ASTM D1121"	рН	Scale 0-14	ASTM D1287		<b>6.50</b>	8.60	9.13
Percentage Glycol   %	Nitrites	ppm	AP-053:2009		412	524	300
Freezing Point	Reserve Alkalinity	Scale 0-20	*ASTM D1121				
Total Dissolved Solids	Percentage Glycol	%	ASTM D3321		<b>△</b> 3.7	35.1	31.9
Carboxylate         fail         fail         fail         fail           CORROSION INHIBITORS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D6130         0         3         16         58           Phosphorus         ppm         ASTM D6130         0         0         3         30           Boron         ppm         ASTM D6130         0         0         7         23           Molybdenum         ppm         ASTM D6130         950         0         548         596           CORROSION         method         limit/base         current         history1         history2           Iron         ppm         ASTM D6130         >15         7         10         13           Aluminum         ppm         ASTM D6130         >10         0         <1	Freezing Point	°F	ASTM D3321		30	-3	3
CORROSION INHIBITORS   method   limit/base   current   history1   history2	Total Dissolved Solids				43.0	266.5	208.5
Silicon	Carboxylate				fail	fail	fail
Phosphorus         ppm         ASTM D6130         0         0         3         30           Boron         ppm         ASTM D6130         0         0         7         23           Molybdenum         ppm         ASTM D6130         950         0         548         596           CORROSION         method         limit/base         current         history1         history2           Iron         ppm         ASTM D6130         >15         7         10         13           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         <1         1           Zinc         ppm         ASTM D6130         0         0         1         1           CONTAMINANTS         method         limit/base         current         history1         history2           Chlorine         ppm         ASTM D6130         352         3467         5389 </th <th>CORROSION INH</th> <th>IBITORS</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	CORROSION INH	IBITORS	method	limit/base	current	history1	history2
Boron	Silicon	ppm	ASTM D6130	0	3	16	58
Molybdenum         ppm         ASTM D6130         950         0         548         596           CORROSION         method         limit/base         current         history1         history2           Iron         ppm         ASTM D6130         >15         7         10         13           Aluminum         ppm         ASTM D6130         >10         0         <1	Phosphorus	ppm	ASTM D6130	0	0	3	30
CORROSION         method         limit/base         current         history1         history2           Iron         ppm         ASTM D6130         >15         7         10         13           Aluminum         ppm         ASTM D6130         >10         0         <1	Boron	ppm	ASTM D6130	0	0	7	23
Iron         ppm         ASTM D6130         >15         7         10         13           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         <1         1           Zinc         ppm         ASTM D6130         0         0         1         1           CONTAMINANTS         method         limit/base         current         history1         history2           Chlorine         ppm         ASTM D6130         31         16         57           CARRIER SALTS         method         limit/base         current         history1         history2           Sodium         ppm         ASTM D6130         352         3467         5389           Potassium         ppm         ASTM D6130         11         246         359           SCALE POTENTIAL         method         limit/base         current         history1         history2           C	Molybdenum	ppm	ASTM D6130	950	0	548	596
Aluminum         ppm         ASTM D6130         >10         0         <1	CORROSION		method	limit/base	current	history1	history2
Copper         ppm         ASTM D6130 bigs         >10         0         1         1           Lead         ppm         ASTM D6130 bigs         >10         0         <1         1           Tin         ppm         ASTM D6130 bigs         >10         0         <1         1           Zinc         ppm         ASTM D6130 bigs         0         0         1           CONTAMINANTS         method         limit/base         current         history1         history2           Chlorine         ppm         ASTM D6130 bigs         31         16         57           CARRIER SALTS         method         limit/base         current         history1 bistory2           Sodium         ppm         ASTM D6130 bigs         352         3467 bistory1 bistory2           SCALE POTENTIAL         method         limit/base         current         history1 bistory2           Calcium         ppm         ASTM D6130         57         25         10	Iron	ppm	ASTM D6130	>15	7	10	13
Lead         ppm         ASTM D6130 > 10         0         <1         1           Tin         ppm         ASTM D6130 > 10         0         <1	Aluminum	ppm	ASTM D6130	>10	0	<1	1
Tin         ppm         ASTM D6130         >10         0         <1         1           Zinc         ppm         ASTM D6130         0         0         1           CONTAMINANTS         method         limit/base         current         history1         history2           Chlorine         ppm         ASTM D6130         31         16         57           CARRIER SALTS         method         limit/base         current         history1         history2           Sodium         ppm         ASTM D6130         352         3467         5389           Potassium         ppm         ASTM D6130         11         246         359           SCALE POTENTIAL         method         limit/base         current         history1         history2           Calcium         ppm         ASTM D6130         57         25         10	Copper	ppm	ASTM D6130	>10	0	1	1
Zinc         ppm         ASTM D6130         0         0         1           CONTAMINANTS         method         limit/base         current         history1         history2           Chlorine         ppm         ASTM D6130         31         16         57           CARRIER SALTS         method         limit/base         current         history1         history2           Sodium         ppm         ASTM D6130         352         3467         5389           Potassium         ppm         ASTM D6130         11         246         359           SCALE POTENTIAL         method         limit/base         current         history1         history2           Calcium         ppm         ASTM D6130         57         25         10	Lead	ppm	ASTM D6130	>10	0	<1	1
CONTAMINANTS         method         limit/base         current         history1         history2           Chlorine         ppm         ASTM D6130         31         16         57           CARRIER SALTS         method         limit/base         current         history1         history2           Sodium         ppm         ASTM D6130         352         3467         5389           Potassium         ppm         ASTM D6130         11         246         359           SCALE POTENTIAL         method         limit/base         current         history1         history2           Calcium         ppm         ASTM D6130         57         25         10	Tin	ppm	ASTM D6130	>10	0	<1	1
Chlorine         ppm         ASTM D6130         31         16         57           CARRIER SALTS         method         limit/base         current         history1         history2           Sodium         ppm         ASTM D6130         352         3467         5389           Potassium         ppm         ASTM D6130         11         246         359           SCALE POTENTIAL         method         limit/base         current         history1         history2           Calcium         ppm         ASTM D6130         57         25         10	Zinc	ppm	ASTM D6130		0	0	1
CARRIER SALTS         method         limit/base         current         history1         history2           Sodium         ppm         ASTM D6130         352         3467         5389           Potassium         ppm         ASTM D6130         11         246         359           SCALE POTENTIAL         method         limit/base         current         history1         history2           Calcium         ppm         ASTM D6130         57         25         10	CONTAMINANTS		method	limit/base	current	history1	history2
Sodium         ppm         ASTM D6130         352         3467         5389           Potassium         ppm         ASTM D6130         11         246         359           SCALE POTENTIAL         method         limit/base         current         history1         history2           Calcium         ppm         ASTM D6130         57         25         10	Chlorine	ppm	ASTM D6130		31	16	57
Potassium         ppm         ASTM D6130         11         246         359           SCALE POTENTIAL         method         limit/base         current         history1         history2           Calcium         ppm         ASTM D6130         57         25         10	CARRIER SALTS		method	limit/base	current	history1	history2
Potassium         ppm         ASTM D6130         11         246         359           SCALE POTENTIAL         method         limit/base         current         history1         history2           Calcium         ppm         ASTM D6130         57         25         10	Sodium	ppm	ASTM D6130		352	3467	5389
Calcium         ppm         ASTM D6130         57         25         10	Potassium		ASTM D6130		11	246	359
	SCALE POTENTI	AL	method	limit/base	current	history1	history2
	Calcium	ppm	ASTM D6130		57	25	10
	Magnesium	ppm	ASTM D6130		9	5	3

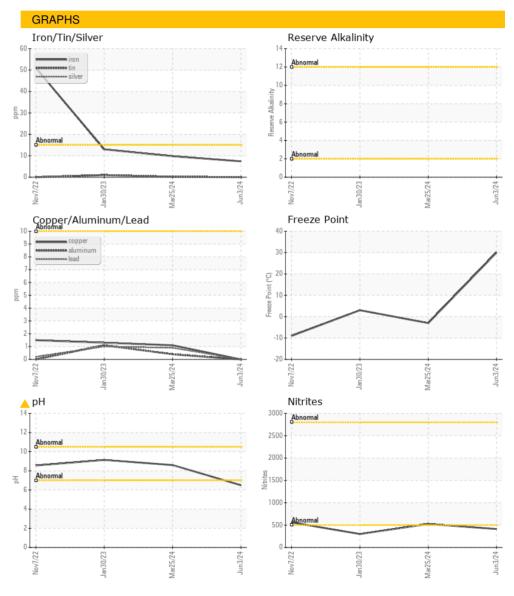


### **COOLANT REPORT**













Certificate 12367

Laboratory Sample No.

Lab Number : 06220315

: WC0804769 Unique Number : 11098512

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 25 Jun 2024 **Tested** 

: 16 Jul 2024

: 16 Jul 2024 - Doug Bogart Diagnosed Test Package : COOL- ( Additional Tests: GlycolType, ICP, KF ) To discuss this sample report, contact Customer Service at 1-800-237-1369.

US 41169 Contact: CORY GUMBERT cagumbert@marathonpetroleum.com

MARATHON PETROLEUM CO.

\* - 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)

F: x: Submitted By: M/V DETROIT

T: (606)585-3950

101 12TH ST

CATLETTSBURG, KY