

### **OIL ANALYSIS REPORT**

Sample Rating Trend

NORMAL

# Machine Id 810034

Component Diesel Engine

### PETRO CANADA DURON SHP 15W40 (--- GAL)

#### DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor. ( Customer Sample Comment: This is a resample from coolant in oil, repairs were completed to correct this . )

#### 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.

,		Mar2022 Ju	2022 Sep2022 Feb2023	Mar2023 Jul2023 Jan2024 Feb20	24 Mar2024	
SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0092541	GFL0092531	GFL0100393
Sample Date		Client Info		07 Mar 2024	08 Feb 2024	16 Jan 2024
Machine Age	hrs	Client Info		4425	4322	4186
Oil Age	hrs	Client Info		59	136	576
Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Sample Status				NORMAL	MARGINAL	SEVERE
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>90	0	9	34
Chromium	ppm	ASTM D5185m	>20	<1	<1	2
Nickel	ppm	ASTM D5185m	>2	0	0	0
Titanium	ppm	ASTM D5185m	>2	0	0	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>20	2	4	13
Lead	ppm	ASTM D5185m	>40	0	0	0
Copper	ppm	ASTM D5185m	>330	0	6	2
Tin	ppm	ASTM D5185m	>15	0	<1	<1
Vanadium	ppm	ASTM D5185m		0	0	<1
Cadmium	ppm	ASTM D5185m		0	0	0
		ام م والح م مر			الاستعاما والم	history?
ADDITIVES		method	limit/base	current	nistory i	TIIStoryz
Boron	ppm	ASTM D5185m	0	11	13	24
Boron Barium	ppm ppm	ASTM D5185m ASTM D5185m	0 0	11 0	13 <1	24 0
Boron Barium Molybdenum	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	11 0 64	13 <1 92	24 0 208
Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	11 0 64 0	13 <1 92 <1	24 0 208 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	11 0 64 0 943	13 <1 92 <1 907	24 0 208 <1 845
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	11 0 64 0 943 1113	13 <1 92 <1 907 956	24 0 208 <1 845 956
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 ASTM D5185m	0 0 60 0 1010 1070 1150	11 0 64 0 943 1113 1059	13 <1 92 <1 907 956 977	24 0 208 <1 845 956 791
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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270	11 0 64 0 943 1113 1059 1245	13   <1   92   <1   907   956   977   1171	24   0   208   <1   845   956   791   1122
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	0 0 60 0 1010 1070 1150 1270 2060	11 0 64 0 943 1113 1059 1245 3566	13   <1   92   <1   907   956   977   1171   3054	24   0   208   <1   845   956   791   1122   2983
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 ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 Limit/base	Current 11 0 64 0 943 1113 1059 1245 3566 Current	13   <1   92   <1   907   956   977   1171   3054   history1	24   0   208   <1   845   956   791   1122   2983   history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	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 <b>method</b> ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25	11   0   64   0   943   1113   1059   1245   3566   current   3	13   <1   92   <1   907   956   977   1171   3054   history1   11	24     0     208     <1     845     956     791     1122     2983     history2     ▲ 34
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	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25	11     0     64     0     943     1113     1059     1245     3566     current     3     63	13     <1     92     <1     907     956     977     1171     3054     history1     11     ▲ 697	24     0     208     <1     845     956     791     1122     2983     history2     ▲ 34     2245
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	0 0 60 0 1010 1070 1150 1270 2060 Limit/base >25 	11     0     64     0     943     1113     1059     1245     3566     current     3     63     <1	13     13     <1     92     <1     907     956     977     1171     3054     history1     11     ▲ 697     12	24     0     208     <1     845     956     791     1122     2983     history2     ▲ 34     2245     ▲ 36
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m *ASTM D2982	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20	11     0     64     0     943     1113     1059     1245     3566     current     3     63     <1     NEG	13     <1     92     <1     907     956     977     1171     3054     history1     11     ▲ 697     12     NEG	24     0     208     <1     845     956     791     1122     2983     history2     ▲ 34     2245     ▲ 36     ▲ 0.10
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m *ASTM D2982	Inni/base 0 0 0 1010 1070 1150 1270 2060 Iimit/base >25 >20 Iimit/base	11     0     64     0     943     1113     1059     1245     3566     current     3     63     <1     NEG	13     13     92     <1     907     956     977     1171     3054     history1     11     ▲ 697     12     NEG     history1	24     0     208     <1     845     956     791     1122     2983     history2     ▲ 34     2245     ▲ 36     ▲ 0.10     history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m *ASTM D2982 Method *ASTM D7844	Inni/base 0 60 0 1010 1070 1150 1270 2060 Iinit/base >20 Simit/base >6	11     0     64     0     943     1113     1059     1245     3566     current     3     63     <1     NEG     current     0.2	13     13     <1     92     <1     907     956     977     1171     3054     history1     11     ▲ 697     12     NEG     history1     0.3	24     0     208     <1     845     956     791     1122     2983     history2     ▲ 34     2245     ▲ 36     ▲ 0.10     history2     1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m       *ASTM D2982       method       *ASTM D7844       *ASTM D7624	Inni/base 0 60 0 1010 1070 1150 1270 2060 Iinit/base >20 Iinit/base >20	11     0     64     0     943     1113     1059     1245     3566     current     3     63     <1     NEG     current     0.2     5.3	13     13     <1     92     <1     907     956     977     1171     3054     history1     11     697     12     NEG     history1     0.3     7.5	24     0     208     <1     845     956     791     1122     2983     history2     ▲ 34     2245     ▲ 36     ▲ 0.10     history2     1     13.7
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m *ASTM D2982 <b>method</b> *ASTM D7844 *ASTM D7624 *ASTM D7415	Inni/Dase     0     60     0     1010     1070     1150     1270     2060     limit/base     >20     limit/base     >6     >20     30	11     0     64     0     943     1113     1059     1245     3566     current     3     63     <1     NEG     current     0.2     5.3     17.4	13     13     92     <1     907     956     977     1171     3054     history1     11     ▲ 697     12     NEG     history1     0.3     7.5     18.7	1     24     0     208     <1     845     956     791     1122     2983     history2     ▲ 34     2245     ▲ 36     ▲ 0.10     history2     1     13.7     23.0
RODITIVES     Boron     Barium     Molybdenum     Manganese     Magnesium     Calcium     Phosphorus     Zinc     Sulfur     CONTAMINAN     Silicon     Sodium     Potassium     Glycol     INFRA-RED     Soot %     Nitration     Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm %	Method       ASTM D5185m       *ASTM D2982       method       *ASTM D7844       *ASTM D7624       *ASTM D7415	Imit/base     0     60     0     1010     1070     1150     1270     2060     limit/base     >20     limit/base     >20     limit/base     >20     limit/base     >30     limit/base	11     0     64     0     943     1113     1059     1245     3566     current     3     63     <1     NEG     current     0.2     5.3     17.4	13     13     92     <1     907     956     977     1171     3054     history1     11     ▲ 697     12     NEG     history1     0.3     7.5     18.7     history1	1     24     0     208     <1     845     956     791     1122     2983     history2     ▲ 34     2245     ▲ 36     ▲ 0.10     history2     1     13.7     23.0     history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation FLUID DEGRAD	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	Method       ASTM D5185m       *ASTM D7842       *ASTM D7844       *ASTM D7844       *ASTM D7415       method       *ASTM D7414	Imit/base     0     60     0     1010     1070     1150     1270     2060     limit/base     >20     limit/base     >6     >20     limit/base     >6     >20     limit/base     >30     Limit/base     >25	11     0     64     0     943     1113     1059     1245     3566     current     3     63     <1     NEG     current     0.2     5.3     17.4     current     13.3	13     13     92     <1     907     956     977     1171     3054     history1     11     ▲ 697     12     NEG     history1     0.3     7.5     18.7     history1     13.9	1     24     0     208     <1     845     956     791     1122     2983     history2     ▲ 34     2245     ▲ 36     ▲ 0.10     history2     1     13.7     23.0     history2     17.8



## **OIL ANALYSIS REPORT**



VISUAL		method	limit/base	current	history1	history2
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
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
	RTIES	method	limit/base	current	historv1	history2
		method	innibado	Garrent	motory	motory
/isc @ 100°C	cSt	ASTM D445	15.4	13.6	13.9	14.3
GRAPHS						



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

Certificate L2367

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