

OIL ANALYSIS REPORT









Area [19160] 50-66 Component

Diesel Engine

CONOCO PHILLIPS GUARDOL ECT 15W40 (--- GAL)

Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

Contamination

There is no indication of any contamination in the

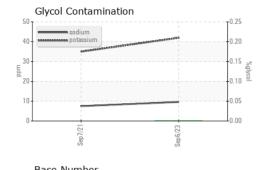
Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORMATION method limit/base current history1 history2				Sep2021	Sep2023		
Sample Date Client Info 3425 3115	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 3425 3115	Sample Number		Client Info		WC0818604	WC0548823	
Oil Age hrs Client Info \$10 170	Sample Date		Client Info		06 Sep 2023	07 Sep 2021	
Oil Changed Sample Status Client Info Changed NORMAL Changed NORMAL	Machine Age	hrs	Client Info		3425	3115	
Sample Status WC Method Secure Sistory Sistory Sistory Secure Sistory Sistory	Oil Age	hrs	Client Info		310	170	
CONTAMINATION method limit/base current history1 history2 Fuel WC Method >2.1 <1.0	Oil Changed		Client Info		Changed	Changed	
WEAR METALS	Sample Status				NORMAL	NORMAL	
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >51 6 4 Chromium ppm ASTM D5185m >11 <1 <1 Nickel ppm ASTM D5185m >5 <1 0 Titanium ppm ASTM D5185m >5 <1 0 Silver ppm ASTM D5185m >3 0 0 Aluminum ppm ASTM D5185m >31 2 0 Lead ppm ASTM D5185m >26 <1 <1 Copper ppm ASTM D5185m >26 <1 <1 Lead ppm ASTM D5185m >26 <1 <1 April Copper ppm ASTM D5185m >26 <1 <1 April Copper ppm ASTM D5185m	CONTAMINATION	I	method	limit/base	current	history1	history2
Iron	Fuel		WC Method	>2.1	<1.0	<1.0	
Chromium ppm ASTM D5185m >11 <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>51	6	4	
Titanium	Chromium	ppm	ASTM D5185m	>11	<1	<1	
Silver	Nickel	ppm	ASTM D5185m	>5	<1	0	
Aluminum	Titanium	ppm	ASTM D5185m		<1	<1	
Lead	Silver	ppm	ASTM D5185m	>3	0	0	
Copper ppm ASTM D5185m >26 10 5 Tin ppm ASTM D5185m >4 <1 0 Antimony ppm ASTM D5185m 0 Vanadium ppm ASTM D5185m <1 0 Cadmium ppm ASTM D5185m 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 Barium ppm ASTM D5185m 0 0 Molybdenum ppm ASTM D5185m 3 8 Magnesium ppm ASTM D5185m 3 8 Magnesium ppm ASTM D5185m 1800 1301 1385 Calcium ppm ASTM D5185m 1000 1107 1016 Zinc ppm ASTM D5185m	Aluminum	ppm	ASTM D5185m	>31	2	0	
Tin	Lead	ppm	ASTM D5185m	>26	<1		
Antimony ppm ASTM D5185m 0 Vanadium ppm ASTM D5185m <1	Copper	ppm	ASTM D5185m	>26	10	5	
Vanadium ppm ASTM D5185m <1	Tin	ppm	ASTM D5185m	>4	<1	0	
Cadmium ppm ASTM D5185m 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 85 88 101 Barium ppm ASTM D5185m 0 0 Molybdenum ppm ASTM D5185m 3 8 Magnesium ppm ASTM D5185m <-1 <1 Magnesium ppm ASTM D5185m 1800 1301 1385 Calcium ppm ASTM D5185m 1000 1107 1016 Phosphorus ppm ASTM D5185m 1000 1107 1016 Zinc ppm ASTM D5185m 1100 1261 1113 Sulfur ppm ASTM D5185m 3500 4218 3223 CONTAMINANTS method limit/base current history1 history2	Antimony	ppm	ASTM D5185m			0	
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 85 88 101 Barium ppm ASTM D5185m 0 0 Molybdenum ppm ASTM D5185m 3 8 Manganese ppm ASTM D5185m <1 <1 Magnesium ppm ASTM D5185m 1800 1301 1385 Calcium ppm ASTM D5185m 1000 1107 1016 Phosphorus ppm ASTM D5185m 1000 1261 1113 Zinc ppm ASTM D5185m 3500 4218 3223 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >22 4 3 Sodium ppm ASTM D5185m >31 10 8 <	Vanadium	ppm	ASTM D5185m		<1	0	
Boron	Cadmium	ppm	ASTM D5185m		0	0	
Barium							
Molybdenum ppm ASTM D5185m 3 8 Manganese ppm ASTM D5185m <1 <1 Magnesium ppm ASTM D5185m 350 716 657 Calcium ppm ASTM D5185m 1800 1301 1385 Phosphorus ppm ASTM D5185m 1000 1107 1016 Zinc ppm ASTM D5185m 1100 1261 1113 Sulfur ppm ASTM D5185m 3500 4218 3223 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >22 4 3 Sodium ppm ASTM D5185m >31 10 8 Potassium ppm ASTM D5185m >20 42 35 Glycol % *ASTM D5285m	ADDITIVES		method	limit/base	current	history1	history2
Manganese ppm ASTM D5185m <1		ppm					
Magnesium ppm ASTM D5185m 350 716 657 Calcium ppm ASTM D5185m 1800 1301 1385 Phosphorus ppm ASTM D5185m 1000 1107 1016 Zinc ppm ASTM D5185m 1100 1261 1113 Sulfur ppm ASTM D5185m 3500 4218 3223 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >22 4 3 Sodium ppm ASTM D5185m >31 10 8 Potassium ppm ASTM D5185m >20 42 35 Glycol % *ASTM D5185m >20 42 35 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624<	Boron	• •	ASTM D5185m		88	101	
Calcium ppm ASTM D5185m 1800 1301 1385 Phosphorus ppm ASTM D5185m 1000 1107 1016 Zinc ppm ASTM D5185m 1100 1261 1113 Sulfur ppm ASTM D5185m 3500 4218 3223 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >22 4 3 Sodium ppm ASTM D5185m >31 10 8 Potassium ppm ASTM D5185m >20 42 35 Glycol % *ASTM D5185m >20 42 35 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.1 Nitration Abs/:mm <	Boron Barium	ppm	ASTM D5185m ASTM D5185m		88 0	101	
Phosphorus ppm ASTM D5185m 1000 1107 1016 Zinc ppm ASTM D5185m 1100 1261 1113 Sulfur ppm ASTM D5185m 3500 4218 3223 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >22 4 3 Sodium ppm ASTM D5185m >31 10 8 Sodium ppm ASTM D5185m >20 42 35 Potassium ppm ASTM D5185m >20 42 35 Glycol % *ASTM D2982 0.0 NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 6.8 6.6 Nitration Abs/.1mm *ASTM D7414 >25<	Boron Barium Molybdenum	ppm	ASTM D5185m ASTM D5185m ASTM D5185m		88 0 3	101 0 8	
Zinc ppm ASTM D5185m 1100 1261 1113 Sulfur ppm ASTM D5185m 3500 4218 3223 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >22 4 3 Sodium ppm ASTM D5185m >31 10 8 Potassium ppm ASTM D5185m >20 42 35 Glycol % *ASTM D2982 0.0 NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.1 Nitration Abs/.mm *ASTM D7415 >30 18.2 18.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414	Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	85	88 0 3 <1	101 0 8 <1	
Sulfur ppm ASTM D5185m 3500 4218 3223 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >22 4 3 Sodium ppm ASTM D5185m >31 10 8 Potassium ppm ASTM D5185m >20 42 35 Glycol % *ASTM D2982 0.0 NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 6.8 6.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.2 18.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM	Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	350	88 0 3 <1 716	101 0 8 <1 657	
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >22 4 3 Sodium ppm ASTM D5185m >31 10 8 Potassium ppm ASTM D5185m >20 42 35 Glycol % *ASTM D2982 0.0 NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 6.8 6.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.2 18.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.9 12.1	Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	350 1800	88 0 3 <1 716 1301	101 0 8 <1 657 1385	
Silicon ppm ASTM D5185m >22 4 3 Sodium ppm ASTM D5185m >31 10 8 Potassium ppm ASTM D5185m >20 42 35 Glycol % *ASTM D2982 0.0 NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 6.8 6.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.2 18.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.9 12.1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	350 1800 1000	88 0 3 <1 716 1301 1107	101 0 8 <1 657 1385 1016	
Sodium ppm ASTM D5185m >31 10 8 Potassium ppm ASTM D5185m >20 42 35 Glycol % *ASTM D2982 0.0 NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 6.8 6.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.2 18.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.9 12.1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	350 1800 1000 1100	88 0 3 <1 716 1301 1107	101 0 8 <1 657 1385 1016	
Potassium ppm ASTM D5185m >20 42 35 Glycol % *ASTM D2982 0.0 NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 6.8 6.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.2 18.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.9 12.1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	350 1800 1000 1100 3500	88 0 3 <1 716 1301 1107 1261 4218	101 0 8 <1 657 1385 1016 1113 3223	
Glycol % *ASTM D2982 0.0 NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 6.8 6.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.2 18.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.9 12.1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	350 1800 1000 1100 3500 limit/base	88 0 3 <1 716 1301 1107 1261 4218 current	101 0 8 <1 657 1385 1016 1113 3223 history1	 history2
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 6.8 6.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.2 18.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.9 12.1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	350 1800 1000 1100 3500 limit/base	88 0 3 <1 716 1301 1107 1261 4218 current	101 0 8 <1 657 1385 1016 1113 3223 history1	 history2
Soot % % *ASTM D7844 >3 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 6.8 6.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.2 18.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.9 12.1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	350 1800 1000 1100 3500 limit/base >22 >31	88 0 3 <1 716 1301 1107 1261 4218 current 4	101 0 8 <1 657 1385 1016 1113 3223 history1 3	history2
Nitration Abs/cm *ASTM D7624 >20 6.8 6.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.2 18.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.9 12.1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	350 1800 1000 1100 3500 limit/base >22 >31	88 0 3 <1 716 1301 1107 1261 4218 current 4 10 42	101 0 8 <1 657 1385 1016 1113 3223 history1 3 8 35	history2
Nitration Abs/cm *ASTM D7624 >20 6.8 6.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.2 18.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.9 12.1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	350 1800 1000 1100 3500 limit/base >22 >31 >20	88 0 3 <1 716 1301 1107 1261 4218 current 4 10 42 0.0	101 0 8 <1 657 1385 1016 1113 3223 history1 3 8 35 NEG	history2
Sulfation Abs/.1mm *ASTM D7415 >30 18.2 18.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.9 12.1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D2982	350 1800 1000 1100 3500 limit/base >22 >31 >20	88 0 3 <1 716 1301 1107 1261 4218 current 4 10 42 0.0 current	101 0 8 <1 657 1385 1016 1113 3223 history1 3 8 35 NEG	history2 history2
Oxidation Abs/.1mm *ASTM D7414 >25 11.9 12.1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m *ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D2982 *Method *ASTM D7844	350 1800 1000 1100 3500 limit/base >22 >31 >20	88 0 3 <1 716 1301 1107 1261 4218 current 4 10 42 0.0 current 0.1	101 0 8 <1 657 1385 1016 1113 3223 history1 3 8 35 NEG history1	history2 history2
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m *ASTM D7844 *ASTM D7844	350 1800 1000 1100 3500 limit/base >22 >31 >20 limit/base	88 0 3 <1 716 1301 1107 1261 4218 current 4 10 42 0.0 current 0.1 6.8	101 0 8 <1 657 1385 1016 1113 3223 history1 3 8 35 NEG history1 0.1 6.6	history2 history2
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m *ASTM D7844 *ASTM D7624 *ASTM D76145	350 1800 1000 1100 3500 limit/base >22 >31 >20 limit/base >3 >20 >3	88 0 3 <1 716 1301 1107 1261 4218 current 4 10 42 0.0 current 0.1 6.8 18.2	101 0 8 <1 657 1385 1016 1113 3223 history1 3 8 35 NEG history1 0.1 6.6 18.4	history2 history2
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m *ASTM D7844 *ASTM D7844 *ASTM D7844 *ASTM D7624 *ASTM D7415 method	350 1800 1000 1100 3500 limit/base >22 >31 >20 limit/base >3 >20 >30 limit/base	88 0 3 <1 716 1301 1107 1261 4218	101 0 8 <1 657 1385 1016 1113 3223 history1 3 8 35 NEG history1 0.1 6.6 18.4 history1	history2 history2 history2 history2



OIL ANALYSIS REPORT

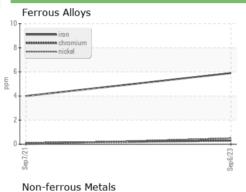


VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	
Precipitate	scalar	*Visual	NONE	NONE	NONE	
Silt	scalar	*Visual	NONE	NONE	NONE	
Debris	scalar	*Visual	NONE	NONE	NONE	
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	
Appearance	scalar	*Visual	NORML	NORML	NORML	
Odor	scalar	*Visual	NORML	NORML	NORML	
Emulsified Water	scalar	*Visual	>0.21	NEG	NEG	
Free Water	scalar	*Visual		NEG	NEG	
	IEC	ام مالم مدر	1::-	a	hintom d	la i a ta uu . O

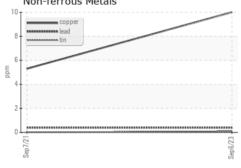
10.0 T Base	
TU.U T Base	
₹ 8.0+	
(6) Hou Koule (Line Koule) Abnormal 4.0 Severe	
Ē 6.0	
Abnormal	
€ 4.0 +	
Severe	
& 2.0	
0.0	_
Sep7/21	
disposed in the contract of th	
∽	

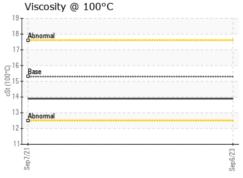
FLUID PROPERTIES		method				history2
Visc @ 100°C	cSt	ASTM D445	15.3	13.9	13.9	

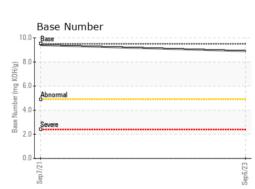
Viscosity @ 100°C ()0015 15 14 13 Abnormal 12



GRAPHS











Laboratory Sample No.

Lab Number Unique Number : 10674851

: WC0818604 : 05968300

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

: 04 Oct 2023 Diagnostician : Wes Davis

: 03 Oct 2023

Test Package : CONST (Additional Tests: Glycol, TBN) 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.

MANHATTAN ROAD AND BRIDGE

5601 S 122ND E AVE TULSA, OK US 74146

Contact: BEN CALDWELL kevin.marson@wearcheck.com T: (918)728-5749

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