

OIL ANALYSIS REPORT

Sample Rating Trend

NORMAL

Machine Id 812031

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.

		Mar2022	Nov2022 Jan2023	Mar2023 May2023		
SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0087079	GFL0075015	GFL0075018
Sample Date		Client Info		10 Jul 2023	17 May 2023	10 May 2023
Machine Age	hrs	Client Info		3768	3477	3431
Oil Age	hrs	Client Info		0	0	0
Oil Changed		Client Info		Not Changd	Changed	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	>100	9	35	31
Chromium	ppm	ASTM D5185m	>20	<1	2	1
Nickel	ppm	ASTM D5185m	>4	0	<1	<1
Titanium	ppm	ASTM D5185m		<1	<1	<1
Silver	ppm	ASTM D5185m	>3	0	<1	<1
Aluminum	ppm	ASTM D5185m	>20	9	34	29
Lead	ppm	ASTM D5185m	>40	0	1	1
Copper	ppm	ASTM D5185m	>330	<1	<1	1
Tin	ppm	ASTM D5185m	>15	<1	<1	<1
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 0	current <1	history1 <1	history2 <1
	ppm ppm		0			
Boron		ASTM D5185m	0	<1	<1	<1
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0 0 60	<1 0	<1 0	<1 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	<1 0 62	<1 0 67	<1 0 66
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	<1 0 62 <1	<1 0 67 1	<1 0 66 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 62 <1 1030	<1 0 67 1 1075	<1 0 66 1 1081
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 62 <1 1030 1134	<1 0 67 1 1075 1210	<1 0 66 1 1081 1202
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 62 <1 1030 1134 1058	<1 0 67 1 1075 1210 1123	<1 0 66 1 1081 1202 1136
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 62 <1 1030 1134 1058 1291	<1 0 67 1 1075 1210 1123 1392	<1 0 66 1 1081 1202 1136 1408
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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	<1 0 62 <1 1030 1134 1058 1291 3714	<1 0 67 1 1075 1210 1123 1392 3445	<1 0 66 1 1081 1202 1136 1408 3514
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 62 <1 1030 1134 1058 1291 3714 current	<1 0 67 1 1075 1210 1123 1392 3445 history1	<1 0 66 1 1081 1202 1136 1408 3514 history2
Boron Barium 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 method	0 0 60 1010 1070 1150 1270 2060	<1 0 62 <1 1030 1134 1058 1291 3714 <i>current</i> 3	<1 0 67 1 1075 1210 1123 1392 3445 history1 4	<1 0 66 1 1081 1202 1136 1408 3514 history2 4
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 method ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 kimit/base >25	<1 0 62 <1 1030 1134 1058 1291 3714 <u>current</u> 3 4	<1 0 67 1 1075 1210 1123 1392 3445 history1 4 7	<1 0 66 1 1081 1202 1136 1408 3514 history2 4 6
Boron Barium 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 0 0 1010 1070 1150 1270 2060 limit/base >25	<1 0 62 <1 1030 1134 1058 1291 3714 current 3 4 17	<1 0 67 1 1075 1210 1123 1392 3445 history1 4 7 56	<1 0 66 1 1081 1202 1136 1408 3514 history2 4 6 49
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 20	<1 0 62 <1 1030 1134 1058 1291 3714 <i>current</i> 3 4 17 <i>current</i>	<1 0 67 1 1075 1210 1123 1392 3445 history1 4 7 56 history1	<1 0 66 1 1081 1202 1136 1408 3514 history2 4 6 49 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 20	<1 0 62 <1 1030 1134 1058 1291 3714 <i>current</i> 3 4 17 <i>current</i> 0.3	<1 0 67 1 1075 1210 1123 1392 3445 history1 4 7 56 history1 0.6	<1 0 66 1 1081 1202 1136 1408 3514 history2 4 6 49 history2 0.6
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 <i>limit/base</i> >25 >20 <i>limit/base</i> >3 >20	<1 0 62 <1 1030 1134 1058 1291 3714 <i>current</i> 3 4 17 <i>current</i> 0.3 7.3	<1 0 67 1 1075 1210 1123 1392 3445 history1 4 7 56 history1 0.6 11.3	<1 0 66 1 1081 1202 1136 1408 3514 history2 4 6 49 history2 0.6 11.0
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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >25 imit/base >3 >20	<1 0 62 <1 1030 1134 1058 1291 3714 current 3 4 17 current 0.3 7.3 19.8	<1 0 67 1 1075 1210 1123 1392 3445 history1 4 7 56 history1 0.6 11.3 23.3	<1 0 66 1 1081 1202 1136 1408 3514 history2 4 6 49 history2 0.6 11.0 22.4
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 TS ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 2060 2060 225 20 220 20 20 20 20 20 20 20 20 20 20 20	<1 0 62 <1 1030 1134 1058 1291 3714 0urrent 3 4 17 0urrent 0.3 7.3 19.8 0urrent	<1 0 67 1 1075 1210 1123 1392 3445 history1 4 7 56 history1 0.6 11.3 23.3 history1	<1 0 66 1 1081 1202 1136 1408 3514 history2 4 6 49 history2 0.6 11.0 22.4 history2



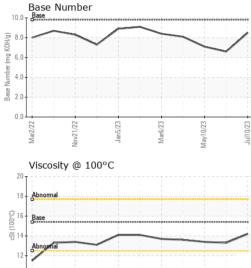
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Mar2/22

Nov21/22

OIL ANALYSIS REPORT

VISUAL



\frown	White Metal Yellow Metal Precipitate Silt	scalar *Visual scalar *Visual scalar *Visual scalar *Visual	NONENONENONENONENONENONE	NONENONENONENONENONENONENONENONE
Jan5/23 Mart 0/23 May10/23	Debris Sand/Dirt Appearance Odor Emulsified Water Free Water	scalar *Visual scalar *Visual scalar *Visual scalar *Visual scalar *Visual scalar *Visual	NONE NONE NONE NORM NORML NORML NORML NORML >0.2 NEG NEG NEG	NONE NONE NONE NONE NORML NORML NORML NORML NEG NEG
	FLUID PROPE Visc @ 100°C GRAPHS Ferrous Alloys	CSt ASTM D445	limit/base curren 15.4 14.2	t history1 history2 13.3 13.4
Jan5/23	Non-ferrous Meta	2	Juli 023	
	Viscosity @ 100°C	2	Base Nun 10.0 Base (0,H0), Bull January Base (0,H0), Bull January Base (0,H0), Bull January Base (0,H0), Bull January Base (0,H0), Bull January Base Nun	nber
Laboratory Sample No. Lab Number Unique Number Test Packago	: GFL0087079 : 05903016 r : 10564372	501 Madison Ave., Ca Received : 20 C Diagnosed : 20 C	ry, NC 27513 GFI Jul 2023 Jul 2023 s Davis	Environmental - 844 - Princeton Hauling 10129 Highway 62 Wes Princeton, K US 4244

Contact/Location: Kenneth Bigers - GFL844