

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id 527042

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.

	MATION	method	limit/base	current	history1	history2	
Sample Number		Client Info		GFL0097506	GFL0097482	GFL0097469	
Sample Date		Client Info		26 Feb 2024	02 Jan 2024	30 Nov 2023	
Machine Age	hrs	Client Info		19503	19177	18956	
Oil Age	hrs	Client Info		17689	17689	17689	
Oil Changed		Client Info		N/A	N/A	N/A	
Sample Status				NORMAL	NORMAL	ABNORMAL	
CONTAMINAT	ION	method	limit/base	current	history1	history2	
Fuel		WC Method	>5	<1.0	<1.0	<1.0	
Water		WC Method	>0.2	NEG	NEG	NEG	
Glycol	Giycol W			NEG	NEG	NEG	
WEAR METAL	S	method	limit/base	current	history1	history2	
Iron	ppm	ASTM D5185m	>100	70	10	1 09	
Chromium	ppm	ASTM D5185m	>20	1	0	2	
Nickel	ppm	ASTM D5185m	>4	0	0	0	
Titanium	ppm	ASTM D5185m		<1	0	<1	
Silver	ppm	ASTM D5185m	>3	0	0	0	
Aluminum	ppm	ASTM D5185m	>20	1	0	2	
Lead	ppm	ASTM D5185m	>40	1	2	6	
Copper	ppm	ASTM D5185m	>330	132	148	▲ 589	
Tin	ppm	ASTM D5185m	>15	<1	0	<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	current 3	history1 4	history2 5	
	ppm ppm						
Boron		ASTM D5185m	0	3	4	5	
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0 0 60	3 0	4 0	5 0	
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	3 0 62	4 0 51	5 0 58	
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	3 0 62 <1	4 0 51 0	5 0 58 <1	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	3 0 62 <1 929	4 0 51 0 820	5 0 58 <1 934	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	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 62 <1 929 1105	4 0 51 0 820 964	5 0 58 <1 934 1117 912 1180	
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 62 <1 929 1105 880	4 0 51 0 820 964 864	5 0 58 <1 934 1117 912	
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 62 <1 929 1105 880 1133	4 0 51 0 820 964 864 1138	5 0 58 <1 934 1117 912 1180	
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 62 <1 929 1105 880 1133 2169	4 0 51 0 820 964 864 1138 2642	5 0 58 <1 934 1117 912 1180 2138	
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 62 <1 929 1105 880 1133 2169 current	4 0 51 0 820 964 864 1138 2642 history1	5 0 58 <1 934 1117 912 1180 2138 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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base	3 0 62 <1 929 1105 880 1133 2169 current 4	4 0 51 0 820 964 864 1138 2642 history1 2	5 0 58 <1 934 1117 912 1180 2138 history2 6	
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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base	3 0 62 <1 929 1105 880 1133 2169 current 4 2	4 0 51 0 820 964 864 1138 2642 history1 2 2 <1	5 0 58 <1 934 1117 912 1180 2138 history2 6 3	
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	3 0 62 <1 929 1105 880 1133 2169 current 4 2 0	4 0 51 0 820 964 864 1138 2642 history1 2 2 <1 2	5 0 58 <1 934 1117 912 1180 2138 history2 6 3 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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 Limit/base >20	3 0 62 <1 929 1105 880 1133 2169 current 4 2 0 0	4 0 51 0 820 964 864 1138 2642 history1 2 <1 <1 <1 history1	5 0 58 <1 934 1117 912 1180 2138 history2 6 3 0 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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 Limit/base >20	3 0 62 <1 929 1105 880 1133 2169 <u>current</u> 4 2 0 <u>current</u> 0.5	4 0 51 0 820 964 864 1138 2642 history1 2 <1 <1 <1 history1 0.1	5 0 58 <1 934 1117 912 1180 2138 history2 6 3 0 bistory2 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 TS 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	3 0 62 <1 929 1105 880 1133 2169 <i>current</i> 4 2 0 <i>current</i> 0.5 9.2	4 0 51 0 820 964 864 1138 2642 history1 2 2 <1 <1 <1 1 0.1 5.6	5 0 58 <1 934 1117 912 1180 2138 history2 6 3 0 bistory2 0.6 9.3	
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 TS ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 20 20 320 33 20 20 20	3 0 62 <1 929 1105 880 1133 2169 <u>current</u> 4 2 0 <u>current</u> 0.5 9.2 19.4	4 0 51 0 820 964 864 1138 2642 history1 2 <1 <1 <1 <1 0.1 5.6 17.8	5 0 58 <1 934 1117 912 1180 2138 history2 6 3 0 history2 0.6 9.3 19.9	



13 Abnormal

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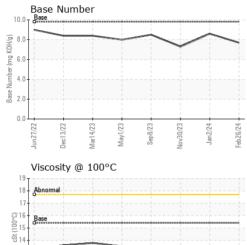
Jun27/22

Dec13/22

Mar14/23

OIL ANALYSIS REPORT

VISUAL



May1/23	Sep 8/23 >	Nov30/23	Jan2/24 +	White Metal Yellow Metal Precipitate Silt Debris Sand/Dirt Appearance Odor Emulsified Water Free Water	scalar	*Visual *Visual *Visual *Visual *Visual *Visual *Visual *Visual *Visual	NONE NONE NONE NONE NORML NORML >0.2	NONE NONE NONE NONE NONE NORML NORML NEG NEG	NON NON NON NON NOR NOR NOR NOR NOR	IE IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	NONE NONE NONE NONE NORML NORML NEG	-	
				FLUID PRO Visc @ 100°C	CSt	method ASTM D445	limit/base	current 13.3	his 13.5	tory1	history 13.1	y2	
				GRAPHS					1010				
				Ferrous Alloys									
May1/23	Sep 8/23	Nov30/23	Jan 2/24 стория	100 100 100 100 100 100 100 100	May1/23 Sep8/23	Nov30/23 Nov30/23 Nov30/23 Part 2/2 Par	Feb26/24 Feb						
				Viscosity @ 10		Base Number							
				18 - Abnormal						~			
				17 () 16 () 015 3 14 3 Abnormal 12			ase Number (mg KOH/6	.0 - .0 - .0 -		\sim		/	
				Jun27/22 Dec13/22	May1/23 Sep8/23	Nov30/23	Feb26/24 +	Jun27/22 +	Mar14/23	Sep 8/23 Nov30/23	Jan 2/24	Feb26/24	
To dis * - De	enotes	Laboratory : WearCheck USA - 501 Sample No. : GFL0097506 Lab Number : 06111269 Unique Number : 10914766				Madison Ave., Cary, NC 27513 Received : 07 Mar 2024 Tested : 08 Mar 2024 Diagnosed : 09 Mar 2024 - Don Ba ce at 1-800-237-1369. 7025 scope of accreditation.			GFL Environmental - 641 - Alpena 1241 KING SETTLEMENT RD ALPENA, MI US 49707 Contact: DYLAN TOLAN dylan.tolan@gflenv.com T: (989)854-7203				