

### **OIL ANALYSIS REPORT**

Sample Rating Trend





914034 Component Diesel Engine Fluid

# PETRO CANADA DURON SHP 15W40 (--- 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.

Machine Id

### Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

SAMPLE INFORM		method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0125442	GFL0116162	
Sample Date		Client Info		17 Jun 2024	20 Mar 2024	
Machine Age	hrs	Client Info		1258	634	
Oil Age	hrs	Client Info		624	634	
Oil Changed		Client Info		Changed	Changed	
Sample Status				NORMAL	ATTENTION	
CONTAMINAT	ON	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0	0.4	
Water		WC Method	>0.2	NEG	NEG	
Glycol		WC Method		NEG	NEG	
	0	mathad	limit/bass	ourroat	biotorut	biotory ()
WEAR METAL	5	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>120	27	53	
Chromium	ppm	ASTM D5185m	>20	<1	1	
Nickel	ppm	ASTM D5185m	>5	1	4	
Titanium	ppm	ASTM D5185m	>2	0	<1	
Silver	ppm	ASTM D5185m	>2	1	0	
Aluminum	ppm	ASTM D5185m	>20	2	6	
Lead	ppm	ASTM D5185m	>40	0	<1	
Copper	ppm	ASTM D5185m	>330	218	96	
Tin	ppm	ASTM D5185m	>15	2	3	
Vanadium	ppm	ASTM D5185m		0	<1	
Cadmium	ppm	ASTM D5185m		0	0	
ADDITIVES		method	limit/base	current	history1	history2
	maa					history2
Boron	ppm	ASTM D5185m	0	8	146	
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	8 0	146 0	
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	8 0 67	146 0 118	
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	8 0 67 2	146 0 118 4	
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	8 0 67 2 1015	146 0 118 4 777	
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	8 0 67 2 1015 1130	146 0 118 4 777 1540	
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	8 0 67 2 1015 1130 1050	146 0 118 4 777 1540 749	   
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	8 0 67 2 1015 1130 1050 1294	146 0 118 4 777 1540 749 888	
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	8 0 67 2 1015 1130 1050 1294 3096	146 0 118 4 777 1540 749 888 2847	
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	8 0 67 2 1015 1130 1050 1294	146 0 118 4 777 1540 749 888	
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 Limit/base	8 0 67 2 1015 1130 1050 1294 3096	146 0 118 4 777 1540 749 888 2847	
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	0 0 60 0 1010 1070 1150 1270 2060 Limit/base	8 0 67 2 1015 1130 1050 1294 3096 current	146 0 118 4 777 1540 749 888 2847 history1	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm	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 <b>limit/base</b>	8 0 67 2 1015 1130 1050 1294 3096 current 10	146 0 118 4 777 1540 749 888 2847 history1 63	     history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	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 <b>limit/base</b>	8 0 67 2 1015 1130 1050 1294 3096 <u>current</u> 10 5	146 0 118 4 777 1540 749 888 2847 <b>history1</b> 63 2	     history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25	8 0 67 2 1015 1130 1050 1294 3096 current 10 5 5 5	146 0 118 4 777 1540 749 888 2847 <b>history1</b> 63 2 6 <b>history1</b>	    history2   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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 imit/base >20	8 0 67 2 1015 1130 1050 1294 3096 current 10 5 5 5 current 0.6	146 0 118 4 777 1540 749 888 2847 history1 63 2 6 6 history1 0.5	     history2   history2
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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 220 220 220 20 20 20 20 20 20 20 20 20	8 0 67 2 1015 1130 1050 1294 3096 <i>current</i> 10 5 5 <i>current</i> 0.6 9.2	146 0 118 4 777 1540 749 888 2847 history1 63 2 8 6 2 6 history1 0.5 9.9	      history2   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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 imit/base >20	8 0 67 2 1015 1130 1050 1294 3096 current 10 5 5 5 current 0.6	146 0 118 4 777 1540 749 888 2847 history1 63 2 6 6 history1 0.5	     history2   history2
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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 220 220 220 20 20 20 20 20 20 20 20 20	8 0 67 2 1015 1130 1050 1294 3096 <i>current</i> 10 5 5 <i>current</i> 0.6 9.2	146 0 118 4 777 1540 749 888 2847 history1 63 2 8 6 2 6 history1 0.5 9.9	      history2   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 2060 225 20 225 20 20 20 20 20 20 20 20 20 20 20 20 20	8 0 67 2 1015 1130 1050 1294 3096 <u>current</u> 10 5 5 5 <u>current</u> 0.6 9.2 20.6	146 0 118 4 777 1540 749 888 2847 history1 63 2 6 6 history1 0.5 9.9 24.1	     history2   history2  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 ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 20 220 20 20 20 20 20 20 20 20 20 20 20	8 0 67 2 1015 1130 1050 1294 3096 <i>current</i> 10 5 5 <i>current</i> 0.6 9.2 20.6	146 0 118 4 777 1540 749 888 2847 history1 63 2 6 6 history1 0.5 9.9 24.1 history1	    history2  history2  history2  history2



## **OIL ANALYSIS REPORT**

FT-IR (Direct Trend)	VISUAL		method	limit/base	current	history1	history2	
30 - Oxidation	White Metal	scalar	*Visual	NONE	NONE	NONE		
25 - Sulfation	Yellow Metal	scalar	*Visual	NONE	NONE	NONE		
520-	Precipitate	scalar	*Visual	NONE	NONE	NONE		
-9	Silt	scalar	*Visual	NONE	NONE	NONE		
10 -	Debris	scalar	*Visual	NONE	NONE	NONE		
5	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE		
0/24	Appearance	scalar	*Visual	NORML	NORML	NORML		
Mar20/24	Odor	scalar	*Visual	NORML	NORML	NORML		
	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG		
Base Number	Free Water	scalar	*Visual	-	NEG	NEG		
8.0	FLUID PROPE	RTIES	method	limit/base	current	history1	history2	
(b) 8.0	Visc @ 100°C	cSt	ASTM D445	15.4	13.3	0.4		
4.0	GRAPHS							
2.0	Ferrous Alloys							
0.0	60 iron							
AC102mM	50 - nickel							
	40 -							
Viscosity @ 100°C	틆 30 -			/				
18 - Abnormal	20-							
	10-							
6 16 Base 00 14 Abnormal								
경 12 Abnormal	0			1/24				
10	Mar20/24			Jun17/24				
8	 Non-ferrous Meta	ls		r				
Mar20/24	250 T							
Mar2	200 - Copper			_				
	200 tin	_						
	150							
	He 100							
	50 -							
	0							
	Mar20/24			17/24				
				Jun				
	Viscosity @ 100°	C			Base Numbe	er.		
	18 Abnormal				.0 Base			
	17-			<u> </u>	.0			
	16 Base			KOH/6				
	© 15 - 00 14 -			Base Number (mg KOH/g)	.0 +			
	형 13 - Abnormal			aquin 4	.0+			
	12			Sase N				
	11			<sup>2</sup> 2	.0+			
	9							
	Mar20/24			Jun17/24	Mar20/24		Jun17/24	
	Ma			Jur	Ma		Jun	
	:GFL0125442 r :06217479 er :11090343 e :FLEET	Rece Teste Diagr	ived : 21 d : 25 nosed : 25	Jun 2024 5 Jun 2024 Jun 2024 - Se		Cont	• WB Horicon HC 96 County Rd V Horicon, WI US 53032 act: Tim Kieffer er@gflenv.com	
* - Denotes test methods that	at are outside of the ISO i	17025 scc	pe of accrea	litation.		T:	(608)219-0288	
Statements of conformity to	specifications are based	on the sin	nple accepta	nce decisior	n rule (JCGM 10	06:2012)	F:	

Submitted By: See also GFL935 - Tim Kieffer