

## **OIL ANALYSIS REPORT**

Sample Rating Trend





## Component

Diesel Engine

## 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.

		Νον2ο22 Feb2o23 Μω2ο23 Μω2ο23 Αυφ2ο23 Sep2o23 Οκε2ο23 Οκε2ο23 Οκε2ο23							
SAMPLE INFORM	MATION	method	limit/base	current	history1	history2			
Sample Number		Client Info		GFL0098465	GFL0098480	GFL0083696			
Sample Date		Client Info		31 Oct 2023	17 Oct 2023	02 Oct 2023			
Machine Age	hrs	Client Info		0	150	9655			
Oil Age	hrs	Client Info		600	600	9655			
Oil Changed		Client Info		Changed	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		NEG	NEG	NEG			
WEAR METAL	S	method	limit/base	current	history1	history2			
Iron	ppm	ASTM D5185m	>110	10	8	59			
Chromium	ppm	ASTM D5185m	>4	<1	<1	2			
Nickel	ppm	ASTM D5185m	>2	0	<1	<1			
Titanium	ppm	ASTM D5185m		0	<1	0			
Silver	ppm	ASTM D5185m	>2	0	0	<1			
Aluminum	ppm	ASTM D5185m	>25	2	2	8			
Lead	ppm	ASTM D5185m	>45	<1	<1	11			
Copper	ppm	ASTM D5185m	>85	0	<1	2			
Tin	ppm	ASTM D5185m	>4	<1	1	1			
Vanadium	ppm	ASTM D5185m		0	0	0			
Cadmium	ppm	ASTM D5185m		0	<1	0			
ADDITIVES		method	limit/base	current	history1	history2			
Boron	nom	ASTM D5185m	0	4	<1	4			
	ppm	ASTIVI DOTODITI	0		< 1	4			
Barium	ppm	ASTM D5185m		0	0	0			
Molybdenum	ppm	ASTM D5185m	0 60	0	0	0			
Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m	0 60	0 57	0 50	0 60			
Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0	0 57 <1	0 50 <1	0 60 1			
Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0 1010	0 57 <1 888	0 50 <1 887	0 60 1 924			
Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0 1010 1070	0 57 <1 888 1144	0 50 <1 887 1060	0 60 1 924 1227			
Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0 1010 1070 1150	0 57 <1 888 1144 1019	0 50 <1 887 1060 903	0 60 1 924 1227 1078			
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	0 60 0 1010 1070 1150 1270	0 57 <1 888 1144 1019 1224	0 50 <1 887 1060 903 1190	0 60 1 924 1227 1078 1318			
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 60 0 1010 1070 1150 1270 2060	0 57 <1 888 1144 1019 1224 3033	0 50 <1 887 1060 903 1190 2906	0 60 1 924 1227 1078 1318 2864			
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	0 60 0 1010 1070 1150 1270 2060	0 57 <1 888 1144 1019 1224 3033 current	0 50 <1 887 1060 903 1190 2906 history1	0 60 1 924 1227 1078 1318 2864 history2			
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	0 60 0 1010 1070 1150 1270 2060 Iimit/base >30	0 57 <1 888 1144 1019 1224 3033 current 4	0 50 <1 887 1060 903 1190 2906 history1 4	0 60 1 924 1227 1078 1318 2864 history2 7			
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	0 60 0 1010 1070 1150 1270 2060 Iimit/base >30	0 57 <1 888 1144 1019 1224 3033 current 4 3	0 50 <1 887 1060 903 1190 2906 history1 4 3	0 60 1 924 1227 1078 1318 2864 history2 7 7 7			
Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b> >30	0 57 <1 888 1144 1019 1224 3033 current 4 3 2	0 50 <1 887 1060 903 1190 2906 history1 4 3 4	0 60 1 924 1227 1078 1318 2864 history2 7 7 7 8			
Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	0 60 0 1010 1070 1150 1270 2060 <i>limit/base</i> >20 <i>limit/base</i> >3	0 57 <1 888 1144 1019 1224 3033 current 4 3 2 2	0 50 <1 887 1060 903 1190 2906 history1 4 3 4 history1	0 60 1 924 1227 1078 1318 2864 history2 7 7 7 8 8			
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 60 0 1010 1070 1150 1270 2060 <b>limit/base</b> >30 >20 <b>limit/base</b> >3 >20	0 57 <1 888 1144 1019 1224 3033 current 4 3 2 2 current 0.2	0 50 <1 887 1060 903 1190 2906 history1 4 3 4 3 4 history1 0.2	0 60 1 924 1227 1078 1318 2864 history2 7 7 7 8 8 history2 0.6			
Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b> >30 >20 <b>limit/base</b> >3 >20	0 57 <1 888 1144 1019 1224 3033 <u>current</u> 4 3 2 2 <u>current</u> 0.2 7.2	0 50 <1 887 1060 903 1190 2906 history1 4 3 4 history1 0.2 5.8	0 60 1 924 1227 1078 1318 2864 history2 7 7 7 8 <i>history2</i> 0.6 10.9			
Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 60 0 1010 1070 1150 1270 2060 imit/base >30 20 imit/base >3 20 >3 30	0 57 <1 888 1144 1019 1224 3033 current 4 3 2 current 0.2 7.2 19.5	0 50 <1 887 1060 903 1190 2906 history1 4 3 4 3 4 0.2 5.8 17.8	0 60 1 924 1227 1078 1318 2864 history2 7 7 7 8 history2 0.6 10.9 22.9			

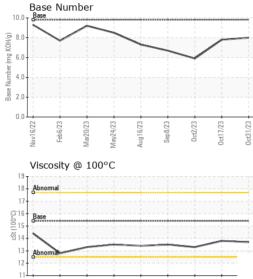


Feb6/23

Mar20/23

Nov16/22

# **OIL ANALYSIS REPORT**



		VISUAL		method	limit/base	current		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
May24/23 Aug16/23 Sep8/23	0ct2/23 0ct17/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
May Aug Se	0 20 20	Cuci	scalar	*Visual	NORML	NORML	NORML	NORML
С		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	15.4	13.7	13.8	13.3
		GRAPHS						
		Ferrous Alloys						
23 23 23 23 23 23 23 23 23 - 23	23	iron						
May24/23 Aug16/23 Sep8/23	0ct2/23 0ct17/23	50 - nickel						
2 4	-							
		₫ <sub>30</sub>						
		20						
		10						
			ug16/23 - Sen8/23		0ct31/23			
		Nov16/22 Feb6/23 Mar20/23	Aug16/23 Sen8/23	Oct1 Oct	0ct3			
		Non-ferrous Meta	ls					
		12 copper		4				
		10 - management lead		$\Lambda$				
		8		/				
		E. 6	/	(				
		4	And the second sec					
			and a supervised of the superv					
		2		-1	weingsam.			
			23-	23	23			
		Nov16/22 Feb6/23 Mar20/23	Aug16/23 Sen8/23	0ct2/23 0ct17/23	0ct31/23			
		Viscosity @ 100°C		-				
		<sup>19</sup>			10.0	Base Number		
		18 - Abnormal				$\backslash \land$	_	
		17			(B/H)	$\sim$		
		⊖ <sup>16</sup> Base			9 6.0 2 6.0			$\checkmark$
		3-16 Base 15 15 14			mber (			
					6.0 Base Number (mg KOH/g)			
		13 Abnorma			2.0			
		12						
		12						
		11	16/23	ct2/23		/16/22 - b6/23 - 20/23 -	/24/23 16/23 p8/23	ct2/23 - 117/23 - 31/23 -
		Nov16/22	Aug16/23	0ct2/230ct2/23	0ct31/23	Nov16/22 - Feb6/23 - Mar20/23 -	May24/23 Aug16/23 Sep8/23	0ct2/23 + 0ct17/23 +
J	Laboratorv	Niov16,/22 Feb6,/23 + Mar/24,/23 +		0	0ct31/23	2 2	2 4	0 0
ANAB	Laboratory Sample No.	: WearCheck USA - 5 : GFL0098465	501 Madis <b>Received</b>	on Ave., Ca	ry, NC 27513 Nov 2023	2 2	ronmental - 846 -	Mayfield Hauling State Route 45
	Sample No. Lab Number	: WearCheck USA - 5 : GFL0098465 : 05998653	501 Madis Received Diagnose	on Ave., Ca I : 06 I ed : 06 I	ry, NC 27513 Nov 2023 Nov 2023	2 2	ronmental - 846 -	Mayfield Hauling State Route 45 Mayfield, KY
	Sample No. Lab Number Unique Numbe	: WearCheck USA - 5 : GFL0098465 : 05998653 r : 10727013	501 Madis <b>Received</b>	on Ave., Ca I : 06 I ed : 06 I	ry, NC 27513 Nov 2023	2 2	<b>conmental - 846 -</b> 3426	Mayfield Hauling State Route 45 Mayfield, KY US 42066
Certificate L2367 To discuss this	Sample No. Lab Number Unique Numbe Test Package	: WearCheck USA - 5 : GFL0098465 : 05998653 r : 10727013	501 Madis Received Diagnose Diagnost	con Ave., Ca I : 06 I ed : 06 I ician : We	ry, NC 27513 Nov 2023 Nov 2023 Sov 2023 S Davis	2 2	ronmental - 846 - 3426 Contac	Mayfield Hauling State Route 45 Mayfield, KY