

## **OIL ANALYSIS REPORT**

#### Sample Rating Trend





### Component

Diesel Engine

## PETRO CANADA DURON HP 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.

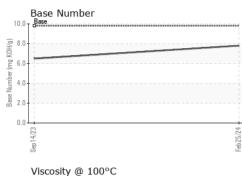
#### Fluid Condition

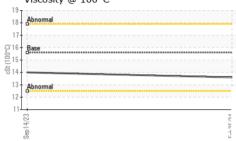
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

•			Sep2023	Feb2024		
SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		PCA0082988	PCA0082961	
Sample Date		Client Info		25 Feb 2024	14 Sep 2023	
Machine Age	mls	Client Info		0	213774	
Oil Age	mls	Client Info		0	20000	
Oil Changed		Client Info		N/A	Changed	
Sample Status				NORMAL	NORMAL	
				-		
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	
Water		WC Method	>0.2	NEG	NEG	
Glycol		WC Method		NEG	NEG	
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	4	15	
Chromium	ppm	ASTM D5185m	>20	<1	1	
Nickel		ASTM D5185m	>4	0	<1	
Titanium	ppm	ASTM D5185m	~	0	0	
	ppm		0			
Silver	ppm	ASTM D5185m	>3	0	0	
Aluminum	ppm	ASTM D5185m	>20	3	2	
Lead	ppm	ASTM D5185m	>40	1	<1	
Copper	ppm	ASTM D5185m	>330	10	15	
Tin	ppm	ASTM D5185m	>15	<1	2	
Vanadium	ppm	ASTM D5185m		<1	0	
Cadmium	ppm	ASTM D5185m		0	0	
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 2	history1 2	history2
	ppm		limit/base			
Boron Barium	ppm ppm	ASTM D5185m	limit/base	2	2	
Boron Barium Molybdenum	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	2 0 67	2 2 72	
Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	2 0 67 <1	2 2 72 <1	
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	2 0 67 <1 1020	2 2 72 <1 976	
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	2 0 67 <1 1020 1200	2 2 72 <1 976 1107	   
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	2 0 67 <1 1020 1200 1086	2 2 72 <1 976 1107 1011	
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	limit/base	2 0 67 <1 1020 1200 1086 1348	2 2 72 <1 976 1107 1011 1291	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	2 0 67 <1 1020 1200 1086	2 2 72 <1 976 1107 1011	   
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	2 0 67 <1 1020 1200 1086 1348	2 2 72 <1 976 1107 1011 1291	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	2 0 67 <1 1020 1200 1086 1348 2874	2 2 72 <1 976 1107 1011 1291 2934	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	2 0 67 <1 1020 1200 1086 1348 2874 current	2 2 72 <1 976 1107 1011 1291 2934 history1	     history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm 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 D5185m	limit/base >25	2 0 67 <1 1020 1200 1086 1348 2874 <u>current</u> 3	2 2 72 <1 976 1107 1011 1291 2934 history1 4	     history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm 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 D5185m ASTM D5185m	limit/base >25	2 0 67 <1 1020 1200 1086 1348 2874 <u>current</u> 3 3	2 2 72 <1 976 1107 1011 1291 2934 history1 4 3	      history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base >25 >20	2 0 67 <1 1020 1200 1086 1348 2874 current 3 3 1 current	2 2 72 <1 976 1107 1011 1291 2934 history1 4 3 2	     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 ppm ppm	ASTM D5185m ASTM D5185m	limit/base >25 >20 limit/base >3	2 0 67 <1 1020 1200 1086 1348 2874 <i>current</i> 3 3 1 <i>current</i> 0.5	2 2 72 <1 976 1107 1011 1291 2934 history1 4 3 2 history1 0.8	     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 ppm ppm	ASTM D5185m ASTM D5185m	limit/base >25 >20 limit/base >3 >20	2 0 67 <1 1020 1200 1086 1348 2874 <i>current</i> 3 3 1 <i>current</i> 0.5 7.9	2 2 72 <1 976 1107 1011 1291 2934 history1 4 3 2 2 history1 0.8 8.9	     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 D5185m	limit/base >25 >20 limit/base >3 >20 >3 >20	2 0 67 <1 1020 1200 1086 1348 2874 <i>current</i> 3 3 1 <i>current</i> 0.5 7.9 19.7	2 2 72 <1 976 1107 1011 1291 2934 history1 4 3 2 2 history1 0.8 8.9 21.8	     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 D7624 *ASTM D7415	limit/base >25 >20 limit/base >3 >20 >30 >30	2 0 67 <1 1020 1200 1086 1348 2874 <i>current</i> 3 3 3 1 <i>current</i> 0.5 7.9 19.7 <i>current</i>	2 2 72 <1 976 1107 1011 1291 2934 history1 4 3 2 history1 0.8 8.9 21.8 history1	     history2  history2  history2  history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAI	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7414	limit/base >25 >20 limit/base >3 >20 >30 >30 limit/base >25	2 0 67 <1 1020 1200 1086 1348 2874 current 3 3 3 1 current 0.5 7.9 19.7 current 15.5	2 2 72 <1 976 1107 1011 2934 history1 4 3 2 history1 0.8 8.9 21.8 history1 18.3	     history2  history2  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 D7624 *ASTM D7415	limit/base >25 >20 limit/base >3 >20 >30 >30	2 0 67 <1 1020 1200 1086 1348 2874 <i>current</i> 3 3 3 1 <i>current</i> 0.5 7.9 19.7 <i>current</i>	2 2 72 <1 976 1107 1011 1291 2934 history1 4 3 2 history1 0.8 8.9 21.8 history1	      history2  history2  history2  history2



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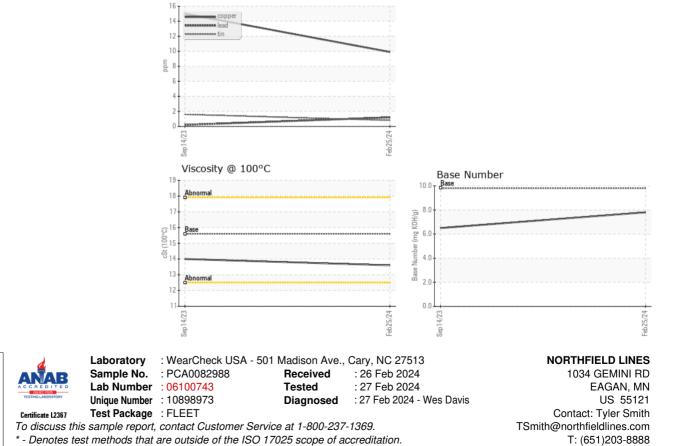




VISUAL		method				history2
White Metal	scalar	*Visual	NONE	NONE	NONE	
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	
Precipitate	scalar	*Visual	NONE	NONE	NONE	
Silt	scalar	*Visual	NONE	NONE	NONE	
Debris	scalar	*Visual	NONE	NONE	NONE	
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	
Appearance	scalar	*Visual	NORML	NORML	NORML	
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	15.6	13.6	14.0	
GRAPHS						
Ferrous Alloys						
iron 1						
4 - chromium						
2 - million nickel	_					
8						
6						
4						
2						
	84444444444444444444444444444444444444					
Sep14/23			Feb 25/24			
Sep			Feb2			



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Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

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