

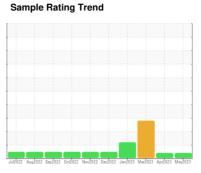
OIL ANALYSIS REPORT



Machine Id **CATERPILLAR BASIN DRILLING 105**

3 Diesel Engine

CHEVRON URSA SUPER PLUS EC 15W40 (--- GAL)





DIAGNOSIS

Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

All component wear rates are normal.

Contamination

There is no indication of any contamination in the

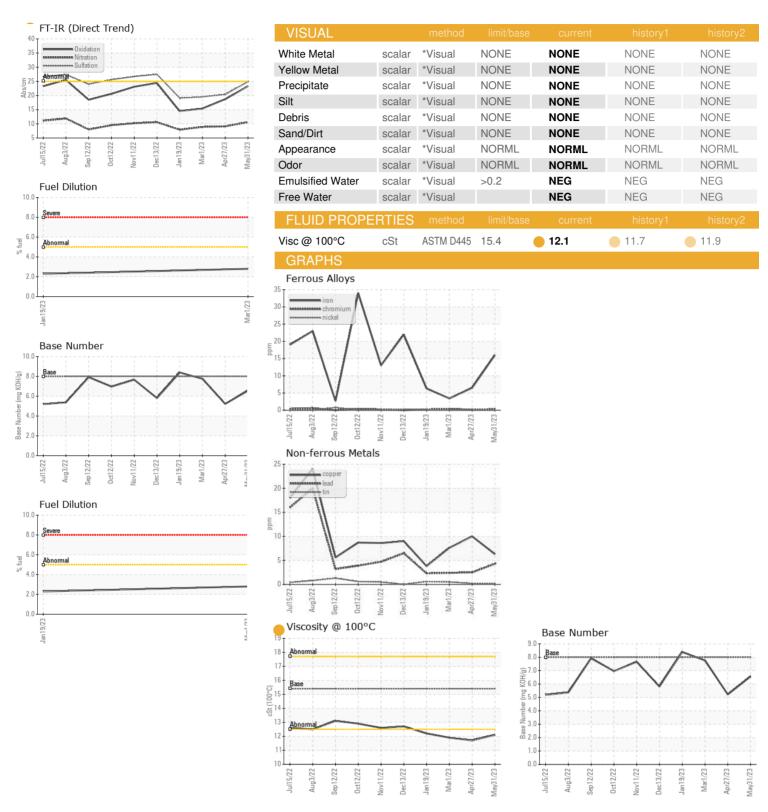
Fluid Condition

The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.

Sample Date Client Info 31 May 2023 27 Apr 2023 01 Mar 2023 Machine Age mls Client Info 0 0 0 0 Oil Age mls Client Info 0 0 0 0 Oil Changed Client Info N/A N/A N/A N/A Sample Status ATTENTION ATTENTION ATTENTION ABNORMAL CONTAMINATION method limit/base current history1 history2 Water WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 16 6 3 Chromium ppm ASTM D5185m >20 <1							
Client Info	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Machine Age mls Client Info 0 0 0 Oil Age mls Client Info 0 0 0 Oil Changed Client Info N/A N/A N/A N/A Sample Status ATTENTION ATTENTION ABNORMAL CONTAMINATION method limit/base current history1 history2 Water WC Method >0.2 NEG NEG NEG Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 16 6 3 Chromium ppm ASTM D5185m >20 <1	Sample Number		Client Info		PCA0096216	PCA0096209	PCA0090233
Oil Age mls Client Info N/A	Sample Date		Client Info		31 May 2023	27 Apr 2023	01 Mar 2023
Colient Info	Machine Age	mls	Client Info		0	0	0
ATTENTION ATTENTION ABNORMAL	Oil Age	mls	Client Info		0	0	0
Water	Oil Changed		Client Info		N/A	N/A	N/A
Water WC Method >0.2 NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 16 6 3 Chromium ppm ASTM D5185m >20 <1 <1 <1 Nickel ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >40 4 2 2 2 Copper ppm ASTM D5185m >330 6 10 8 Tin ppm ASTM D5185m 0 0 0 0 Cadadium ppm ASTM D5185m 0 0	Sample Status				ATTENTION	ATTENTION	ABNORMAL
WEAR METALS	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 16 6 3 Chromium ppm ASTM D5185m >20 <1	Water		WC Method	>0.2	NEG	NEG	NEG
Pron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 <1 <1 <1 Nickel ppm ASTM D5185m >2 0 0 0 Tittanium ppm ASTM D5185m >2 0 0 -1 Siliver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >40 4 2 2 Copper ppm ASTM D5185m >40 4 2 2 Copper ppm ASTM D5185m >15 <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	16	6	3
Titanium ppm ASTM D5185m >2 0 0 <1 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >2 0 0 0 Lead ppm ASTM D5185m >40 4 2 2 Copper ppm ASTM D5185m >330 6 10 8 Tin ppm ASTM D5185m 0 0 0 0 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 62 78 104 Barium ppm ASTM D5185m 62 78 104 Barium ppm ASTM D5185m 84 77 75 Manganese ppm ASTM D5185m 84 77 75 Manganesium ppm ASTM D5185m 1796 1693 1719 Phosphorus ppm <	Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Silver	Nickel	ppm	ASTM D5185m	>2	0	0	0
Aluminum	Titanium	ppm	ASTM D5185m	>2	0	0	<1
Lead ppm ASTM D5185m >40 4 2 2 Copper ppm ASTM D5185m >330 6 10 8 Tin ppm ASTM D5185m >15 <1	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper ppm ASTM D5185m >330 6 10 8 Tin ppm ASTM D5185m >15 <1	Aluminum	ppm	ASTM D5185m	>25	<1	0	2
Tin ppm ASTM D5185m > 15 <1 <1 <1 <1 <1	Lead	ppm	ASTM D5185m	>40	4	2	2
Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 62 78 104 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 84 77 75 Manganese ppm ASTM D5185m <1 1 1 Manganesium ppm ASTM D5185m 331 145 156 Calcium ppm ASTM D5185m 1200 943 873 883 Zinc ppm ASTM D5185m 1300 1192 1062 1131 Sulfur ppm ASTM D5185m 3811 3127 3626 CONTAMINANTS method limit/base current history1 history2 Solicon ppm ASTM D5185m <th< td=""><td>Copper</td><td>ppm</td><td>ASTM D5185m</td><td>>330</td><th>6</th><td>10</td><td>8</td></th<>	Copper	ppm	ASTM D5185m	>330	6	10	8
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 62 78 104 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 84 77 75 Manganese ppm ASTM D5185m <1 <1 1 Magnesium ppm ASTM D5185m 331 145 156 Calcium ppm ASTM D5185m 1796 1693 1719 Phosphorus ppm ASTM D5185m 1200 943 873 883 Zinc ppm ASTM D5185m 1300 1192 1062 1131 Sulfur ppm ASTM D5185m 3811 3127 3626 CONTAMINANTS method limit/base current history1 history2 Solicon ppm ASTM D5185m	Tin	ppm	ASTM D5185m	>15	<1	<1	<1
ADDITIVES	Vanadium	ppm	ASTM D5185m		0	0	0
Boron	Cadmium	ppm	ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 84 77 75 Manganese ppm ASTM D5185m <1 <1 1 Magnesium ppm ASTM D5185m 331 145 156 Calcium ppm ASTM D5185m 1796 1693 1719 Phosphorus ppm ASTM D5185m 1200 943 873 883 Zinc ppm ASTM D5185m 1300 1192 1062 1131 Sulfur ppm ASTM D5185m 3811 3127 3626 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 13 27 Sodium ppm ASTM D5185m >20 2 <1 3 Fuel % ASTM D5185m >20 2 <1 3 Fuel %	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 84 77 75 Manganese ppm ASTM D5185m <1 <1 1 Magnesium ppm ASTM D5185m 331 145 156 Calcium ppm ASTM D5185m 1200 943 873 883 Zinc ppm ASTM D5185m 1200 943 873 883 Zinc ppm ASTM D5185m 1300 1192 1062 1131 Sulfur ppm ASTM D5185m 3811 3127 3626 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 13 27 Sodium ppm ASTM D5185m >20 2 <1 3 Fuel % ASTM D5185m >20 2 <1 3 Fuel % ASTM D7844 >3 0.1 0.1 0.1	Boron	ppm	ASTM D5185m		62	78	104
Manganese ppm ASTM D5185m <1 <1 1 Magnesium ppm ASTM D5185m 331 145 156 Calcium ppm ASTM D5185m 1796 1693 1719 Phosphorus ppm ASTM D5185m 1200 943 873 883 Zinc ppm ASTM D5185m 1300 1192 1062 1131 Sulfur ppm ASTM D5185m 3811 3127 3626 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 13 27 Sodium ppm ASTM D5185m >20 2 <1	Barium	ppm	ASTM D5185m		0	0	0
Magnesium ppm ASTM D5185m 331 145 156 Calcium ppm ASTM D5185m 1796 1693 1719 Phosphorus ppm ASTM D5185m 1200 943 873 883 Zinc ppm ASTM D5185m 1300 1192 1062 1131 Sulfur ppm ASTM D5185m 3811 3127 3626 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 13 27 Sodium ppm ASTM D5185m >25 5 13 27 Sodium ppm ASTM D5185m >20 2 <1	Molybdenum	ppm	ASTM D5185m		84	77	75
Calcium ppm ASTM D5185m 1796 1693 1719 Phosphorus ppm ASTM D5185m 1200 943 873 883 Zinc ppm ASTM D5185m 1300 1192 1062 1131 Sulfur ppm ASTM D5185m 3811 3127 3626 CONTAMINANTS method limit/base current history1 history2 Soliicon ppm ASTM D5185m >25 5 13 ▲ 27 Sodium ppm ASTM D5185m >20 2 <1	Manganese	ppm	ASTM D5185m		<1	<1	1
Phosphorus ppm ASTM D5185m 1200 943 873 883 Zinc ppm ASTM D5185m 1300 1192 1062 1131 Sulfur ppm ASTM D5185m 3811 3127 3626 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 13 ▲ 27 Sodium ppm ASTM D5185m >20 2 <1	Magnesium	ppm	ASTM D5185m		331	145	156
Zinc ppm ASTM D5185m 1300 1192 1062 1131 Sulfur ppm ASTM D5185m 3811 3127 3626 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 13 27 Sodium ppm ASTM D5185m >20 2 <1	Calcium		AOTH DOTOOM			140	
Sulfur ppm ASTM D5185m 3811 3127 3626 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 13 ▲ 27 Sodium ppm ASTM D5185m 4 2 2 Potassium ppm ASTM D5185m >20 2 <1	Calcium	ppm					
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 13 ▲ 27 Sodium ppm ASTM D5185m 4 2 2 Potassium ppm ASTM D5185m >20 2 <1			ASTM D5185m	1200	1796	1693	1719
Silicon ppm ASTM D5185m >25 5 13 ▲ 27 Sodium ppm ASTM D5185m 4 2 2 Potassium ppm ASTM D5185m >20 2 <1 3 Fuel % ASTM D3524 >5 <1.0 <1.0 ▲ 2.8 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 10.6 9.1 8.9 Sulfation Abs/.1mm *ASTM D7415 >30 24.9 20.4 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 23.3 18.7 15.4	Phosphorus	ppm	ASTM D5185m ASTM D5185m		1796 943	1693 873	1719 883
Sodium ppm ASTM D5185m 4 2 2 Potassium ppm ASTM D5185m >20 2 <1	Phosphorus Zinc	ppm	ASTM D5185m ASTM D5185m ASTM D5185m		1796 943 1192	1693 873 1062	1719 883 1131
Potassium ppm ASTM D5185m >20 2 <1 3 Fuel % ASTM D3524 >5 <1.0 <1.0 ▲ 2.8 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 10.6 9.1 8.9 Sulfation Abs/.1mm *ASTM D7415 >30 24.9 20.4 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 23.3 18.7 15.4	Phosphorus Zinc Sulfur	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	1300	1796 943 1192 3811	1693 873 1062 3127	1719 883 1131 3626
Fuel % ASTM D3524 >5 <1.0 <1.0	Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method	1300 limit/base	1796 943 1192 3811 current	1693 873 1062 3127 history1	1719 883 1131 3626 history2
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 10.6 9.1 8.9 Sulfation Abs/.1mm *ASTM D7415 >30 24.9 20.4 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 23.3 18.7 15.4	Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m	1300 limit/base	1796 943 1192 3811 current	1693 873 1062 3127 history1	1719 883 1131 3626 history2 ▲ 27
Soot % % *ASTM D7844 >3 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 10.6 9.1 8.9 Sulfation Abs/.1mm *ASTM D7415 >30 24.9 20.4 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 23.3 18.7 15.4	Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m	1300 limit/base >25	1796 943 1192 3811 current 5	1693 873 1062 3127 history1 13	1719 883 1131 3626 history2 ▲ 27 2
Nitration Abs/cm *ASTM D7624 >20 10.6 9.1 8.9 Sulfation Abs/.1mm *ASTM D7415 >30 24.9 20.4 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 23.3 18.7 15.4	Phosphorus Zinc Sulfur	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m	1300 limit/base >25 >20	1796 943 1192 3811 current 5 4	1693 873 1062 3127 history1 13 2 <1	1719 883 1131 3626 history2 ▲ 27 2 3
Sulfation Abs/.1mm *ASTM D7415 >30 24.9 20.4 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 23.3 18.7 15.4	Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D3524	1300 limit/base >25 >20 >5	1796 943 1192 3811 current 5 4 2 <1.0	1693 873 1062 3127 history1 13 2 <1	1719 883 1131 3626 history2 ▲ 27 2 3 ▲ 2.8
Sulfation Abs/.1mm *ASTM D7415 >30 24.9 20.4 19.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 23.3 18.7 15.4	Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED	ppm ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m MEthod ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D3524	1300 limit/base >25 >20 >5 limit/base	1796 943 1192 3811 current 5 4 2 <1.0	1693 873 1062 3127 history1 13 2 <1 <1.0	1719 883 1131 3626 history2 ▲ 27 2 3 ▲ 2.8
Oxidation Abs/.1mm *ASTM D7414 >25 23.3 18.7 15.4	Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot %	ppm ppm ppm TS ppm ppm ppm %	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D3524 Method *ASTM D7844	1300 limit/base >25 >20 >5 limit/base >3	1796 943 1192 3811 current 5 4 2 <1.0 current 0.1	1693 873 1062 3127 history1 13 2 <1 <1.0 history1	1719 883 1131 3626 history2 ▲ 27 2 3 ▲ 2.8 history2
	Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm ppm ppm TS ppm ppm ppm %	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D7844 *ASTM D7844	1300 limit/base >25 >20 >5 limit/base >3 >20	1796 943 1192 3811 current 5 4 2 <1.0 current 0.1 10.6	1693 873 1062 3127 history1 13 2 <1 <1.0 history1 0.1	1719 883 1131 3626 history2 ▲ 27 2 3 ▲ 2.8 history2 0.1 8.9
	Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm % Abs/.1mm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D3524 Method *ASTM D7844 *ASTM D7624 *ASTM D76145	1300 limit/base >25 >20 >5 limit/base >3 >20 >3	1796 943 1192 3811 current 5 4 2 <1.0 current 0.1 10.6 24.9	1693 873 1062 3127 history1 13 2 <1 <1.0 history1 0.1 9.1 20.4	1719 883 1131 3626 history2 ▲ 27 2 3 ▲ 2.8 history2 0.1 8.9 19.5
	Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm ppm ppm ppm ppm ppm ppm ppm Abs/.1mm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D3524 Method *ASTM D7844 *ASTM D7624 *ASTM D7415 Method	1300 limit/base >25 >20 >5 limit/base >3 >20 >30 limit/base	1796 943 1192 3811 current 5 4 2 <1.0 current 0.1 10.6 24.9 current	1693 873 1062 3127 history1 13 2 <1 <1.0 history1 0.1 9.1 20.4 history1	1719 883 1131 3626 history2 ▲ 27 2 3 ▲ 2.8 history2 0.1 8.9 19.5 history2



OIL ANALYSIS REPORT







Certificate 12367

Laboratory Sample No.

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : PCA0096216 Lab Number : 05864515 Unique Number : 10498980

Received : 05 Jun 2023 **Tested** Diagnosed

: 06 Jun 2023 : 06 Jun 2023 - Doug Bogart

Test Package : IND 2 (Additional Tests: FuelDilution)

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.

DELTA FUEL COMPANY

1000 WELLS ISLAND RD SHREVEPORT, LA US 71107

Contact: BRAD GORDON bgordon@deltafuel.com T: (318)780-3921

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