

# **OIL ANALYSIS REPORT**

Sample Rating Trend





Component Diesel Engine Fluid

## PETRO CANADA DURON SHP 15W40 (36 QTS)

### 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		GFL0084887	GFL0052104	GFL0018513
Sample Date		Client Info		27 Jun 2023	30 Sep 2022	30 Mar 2022
Machine Age	hrs	Client Info		1500	1500	900
Oil Age	hrs	Client Info		1500	1500	900
Oil Changed		Client Info		Changed	Changed	N/A
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<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	>120	10	7	14
Chromium	ppm	ASTM D5185m	>20	0	<1	<1
Nickel	ppm	ASTM D5185m	>5	0	0	0
Titanium	ppm	ASTM D5185m	>2	<1	0	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m		2	5	2
Lead	ppm	ASTM D5185m	>40	1	0	1
Copper	ppm	ASTM D5185m		<1	1	8
Tin	ppm	ASTM D5185m	>15	<1	0	<1
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
	ppm			•	0	0
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	<1	2	5
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	<1 0	2 <1	5
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	<1 0 58	2 <1 59	5 0 61
Boron Barium Molybdenum Manganese	ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	<1 0 58 <1	2 <1 59 0	5 0 61 <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 58 <1 944	2 <1 59 0 873	5 0 61 <1 944
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	<1 0 58 <1 944 1064	2 <1 59 0 873 1069	5 0 61 <1 944 1106
Boron Barium Molybdenum Manganese Magnesium	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 58 <1 944 1064 1008	2 <1 59 0 873 1069 998	5 0 61 <1 944 1106 1016
Boron Barium Molybdenum Manganese Magnesium Calcium	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	<1 0 58 <1 944 1064	2 <1 59 0 873 1069	5 0 61 <1 944 1106 1016 1309
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 58 <1 944 1064 1008	2 <1 59 0 873 1069 998	5 0 61 <1 944 1106 1016
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 58 <1 944 1064 1008 1226	2 <1 59 0 873 1069 998 1202	5 0 61 <1 944 1106 1016 1309
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	<1 0 58 <1 944 1064 1008 1226 3569	2 <1 59 0 873 1069 998 1202 3120	5 0 61 <1 944 1106 1016 1309 2698
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 1010 1070 1150 1270 2060	<1 0 58 <1 944 1064 1008 1226 3569 current	2 <1 59 0 873 1069 998 1202 3120 history1	5 0 61 <1 944 1106 1016 1309 2698 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 kimit/base >25	<1 0 58 <1 944 1064 1008 1226 3569 current 3	2 <1 59 0 873 1069 998 1202 3120 history1 2	5 0 61 <1 944 1106 1016 1309 2698 history2 5
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	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	0 0 60 1010 1070 1150 1270 2060 kimit/base >25	<1 0 58 <1 944 1064 1008 1226 3569 current 3 4	2 <1 59 0 873 1069 998 1202 3120 history1 2 5	5 0 61 <1 944 1106 1016 1309 2698 history2 5 11
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25	<1 0 58 <1 944 1064 1008 1226 3569 current 3 4 4	2 <1 59 0 873 1069 998 1202 3120 history1 2 5 5 12	5 0 61 <1 944 1106 1016 1309 2698 history2 5 11 4
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>Imit/base</b> >25 >20 <b>Imit/base</b> >20	<1 0 58 <1 944 1064 1008 1226 3569 current 3 4 4 4	2 <1 59 0 873 1069 998 1202 3120 history1 2 5 12 5 12 history1	5 0 61 <1 944 1106 1016 1309 2698 history2 5 11 4 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 limit/base >25 >20 limit/base >20	<1 0 58 <1 944 1064 1008 1226 3569 <u>current</u> 3 4 4 4 0.3	2 <1 59 0 873 1069 998 1202 3120 history1 2 5 12 5 12 history1 0.6	5 0 61 <1 944 1106 1016 1309 2698 history2 5 11 4 history2 0.3
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 limit/base >25 >20 limit/base >20	<1 0 58 <1 944 1064 1008 1226 3569 current 3 4 4 Current 0.3 10.0	2 <1 59 0 873 1069 998 1202 3120 history1 2 5 12 5 12 history1 0.6 11.6	5 0 61 <1 944 1106 1016 1309 2698 history2 5 11 4 history2 0.3 11.9
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 1imit/base >4 >20 >30 30	<1 0 58 <1 944 1064 1008 1226 3569 <u>current</u> 3 4 4 4 <u>current</u> 0.3 10.0 20.3	2 <1 59 0 873 1069 998 1202 3120 history1 2 5 12 5 12 history1 0.6 11.6 24.6	5 0 61 <1 944 1106 1016 1309 2698 history2 5 11 4 <u>history2</u> 0.3 11.9 23.4
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 D7844 *ASTM D7624	0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 20 1000 220 20 20 20 20 20 20 20 20 20 20 20	<1 0 58 <1 944 1064 1008 1226 3569 Current 3 4 4 0.3 10.0 20.3 Current	2 <1 59 0 873 1069 998 1202 3120 history1 2 5 12 5 12 history1 0.6 11.6 24.6 history1	5 0 61 <1 944 1106 1016 1309 2698 history2 5 11 4 history2 0.3 11.9 23.4 history2

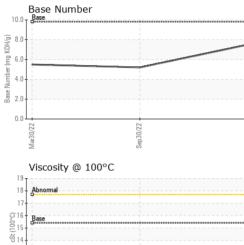


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Mar30/22

# **OIL ANALYSIS REPORT**



	VISUAL		method				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
0/22	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Sep30/22	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
	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	13.2	12.7	13.1
	GRAPHS						
	Ferrous Alloys						
/22	12 iron						
Sep30/22	10						
	8						
	Ed 6	-					
	4						
	2						
	0	/22		/23			
	Mar30/22	Sep30/22		Jun27/23			
	– Non-ferrous Meta			,			
	<sup>10</sup> T						
	copper						
	tin						
	6						
	4						
	4 4 2						
	4		A A TATI TA YOU AND A STATE	27.70 <sup>0000000000000000000000000000000000</sup>			
	4 2 0	Contraction of the local division of the loc		7/23			
	4	Sep 30/22	and a little of the second	Jun27/23			
	Viscosity @ 100°	Sep30/22	1447733797979797979797979797979797979797	Jun27/23	Base Number		
		Sep30/22			Base		
	Viscosity @ 100°	Sep30/22	1077379799999999999999999999999999999999		Base		
	Viscosity @ 100°	Sep30/22			Base		
	Viscosity @ 100°	Sep30/22			Base		
	Viscosity @ 100°	Sep30/22			Base		
	Viscosity @ 100°	Sep30/22			Base		
	Viscosity @ 100°	Sep30/22		7	Base		
	Viscosity @ 100°	C Sep30/22		10.0 (0)HOX Bul HOX BU	Base	2	
	Viscosity @ 100°	C Sep30/22		10.0 (0)HOX Bul HOX BU	Base	p30/22 -	
	Viscosity @ 100°	Sep30/22		10.0 (0HO) 8.0 but aquin 4.0 2.0	Base	Sep30/22	
Laboratorv	Viscosity @ 100° Abnomal Base Abnomal COCCEPT	Sep30/22		10.0 (0)HOX 6.0 bul) Jarqum N see 2.0 c2/2Unr	Base 220002 ref		- Michigan W
Laboratory Sample No.	Viscosity @ 100° Viscosity @ 100°	C C 501 Madia Received	son Ave., Ca d : 13 v	10.0 (0HO) 6.0 (0HO) 4.0 (0HO) 4.0 (	Base 220002 ref	vironmental - 410	00 Van Born I
Sample No. Lab Number	Viscosity @ 100° Viscosity @ 100°	C C 501 Madia Received Diagnos	son Ave., Ca d : 13 . ed : 13 .	ry, NC 27513 Jul 2023 Jul 2023	Base 220002 ref	vironmental - 410	00 Van Born F Wayne,
Sample No. Lab Number Unique Number	Viscosity @ 100° Viscosity @ 100° Abnomal Abnomal Base E WearCheck USA - : GFL0084887 r : 05897196 er : 10553006	C C 501 Madia Received	son Ave., Ca d : 13 . ed : 13 .	10.0 (0HO) 6.0 (0HO) 4.0 (0HO) 4.0 (	Base 220002 ref	r <b>ironmental - 410</b> 3900	00 Van Born F Wayne, US 481
Sample No. Lab Number	Viscosity @ 100° Viscosity @ 100°	C C 501 Madii Received Diagnos	son Ave., Ca d : 13, ed : 13, tician : We	10.0 (0)(10)(10)(10)(10)(10)(10)(10)(10)(10)(	Base 220002 ref	rironmental - 410 3900 Contact	00 Van Born I Wayne,

Submitted By: Belal Dgheish

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