

## **OIL ANALYSIS REPORT**

Sample Rating Trend NORMAL



Component **1 Diesel Engine** Fluid

{UNASSIGNED}

711047

### PETRO CANADA DURON SHP 15W40 (7 GAL)

SAMPLE INFORMATION method

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.

		methou	iiiiii/base	current	nistory i	nistoryz
Sample Number		Client Info		GFL0097689	GFL0087313	GFL0087332
Sample Date		Client Info		29 Nov 2023	27 Sep 2023	12 Jul 2023
Machine Age	hrs	Client Info		5818	5284	4575
Oil Age	hrs	Client Info		534	709	625
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
		ام و وال و ور			-	histow.0
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
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>75	28	77	36
Chromium	ppm	ASTM D5185m		2	3	2
Nickel	ppm	ASTM D5185m	>4	- <1	<1	<1
Titanium	ppm	ASTM D5185m		<1	0	<1
Silver	ppm	ASTM D5185m		0	0	0
Aluminum	ppm	ASTM D5185m		17	39	29
Lead	ppm		>25	<1	<1	1
Copper	ppm	ASTM D5185m		2	4	3
Tin	ppm		>4	2 <1	+ <1	<1
Vanadium	ppm	ASTM D5185m	21	<1	<1	<1
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES	ррпп					-
		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	2	27	55
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	2 0	27 0	55 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	2 0 59	27 0 62	55 0 59
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	2 0 59 <1	27 0 62 <1	55 0 59 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	2 0 59 <1 908	27 0 62 <1 433	55 0 59 1 392
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	2 0 59 <1 908 1120	27 0 62 <1 433 1653	55 0 59 1 392 1783
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	0 0 60 0 1010 1070 1150	2 0 59 <1 908 1120 1021	27 0 62 <1 433 1653 953	55 0 59 1 392 1783 981
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 0 1010 1070 1150 1270	2 0 59 <1 908 1120 1021 1262	27 0 62 <1 433 1653 953 1230	55 0 59 1 392 1783 981 1237
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	0 0 60 0 1010 1070 1150	2 0 59 <1 908 1120 1021	27 0 62 <1 433 1653 953	55 0 59 1 392 1783 981
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	0 0 60 0 1010 1070 1150 1270	2 0 59 <1 908 1120 1021 1262	27 0 62 <1 433 1653 953 1230	55 0 59 1 392 1783 981 1237
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	2 0 59 <1 908 1120 1021 1262 2796	27 0 62 <1 433 1653 953 1230 2991	55 0 59 1 392 1783 981 1237 3615
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	0 0 60 0 1010 1070 1150 1270 2060	2 0 59 <1 908 1120 1021 1262 2796 current	27 0 62 <1 433 1653 953 1230 2991 history1	55 0 59 1 392 1783 981 1237 3615 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	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 <b>method</b>	0 0 60 0 1010 1070 1150 1270 2060	2 0 59 <1 908 1120 1021 1262 2796 current 5	27 0 62 <1 433 1653 953 1230 2991 history1 5	55 0 59 1 392 1783 981 1237 3615 history2 6
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 kimit/base >25	2 0 59 <1 908 1120 1021 1262 2796 current 5 5	27 0 62 <1 433 1653 953 1230 2991 history1 5 7	55 0 59 1 392 1783 981 1237 3615 history2 6 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25	2 0 59 <1 908 1120 1021 1262 2796 current 5 5 38	27 0 62 <1 433 1653 953 1230 2991 history1 5 7 106	55 0 59 1 392 1783 981 1237 3615 history2 6 3 62
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25	2 0 59 <1 908 1120 1021 1262 2796 current 5 5 38 28 current	27 0 62 <1 433 1653 953 1230 2991 history1 5 7 106 history1	55 0 59 1 392 1783 981 1237 3615 history2 6 3 62 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >20	2 0 59 <1 908 1120 1021 1262 2796 current 5 5 38 current 0.5	27 0 62 <1 433 1653 953 1230 2991 history1 5 7 106 history1 0.8	55 0 59 1 392 1783 981 1237 3615 history2 6 3 62 history2 0.5
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >20 imit/base >20 imit/base >20	2 0 59 <1 908 1120 1021 1262 2796 <i>current</i> 5 5 5 38 <i>current</i> 0.5 9.6	27 0 62 <1 433 1653 953 1230 2991 history1 5 7 106 history1 0.8 11.4	55 0 59 1 392 1783 981 1237 3615 history2 6 3 62 6 3 62 history2 0.5 9.8
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAC	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm ppm ppm Abs/cm Abs/cm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 2060 225 20 220 220 20 20 20 20 20 20 20 20 20 2	2 0 59 <1 908 1120 1021 1262 2796 Current 5 5 38 Current 0.5 9.6 19.4 Current	27 0 62 <1 433 1653 953 1230 2991 history1 5 7 106 history1 0.8 11.4 25.0 history1	55 0 59 1 392 1783 981 1237 3615 history2 6 3 62 history2 0.5 9.8 21.5 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 <b>imit/base</b> >6 >20	2 0 59 <1 908 1120 1021 1262 2796 <u>current</u> 5 5 38 <u>current</u> 0.5 9.6 19.4	27 0 62 <1 433 1653 953 1230 2991 history1 5 7 106 history1 0.8 11.4 25.0	55 0 59 1 392 1783 981 1237 3615 <b>history2</b> 6 3 62 <b>history2</b> 0.5 9.8 21.5

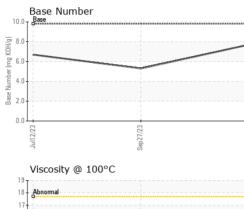


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# **OIL ANALYSIS REPORT**



	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
Sep 27/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Sep	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
2	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
	Free Water	scalar	*Visual		NEG	NEG	NEG
	FLUID PROPI	ERTIES	method	limit/base	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445	15.4	13.3	13.3	13.2
	GRAPHS						
	Ferrous Alloys						
//23	70 - iron	$\wedge$					
Sep 27/23	60 - nickel						
	50						
	E 40						
	30 -						
	20						
		/23 -		/23			
	Jul12/23	Sep27/23		Nov29/23			
	Non-ferrous Meta			2			
	<sup>10</sup> T						
	8 - copper						
	tin						
	6-						
	u dd						
	2-						
		Lanse					
	o 1112/23	7/23 -		9/23 -			
	Jult	Sep 27/23		Nov29/23			
	Viscosity @ 100°	C			Base Number		
	19			10.0	Base		
	18 - Abnormal						
	17			(B/HO			
	G16 Base 15 15 14			Ĕ 6.0			
	S 14			0.6 Base Number (mg KOH/g)	I		
	12			100	1		
	13 - Abnormal			<sup>2</sup> 2.0	1		
	12			2.0			
	13 - Abnormal 12	7/23		2.0		7/23	c E
	13 - Abnormal	Sep21/23		2.0	Juli 2/23	Sep 27/23	
	13 - Abnormal 12 11 - EXC			0.0	Juli 2/23		
Laboratory Sample No.	: WearCheck USA -	501 Madi		ry, NC 27513	Juli 2/23	rironmental - 4	05 - Arbor Hill
Laboratory Sample No. Lab Number	13 - Abnormal 12 11 - EXC		d : 06 l	0.0	Juli 2/23	rironmental - 40 7	
Sample No. Lab Number Unique Number	: WearCheck USA - : GFL0097689 : 06025985 : 10775776	501 Madia	d : 06 l ed : 07 l	ry, NC 27513 Dec 2023	GFL Env	r <b>ironmental - 4</b> 1 7 NC	0 <b>5 - Arbor Hill</b> 7400 Napier R 0RTHVILLE, M US 4816
Sample No. Lab Number Unique Number Test Package	: WearCheck USA - : GFL0097689 : 06025985 : 10775776 : FLEET	501 Madia Received Diagnos Diagnost	d : 06 I ed : 07 I tician : Jon	ry, NC 27513 Dec 2023 Dec 2023 athan Hester	GFL Env	r <b>ironmental - 4</b> 0 7 NC Contact: Ar	0 <b>5 - Arbor Hill</b> 7400 Napier R 0RTHVILLE, M US 4816 nthony Hopkin
Sample No. Lab Number Unique Number	: WearCheck USA - : GFL0097689 : 06025985 : 10775776 : FLEET contact Customer Ser	501 Madia Received Diagnos Diagnost	d : 06 l ed : 07 l tician : Jon 800-237-1369	ry, NC 27513 Dec 2023 Dec 2023 athan Hester	GFL Env	r <b>ironmental - 4</b> 0 7 NC Contact: Ar	0 <b>5 - Arbor Hil</b> 7400 Napier F 0RTHVILLE, N US 4816

Submitted By: John Nahal Page 2 of 2