

## **OIL ANALYSIS REPORT**

Sample Rating Trend

### NORMAL

# VOLVO VNL 178 (S/N 4V4NC9EHXPN315471)

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

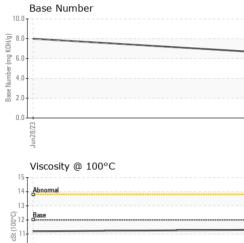
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		PCA0097557	PCA0097579	
Sample Date		Client Info		24 Aug 2023	28 Jun 2023	
Machine Age	mls	Client Info		152000	128000	
Oil Age	mls	Client Info		24000	0	
Oil Changed		Client Info		Changed	Changed	
Sample Status				NORMAL	NORMAL	
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>6.0	<1.0	<1.0	
Glycol		WC Method		NEG	NEG	
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	15	12	
Chromium	ppm		>20	<1	<1	
Nickel		ASTM D5185m	>2	0	0	
Titanium	ppm ppm	ASTM D5185m	~_	0	0	
Silver	ppm	ASTM D5185m	>2	0	0	
Aluminum	ppm		>25	6	2	
Lead	ppm	ASTM D5185m	>40	ہ <1	<1	
Copper	ppm	ASTM D5185m		5	6	
Tin		ASTM D5185m	>15	ر 1	<1	
Vanadium	ppm ppm	ASTM D5185m	>10	0	0	
Cadmium		ASTM D5185m		0	0	
Gaumum	ppm	ASTIVI DSTOSIII		0	0	
ADDITIVES		method	limit/base	current	history1	history2
	ppm	method ASTM D5185m	limit/base 2	current 0	0	history2
Boron	ppm ppm					
Boron Barium		ASTM D5185m	2	0	0	
Boron Barium Molybdenum	ppm	ASTM D5185m ASTM D5185m	2 0	0 0	0	
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50	0 0 66	0 0 63	
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0	0 0 66 <1	0 0 63 <1	
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0 950	0 0 66 <1 993 1095 1095	0 0 63 <1 971	
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	0 0 66 <1 993 1095	0 0 63 <1 971 1097	  
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	2 0 50 0 950 1050 995	0 0 66 <1 993 1095 1095	0 0 63 <1 971 1097 1062	
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 66 <1 993 1095 1095 1343	0 0 63 <1 971 1097 1062 1288	    
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	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 66 <1 993 1095 1095 1343 3458	0 0 63 <1 971 1097 1062 1288 3368	
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	2 0 50 950 1050 995 1180 2600	0 0 66 <1 993 1095 1095 1343 3458 current	0 0 63 <1 971 1097 1062 1288 3368 history1	
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 <b>limit/base</b> >25	0 0 66 <1 993 1095 1095 1343 3458 current 5	0 0 63 <1 971 1097 1062 1288 3368 history1 4	    history2
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 ASTM D5185m	2 0 50 950 1050 995 1180 2600 <b>limit/base</b> >25	0 0 66 <1 993 1095 1095 1343 3458 <u>current</u> 5 2	0 0 63 <1 971 1097 1062 1288 3368 history1 4 1	     history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	2 0 50 0 950 1050 995 1180 2600 <b>limit/base</b> >25 >20	0 0 66 <1 993 1095 1095 1343 3458 current 5 2 5	0 0 63 <1 971 1097 1062 1288 3368 history1 4 1 6	     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 0 950 1050 995 1180 2600 <b>imit/base</b> >25 -20 <b>imit/base</b>	0 0 66 <1 993 1095 1095 1343 3458 current 5 2 5 5 current	0 0 63 <1 971 1097 1062 1288 3368 history1 4 1 6 <i>history1</i>	    history2   history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	2 0 50 0 950 1050 995 1180 2600 <i>limit/base</i> >25 >20 <i>limit/base</i>	0 0 66 <1 993 1095 1095 1343 3458 <u>current</u> 5 2 5 5 <u>current</u> 0.4	0 0 63 <1 971 1097 1062 1288 3368 history1 4 1 6 history1 0.4	     history2  history2  history2
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 <b>TS</b> ppm ppm ppm	ASTM D5185m ASTM D5185m	2 0 50 0 950 1050 995 1180 2600 <i>limit/base</i> >25 >20 <i>limit/base</i>	0 0 66 <1 993 1095 1095 1343 3458 <u>current</u> 5 2 5 2 5 <u>current</u> 0.4 9.3	0 0 63 <1 971 1097 1062 1288 3368 history1 4 1 6 <u>history1</u> 0.4 9.0	history2 history2 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b> ppm ppm ppm	ASTM D5185m ASTM D5185m	2 0 50 0 950 1050 995 1180 2600 <i>imit/base</i> >25 >20 <i>imit/base</i> >3 >20 >30	0 0 66 <1 993 1095 1343 3458 <u>current</u> 5 2 5 2 5 <u>current</u> 0.4 9.3 19.9	0 0 63 <1 971 1097 1062 1288 3368 history1 4 1 6 <u>history1</u> 0.4 9.0 20.1	     history2  history2  history2
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 ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844	2 0 50 0 950 1050 995 1180 2600 <i>imit/base</i> >25 >20 <i>imit/base</i> >3 >20 >30	0 0 66 <1 993 1095 1095 1343 3458 <i>current</i> 5 2 5 <i>current</i> 0.4 9.3 19.9 <i>current</i>	0 0 63 <1 971 1097 1062 1288 3368 history1 4 1 6 history1 0.4 9.0 20.1 history1	     history2  history2  history2



10 Abnormal 9 8. Jun28/23

# **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	
Aug24/23	Appearance	scalar	*Visual	NORML	NORML	NORML	
Aug2	Odor	scalar	*Visual	NORML	NORML	NORML	
	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	
	Free Water	scalar	*Visual		NEG	NEG	
	FLUID PROPE	RTIES	method	limit/base	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445	12.00	11.3	11.2	
	GRAPHS						
	Ferrous Alloys						
	16 14						
	14 12						
	10						
	E 8						
	6-						
	4						
	2						
				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			
	Jun 28/23			Aug24/23			
	-			Aur			
	Non-ferrous Metal	5					
	copper						
	8 - sessesses lead						
	6 -						
	E d						
	4						
	2						
	0 23			23			
	un 28/23			Aug 24/23			
	⊰ Viscosity @ 100°C			Aı			
	VISCOSITY @ 100°C				Base Number		
	14 Abnormal			9.0			
	Ţ						
	13 0 12 Base			(B/T.0 D/HOX 6.0 L			
	0012 8311			ڦ 5.0	1		
	ස් 11 <del>-</del>				•		
	10 - Abnormal			2.0			
	9			± 2.0			
	8			0.0	1		
	Jun28/23			Aug24/23	Jun 28/23		Aug24/23
	Jun			Aug	Jun		Aug
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Number	: 05972000	Diagnos	ed : 09 (	Oct 2023			LAINFIELD, IL
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