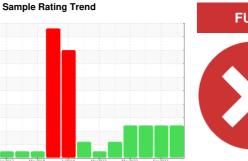


# **OIL ANALYSIS REPORT**

### DT







Machine Id
8137
Component
Diesel Engine
Fluid

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

### DIAGNOSIS

### Recommendation

We advise that you check the fuel injection system. We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition.

### Wear

All component wear rates are normal.

#### Contamination

There is a high amount of fuel present in the oil. Tests confirm the presence of fuel in the oil.

### Fluid Condition

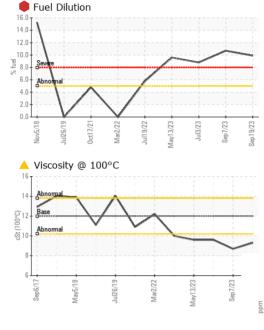
Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.

		Sep2017	May2018 Jul2019	Mar2022 May2023 S	ep2023	
SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0093901	GFL0090583	GFL0085922
Sample Date		Client Info		19 Sep 2023	07 Sep 2023	03 Jul 2023
Machine Age	hrs	Client Info		18000	0	258577
Oil Age	hrs	Client Info		81	0	0
Oil Changed		Client Info		Not Changd	N/A	Changed
Sample Status				SEVERE	SEVERE	SEVERE
CONTAMINAT	ION	method	limit/base	current	history1	history2
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185(m)	>80	14	25	23
Chromium	ppm	ASTM D5185(m)	>5	<1	2	2
Nickel	ppm	ASTM D5185(m)	>2	<1	<1	<1
Titanium	ppm	ASTM D5185(m)		0	0	0
Silver	ppm	ASTM D5185(m)	>3	<1	<1	0
Aluminum	ppm	ASTM D5185(m)	>30	1	1	2
Lead	ppm	ASTM D5185(m)	>30	<1	1	<1
Copper	ppm	ASTM D5185(m)	>150	<1	1	1
Tin	ppm	ASTM D5185(m)	>5	0	0	0
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	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185(m)	limit/base	current	history1	history2
	ppm					
Boron		ASTM D5185(m)	2	3	3	2
Boron Barium	ppm	ASTM D5185(m) ASTM D5185(m)	2	3 0	3	2
Boron Barium Molybdenum	ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	2 0 50	3 0 51	3 0 47	2 0 52
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	2 0 50 0	3 0 51 0	3 0 47 <1	2 0 52 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	2 0 50 0 950	3 0 51 0 818	3 0 47 <1 758	2 0 52 <1 870
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	2 0 50 0 950 1050	3 0 51 0 818 891	3 0 47 <1 758 809	2 0 52 <1 870 909
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185(m)	2 0 50 0 950 1050 995	3 0 51 0 818 891 862	3 0 47 <1 758 809 808	2 0 52 <1 870 909 959
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185(m)	2 0 50 0 950 1050 995 1180	3 0 51 0 818 891 862 1006	3 0 47 <1 758 809 808 928	2 0 52 <1 870 909 959 1068
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)	2 0 50 0 950 1050 995 1180	3 0 51 0 818 891 862 1006 2216	3 0 47 <1 758 809 808 928 1970	2 0 52 <1 870 909 959 1068 2302
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)	2 0 50 0 950 1050 995 1180 2600	3 0 51 0 818 891 862 1006 2216	3 0 47 <1 758 809 808 928 1970 <1	2 0 52 <1 870 909 959 1068 2302 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)	2 0 50 0 950 1050 995 1180 2600	3 0 51 0 818 891 862 1006 2216 <1	3 0 47 <1 758 809 808 928 1970 <1	2 0 52 <1 870 909 959 1068 2302 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)	2 0 50 0 950 1050 995 1180 2600	3 0 51 0 818 891 862 1006 2216 <1 current	3 0 47 <1 758 809 808 928 1970 <1 history1	2 0 52 <1 870 909 959 1068 2302 <1 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium	ppm	ASTM D5185(m)	2 0 50 0 950 1050 995 1180 2600	3 0 51 0 818 891 862 1006 2216 <1 current	3 0 47 <1 758 809 808 928 1970 <1 history1	2 0 52 <1 870 909 959 1068 2302 <1 history2 6
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium  CONTAMINAN Silicon Sodium Potassium	ppm	ASTM D5185(m)	2 0 50 0 950 1050 995 1180 2600 limit/base >20	3 0 51 0 818 891 862 1006 2216 <1 current 4	3 0 47 <1 758 809 808 928 1970 <1 history1 5 4	2 0 52 <1 870 909 959 1068 2302 <1 history2 6 6
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium Fuel	ppm	ASTM D5185(m)	2 0 50 0 950 1050 995 1180 2600 limit/base >20 >5	3 0 51 0 818 891 862 1006 2216 <1 current 4 4 1	3 0 47 <1 758 809 808 928 1970 <1 history1 5 4 <1 10.7	2 0 52 <1 870 909 959 1068 2302 <1 history2 6 6 6 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium Fuel	ppm	ASTM D5185(m) ASTM D7593*  method  ASTM D7844*	2 0 50 0 950 1050 995 1180 2600 limit/base >20 >5	3 0 51 0 818 891 862 1006 2216 <1 current 4 4 1 9.9	3 0 47 <1 758 809 808 928 1970 <1 history1  5 4 <1 10.7 history1	2 0 52 <1 870 909 959 1068 2302 <1 history2 6 6 6 <1  8.8 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot %	ppm	ASTM D5185(m) ASTM D7593*  method  ASTM D7844*	2 0 50 0 950 1050 995 1180 2600 limit/base >20 >5 limit/base >3	3 0 51 0 818 891 862 1006 2216 <1 current 4 4 1 9.9	3 0 47 <1 758 809 808 928 1970 <1 history1 5 4 <1 10.7 history1 0.6	2 0 52 <1 870 909 959 1068 2302 <1 history2 6 6 6 <1  8.8 history2 0.4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm	ASTM D5185(m) ASTM D7593*  method  ASTM D7593*	2 0 50 0 950 1050 995 1180 2600 limit/base >20 >5 limit/base >3 >20	3 0 51 0 818 891 862 1006 2216 <1 current 4 4 1 9.9 current 0.3 7.4	3 0 47 <1 758 809 808 928 1970 <1 history1 5 4 <1 ■ 10.7 history1 0.6 10.3	2 0 52 <1 870 909 959 1068 2302 <1 history2 6 6 6 <1  8.8 history2 0.4 8.2

Submitted By: Brian Gagne



## **OIL ANALYSIS REPORT**



VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	Visual*	NONE	NONE		
Yellow Metal	scalar	Visual*	NONE	NONE		
Precipitate	scalar	Visual*	NONE	NONE		
Silt	scalar	Visual*	NONE	NONE		
Debris	scalar	Visual*	NONE	NONE		
Sand/Dirt	scalar	Visual*	NONE	NONE		
Appearance	scalar	Visual*	NORML	NORML		
Odor	scalar	Visual*	NORML	NORML	NORML	NORML
<b>Emulsified Water</b>	scalar	Visual*	>0.2	NEG	NEG	NEG
Free Water	scalar	Visual*		NEG	NEG	NEG
FLUID PROPE	RTIES	method	limit/base	current	history1	history2

Visc @ 100°C	cSt	ASTM D7279(m) 12.00	<b>9.3</b>	<b>▲</b> 8.7		<u>\$\text{\$\text{\$}}\$</u> 9.6	
GRAPHS							
Iron (ppm)			Lead (ppm	1)			
Severe Severe			Severe				
Abnormal			00   3				-
50 Abronnal	\ ~		Abnormal				
			20	^			
0 1/2	/19+	- 1/23	0 178	- 61/	722/	1/23	/23
Sep 6/17 May 5/18	Jul26/19 -	May13/23	Sep6/17	Jul26/19	Mar2/22	May13/23	Sep7/23
Aluminum (ppm) Chromium (ppm)							
60 Severe 50			12 Severe				
40 Abnormal			8+				
Abnormal		-	Abnormal				
10	<u> </u>		2-			^	
Sep6/17 May5/18	JulZ6/19 +	(ay 13/23 -	Sep6/17	9/19	Mar2/22	3/23	Sep7/23 -
Sep6/1'	Jul26/19 Mar2/22	May13/23 Sep7/23	Sep(	Jul26/19	Marí	May13/23	Sep
Copper (ppm)			Silicon (pp	m)			
300 Severe 250			Severe 30				
200 Abnormal			1: : :				
Abnormal			820				
50			10-	~/		$\wedge$	
Sep6/17	9/19	3/23	Sep6/17	3/19	2/22	3/23	Sep7/23 +
Sep6/17 May5/18	Jul26/19 Mar2/22	May13/23 Sep7/23	Sep6/17	Jul26/19	Mar2/22	May13/23	Sep



CALA ISO 17025:2017 Accredited Laboratory

Laboratory Sample No. Lab Number Unique Number : 5645899

: 02584834

: WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 GFL Environmental - 554 - Edmonton SW : GFL0093901

Validity of results and interpretation are based on the sample and information as supplied.

Viscosity @ 100°C

Received Diagnosed : 25 Sep 2023

Sep7/23 -

May13/23

: 26 Sep 2023 Diagnostician : Wes Davis

8409 -15th Street NW **Test Package**: MOB 1 (Additional Tests: PercentFuel, Visual)

Fuel Dilution

15.0

5.0 0.0

> Contact: Antonio De Rosa aderosa@gflenv.com T: (780)509-2640

To discuss this sample report, contact Customer Service at 1-800-268-2131. Test denoted (\*) outside scope of accreditation, (m) method modified, (e) tested at external lab. Edmonton, AB

F: (780)444-8851

CA T6P 0B8