

# **OIL ANALYSIS REPORT**

Sample Rating Trend





Machine Id 4578M Component

Fluid

Diesel Engine

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

## 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.

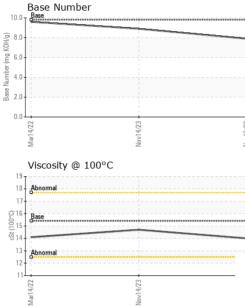
### Fluid Condition

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

SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0059251	GFL0059243	GFL0018432
Sample Date		Client Info		15 Nov 2023	14 Nov 2023	14 Mar 2022
Machine Age	hrs	Client Info		23199	23212	19664
Oil Age	hrs	Client Info		23199	23212	0
Oil Changed		Client Info		Not Changd	N/A	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	>90	13	25	18
Chromium	ppm	ASTM D5185m	>20	<1	1	<1
Nickel	ppm	ASTM D5185m	>2	<1	<1	0
Titanium	ppm	ASTM D5185m		0	0	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m		2	3	1
Lead	ppm	ASTM D5185m	>40	= <1	3	<1
Copper	ppm	ASTM D5185m		0	0	3
Tin	ppm	ASTM D5185m	>15	<1	<1	<1
Vanadium	ppm	ASTM D5185m	210	0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
	ppm			Ū.		-
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ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	3	3	10
	ppm ppm		0	3 0	3 0	10 0
Boron		ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	3 0 60	3 0 60	10 0 59
Boron Barium Molybdenum Manganese	ppm	ASTM D5185m ASTM D5185m	0 0 60	3 0 60 <1	3 0 60 <1	10 0 59 <1
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	3 0 60	3 0 60	10 0 59
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	3 0 60 <1	3 0 60 <1	10 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	3 0 60 <1 973	3 0 60 <1 986	10 0 59 <1 846
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	3 0 60 <1 973 1088	3 0 60 <1 986 1108	10 0 59 <1 846 1208
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	3 0 60 <1 973 1088 1049	3 0 60 <1 986 1108 1087	10 0 59 <1 846 1208 1011
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	3 0 60 <1 973 1088 1049 1324	3 0 60 <1 986 1108 1087 1347	10 0 59 <1 846 1208 1011 1138
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	3 0 60 <1 973 1088 1049 1324 2886	3 0 60 <1 986 1108 1087 1347 3068	10 0 59 <1 846 1208 1011 1138 2523
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	3 0 60 <1 973 1088 1049 1324 2886 current	3 0 60 <1 986 1108 1087 1347 3068 history1	10 0 59 <1 846 1208 1011 1138 2523 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	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 <b>method</b>	0 0 60 1010 1070 1150 1270 2060 kimit/base >25	3 0 60 <1 973 1088 1049 1324 2886 current 5	3 0 60 <1 986 1108 1087 1347 3068 history1 7	10 0 59 <1 846 1208 1011 1138 2523 history2 4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm 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 ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 kimit/base >25	3 0 60 <1 973 1088 1049 1324 2886 <u>current</u> 5 10	3 0 60 <1 986 1108 1087 1347 3068 history1 7 2	10 0 59 <1 846 1208 1011 1138 2523 history2 4 11
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm 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> >25	3 0 60 <1 973 1088 1049 1324 2886 <u>current</u> 5 10 <1	3 0 60 <1 986 1108 1087 1347 3068 history1 7 2 2 <1	10 0 59 <1 846 1208 1011 1138 2523 history2 4 11 0
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> >25 >20 <b>limit/base</b>	3 0 60 <1 973 1088 1049 1324 2886 current 5 10 <1 current	3 0 60 <1 986 1108 1087 1347 3068 history1 7 2 <1 2 <1	10 0 59 <1 846 1208 1011 1138 2523 history2 4 11 0 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	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25 >20 <b>limit/base</b>	3 0 60 <1 973 1088 1049 1324 2886 <u>current</u> 5 10 <1 <1 <u>current</u>	3 0 60 <1 986 1108 1087 1347 3068 history1 7 2 <1 7 2 <1 <i>history1</i> 0.4	10 0 59 <1 846 1208 1011 1138 2523 history2 4 11 0 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	3 0 60 <1 973 1088 1049 1324 2886 <i>current</i> 5 10 <1 <i>current</i> 0.4 9.0	3 0 60 <1 986 1108 1087 1347 3068 history1 7 2 <1 2 <1 history1 0.4 9.8	10 0 59 <1 846 1208 1011 1138 2523 history2 4 11 0 history2 0.3 8.7
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 >6 >20 >20 30	3 0 60 <1 973 1088 1049 1324 2886 <u>current</u> 5 10 <1 <1 <u>current</u> 0.4 9.0 20.3	3 0 60 <1 986 1108 1087 1347 3068 history1 7 2 <1 7 2 <1 0.4 9.8 21.2	10 0 59 <1 846 1208 1011 1138 2523 history2 4 11 0 history2 0.3 8.7 20.3
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 20 220 20 20 20 20 20 20 20 20 20 20 20	3 0 60 <1 973 1088 1049 1324 2886 <i>current</i> 5 10 <1 <i>current</i> 0.4 9.0 20.3 <i>current</i>	3 0 60 <1 986 1108 1087 1347 3068 history1 7 2 2 <1 7 2 1 0.4 9.8 21.2 history1	10 0 59 <1 846 1208 1011 1138 2523 history2 4 11 0 history2 0.3 8.7 20.3 history2



# **OIL ANALYSIS REPORT**



White Metal Yellow Metal Precipitate Silt Debris Sand/Dirt Appearance Odor Emulsified Water Free Water Free Water Visc @ 100°C GRAPHS Ferrous Alloys	cSt	*Visual *Visual *Visual *Visual *Visual *Visual *Visual *Visual <b>method</b> ASTM D445	NONE NONE NONE NONE NORML >0.2 15.4	NONE NONE NONE NONE NOR NOR NOR NEG Current 14.0	NONE NONE NONE NONE NORML NORML NEG NEG 14.7	NONE NONE NONE NONE NORML NORML NEG NEG 14.1
Precipitate Silt Debris Sand/Dirt Appearance Odor Emulsified Water Free Water Free Water Visc @ 100°C GRAPHS Ferrous Alloys	scalar scalar scalar scalar scalar scalar <b>ERTIES</b> cSt	*Visual *Visual *Visual *Visual *Visual *Visual *Visual *Visual	NONE NONE NONE NORML NORML >0.2 limit/base 15.4	NONE NONE NONE NORML NORML NEG NEG	NONE NONE NONE NORML NORML NEG NEG history1	NONE NONE NONE NORML NORML NEG NEG history2
Silt Debris Sand/Dirt Appearance Odor Emulsified Water Free Water Free Water Visc @ 100°C GRAPHS Ferrous Alloys	scalar scalar scalar scalar scalar scalar ERTIES cSt	*Visual *Visual *Visual *Visual *Visual *Visual *Visual <b>method</b>	NONE NONE NORML NORML >0.2 limit/base 15.4	NONE NONE NORML NORML NEG NEG	NONE NONE NORML NORML NEG NEG history1	NONE NONE NORML NORML NEG NEG history2
Debris Sand/Dirt Appearance Odor Emulsified Water Free Water Fluid PROPE Visc @ 100°C GRAPHS Ferrous Alloys 25 0 15 10 5 0 15 10 5 0 10 10 10 10 10 10 10 10 10 10 10 10 1	scalar scalar scalar scalar scalar ERTIES cSt	*Visual *Visual *Visual *Visual *Visual *Visual method	NONE NORML NORML >0.2 limit/base 15.4	NONE NORML NORML NEG NEG current	NONE NORML NORML NEG NEG history1	NONE NORML NORML NEG NEG history2
Sand/Dirt Appearance Odor Emulsified Water Free Water Fluid PROPE Visc @ 100°C GRAPHS Ferrous Alloys 20 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	scalar scalar scalar scalar scalar ERTIES cSt	*Visual *Visual *Visual *Visual *Visual method	NONE NORML >0.2 limit/base 15.4	NONE NORML NORML NEG NEG current	NONE NORML NORML NEG NEG history1	NONE NORML NORML NEG NEG history2
Appearance Odor Emulsified Water Free Water Fluid PROPI Visc @ 100°C GRAPHS Ferrous Alloys	scalar scalar scalar scalar ERTIES cSt	*Visual *Visual *Visual *Visual method	NORML >0.2 limit/base 15.4	NORML NORML NEG NEG current	NORML NORML NEG NEG history1	NORML NORML NEG NEG history2
Emulsified Water Free Water Fluid PROPE Visc @ 100°C GRAPHS Ferrous Alloys 20 10 10 10 10 10 10 10 10 10 1	scalar scalar scalar ERTIES cSt	*Visual *Visual *Visual method	NORML >0.2	NORML NEG NEG current	NORML NEG NEG history1	NORML NEG NEG history2
Emulsified Water Free Water Fluid PROPE Visc @ 100°C GRAPHS Ferrous Alloys 20 10 10 10 10 10 10 10 10 10 1	scalar scalar ERTIES cSt	*Visual *Visual method	>0.2 limit/base 15.4	NEG NEG current	NEG NEG history1	NEG NEG history2
Free Water FLUID PROPI Visc @ 100°C GRAPHS Ferrous Alloys 25 10 15 10 15 10 15 10 15 10 15 10 15 10 10 15 10 10 10 10 10 10 10 10 10 10	scalar scalar ERTIES cSt	*Visual method	>0.2 limit/base 15.4	NEG NEG current	NEG NEG history1	NEG NEG history2
FLUID PROPE Visc @ 100°C GRAPHS Ferrous Alloys	CSt	method	limit/base 15.4	NEG current	NEG history1	NEG history2
Visc @ 100°C GRAPHS Ferrous Alloys	cSt		15.4			
GRAPHS Ferrous Alloys	Nov14/23	ASTM D445		14.0	14.7	14.1
Ferrous Alloys	-		Nov15/23			
Ferrous Alloys	-		Nov15/23			
Non-ferrous Meta	-		Nov15/23			
Non-ferrous Meta	-		Nov15/23			
Non-ferrous Meta	-		Nov15/23			
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Submitted By: Belal Dgheish

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