

OIL ANALYSIS REPORT

Sample Rating Trend





Area BD SHOP 200301 Component Diesel Engine

PETRO CANADA DURON SHP 10W30 (--- GAL)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Wear

Metal levels are typical for a new component breaking in.

Contamination

There is no indication of any contamination in the oil.

Fluid Condition

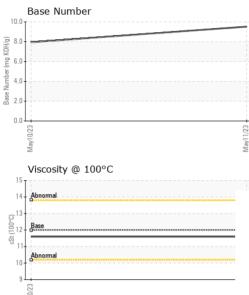
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

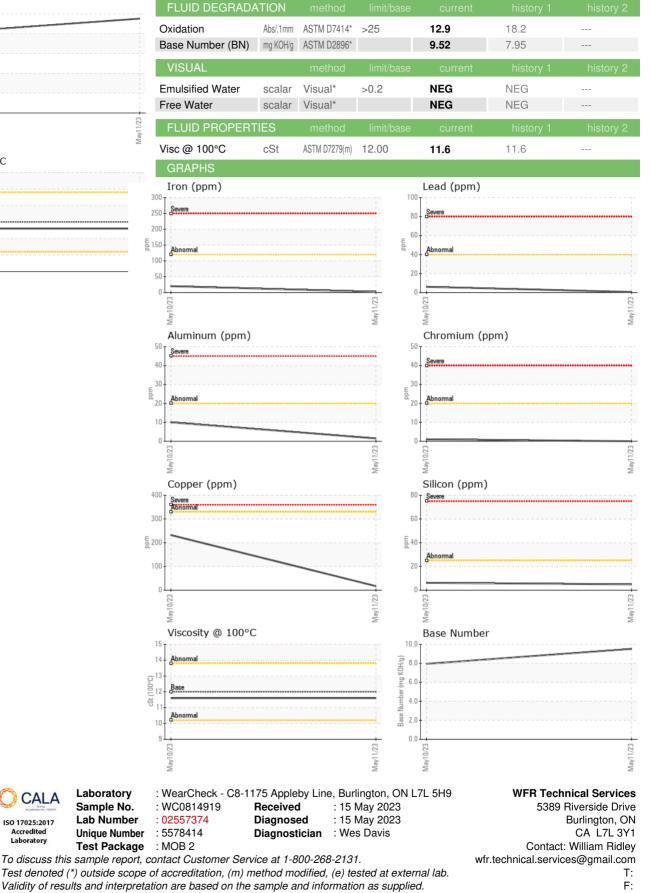
SAMPLE INFORMATION method limit/base current history 1 history 2 Sample Date Client Info WC0814919 WC0814930 Machine Age Kms Client Info 11 May 2023 10 May 2023 Oil Age Kms Client Info 0 55542 Oil Changed Client Info 0 55542 Sample Status Imit/base current history 1 history 2 Fuel WC Method >5 <1.0 <1.0 Glycol WC Method >5 <1.0 <1.0 WEAR METALS method Imit/base current history 1 history 2 from< ppm ASTM0586m >120 2 20 Mickel ppm ASTM0586m >20 <1 Mickel ppm ASTM0586m >20 <1 Aluminum ppm ASTM0586m >300				May2023	maroro		
Sample Date Client Info 11 May 2023 10 May 2023 Machine Age kms Client Info 119748 119747 Oil Age Kms Client Info 0 55542 Oil Changed Client Info Changed Not Changed Sample Status Imit/base current history 1 history 2 Fuel WC Method >5 <1.0 WEAR METALS method imit/base current history 1 history 2 Iron ppm ASTM 05185(m) >20 0 1 Nickel ppm ASTM 05185(m) >20 0 <1 Aluminum ppm ASTM 05185(m) >20 <1 Aluminum ppm ASTM 05185(m) >20 <1 Aluminum ppm ASTM 05185(m) 20 <1 Aluminum	SAMPLE INFORM	1ATION	method	limit/base	current	history 1	history 2
Machine Age kms Client Info 119748 119747 Oil Age kms Client Info 0 55542 Oil Changed Client Info 0 55542 Sample Status Imit/base Current NoRMAL GONTAMINATION method Somple Status NorAMAL Glycol WC Method >5 <1.0 <1.0 Glycol WC Method >5 <1.0 < WEAR METALS method Imit/base current history 1 history 2 Iron ppm ASTM05185/m >20 0 < Nickel ppm ASTM05185/m >20 < Aluminum ppm ASTM05185/m >20 < Aluminum ppm ASTM05185/m >0 1 Aluminum ppm ASTM0	Sample Number		Client Info		WC0814919	WC0814930	
Oil Age Kms Client Info 0 55542 Sample Status Client Info Changed No Changd Sample Status method Imit/base current No Changd CONTAMINATION method Imit/base current No Changd Glycol WC Method >5 <1.0 < Glycol WC Method >5 <1.0 < MEAR METALS method Imit/base current history 1 history 2 Iron ppm ASTM D5185(m) >20 0 1 Nickel ppm ASTM D5185(m) >20 0 <1 Aluminum ppm ASTM D5185(m) >20 0 <1 Aluminum ppm ASTM D5185(m) >20 2 10 Aluminum ppm ASTM D5185(m) >20 1	Sample Date		Client Info		11 May 2023	10 May 2023	
Oil Changed Sample Status Client Info Changed NORMAL Not Changed NORMAL Not Changed CONTAMINATION method imit/base current history 1 history 2 Fuel WC Method >5 <1.0 <1.0 Glycol WC Method >5 <1.0 <1.0 WEAR METALS method limit/base current history 1 history 2 Iron ppm ASTM 05165(m) >20 0 1 Nickel ppm ASTM 05165(m) >20 0 <1 Nickel ppm ASTM 05165(m) >2 0 <1 Silver ppm ASTM 05165(m) >20 2 10 Lead ppm ASTM 05165(m) >330 17 232 Antimony ppm ASTM 05165(m) 0 0 Antimony ppm ASTM 05165(m) 0 0	Machine Age	kms	Client Info		119748	119747	
Sample Status NORMAL NORMAL NORMAL	Oil Age	kms	Client Info		0	55542	
CONTAMINATION method limit/base current history 1 history 2 Fuel WC Method >5 <1.0 <1.0 Glycol WC Method >5 <1.0 <1.0 WEAR METALS method limit/base current history 1 history 2 Iron ppm ASTM D5185(m) >20 0 1 Nickel ppm ASTM D5185(m) >2 0 <1 Aluminum ppm ASTM D5185(m) >2 0 <1 Lead ppm ASTM D5185(m) >2 0 <1 Lead ppm ASTM D5185(m) >30 17 232 Tin ppm ASTM D5185(m) 1 Antimony ppm ASTM D5185(m) 0 0 0 Astm D5185(m) pm ASTM D5185(m) 0 0	Oil Changed		Client Info		Changed	Not Changd	
Fuel WC Method >5 <1.0	Sample Status				NORMAL	NORMAL	
Glycol WC Method NEG NEG WEAR METALS method limit/base current history 1 history 2 Iron ppm ASTMD5185(m) >120 2 20 Nickel ppm ASTMD5185(m) >20 0 1 Nickel ppm ASTMD5185(m) >2 0 <1 Silver ppm ASTMD5185(m) >2 0 <1 Lead ppm ASTMD5185(m) >2 0 <1 Antimoum ppm ASTMD5185(m) >20 2 10 Lead ppm ASTMD5185(m) >15 0 1 Antimony ppm ASTMD5185(m) 0 0 0 Vanadium ppm ASTMD5185(m) 0 0 Boron ppm ASTMD5185(m) 0 0 0	CONTAMINATION	١	method	limit/base	current	history 1	history 2
WEAR METALS method limit/base current history 1 history 2 Iron ppm ASTM D5165(m) >120 2 20 Nickel ppm ASTM D5165(m) >20 0 1 Nickel ppm ASTM D5165(m) >2 0 <1 Titanium ppm ASTM D5165(m) >2 0 <1 Aluminum ppm ASTM D5165(m) >2 0 <1 Lead ppm ASTM D5165(m) >20 2 10 Copper ppm ASTM D5165(m) >20 2 10 Lead ppm ASTM D5165(m) >20 1 6 Vanadium ppm ASTM D5165(m) >15 0 1 Vanadium ppm ASTM D5165(m) 0 0 0 Cadmium ppm ASTM D5165(m) 0	Fuel		WC Method	>5	<1.0	<1.0	
Iron ppm ASTM D5185(m) >12.0 2 20 Chromium ppm ASTM D5185(m) >2 0 1 Nickel ppm ASTM D5185(m) >2 0 <1 Titanium ppm ASTM D5185(m) >2 0 <1 Silver ppm ASTM D5185(m) >2 0 <1 Aluminum ppm ASTM D5185(m) >2 0 <1 6 Copper ppm ASTM D5185(m) >20 2 10 Antimony ppm ASTM D5185(m) >330 17 232 Antimony ppm ASTM D5185(m) 0 0 Vanadium ppm ASTM D5185(m) 0 0 Cadmium ppm ASTM D5185(m) 0 0 Boron ppm	Glycol		WC Method		NEG	NEG	
Chromium ppm ASTM D5186(m) >20 0 1 Nickel ppm ASTM D5186(m) >5 <1 7 Titanium ppm ASTM D5186(m) >2 0 <1 Silver ppm ASTM D5186(m) >2 0 <1 Aluminum ppm ASTM D5186(m) >2 0 <1 Lead ppm ASTM D5186(m) >330 17 232 Copper ppm ASTM D5186(m) >330 17 232 Antimony ppm ASTM D5186(m) 0 0 Vanadium ppm ASTM D5186(m) 0 0 Cadmium ppm ASTM D5186(m) 0 0 Boron ppm ASTM D5186(m) 2 8 7 Maganese ppm ASTM D5186(m) 5 60	WEAR METALS		method	limit/base	current	history 1	history 2
Chromium ppm ASTM D5185(m) >20 0 1 Nickel ppm ASTM D5185(m) >5 <1 7 Titanium ppm ASTM D5185(m) >2 0 <1 Silver ppm ASTM D5185(m) >2 0 <1 Aluminum ppm ASTM D5185(m) >2 0 <1 Aluminum ppm ASTM D5185(m) >20 2 10 Lead ppm ASTM D5185(m) >330 17 232 Copper ppm ASTM D5185(m) >330 17 232 Yanadium ppm ASTM D5185(m) 0 0 Vanadium ppm ASTM D5185(m) 0 0 0 Cadmium ppm ASTM D5185(m) 0 0 Boron ppm ASTM D5185(m)	Iron	ppm	ASTM D5185(m)	>120	2	20	
Titanium ppm ASTM D5185(m) >2 0 <1	Chromium		ASTM D5185(m)	>20	0	1	
Silver ppm ASTM D5185(m) >2 0 <1	Nickel	ppm	ASTM D5185(m)	>5	<1	7	
Silver ppm ASTM D5185(m) >2 0 <1	Titanium			>2	0	<1	
Aluminum ppm ASTM D5185(m) >20 2 10 Lead ppm ASTM D5185(m) >40 <1 6 Copper ppm ASTM D5185(m) >330 17 232 Tin ppm ASTM D5185(m) >15 0 1 Antimony ppm ASTM D5185(m) 0 0 0 Vanadium ppm ASTM D5185(m) 0 0 0 Beryllium ppm ASTM D5185(m) 0 0 0 ADDITIVES method limit/base current history 1 history 2 Boron ppm ASTM D5185(m) 0 0 0 Maganese ppm ASTM D5185(m) 0 58 60 Magnesium ppm ASTM D5185(m) 1050 1092 1255 Calcium ppm ASTM D5185(m)	Silver		ASTM D5185(m)	>2	0	<1	
Copper ppm ASTM D5185(m) >330 17 232 Tin ppm ASTM D5185(m) >15 0 1 Antimony ppm ASTM D5185(m) <1 Vanadium ppm ASTM D5185(m) 0 0 Beryllium ppm ASTM D5185(m) 0 0 Cadmium ppm ASTM D5185(m) 0 0 ADDITIVES method limit/base current history 1 history 2 Boron ppm ASTM D5185(m) 2 8 7 Barium ppm ASTM D5185(m) 0 0 0 Manganese ppm ASTM D5185(m) 0 1 1 Magnesium ppm ASTM D5185(m) 950 929 896 Calcium ppm ASTM D5185(m) 950 1060 940	Aluminum	ppm	ASTM D5185(m)	>20	2	10	
Tin ppm ASTM D5186(m) >15 0 1 Antimony ppm ASTM D5185(m) 0 0 0 Vanadium ppm ASTM D5185(m) 0 0 0 Beryllium ppm ASTM D5185(m) 0 0 0 Cadmium ppm ASTM D5185(m) 0 0 0 ADDITIVES method limit/base current history 1 history 2 Boron ppm ASTM D5185(m) 0 0 0 0 Molybdenum ppm ASTM D5185(m) 0 58 60 Manganese ppm ASTM D5185(m) 0 <11	Lead	ppm	ASTM D5185(m)	>40	<1	6	
Antimony ppm ASTM D5185(m) <1	Copper		ASTM D5185(m)	>330	17	232	
Vanadium ppm ASTM D5185(m) 0 0 Beryllium ppm ASTM D5185(m) 0 0 Cadmium ppm ASTM D5185(m) 0 0 ADDITIVES method limit/base current history 1 history 2 Boron ppm ASTM D5185(m) 2 8 7 Barium ppm ASTM D5185(m) 0 0 0 Magnaese ppm ASTM D5185(m) 50 58 60 Magnesium ppm ASTM D5185(m) 950 929 896 Calcium ppm ASTM D5185(m) 950 929 896 Calcium ppm ASTM D5185(m) 950 929 896 Calcium ppm ASTM D5185(m) 950 929 896 Sulfur ppm ASTM D5185(m) 2600 2697 215	Tin	ppm	ASTM D5185(m)	>15	0	1	
Beryllium ppm ASTM D5185(m) 0 0 Cadmium ppm ASTM D5185(m) 0 0 ADDITIVES method limit/base current history 1 history 2 Boron ppm ASTM D5185(m) 2 8 7 Barium ppm ASTM D5185(m) 0 0 0 0 Barium ppm ASTM D5185(m) 0 58 60 Manganese ppm ASTM D5185(m) 0 <1	Antimony	ppm	ASTM D5185(m)		<1	<1	
Cadmium ppm ASTM D5185(m) 0 0 ADDITIVES method limit/base current history 1 history 2 Boron ppm ASTM D5185(m) 2 8 7 Barium ppm ASTM D5185(m) 0 0 0 0 Barium ppm ASTM D5185(m) 0 0 0 0 Barium ppm ASTM D5185(m) 0 0 0 0 Manganese ppm ASTM D5185(m) 0 <11	Vanadium	ppm	ASTM D5185(m)		0	0	
ADDITIVES method limit/base current history 1 history 2 Boron ppm ASTM D5185(m) 2 8 7 Barium ppm ASTM D5185(m) 0 0 0 Malybdenum ppm ASTM D5185(m) 50 58 60 Manganese ppm ASTM D5185(m) 0 <1 1 Magnesium ppm ASTM D5185(m) 950 929 896 Calcium ppm ASTM D5185(m) 1050 1092 1255 Phosphorus ppm ASTM D5185(m) 1950 1060 940 Zinc ppm ASTM D5185(m) 2600 2697 2156 Sulfur ppm ASTM D5185(m) 2600 2697 2156 Silicon ppm ASTM D5185(m) >25 5 6 Sodium ppm ASTM D5185(Beryllium	ppm	ASTM D5185(m)		0	0	
Boron ppm ASTM D5185(m) 2 8 7 Barium ppm ASTM D5185(m) 0 0 0 Molybdenum ppm ASTM D5185(m) 50 58 60 Manganese ppm ASTM D5185(m) 0 <1 1 Magnesium ppm ASTM D5185(m) 950 929 896 Calcium ppm ASTM D5185(m) 1050 1092 1255 Phosphorus ppm ASTM D5185(m) 995 1060 940 Zinc ppm ASTM D5185(m) 2600 2697 2156 Sulfur ppm ASTM D5185(m) 2600 2697 2156 Lithium ppm ASTM D5185(m) >25 5 6 Sodium ppm ASTM D5185(m) >20 1 3 Potassium ppm	Cadmium	ppm	ASTM D5185(m)		0	0	
Barium ppm ASTM D5185(m) 0 0 0 0 Molybdenum ppm ASTM D5185(m) 50 58 60 Manganese ppm ASTM D5185(m) 0 <1 1 Magnesium ppm ASTM D5185(m) 950 929 896 Calcium ppm ASTM D5185(m) 1050 1092 1255 Calcium ppm ASTM D5185(m) 1050 1092 1255 Phosphorus ppm ASTM D5185(m) 1050 1092 1255 Zinc ppm ASTM D5185(m) 995 1060 940 Sulfur ppm ASTM D5185(m) 2600 2697 2156 Lithium ppm ASTM D5185(m) 2600 2697 2156 Silicon ppm ASTM D5185(m) >25 5 6 Sodium <th>ADDITIVES</th> <th></th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history 1</th> <th>history 2</th>	ADDITIVES		method	limit/base	current	history 1	history 2
Molybdenum ppm ASTM D5185(m) 50 58 60 Manganese ppm ASTM D5185(m) 0 <1 1 Magnesium ppm ASTM D5185(m) 950 929 896 Calcium ppm ASTM D5185(m) 1050 1092 1255 Calcium ppm ASTM D5185(m) 905 1060 940 Zinc ppm ASTM D5185(m) 915 1060 940 Sulfur ppm ASTM D5185(m) 2600 2697 2156 Lithium ppm ASTM D5185(m) 2600 2697 2156 CONTAMINANTS method limit/base current history 1 history 2 Silicon ppm ASTM D5185(m) >25 5 6 Sodium ppm ASTM D5185(m) >20 1 23 INFRA-RED method </th <th>Boron</th> <th>ppm</th> <th>ASTM D5185(m)</th> <th>2</th> <th>8</th> <th>7</th> <th></th>	Boron	ppm	ASTM D5185(m)	2	8	7	
Manganese ppm ASTM D5185(m) 0 <1	Barium	ppm	ASTM D5185(m)	0	0	0	
Magnesium ppm ASTM D5185(m) 950 929 896 Calcium ppm ASTM D5185(m) 1050 1092 1255 Phosphorus ppm ASTM D5185(m) 995 1060 940 Zinc ppm ASTM D5185(m) 995 1060 940 Zinc ppm ASTM D5185(m) 960 2697 2156 Sulfur ppm ASTM D5185(m) 2600 2697 2156 Lithium ppm ASTM D5185(m) 2600 2697 2156 CONTAMINANTS method limit/base current history 1 history 2 Silicon ppm ASTM D5185(m) >25 5 6 Sodium ppm ASTM D5185(m) >20 1 3 INFRA-RED method limit/base current history 1 history 2 Soot % %	Molybdenum	ppm	ASTM D5185(m)	50	58	60	
Calcium ppm ASTM D5185(m) 1050 1092 1255 Phosphorus ppm ASTM D5185(m) 995 1060 940 Zinc ppm ASTM D5185(m) 995 1060 940 Zinc ppm ASTM D5185(m) 1180 1154 1093 Sulfur ppm ASTM D5185(m) 2600 2697 2156 Lithium ppm ASTM D5185(m) 2600 2697 2156 CONTAMINANTS method limit/base current history 1 history 2 Silicon ppm ASTM D5185(m) >25 5 6 Sodium ppm ASTM D5185(m) >20 1 3 Potassium ppm ASTM D5185(m) >20 1 23 INFRA-RED method limit/base current history 1 history 2 Soot % %	Manganese	ppm	ASTM D5185(m)	0	<1	1	
Phosphorus ppm ASTM D5185(m) 995 1060 940 Zinc ppm ASTM D5185(m) 1180 1154 1093 Sulfur ppm ASTM D5185(m) 2600 2697 2156 Lithium ppm ASTM D5185(m) 2600 2697 2156 CONTAMINANTS method limit/base current history 1 history 2 Silicon ppm ASTM D5185(m) >25 5 6 Sodium ppm ASTM D5185(m) >25 5 6 Potassium ppm ASTM D5185(m) >20 1 3 INFRA-RED method limit/base current history 1 history 2 Soot % % ASTM D7844* >4 0 0.3 Nitration Abs/cm ASTM D7624* >20 4.6 9.8	Magnesium	ppm	ASTM D5185(m)	950	929	896	
Zinc ppm ASTM D5185(m) 1180 1154 1093 Sulfur ppm ASTM D5185(m) 2600 2697 2156 Lithium ppm ASTM D5185(m) 2600 <1 <1 CONTAMINANTS method limit/base current history 1 history 2 Silicon ppm ASTM D5185(m) >25 5 6 Sodium ppm ASTM D5185(m) >25 5 6 Potassium ppm ASTM D5185(m) >20 1 3 INFRA-RED method limit/base current history 1 history 2 Soot % % ASTM D7844* >4 0 0.3 Nitration Abs/cm ASTM D7624* >20 4.6 9.8	Calcium	ppm	ASTM D5185(m)	1050	1092	1255	
Sulfur ppm ASTM D5185(m) 2600 2697 2156 Lithium ppm ASTM D5185(m) 2600 <1 <1 CONTAMINANTS method limit/base current history 1 history 2 Silicon ppm ASTM D5185(m) >25 5 6 Sodium ppm ASTM D5185(m) >25 5 6 Sodium ppm ASTM D5185(m) >20 1 3 Potassium ppm ASTM D5185(m) >20 1 23 INFRA-RED method limit/base current history 1 history 2 Soot % % ASTM D7844* >4 0 0.3 Nitration Abs/cm ASTM D7624* >20 4.6 9.8	Phosphorus	ppm	ASTM D5185(m)	995	1060	940	
Lithium ppm ASTM D5185(m) <1	Zinc	ppm	ASTM D5185(m)	1180	1154	1093	
CONTAMINANTS method limit/base current history 1 history 2 Silicon ppm ASTM D5185(m) >25 5 6 Sodium ppm ASTM D5185(m) >20 1 3 Potassium ppm ASTM D5185(m) >20 1 23 INFRA-RED method limit/base current history 1 history 2 Soot % % ASTM D7844* >4 0 0.3 Nitration Abs/cm ASTM D7624* >20 4.6 9.8	Sulfur	ppm	ASTM D5185(m)	2600	2697	2156	
Silicon ppm ASTM D5185(m) >25 5 6 Sodium ppm ASTM D5185(m) 1 3 Potassium ppm ASTM D5185(m) >20 1 23 INFRA-RED method limit/base current history 1 history 2 Soot % % ASTM D7844* >4 0 0.3 Nitration Abs/cm ASTM D7624* >20 4.6 9.8	Lithium	ppm	ASTM D5185(m)		<1	<1	
Sodium ppm ASTM D5185(m) 1 3 Potassium ppm ASTM D5185(m) >20 1 23 INFRA-RED method limit/base current history 1 history 2 Soot % % ASTM D7844* >4 0 0.3 Nitration Abs/cm ASTM D7624* >20 4.6 9.8	CONTAMINANTS		method	limit/base	current	history 1	history 2
Potassium ppm ASTM D5185(m) >20 1 23 INFRA-RED method limit/base current history 1 history 2 Soot % % ASTM D7844* >4 0 0.3 Nitration Abs/cm ASTM D7624* >20 4.6 9.8	Silicon	ppm	ASTM D5185(m)	>25	5	6	
INFRA-REDmethodlimit/basecurrenthistory 1history 2Soot %%ASTM D7844*>400.3NitrationAbs/cmASTM D7624*>204.69.8	Sodium	ppm	ASTM D5185(m)		1	3	
Soot % % ASTM D7844* >4 0 0.3 Nitration Abs/cm ASTM D7624* >20 4.6 9.8	Potassium	ppm	ASTM D5185(m)	>20	1	23	
Nitration Abs/cm ASTM D7624* >20 4.6 9.8	INFRA-RED		method	limit/base	current	history 1	history 2
	Soot %	%	ASTM D7844*	>4	0	0.3	
Sulfation Abs/.1mm ASTM D7415* >30 18.0 21.7	Nitration	Abs/cm	ASTM D7624*	>20	4.6	9.8	
	Sulfation	Abs/.1mm	ASTM D7415*	>30	18.0	21.7	



Mav1

OIL ANALYSIS REPORT





CALA

ISO 17025:2017 Accredited

Laboratory