

OIL ANALYSIS REPORT

Sample Rating Trend



Area [17584] 20-80 Component

Diesel Engine

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

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

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.

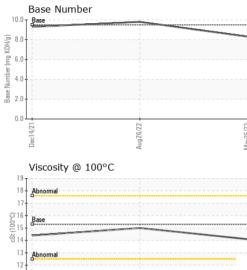
SAMPLE INFORM	1ATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0793328	WC0619274	WC0601534
Sample Date		Client Info		25 May 2023	26 Aug 2022	14 Dec 2021
Machine Age	hrs	Client Info		6026	5538	5241
Oil Age	hrs	Client Info		488	5241	0
Oil Changed		Client Info		Changed	Changed	N/A
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATION	١	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	32	20	24
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Nickel	ppm	ASTM D5185m	>4	0	0	0
Titanium	ppm	ASTM D5185m		0	<1	<1
Silver	ppm	ASTM D5185m	>3	0	0	<1
Aluminum	ppm	ASTM D5185m	>20	1	2	2
Lead	ppm	ASTM D5185m	>40	0	0	<1
Copper	ppm	ASTM D5185m	>330	<1	<1	1
Tin	ppm	ASTM D5185m	>15	0	<1	<1
Antimony	ppm	ASTM D5185m				0
Vanadium	ppm	ASTM D5185m		0	0	<1
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 85	current 92	history1 78	history2 105
	ppm ppm					
Boron		ASTM D5185m		92	78	105
Boron Barium	ppm	ASTM D5185m ASTM D5185m		92 0	78 <1	105 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m		92 0 2	78 <1 9	105 0 2
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	85	92 0 2 <1	78 <1 9 <1	105 0 2 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	85 350	92 0 2 <1 772	78 <1 9 <1 705	105 0 2 <1 698
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	85 350 1800	92 0 2 <1 772 1477	78 <1 9 <1 705 1227	105 0 2 <1 698 1437
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	85 350 1800 1000	92 0 2 <1 772 1477 1079	78 <1 9 <1 705 1227 1005	105 0 2 <1 698 1437 1108
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	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	92 0 2 <1 772 1477 1079 1329	78 <1 9 <1 705 1227 1005 1184	105 0 2 <1 698 1437 1108 1281
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	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 limit/base	92 0 2 <1 772 1477 1079 1329 4644	78 <1 9 <1 705 1227 1005 1184 3627	105 0 2 <1 698 1437 1108 1281 3467
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	85 350 1800 1000 1100 3500 limit/base	92 0 2 <1 772 1477 1079 1329 4644 current	78 <1 9 <1 705 1227 1005 1184 3627 history1	105 0 2 <1 698 1437 1108 1281 3467 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method	85 350 1800 1000 1100 3500 limit/base >25	92 0 2 <1 772 1477 1079 1329 4644 <i>current</i> 5	78 <1 9 <1 705 1227 1005 1184 3627 history1 4	105 0 2 <1 698 1437 1108 1281 3467 history2 5
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	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 >25	92 0 2 <1 772 1477 1079 1329 4644 <u>current</u> 5 2	78 <1 9 <1 705 1227 1005 1184 3627 history1 4 3	105 0 2 <1 698 1437 1108 1281 3467 history2 5 4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm	ASTM D5185m ASTM D5185m	85 350 1800 1000 1100 3500 limit/base >25 >20	92 0 2 <1 772 1477 1079 1329 4644 <u>current</u> 5 2 4	78 <1 9 <1 705 1227 1005 1184 3627 history1 4 3 13	105 0 2 <1 698 1437 1108 1281 3467 history2 5 4 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	85 350 1800 1000 1100 3500 limit/base >25 >20 limit/base	92 0 2 <1 772 1477 1079 1329 4644 <i>current</i> 5 2 4 4 <i>current</i>	78 <1 9 <1 705 1227 1005 1184 3627 history1 4 3 13 history1	105 0 2 <1 698 1437 1108 1281 3467 history2 5 4 3 3 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	85 350 1800 1000 1100 3500 limit/base >25 >20 limit/base >3	92 0 2 <1 772 1477 1079 1329 4644 <i>current</i> 5 2 4 4 <i>current</i> 0.3	78 <1 9 <1 705 1227 1005 1184 3627 history1 4 3 13 13 history1 0.3	105 0 2 <1 698 1437 1108 1281 3467 history2 5 4 3 3 history2 0.2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	85 350 1800 1000 1100 3500 imit/base >25 >20 imit/base >3 >20	92 0 2 <1 772 1477 1079 1329 4644 <i>current</i> 5 2 4 4 <i>current</i> 0.3 8.1	78 <1 9 <1 705 1227 1005 1184 3627 history1 4 3 13 history1 0.3 7.8	105 0 2 <1 698 1437 1108 1281 3467 history2 5 4 3 3 history2 0.2 7.5
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	85 350 1800 1000 1100 3500 imit/base >25 >20 imit/base >3 >20 >30	92 0 2 <1 772 1477 1079 1329 4644 <i>current</i> 5 2 4 4 <i>current</i> 0.3 8.1 19.3	78 <1 9 <1 705 1227 1005 1184 3627 history1 4 3 13 13 history1 0.3 7.8 20.6	105 0 2 <1 698 1437 1108 1281 3467 history2 5 4 3 bistory2 0.2 7.5 19.6
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	85 350 1800 1000 1100 3500 imit/base >25 >20 imit/base >3 >20 >30	92 0 2 <1 772 1477 1079 1329 4644 <i>current</i> 5 2 4 4 <i>current</i> 0.3 8.1 19.3	78 <1 9 <1 705 1227 1005 1184 3627 history1 4 3 13 history1 0.3 7.8 20.6 history1	105 0 2 <1 698 1437 1108 1281 3467 history2 5 4 3 history2 0.2 7.5 19.6 history2



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Dec14/21

OIL ANALYSIS REPORT



	VISUAL		method	limit/base	current	history1	history2	
	White Metal	scalar	*Visual	NONE	NONE	NONE	NONE	
	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE	
	Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE	
	Silt	scalar	*Visual	NONE	NONE	NONE	NONE	
	Debris	scalar	*Visual	NONE	NONE	NONE	NONE	
	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE	
Aug26/22 May25/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML	
Aug	Odor	scalar	*Visual	NORML	NORML	NORML	NORML	
C	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG	
_	Free Water	scalar	*Visual		NEG	NEG	NEG	
	FLUID PROPERT	TIES	method	limit/base	current	history1	history2	
	Visc @ 100°C	cSt	ASTM D445	15.3	14.1	15.0	14.4	
	GRAPHS							
	Ferrous Alloys							
2	35 iron							
Aug26/22	30 - newseenees chromium							
AL	25-							
	E 20 E 15							
	15							
	10							
	5							
		2						
	Dec14/21	Aug26/22		May25/23				
				Ma				
	Non-ferrous Metal	S						
	copper							
	8 - tin							
	6-							
	u dd							
	4							
	2							
	2							
		22		33				
	ec14/2	wg26/22		ay25/23				
	Q	4		Ma				
	Viscosity @ 100°C				Base Number			
	18 - Abnormal			10.0	Base			
	17						1	
	Dia Base			(0,7HO X 0.0 (0,7HO X 0.0 0,0HO X 0.0 0,0				
	000015 314			per (jii				
	·3 14			4.0-	1			
	13 Abnormal			²⁰ 2.0				
	12							
	114	22		L0.0	21+	- 22	23	
	Dec14/2	Aug26/22		May25/23	Dec14/2	Aug26/22	May25/23	
Laboratory Sample No. Lab Number Unique Number Test Package To discuss this sample report,		MANHATTAN ROAD AND BRIDGE 5601 S 122ND E AVE TULSA, OK US 74146 Contact: LANCE HARMON lance.harmon@manhattanrb.com						
* - Denotes test methods that Statements of conformity to spe					CGM 106:2012)	T:	(918)576-9071 F:	



Submitted By: JAMES STEELMON

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