

## **OIL ANALYSIS REPORT**

#### Area (DQY489) Machine Id 10558

Component
Diesel Engine

### PETRO CANADA DURON SHP 15W40 (9 GAL)

#### DIAGNOSIS

#### Recommendation

We advise that you check for the source of the coolant leak. Check for low coolant level. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

#### 🔺 Wear

The copper level is abnormal. All other component wear rates are normal.

#### Contamination

Sodium and/or potassium levels are high. Elemental level of silicon (Si) above normal indicating ingress of seal material.

#### Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil.



SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0072071	GFL0072031	GFL0072046
Sample Date		Client Info		22 Mar 2024	18 Dec 2023	19 Oct 2023
Machine Age	hrs	Client Info		25642	25036	24275
Oil Age	hrs	Client Info		600	600	0
Oil Changed		Client Info		Changed	Changed	N/A
Sample Status				ABNORMAL	ABNORMAL	ABNORMAL
		method	limit/base	current	history1	history2
Fuel		WC Mothod	. 2.0	.1.0	-1.0	-1.0
Fuel		WC Method	>3.0	<1.0	<1.0 NEC	
water		WC Welliou	>0.2	NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>75	48	10	6
Chromium	ppm	ASTM D5185m	>5	2	<1	<1
Nickel	ppm	ASTM D5185m	>4	<1	0	0
Titanium	ppm	ASTM D5185m	>2	<1	0	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>15	8	2	2
Lead	ppm	ASTM D5185m	>25	3	0	<1
Copper	ppm	ASTM D5185m	>100	<mark>/</mark> 93	<1	<1
Tin	ppm	ASTM D5185m	>4	0	0	0
Vanadium	ppm	ASTM D5185m		0	0	<1
Cadmium	ppm	ASTM D5185m		0	0	0
		and a block of	limit/booo		Intertermed.	history ()
ADDITIVES		method	innit/base	current	nistory i	nistory2
Boron	ppm	ASTM D5185m	0	21	6	10
Boron Barium	ppm ppm	ASTM D5185m ASTM D5185m	0 0	21 0	6 0	10 0
Boron Barium Molybdenum	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	21 0 117	6 0 68	10 0 69
Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	21 0 117 <1	6 0 68 0	10 0 69 0
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	21 0 117 <1 979	6 0 68 0 1022	10 0 69 0 969
ADDITIVES 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	21 0 117 <1 979 1175	6 0 68 0 1022 1102	10 0 69 0 969 1135
ADDITIVES 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	21 0 117 <1 979 1175 1063	6 0 68 0 1022 1102 1066	10 0 69 0 969 1135 1044
ADDITIVES 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	21 0 117 <1 979 1175 1063 1297	6 0 68 0 1022 1102 1066 1313	10 0 69 0 969 1135 1044 1302
ADDITIVES 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	0 0 60 0 1010 1070 1150 1270 2060	21 0 117 <1 979 1175 1063 1297 3857	6 0 68 0 1022 1102 1066 1313 3301	10 0 69 0 969 1135 1044 1302 3271
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	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	21 0 117 <1 979 1175 1063 1297 3857 current	6 0 68 0 1022 1102 1066 1313 3301 history1	10 0 69 0 969 1135 1044 1302 3271 history2
ADDITIVES 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	0 0 60 1010 1070 1150 1270 2060 limit/base >25	21         0         117         <1         979         1175         1063         1297         3857         current         ▲         45	6         0         68         0         1022         1102         1066         1313         3301         history1         8	10 0 69 0 969 1135 1044 1302 3271 history2 7
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b>	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25	21         0         117         <1         979         1175         1063         1297         3857         current         ▲ 45         ▲ 1935	6         0         68         0         1022         1102         1066         1313         3301         history1         8         305	10 0 69 0 969 1135 1044 1302 3271 history2 7 264
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b>	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20	21         0         117         <1         979         1175         1063         1297         3857         current         ▲ 45         ▲ 1935         ▲ 13	6         0         68         0         1022         1102         1066         1313         3301         history1         8         305         <1	10 0 69 0 969 1135 1044 1302 3271 history2 7 7 ▲ 264 4
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol	ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b> ppm ppm	ASTM D5185m ASTM D2982	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20	21         0         117         <1         979         1175         1063         1297         3857         current         ▲         45         ▲         1935         ▲         13         NEG	6         0         68         0         1022         1102         1066         1313         3301         history1         8         305         <1         NEG	10         0         69         0         969         1135         1044         1302         3271         history2         7         264         4         NEG
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b> ppm ppm	ASTM D5185m ASTM D2982	0         0         60         0         1010         1070         1150         1270         2060         limit/base         >25         >20         limit/base         Set         Imit/base	21         0         117         <1         979         1175         1063         1297         3857         current         ▲         45         ▲         1935         ▲         13         NEG	6         0         68         0         1022         1102         1066         1313         3301         history1         8         305         <1         NEG         history1	10 0 69 0 969 1135 1044 1302 3271 history2 7 264 4 NEG history2
ADDITIVES 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 D2982 *ASTM D2982	Imil/base         0         60         0         1010         1070         1150         1270         2060         limit/base         >25         >20         limit/base         >20         >20         >66	21         0         117         <1         979         1175         1063         1297         3857         current         ▲ 45         1935         ▲ 1935         ▲ 13         NEG         0.4	6         0         68         0         1022         1102         1066         1313         3301         history1         8         305         <1         NEG         history1         0.1	10 0 69 0 969 1135 1044 1302 3271 history2 7 264 4 NEG history2 0.1
ADDITIVES 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 <b>TS</b> ppm ppm ppm %	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D2982 ASTM D2982 *ASTM D7844	Inni/base 0 0 60 0 1010 1070 1150 1270 2060 Iimit/base >25 >20 Iimit/base >20	21         0         117         <1         979         1175         1063         1297         3857         current         ▲ 45         1935         ▲ 1935         ▲ 13         NEG         0.4         12.2	6         0         68         0         1022         1102         1066         1313         3301         history1         8         305         <1         NEG         history1         0.1         6.4	10         0         69         0         969         1135         1044         1302         3271         history2         7         ▲ 264         4         NEG         history2         0.1         6.1
ADDITIVES 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 method *ASTM D7844 *ASTM D7844	Inni/base 0 0 60 1010 1070 1150 1270 2060 Iimit/base >25 >20 Iimit/base >20 Iimit/base >20	21         0         117         <1         979         1175         1063         1297         3857         current         ▲ 45         ▲ 1935         ▲ 13         NEG         current         0.4         12.2         22.6	6         0         68         0         1022         1102         1066         1313         3301         history1         8         305         <1         NEG         history1         0.1         6.4         18.4	10         0         69         0         969         1135         1044         1302         3271         history2         7         ▲ 264         4         NEG         history2         0.1         6.1         17.3
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation FLUID DEGRAI	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m *ASTM D2982 Method *ASTM D7844 *ASTM D7624 *ASTM D7415	Inni/base 0 0 0 1010 1070 1150 1270 2060 Iimit/base >25 >20 Iimit/base >6 >20 >30 Iimit/base	21         0         117         <1         979         1175         1063         1297         3857         current         ▲         45         1935         ▲         13         NEG         0.4         12.2         22.6	6         0         68         0         1022         1102         1066         1313         3301         history1         8         305         <1         NEG         history1         0.1         6.4         18.4	10         0         69         0         969         1135         1044         1302         3271         history2         7         ▲ 264         4         NEG         history2         0.1         6.1         17.3         history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation FLUID DEGRAI	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	Imethoo           ASTM D5185m           *ASTM D7844           *ASTM D76244           *ASTM D7415           method	Imil/base         0         0         60         0         1010         1070         1150         1270         2060         limit/base         >25         >20         limit/base         >20         limit/base         >20         limit/base         >20         limit/base         >20         limit/base         >30         limit/base         >25	21         0         117         <1         979         1175         1063         1297         3857         current         ▲ 45         1935         ▲ 1935         ▲ 13         NEG         0.4         12.2         22.6         current	6         0         68         0         1022         1102         1066         1313         3301         history1         8         305         <1         NEG         history1         0.1         6.4         18.4	10         0         69         0         969         1135         1044         1302         3271         history2         7         ▲ 264         4         NEG         history2         0.1         6.1         17.3         history2         12.1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE Oxidation Base Number (BN)	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	Imethod         ASTM D5185m         *ASTM D7844         *ASTM D7415         method         *ASTM D7414	Imil/base         0         0         60         0         1010         1070         1150         1270         2060         limit/base         >25         >20         limit/base         >20         limit/base         >20         limit/base         >20         limit/base         >20         limit/base         >20         limit/base         >20	21         0         117         <1         979         1175         1063         1297         3857         current         ▲ 45         ▲ 1935         ▲ 13         NEG         current         0.4         12.2         22.6         current         15.7         12.6	6         0         68         0         1022         1102         1066         1313         3301         history1         8         305         <1         NEG         history1         0.1         6.4         18.4         history1         13.8         9	10         0         69         0         969         1135         1044         1302         3271         history2         7         ▲ 264         4         NEG         history2         0.1         6.1         17.3         history2         13.1         9.2



# **OIL ANALYSIS REPORT**

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method

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method

ASTM D445

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NONE

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NORML

NORML

limit/base

>0.2

15.4

en11/7:

Sep11/23

Sep11/23

current

NONE

NONE

NONE

NONE

NONE

NONE

NORML

NORML

curren

NEG

NEG

14.5

history1

NONE

NONE

NONE

NONE

NONE

NONE

NORML

NORML

history

NEG

NEG

14.1

history2

NONE

NONE

NONE

NONE

NONE

NONE

NORML

NORML

history2

NEG

NEG

14.3

VISUAL

White Metal

Yellow Metal

Precipitate

Silt

Debris

Odor

70

60

50 40

20

100

80

60

40

20

Sand/Dirt

Appearance

Free Water

Visc @ 100°C

GRAPHS

Ferrous Alloys

Non-ferrous Metals

**Emulsified Water** 

**FLUID PROPERTIES** 

un18/













: 06127544



Test Package : FLEET (Additional Tests: Glycol) Contact: WILLIAM FOSTER william.foster@gflenv.com To discuss this sample report, contact Customer Service at 1-800-237-1369. \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation. T: (800)207-6618

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

Tested

Diagnosed

Lab Number

Unique Number : 10941695

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