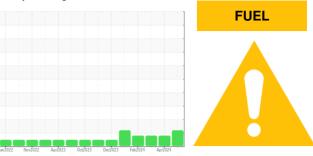


## **OIL ANALYSIS REPORT**

Sample Rating Trend



Machine Id

## 411027

#### Component Diesel Engine Fluid PETRO CANADA DURON SHP 15W40 (--- GAL)

### DIAGNOSIS

#### Recommendation

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 moderate amount of fuel present in the oil. Tests confirm the presence of fuel in the oil.

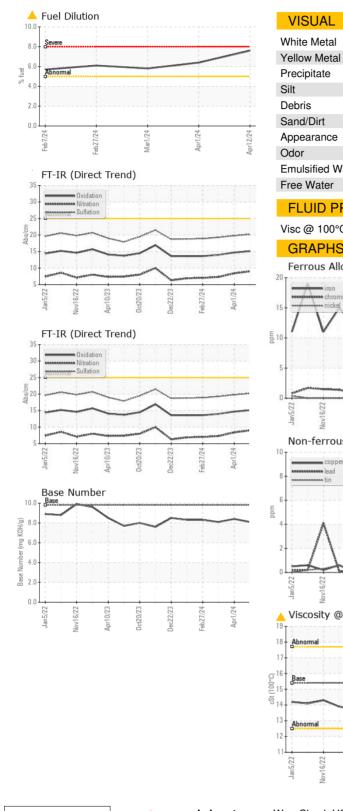
#### Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.

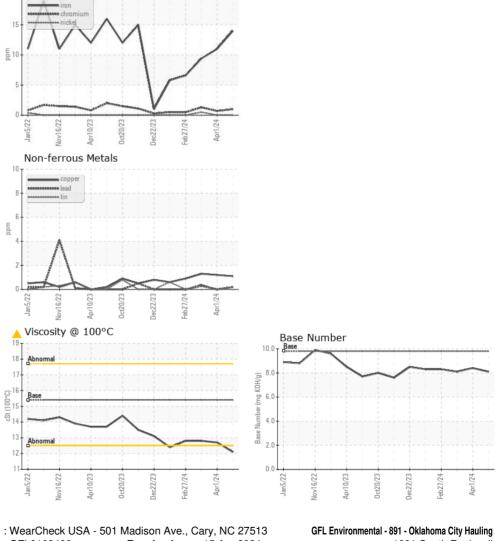
SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0109400	GFL0109241	GFL0109254
Sample Date		Client Info		12 Apr 2024	01 Apr 2024	01 Mar 2024
Machine Age	hrs	Client Info		6598	6475	6348
Oil Age	hrs	Client Info		527	149	622
Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Sample Status				ABNORMAL	ABNORMAL	ABNORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron		ASTM D5185m	>100	14	11	9
Chromium	ppm	ASTM D5185m	>20	14	<1	9
Nickel	ppm		>20	0	0	<1
Titanium	ppm	ASTM D5185m ASTM D5185m	>4	0 18	19	18
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>3	4	4	4
	ppm	ASTM D5185m	>20	4 <1	4	4 <1
Lead	ppm			1	1	<1
Copper	ppm	ASTM D5185m	>330			
Tin	ppm	ASTM D5185m	>15	<1	0	<1
Vanadium	ppm	ASTM D5185m		0	<1 0	<1
Cadmium	ppm	ASTM D5185m		U	-	<1
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	15	15	20
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	15 <1	15 0	20 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	15 <1 43	15 0 44	20 0 42
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	15 <1 43 <1	15 0 44 0	20 0 42 <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	15 <1 43 <1 702	15 0 44 0 790	20 0 42 <1 745
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	15 <1 43 <1 702 1096	15 0 44 0 790 1162	20 0 42 <1 745 1009
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	15 <1 43 <1 702 1096 921	15 0 44 0 790 1162 971	20 0 42 <1 745 1009 928
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270	15 <1 43 <1 702 1096 921 1061	15 0 44 0 790 1162 971 1189	20 0 42 <1 745 1009 928 1093
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	15 <1 43 <1 702 1096 921	15 0 44 0 790 1162 971 1189 3581	20 0 42 <1 745 1009 928
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	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 1010 1070 1150 1270 2060 limit/base	15 <1 43 <1 702 1096 921 1061	15 0 44 0 790 1162 971 1189 3581 history1	20 0 42 <1 745 1009 928 1093
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 <b>method</b>	0 0 60 1010 1070 1150 1270 2060 limit/base	15 <1 43 <1 702 1096 921 1061 2797	15 0 44 0 790 1162 971 1189 3581 history1 3	20 0 42 <1 745 1009 928 1093 3062
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	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	15 <1 43 <1 702 1096 921 1061 2797 current	15 0 44 0 790 1162 971 1189 3581 history1 3 3 3	20 0 42 <1 745 1009 928 1093 3062 history2 4 4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base >25	15 <1 43 <1 702 1096 921 1061 2797 current 4 3 10	15 0 44 0 790 1162 971 1189 3581 history1 3 3 8	20 0 42 <1 745 1009 928 1093 3062 history2 4 4 7
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm TS	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	15 <1 43 <1 702 1096 921 1061 2797 current 4 3	15 0 44 0 790 1162 971 1189 3581 history1 3 3 3	20 0 42 <1 745 1009 928 1093 3062 history2 4 4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base >25	15 <1 43 <1 702 1096 921 1061 2797 current 4 3 10	15 0 44 0 790 1162 971 1189 3581 history1 3 3 8	20 0 42 <1 745 1009 928 1093 3062 history2 4 4 7
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	0 0 1010 1070 1150 1270 2060 limit/base >25 >20 >5 limit/base >3	15 <1 43 <1 702 1096 921 1061 2797 current 4 3 10 ▲ 7.6	15 0 44 0 790 1162 971 1189 3581 history1 3 3 3 8 8 ▲ 6.4	20 0 42 <1 745 1009 928 1093 3062 history2 4 4 7 × 5.8
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED	ppm ppm ppm ppm ppm ppm ppm <b>TS</b> ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 1010 1070 1150 1270 2060 limit/base >25 >20 >5 limit/base >3	15 <1 43 <1 702 1096 921 1061 2797 current 4 3 10 ▲ 7.6 current	15 0 44 0 790 1162 971 1189 3581 history1 3 3 8 ▲ 6.4 history1	20 0 42 <1 745 1009 928 1093 3062 history2 4 4 4 7 5.8 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base >25 >20 >5 limit/base >3 >20	15 <1 43 <1 702 1096 921 1061 2797 current 4 3 10 ↓ 7.6 current 1.1	15 0 44 0 790 1162 971 1189 3581 history1 3 3 3 8 ▲ 6.4 history1 0.9	20 0 42 <1 745 1009 928 1093 3062 history2 4 4 4 7 5.8 history2 0.6
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b> ppm ppm ppm %	ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base >25 >20 >5 limit/base >3 >20	15 <1 43 <1 702 1096 921 1061 2797 current 4 3 10 ↓ 7.6 current 1.1 9.0	15 0 44 0 790 1162 971 1189 3581 history1 3 3 3 8 6.4 history1 0.9 8.4	20 0 42 <1 745 1009 928 1093 3062 history2 4 4 4 5.8 bistory2 0.6 7.3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b> ppm ppm ppm %	ASTM D5185m ASTM D5185m	0 0 1010 1070 1150 1270 2060 limit/base >25 limit/base >3 >20 >30 limit/base	15 <1 43 <1 702 1096 921 1061 2797 current 4 3 10 ▲ 7.6 current 1.1 9.0 20.2	15 0 44 0 790 1162 971 1189 3581 history1 3 3 8 ▲ 6.4 history1 0.9 8.4 19.8	20 0 42 <1 745 1009 928 1093 3062 history2 4 4 4 7 5.8 history2 0.6 7.3 19.3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >25 imit/base >3 >20 >30 imit/base >3	15 <1 43 <1 702 1096 921 1061 2797 current 4 3 10 ▲ 7.6 current 1.1 9.0 20.2 current	15 0 44 0 790 1162 971 1189 3581 history1 3 3 3 8 ▲ 6.4 history1 0.9 8.4 19.8 history1	20 0 42 <1 745 1009 928 1093 3062 history2 4 4 4 5.8 history2 0.6 7.3 19.3



# **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
FLUID PROPE	RTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	<b>12.1</b>	12.7	12.8
GRAPHS						
Ferrous Alloys						



Laboratory Sample No. : GFL0109400 Received : 15 Apr 2024 1001 South Rockwell Lab Number : 06148482 Tested : 17 Apr 2024 Oklahoma City, OK Unique Number : 10978560 Diagnosed : 17 Apr 2024 - Wes Davis US 73128 Test Package : FLEET ( Additional Tests: PercentFuel ) Contact: Andy Smith Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369. andrew.smith@gflenv.com T: (405)306-1651 \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation. Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012) F:

Report Id: GFL891 [WUSCAR] 06148482 (Generated: 04/17/2024 17:25:31) Rev: 1

Submitted By: Andy Smith