

OIL ANALYSIS REPORT





VOLVO VNL 165 (S/N 4V4NC9EJ1LN234484)

Diesel Engine

PETRO CANADA DURON SHP 10W30 (--- 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

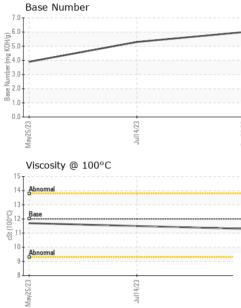
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		PCA0097427	PCA0097649	PCA0097485
Sample Date		Client Info		28 Sep 2023	14 Jul 2023	25 May 2023
Machine Age	mls	Client Info		411000	386000	361000
Oil Age	mls	Client Info		0	361000	0
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>6.0	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	18	22	46
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Nickel	ppm	ASTM D5185m	>2	0	0	<1
Titanium	ppm	ASTM D5185m		0	<1	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m		2	2	2
Lead	ppm	ASTM D5185m	>40	- <1	<1	1
Copper	ppm	ASTM D5185m	>330	1	2	3
Tin	ppm	ASTM D5185m	>15	<1	<1	<1
Vanadium	ppm	ASTM D5185m		0	<1	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method				history2
ADDITIVES Boron	ppm	Method ASTM D5185m	limit/base	current 0	history1 0	history2 0
	ppm ppm	ASTM D5185m				
Boron		ASTM D5185m	2	0	0	0
Boron Barium	ppm	ASTM D5185m ASTM D5185m	2 0 50	0 0	0	0 2
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50	0 0 61	0 0 64	0 2 99
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0	0 0 61 <1	0 0 64 <1	0 2 99 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0 950	0 0 61 <1 930	0 0 64 <1 1042	0 2 99 <1 1426
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0 950 1050	0 0 61 <1 930 994	0 0 64 <1 1042 1156	0 2 99 <1 1426 1625
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0 950 1050 995	0 0 61 <1 930 994 991	0 0 64 <1 1042 1156 1101	0 2 99 <1 1426 1625 1604
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	2 0 50 950 1050 995 1180	0 0 61 <1 930 994 991 1207	0 0 64 <1 1042 1156 1101 1322	0 2 99 <1 1426 1625 1604 1949
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	2 0 50 950 1050 995 1180 2600	0 0 61 <1 930 994 991 1207 2959	0 0 64 <1 1042 1156 1101 1322 3403	0 2 99 <1 1426 1625 1604 1949 4623
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 950 1050 995 1180 2600	0 0 61 <1 930 994 991 1207 2959 current	0 0 64 <1 1042 1156 1101 1322 3403 history1	0 2 99 <1 1426 1625 1604 1949 4623 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN 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 method	2 0 50 950 1050 995 1180 2600 Limit/base	0 0 61 <1 930 994 991 1207 2959 current 4	0 0 64 <1 1042 1156 1101 1322 3403 history1 4	0 2 99 <1 1426 1625 1604 1949 4623 history2 6
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 950 1050 995 1180 2600 Limit/base	0 0 61 <1 930 994 991 1207 2959 current 4 1	0 0 64 <1 1042 1156 1101 1322 3403 history1 4 3	0 2 99 <1 1426 1625 1604 1949 4623 history2 6 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	2 0 50 0 950 1050 995 1180 2600 limit/base >25 -20 limit/base	0 0 61 <1 930 994 991 1207 2959 current 4 1 2	0 0 64 <1 1042 1156 1101 1322 3403 history1 4 3 0	0 2 99 <1 1426 1625 1604 1949 4623 history2 6 3 4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	2 0 50 950 1050 995 1180 2600 imit/base >25 >20 imit/base >3	0 0 61 <1 930 994 991 1207 2959 current 4 1 2	0 0 64 <1 1042 1156 1101 1322 3403 history1 4 3 0 history1	0 2 99 <1 1426 1625 1604 1949 4623 history2 6 3 4 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	2 0 50 950 1050 995 1180 2600 imit/base >25 >20 imit/base >3	0 0 61 <1 930 994 991 1207 2959 current 4 1 2 2 2 0.3	0 0 64 <1 1042 1156 1101 1322 3403 history1 4 3 0 history1 0.4	0 2 99 <1 1426 1625 1604 1949 4623 history2 6 3 4 history2 0.4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	2 0 50 950 1050 995 1180 2600 limit/base >25 >20 limit/base >3 >20	0 0 61 <1 930 994 991 1207 2959 <u>current</u> 4 1 2 2 <u>current</u> 0.3 9.3	0 0 64 <1 1042 1156 1101 1322 3403 history1 4 3 0 history1 0.4 10.5	0 2 99 <1 1426 1625 1604 1949 4623 history2 6 3 4 4 history2 0.4 11.4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	2 0 50 0 950 1050 995 1180 2600 i mit/base >25 20 i mit/base >3 >20 >30	0 0 61 <1 930 994 991 1207 2959 <u>current</u> 4 1 2 2 <u>current</u> 0.3 9.3 21.0	0 0 64 <1 1042 1156 1101 1322 3403 history1 4 3 0 history1 0.4 10.5 22.9	0 2 99 <1 1426 1625 1604 1949 4623 history2 6 3 4 history2 0.4 11.4 25.1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844	2 0 50 0 950 1050 995 1180 2600 i mit/base >25 20 i mit/base >3 >20 >30	0 0 61 <1 930 994 991 1207 2959 current 4 1 2 2 current 0.3 9.3 21.0 current	0 0 64 <1 1042 1156 1101 1322 3403 history1 4 3 0 history1 0.4 10.5 22.9 history1	0 2 99 <1 1426 1625 1604 1949 4623 history2 6 3 4 history2 0.4 11.4 25.1 history2



OIL ANALYSIS REPORT

VISUAL



		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	
1		Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE	
Jul14/23 -	8/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML	
Jult	Sep28/23	Odor	scalar	*Visual	NORML	NORML	NORML	NORML	
		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG	
		Free Water		*Visual		NEG	NEG	NEG	
		FLUID PROPE	ERTIES	method	limit/base	e current	history1	history2	
		Visc @ 100°C	cSt	ASTM D445	12.00	11.3	11.5	11.7	
		GRAPHS							
		Ferrous Alloys							
23		50 iron							
Jul14/23		40 - nickel							
7		30							
		mdd							
		20							
		10							
		10							
		0	~		~				
		May25/22	Jul14/23		Sep 28/23				
		—	-		Se				
		Non-ferrous Meta	als						
		copper							
		8 - second lead							
		udd							
		4-							
		2-							
			hthat an a subscription of the						
		May25/23	Jul14/23		Sep28/23				
		May	JuL		Sep				
		Viscosity @ 100°	С			Base Number			
		15 T				7.0 T			
		14 - Abnormal				6.0			
		13			Base Number (mg KOH/g)	5.0			
		0 12 - Base	 		Bu K	4.0			
		6 12 - Base				3.0			
		10-			se Nu	2.0-			
		Abnormal	1			1.0			
		0				0.0			
		5/23	\$/23				1/23 -		
		May25/23	Jul14/23		Sep28/23	May25/23	Jul14/23		
	Sample No. Lab Number	: WearCheck USA - : PCA0097427 : 05971947	Received Diagnose	l : 06 (ed : 09 (Oct 2023 Oct 2023		1391	A REPAIR LL 5 W ROUTE (PLAINFIELD,	
ESTING LABORATORY	Unique Number	: 10683897	Diagnosti	ician : Wes	s Davis			US 6054	
	Test Package	: FLEET					Contact: JOSHUA HUBBAF		
ertificate L2367		contact Customer Ser		~ ~ ~ ~ ~ ~ ~ ~				tvarepairllc.co	

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