

## **OIL ANALYSIS REPORT**

Sample Rating Trend

ISO

### 30-68 Hydraulic System

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

#### DIAGNOSIS

Area [21115] Machine Id

#### Recommendation

Oil and filter change at the time of sampling has been noted. No corrective action is recommended at this time. Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

#### Contamination

There is a high amount of silt (particulates < 14 microns in size) present in the oil.

#### Fluid Condition

The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0923372	WC0549018	
Sample Date		Client Info		16 Apr 2024	19 Apr 2021	
Machine Age	hrs	Client Info		4065	3215	
Oil Age	hrs	Client Info		2065	1265	
Oil Changed		Client Info		Changed	Changed	
Sample Status				ABNORMAL	ABNORMAL	
CONTAMINATION	N	method	limit/base	current	history1	history2
Water		WC Method	>0.1	NEG	NEG	
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>20	6	10	
Chromium	ppm	ASTM D5185m	>10	<1	<1	
Nickel	ppm	ASTM D5185m	>10	<1	<1	
Titanium	ppm	ASTM D5185m		1	<1	
Silver	ppm	ASTM D5185m		<1	<1	
Aluminum	ppm	ASTM D5185m	>10	2	<1	
Lead	ppm	ASTM D5185m	>10	4	9	
Copper	ppm	ASTM D5185m	>75	9	21	
Tin	ppm	ASTM D5185m	>10	<1	<1	
Antimony	ppm	ASTM D5185m			0	
Vanadium	ppm	ASTM D5185m		<1	0	
Cadmium	ppm	ASTM D5185m		<1	0	
			Provide a second		In the term of	
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	ASTM D5185m	85	117	40	history2
	ppm ppm					
Boron		ASTM D5185m		117	40	
Boron Barium	ppm	ASTM D5185m ASTM D5185m		117 0	40 0	
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m		117 0 7	40 0 46	
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	85	117 0 7 <1	40 0 46 <1	
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	85 350	117 0 7 <1 167	40 0 46 <1 54	
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	85 350 1800	117 0 7 <1 167 3069	40 0 46 <1 54 3302	  
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	85 350 1800 1000	117 0 7 <1 167 3069 1145	40 0 46 <1 54 3302 1130	   
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	85 350 1800 1000 1100	117 0 7 <1 167 3069 1145 1367	40 0 46 <1 54 3302 1130 1285	   
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	85 350 1800 1000 1100 3500	117 0 7 <1 167 3069 1145 1367 4088	40 0 46 <1 54 3302 1130 1285 5936	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	85 350 1800 1000 1100 3500	117 0 7 <1 167 3069 1145 1367 4088 current	40 0 46 <1 54 3302 1130 1285 5936 history1	     history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	85 350 1800 1000 1100 3500	117 0 7 <1 167 3069 1145 1367 4088 current 11	40 0 46 <1 54 3302 1130 1285 5936 history1 8	     history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm 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	85 350 1800 1000 1100 3500 limit/base >20	1117 0 7 <1 167 3069 1145 1367 4088 current 11 2	40 0 46 <1 54 3302 1130 1285 5936 history1 8 3	     history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	85 350 1800 1000 1100 3500 limit/base >20	1117 0 7 <1 167 3069 1145 1367 4088 <u>current</u> 11 2 3	40 0 46 <1 54 3302 1130 1285 5936 history1 8 3 2	     history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	85 350 1800 1000 1100 3500 <b>limit/base</b> >20 <b>limit/base</b>	117 0 7 <1 167 3069 1145 1367 4088 <u>current</u> 11 2 3 <u>current</u>	40 0 46 <1 54 3302 1130 1285 5936 history1 8 3 2 2 history1	     history2   history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLIN Particles >4µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	85 350 1800 1000 1100 3500 limit/base >20 limit/base >20	1117 0 7 <1 167 3069 1145 1367 4088 <u>current</u> 11 2 3 <u>current</u> ▲ 12108	40 0 46 <1 54 3302 1130 1285 5936 history1 8 3 2 2 history1 ∧ 12217	    history2  history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLIN Particles >4µm Particles >6µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	85 350 1800 1000 1100 3500 limit/base >20 limit/base >20 limit/base	1117 0 7 <1 167 3069 1145 1367 4088 current 11 2 3 current 11 2 3 12108 134	40 0 46 <1 54 3302 1130 1285 5936 history1 8 3 2 2 history1 8 3 2 2 12217 59	     history2   history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLIN Particles >4µm Particles >14µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7647 ASTM D7647	85 350 1800 1000 1100 3500 <b>limit/base</b> >20 <b>limit/base</b> >20 <b>limit/base</b> >20 >20	1117 0 7 <1 167 3069 1145 1367 4088 current 11 2 3 current 11 2 3 12108 134 4	40 0 46 <1 54 3302 1130 1285 5936 history1 8 3 2 history1 8 3 2 12217 59 59 7	     history2   history2

ASTM D7647 >3

ISO 4406 (c) >19/17/14 A 21/14/9

Particles >71µm **Oil Cleanliness** 

2

0

▲ 21/13/10



# **OIL ANALYSIS REPORT**

The second secon	FLUID DEGRAD		method	limit/base	current	history1	history2
ελοματικό 6μm	Acid Number (AN)	mg KOH/g	ASTM D8045		1.27	1.557	
, , , , , , , , , , , , , , , , ,	VISUAL		method	limit/base	current	history1	history2
Abnormal	White Metal	scalar	*Visual	NONE	NONE	NONE	
<b>0</b>	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	
	Precipitate	scalar	*Visual	NONE	NONE	NONE	
//21	-	scalar	*Visual	NONE	NONE	NONE	
Apr19/21 Apr16/24	Debris	scalar	*Visual	NONE	NONE	NONE	
-	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	
Particle Trend	Appearance	scalar	*Visual	NORML	NORML	NORML	
	Odor	scalar	*Visual	NORML	NORML	NORML	
	Emulsified Water	scalar	*Visual	>0.1	NEG	NEG	
	Free Water	scalar	*Visual		NEG	NEG	
Abnormal	FLUID PROPER	TIES	method	limit/base	current	history1	history2
	Visc @ 40°C	cSt	ASTM D445	115	48.7	54.1	
April 9/24	SAMPLE IMAGE	S	method	limit/base	current	history1	history2
Apri 5/24	0,000	•					
Acid Number	Color						na imaga
	Color						no image
						1521 W	
	Bottom				3	C C HOINE	no image
	GRAPHS						
- 12/					Darticla Count		
Apr19/21	Ferrous Alloys			491,52	Particle Count		T <sup>26</sup>
	iron			122,88	0		-24
Viscosity @ 40°C	ā. 5-				Severe		
Abnormal				30,72	"t		-22
Base	0			1,68 12 TE 7,68	Anormal		-20
	Apr19/21			Apr16/24 (per 1 ml		<b>N</b>	-18
Abnormal	Non-ferrous Meta	ls		Apr16/24 -			+18
	30 T			5 10		•	
	20 - copper			12			14
				PL 3			-12
9.21	E 10-			3			
Apri 9/21	E 10	*******					-10
Apr19/21					2-		-10
Apri 9/21	Apr19/21			Apr16/24	2-		-10
April 19/2	Viscosity @ 40°C			Apr16/24	$a_{\mu}$	14μ 21μ	10 8 38µ 71µ
Apt 19/2	Viscosity @ 40°C			Apr16/24	$a_{\mu}$	14μ 21μ	8
Apri 19/2	<sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup>			Apr16/24	$a_{\mu}$	14μ 21μ	8
Apr19/21	<sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup> <sup>140</sup>			Apr16/24	$\beta = \frac{1}{4\mu}$	14μ 21μ	8
April 9/21	Viscosity @ 40°C			Apr16/24	Acid Number	14μ 21μ	8
Apr19/2	10 126 126 126 126 126 126 126 126			1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1	Acid Number	14μ 21μ	8 38µ 71µ
April9/21	10 126 126 126 126 126 126 126 126			1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1	Acid Number	14μ 21μ	
Apr19/21	10 0 120 120 120 120 120 120 120			Apr16/24 Apr	Acid Number		38µ 71µ
Laboratory	Viscosity @ 40°C			+2/91/04 +2/91/04 +2/91/04 +2/91/04 +2/91/04 +2/91/04 +2/91/04 +2/91/04 +2/91/04 +2/91/04 +2/91/04	Acid Number	IATTAN ROAD	38µ 71µ
Laboratory Sample No.	Viscosity @ 40°C	Recei	ved : 17	+2/91/04 +2/91/04 +2/91/04 +2/91/04 +2/91/04 +2/91/04 +2/91/04 +2/91/04 +2/91/04 +2/91/04 +2/91/04	Acid Number	IATTAN ROAD	ан <b>д в</b> я <b>і</b> д 122ND E AV
Laboratory Sample No. Lab Numbe	Viscosity @ 40°C		ved : 17 d : 20	+2/91/04 +2/91/04 +2/91/04 +2/91/04 +2/91/04 +2/91/04 +2/91/04 +2/91/04 +2/91/04 +2/91/04 +2/91/04	Acid Number	IATTAN ROAD	38μ 71μ
Laboratory Sample No. Lab Number Unique Number Test Packag	Viscosity @ 40°C	Recei Teste Diagn	ved : 17 d : 20 losed : 21	the second secon	Acid Number Acid Number MANH	HATTAN ROAD 5601 S Contact: BE	AND BRIDG 122ND E AV TULSA, C US 7412 N CALDWEI
Laboratory Sample No. Lab Number Unique Number	Viscosity @ 40°C	Recei Teste Diagn	ved : 17 d : 20 osed : 21 00-237-1369	r, NC 27513 7 May 2024 9 May 2024 - Dor 7.	Acid Number Acid Number MANH	HATTAN ROAD 5601 S Contact: BE cevin.marson@w	анд влід аку тір Анд влід( 122ND E A' TULSA, ( US 741 N CALDWE

Submitted By: JAMES STEELMON

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