

# **OIL ANALYSIS REPORT**

### Sample Rating Trend





#### Component Diesel Engine

Fluid

PETRO CANADA DURON SHP 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.

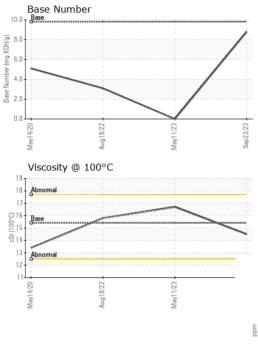
SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0093274	GFL0065151	GEL 0054387
Sample Date		Client Info		23 Sep 2023	11 May 2023	18 Aug 2022
Machine Age	mls	Client Info		139964	13736	95382
Oil Age	mls	Client Info		139964	13736	0
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	ABNORMAL	ABNORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Glycol		WC Method	20	NEG	NEG	NEG
WEAR METAL	c	method	limit/base	current	history1	history2
				25		
Iron Chromium	ppm	ASTM D5185m ASTM D5185m	>100 >20	25	▲ 139 10	▲ 113 6
Nickel	ppm		>20	2	<1	<1
Titanium	ppm	ASTM D5185m	>4	0	<1	<1
Silver	ppm	ASTM D5185m	2	0	0	<1
Aluminum	ppm ppm	ASTM D5185m	>20	4	16	12
Lead	ppm		>20	4	<1	0
Copper	ppm	ASTM D5185m		۰ <1	3	4
Tin		ASTM D5185m	>15	<1	1	1
Antimony	ppm ppm	ASTM D5185m	>15			
Vanadium		ASTM D5185m		0	<1	0
Cadmium	ppm ppm	ASTM D5185m		0	0	0
	ррш			U		
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	0	4	8
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	0 0	4	8 <1
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	0 0 64	4 0 90	8 <1 97
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	0 0 64 <1	4 0 90 2	8 <1 97 2
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	0 0 64 <1 889	4 0 90 2 818	8 <1 97 2 658
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	0 0 64 <1 889 1052	4 0 90 2 818 1397	8 <1 97 2 658 1398
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	0 0 64 <1 889 1052 994	4 0 90 2 818 1397 896	8 <1 97 2 658 1398 730
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	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 1270	0 0 64 <1 889 1052 994 1217	4 0 90 2 818 1397 896 1134	8 <1 97 2 658 1398 730 944
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	0 0 64 <1 889 1052 994 1217 3455	4 0 90 2 818 1397 896 1134 3173	8 <1 97 2 658 1398 730 944 2343
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium	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 0 1010 1070 1150 1270 2060	0 0 64 <1 889 1052 994 1217	4 0 90 2 818 1397 896 1134 3173 	8 <1 97 2 658 1398 730 944 2343 
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	0 0 64 <1 889 1052 994 1217 3455	4 0 90 2 818 1397 896 1134 3173	8 <1 97 2 658 1398 730 944 2343
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon	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	0 0 64 <1 889 1052 994 1217 3455  Current 4	4 0 90 2 818 1397 896 1134 3173  <u>history1</u> 12	8 <1 97 2 658 1398 730 944 2343  history2 9
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 ilimit/base >25	0 0 64 <1 889 1052 994 1217 3455 	4 0 90 2 818 1397 896 1134 3173  <u>history1</u> 12 2	8 <1 97 2 658 1398 730 944 2343  history2 9 0
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium 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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 ilimit/base >25	0 0 64 <1 889 1052 994 1217 3455  Current 4	4 0 90 2 818 1397 896 1134 3173  <u>history1</u> 12	8 <1 97 2 658 1398 730 944 2343  history2 9
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium 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 ilimit/base >25	0 0 64 <1 889 1052 994 1217 3455  Current 4 4	4 0 90 2 818 1397 896 1134 3173  <u>history1</u> 12 2	8 <1 97 2 658 1398 730 944 2343  history2 9 0
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 <b>imit/base</b> >25 >20	0 0 64 <1 889 1052 994 1217 3455  <u>current</u> 4 4 4	4 0 90 2 818 1397 896 1134 3173  history1 12 2 32	8 <1 97 2 658 1398 730 944 2343  history2 9 0 23
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 .20	0 0 64 <1 889 1052 994 1217 3455  current 4 4 6 5 current	4 0 90 2 818 1397 896 1134 3173  <b>history1</b> 12 2 32 <b>history1</b>	8 <1 97 2 658 1398 730 944 2343 history2 9 0 23 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>Imit/base</b> >25 >20 <b>Imit/base</b> >3	0 0 64 <1 889 1052 994 1217 3455  current 4 4 6 <i>current</i>	4 0 90 2 818 1397 896 1134 3173  history1 12 2 32 32 history1 ▲ 4.5	8 <1 97 2 658 1398 730 944 2343  history2 9 0 23 history2 ∧ 3.6
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b> ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >25 >20 imit/base >3 >20	0 0 64 <1 889 1052 994 1217 3455  current 4 4 6 current 1 8.9	4 0 90 2 818 1397 896 1134 3173  history1 12 2 32 history1 ∧ 4.5 19.3	8 <1 97 2 658 1398 730 944 2343  history2 9 0 23 history2 0 23 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b> ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 >20 <b>imit/base</b> >3 >20	0 0 64 <1 889 1052 994 1217 3455  <u>current</u> 4 4 6 <u>current</u> 1 8.9 20.3	4 0 90 2 818 1397 896 1134 3173  history1 12 2 32 12 32 history1 ▲ 4.5 19.3 38.3	8 <1 97 2 658 1398 730 944 2343  history2 9 0 23 history2 ▲ 3.6 17.8 36.3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm % Abs/cm Abs/cm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7614	0 0 0 1010 1070 1150 1270 2060 imit/base >25 20 imit/base >3 >20 >30 imit/base	0 0 64 <1 889 1052 994 1217 3455  <i>current</i> 4 4 4 6 <i>current</i> 1 8.9 20.3	4 0 90 2 818 1397 896 1134 3173  history1 12 2 32 history1 ▲ 4.5 19.3 38.3	8 <1 97 2 658 1398 730 944 2343  history2 9 0 23 history2 ∧ 3.6 17.8 36.3 history2

Submitted By: TECHNICIAN ACCOUNT



# **OIL ANALYSIS REPORT**

VISUAL



	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
23		scalar	*Visual	NORML	NORML	NORML	NORML
May11/23 Sen23/23	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
2 0,	Emulsified Water		*Visual	>0.2	NEG	NEG	NEG
		scalar		>0.2			
	Free Water	scalar	*Visual		NEG	NEG	NEG
	FLUID PROPE		method	limit/base	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445	15.4	14.5	<b>1</b> 6.7	15.8
	GRAPHS						
	Ferrous Alloys						
	iron		7				
May11/23	nickel						
2	100						
	E 80						
	60						
	40						
	20						
			CONTRACTOR CONTRA	and and the state of the state			
	May14/20 Aug18/22		May11/23	Sep23/23			
	May		May	Sept			
	Non-ferrous Meta	s					
	10 conner 1						
	copper lead						
	exercise tin						
	6-						
	u d						
	4						
	2						
			and and an and an and and and and and an	/			
			CO.	C.			
	May14/20 Aug18/22		May11/23	Sep 23/23			
			Ma	Se			
	Viscosity @ 100°C	2			Base Numbe	er	
	Viscosity @ 100°C	;		10.0		۲ ۱	
	Viscosity @ 100°C	2			Base	er	
	Viscosity @ 100°C	: 	~		Base	9 <b>r</b>	
	Viscosity @ 100°C				Base	P <b>r</b>	/
	Viscosity @ 100°C				Base	27	/
	Viscosity @ 100°C				Base	217	/
	Viscosity @ 100°C		$\sum$		Base	21	
	Viscosity @ 100°C			(0,000 Base Mumber (mg KOH(0) Base Mumber (mg	Base	PL	
	Viscosity @ 100°C		33	8.0 6.0 9399 Mumber (m0 KOH(4) 9399 Mumber (m0 KOH(4) 9390 Mumber (m0 KOH(4) 9390 Mumber (m0 KOH(4) 9300 Mumber (m	Base		
	Viscosity @ 100°C		123	8.0 6.0 9399 Mumber (m0 KOH(4) 9399 Mumber (m0 KOH(4) 9390 Mumber (m0 KOH(4) 9390 Mumber (m0 KOH(4) 9300 Mumber (m	Base		
	Viscosity @ 100°C		May11/23 +	(0,000 Base Mumber (mg KOH(0) Base Mumber (mg	Base	Aug18/22 Mart11/23	
Laboratory	Viscosity @ 100°C	501 Madis	son Ave., Ca	(0)HOX Bul Jaquing 4.0 ECCECTARS Try, NC 27513	GFL En	ZZOQI Davy vironmental - 865 - E	ast Mount Hauli
Sample No.	Viscosity @ 100°C	501 Madis Received	son Ave., Ca	(0)HOX Bu) Jaquing eee 2.0 	GFL En	Aug 18/22	ast Mount Hauli Houston Roa
Sample No. Lab Number	Viscosity @ 100°C	501 Madis Received Diagnose	son Ave., Ca 29 : ed : 29 :	ry, NC 27513 Sep 2023 Sep 2023	GFL En	ZZOQI Davy vironmental - 865 - E	<b>ast Mount Hauli</b> Houston Roa Houston, 1
Sample No. Lab Number Unique Numbe	Viscosity @ 100°C	501 Madis Received	son Ave., Ca 29 : ed : 29 :	(0)HOX Bu) Jaquing eee 2.0 	GFL En	vironmental - 865 - E 7213 East Mount	ast Mount Hauli
Sample No. Lab Number Unique Numbe Test Package	Viscosity @ 100°C	501 Madis Received Diagnost	son Ave., Ca 1 : 29 s ed : 29 s ician : We	ry, NC 27513 Sep 2023 s Davis	GFL En	vironmental - 865 - E 7213 East Mount Contac	ast Mount Hauli Houston Ro Houston, <sup>-</sup> US 770

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