

## **OIL ANALYSIS REPORT**

Sample Rating Trend



## Area **166** Machine Id **920100-63**

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.

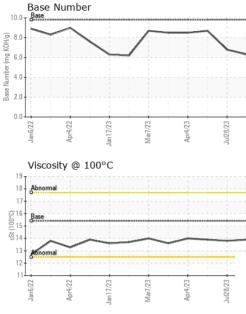
SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0087860	GFL0087838	GFL0081186
Sample Date		Client Info		17 Aug 2023	28 Jul 2023	06 Jun 2023
Machine Age	hrs	Client Info		10498	10400	10131
Oil Age	hrs	Client Info		200	600	600
Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Sample Status				NORMAL	NORMAL	NORMAL
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	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>110	69	48	19
Chromium	ppm	ASTM D5185m	>4	4	3	1
Nickel	ppm	ASTM D5185m	>2	0	0	0
Titanium	ppm	ASTM D5185m		<1	<1	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>25	6	5	<1
Lead	ppm	ASTM D5185m	>45	7	3	<1
Copper	ppm	ASTM D5185m	>85	3	2	1
Tin	ppm	ASTM D5185m	>4	<1	<1	0
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	Method ASTM D5185m	limit/base	current	history1 7	history2 2
	ppm ppm	ASTM D5185m				
Boron		ASTM D5185m	0	<1	7	2
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0 0 60	<1 0	7 0	2 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	<1 0 65	7 0 67	2 0 65
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	<1 0 65 <1	7 0 67 <1	2 0 65 <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	<1 0 65 <1 1043	7 0 67 <1 1091	2 0 65 <1 1008
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	<1 0 65 <1 1043 1164	7 0 67 <1 1091 1163	2 0 65 <1 1008 1104
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	<1 0 65 <1 1043 1164 1106	7 0 67 <1 1091 1163 1124	2 0 65 <1 1008 1104 1081
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	<1 0 65 <1 1043 1164 1106 1362	7 0 67 <1 1091 1163 1124 1422	2 0 65 <1 1008 1104 1081 1319
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 1010 1070 1150 1270 2060	<1 0 65 <1 1043 1164 1106 1362 3401	7 0 67 <1 1091 1163 1124 1422 3719	2 0 65 <1 1008 1104 1081 1319 3653
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 1010 1070 1150 1270 2060	<1 0 65 <1 1043 1164 1106 1362 3401 current	7 0 67 <1 1091 1163 1124 1422 3719 history1	2 0 65 <1 1008 1104 1081 1319 3653 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur 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 <b>method</b>	0 0 60 1010 1070 1150 1270 2060 Limit/base >30	<1 0 65 <1 1043 1164 1106 1362 3401 current 23	7 0 67 <1 1091 1163 1124 1422 3719 history1 18	2 0 65 <1 1008 1104 1081 1319 3653 history2 8
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 <b>method</b> ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 Limit/base >30	<1 0 65 <1 1043 1164 1106 1362 3401 current 23 8	7 0 67 <1 1091 1163 1124 1422 3719 history1 18 5	2 0 65 <1 1008 1104 1081 1319 3653 history2 8 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>limit/base</b> >30 -20	<1 0 65 <1 1043 1164 1106 1362 3401 current 23 8 0 0	7 0 67 <1 1091 1163 1124 1422 3719 history1 18 5 2 2 history1	2 0 65 <1 1008 1104 1081 1319 3653 history2 8 2 1 1 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>Imit/base</b> >30 >20 <b>Imit/base</b>	<1 0 65 <1 1043 1164 1106 1362 3401 <u>current</u> 23 8 0 <u>current</u>	7 0 67 <1 1091 1163 1124 1422 3719 history1 18 5 2 2 history1 0.3	2 0 65 <1 1008 1104 1081 1319 3653 history2 8 2 1 1 history2 0.2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm 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 >30 20 limit/base >33 >20	<1 0 65 <1 1043 1164 1106 1362 3401 <i>current</i> 23 8 0 <i>current</i> 0.4 11.6	7 0 67 <1 1091 1163 1124 1422 3719 history1 18 5 2 2 history1 0.3 10.8	2 0 65 <1 1008 1104 1081 1319 3653 history2 8 2 1 history2 0.2 8.6
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 ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >30 <b>imit/base</b> >3 20	<1 0 65 <1 1043 1164 1106 1362 3401 <u>current</u> 23 8 0 <u>current</u> 0.4 11.6 23.0	7 0 67 <1 1091 1163 1124 1422 3719 history1 18 5 2 history1 0.3 10.8 22.2	2 0 65 <1 1008 1104 1081 1319 3653 history2 8 2 1 history2 0.2 8.6 19.0
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 ppm TS ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 22060 2060 2060 2060 200 200 200 200 2	<1 0 65 <1 1043 1164 1106 1362 3401  Current 23 8 0 Current 0.4 11.6 23.0 Current	7 0 67 <1 1091 1163 1124 1422 3719 history1 18 5 2 history1 0.3 10.8 22.2 history1	2 0 65 <1 1008 1104 1081 1319 3653 history2 8 2 1 history2 0.2 8.6 19.0 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 ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >30 imit/base >3 >20 imit/base >3 >20	<1 0 65 <1 1043 1164 1106 1362 3401 <u>current</u> 23 8 0 <u>current</u> 0.4 11.6 23.0	7 0 67 <1 1091 1163 1124 1422 3719 history1 18 5 2 history1 0.3 10.8 22.2	2 0 65 <1 1008 1104 1081 1319 3653 history2 8 2 1 history2 0.2 8.6 19.0



# **OIL ANALYSIS REPORT**

VISUAL

method



-		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
Jan 17/23 Mar7/23	Apr4/23 Jul28/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Ma	Ap	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
°C		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		Free Water	scalar	*Visual		NEG	NEG	NEG
		FLUID PROPE		method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445		13.9	13.8	13.9
		GRAPHS	001		10.1	1010	10.0	10.0
		Ferrous Alloys						
Jan 17/23 + Mar/ 7/23 -	Apr4/23 - Jul28/23 - Jul28/23 -	500 600 100 100 100 100 100 100 1	CZ/LEW	Apri/23	4			
		Viscosity @ 100°C	C			Base Number		
		18 - Abnormal			10.0	Base		
		17-				$\sim$	$\square$	
		Base			НОУ В 6.0-		$\checkmark$	$\sim$
		Base 15 15 14			(0,7HO) (0,			
		<sup>43</sup> 14			4.0-			
		13 Abnormal		T	Base			
		12		+	° 2.0-			
		11			0.0	5		
		Jan6/22 Apr4/22 Jan 17/23	Mar7/23	Apr4/23	7/07	Jan6/22 Apr4/22	Jan 17/23 Mar7/23	Apr4/23 Jul28/23
Laboratory Sample No. Lab Number Unique Number Test Package To discuss this sample report,		: WearCheck USA - : GFL0087860	501 Madison Ave., Cary, NC 27513 Received : 22 Aug 2023 Diagnosed : 23 Aug 2023 Diagnostician : Wes Davis			7		

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Submitted By: DARRIN WRIGHT