

### **OIL ANALYSIS REPORT**

Sample Rating Trend

#### NORMAL

# VOLVO VNL 173 (S/N 4V4NC9EH6PN315466)

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.

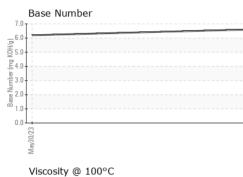
#### Fluid Condition

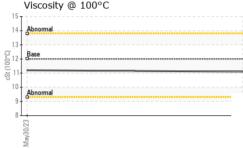
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		PCA0097447	PCA0097614	
Sample Date		Client Info		24 Aug 2023	30 May 2023	
Machine Age	mls	Client Info		197000	146000	
Oil Age	mls	Client Info		29000	0	
Oil Changed		Client Info		Changed	Changed	
Sample Status				NORMAL	NORMAL	
CONTAMINAT		method	limit/base	ourront	biotonut	history2
				current	history1	TIIStoryz
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	16	19	
Chromium	ppm	ASTM D5185m	>20	<1	<1	
Nickel	ppm	ASTM D5185m	>2	0	<1	
Titanium	ppm	ASTM D5185m		0	0	
Silver	ppm	ASTM D5185m	>2	0	0	
Aluminum	ppm	ASTM D5185m	>25	2	1	
Lead	ppm	ASTM D5185m	>40	<1	1	
Copper	ppm	ASTM D5185m	>330	3	6	
Tin	ppm	ASTM D5185m	>15	<1	<1	
Vanadium	ppm	ASTM D5185m		0	0	
Cadmium	ppm	ASTM D5185m		0	0	
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	2	0	2	
Barium	ppm	ASTM D5185m	0	0	2	
Molybdenum		ASTM D5185m	50	62	67	
	ppm	ASTM D5185m ASTM D5185m	50 0	62 <1	67 <1	
Manganese	ppm ppm			<1		
Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m	0 950	<1 936	<1 938	
Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 950 1050	<1 936 988	<1 938 1115	
Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 950 1050 995	<1 936 988 995	<1 938 1115 1085	
Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 950 1050	<1 936 988	<1 938 1115	
Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 950 1050 995 1180 2600	<1 936 988 995 1217 3353	<1 938 1115 1085 1296 3626	  
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	0 950 1050 995 1180 2600 limit/base	<1 936 988 995 1217 3353 current	<1 938 1115 1085 1296 3626 history1	  
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	0 950 1050 995 1180 2600 limit/base	<1 936 988 995 1217 3353 current 4	<1 938 1115 1085 1296 3626 history1 4	    history2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 950 1050 995 1180 2600 limit/base >25	<1 936 988 995 1217 3353 current 4 <1	<1 938 1115 1085 1296 3626 history1 4 0	   history2 
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 950 1050 995 1180 2600 <b>limit/base</b> >25 >20	<1 936 988 995 1217 3353 current 4 <1 3	<1 938 1115 1085 1296 3626 history1 4 0 4	   history2 
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	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	0 950 1050 995 1180 2600 limit/base >25	<1 936 988 995 1217 3353 current 4 <1 3 current	<1 938 1115 1085 1296 3626 history1 4 0	   history2 
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	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	0 950 1050 995 1180 2600 <b>limit/base</b> >25 >20	<1 936 988 995 1217 3353 current 4 <1 3 current 0.3	<1 938 1115 1085 1296 3626 history1 4 0 4 Nistory1 0.4	   history2 
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 ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 950 1050 995 1180 2600 <i>limit/base</i> >25 >20	<1 936 988 995 1217 3353 current 4 <1 3 current	<1 938 1115 1085 1296 3626 history1 4 0 4 0 4 0 0 4 0.4 9.2	   history2   history2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 950 1050 995 1180 2600 <b>limit/base</b> >25 >20 <b>limit/base</b> >3	<1 936 988 995 1217 3353 current 4 <1 3 current 0.3	<1 938 1115 1085 1296 3626 history1 4 0 4 Nistory1 0.4	   history2   history2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm ppm ppm Abs/cm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 950 1050 995 1180 2600 <b>limit/base</b> >25 >20 <b>limit/base</b> >3 >20	<1 936 988 995 1217 3353 current 4 <1 3 current 0.3 9.2	<1 938 1115 1085 1296 3626 history1 4 0 4 0 4 0 0 4 0.4 9.2	    history2   history2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm ppm ppm Abs/cm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7624	0 950 1050 995 1180 2600 imit/base >25 20 20 imit/base >3 >20 30 imit/base	<1 936 988 995 1217 3353 current 4 <1 3 current 0.3 9.2 20.0	<1 938 1115 1085 1296 3626 history1 4 0 4 0 4 history1 0.4 9.2 21.2	    history2  history2  history2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAI Oxidation	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm ppm ppm ppm ppm pp	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7644 *ASTM D7415	0 950 1050 995 1180 2600 imit/base >25 20 20 imit/base >3 >20 30 imit/base	<1 936 988 995 1217 3353 current 4 <1 3 current 0.3 9.2 20.0 current 17.4	<1 938 11115 1085 1296 3626 history1 4 0 4 0 4 0 4 0 10 21.2 19.2	   history2  history2  history2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm ppm ppm ppm ppm ppm ppm TS 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 D7844 *ASTM D7844 *ASTM D7624 *ASTM D7415	0 950 1050 995 1180 2600 imit/base >25 20 20 imit/base >3 >20 30 imit/base	<1 936 988 995 1217 3353 current 4 <1 3 current 0.3 9.2 20.0 current	<1 938 1115 1085 1296 3626 history1 4 0 4 0 4 0 4 0 10 2 21.2 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	
4,23 -	Appearance	scalar	*Visual	NORML	NORML	NORML	
Aug24/23	Odor	scalar	*Visual	NORML	NORML	NORML	
°C	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	
·C	Free Water	scalar	*Visual		NEG	NEG	
	FLUID PROPE	RTIES	method	limit/base	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445		11.1	11.2	
	GRAPHS						
	Ferrous Alloys						
	<sup>20</sup> T						
	iron chromium						
	15 - mickel						
	톱 10-						
	5						
	0 <del>                                     </del>			23			
	May30/23			Aug24/23			
	—	_		AL			
	Non-ferrous Metal	s 					
	copper						
	8 - tin						
	6						
	u dd						
	4						
	2						
	***************************************						
	0						
	ay30/23			Aug24/23			
	M			Au			
	Viscosity @ 100°C				Base Number		
	14 - Abnormal				7.0		
	T				5.0 -		
	13 G 12 Base			Base Number (mg KOH/g)	5.0 -		
	50 12 Base	******		Bu)	4.0		
				a a a a a a a a a a a a a a a a a a a	3.0 -		
	10			ase N	2.0		
	Abnormal 9 -				1.0+		
	8				D.0		
	May30/23			Aug24/23	May30/23		Aug24/23
	May			Aug	May		Aug2
Laboratory	: WearCheck USA - 5	i01 Madis	on Ave Ca	rv. NC 275 <sup>.</sup>	13	ти	A REPAIR LLC
Sample No.		Received		Dct 2023			5 W ROUTE 30
Lab Number	: 05971945	Diagnose	d : 09 (	Oct 2023			PLAINFIELD, IL
Unique Number		Diagnosti	cian : We	s Davis			US 60544
Test Deskans	: FLEET						IUA HUBBARD
Certificate L2367 Test Package		C		<b>`</b>		1 C	and the second
To discuss this sample report, of * - Denotes test methods that a	contact Customer Servi						varepairllc.com (815)306-0330