

OIL ANALYSIS REPORT

Sample Rating Trend

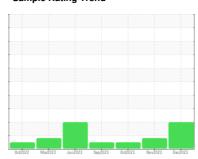
DEGRADATION



423031-402164

Component **Diesel Engine**

PETRO CANADA DURON SHP 15W40 (--- GAL)





DIAGNOSIS

Recommendation

We advise that you check for faulty combustion, plugged air filters, or aftercoolers. Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor. NOTE: High solids (carbon/soot) in the sample have limited the accuracy of Infra-Red data including Total Base Number (TBN) value.

All component wear rates are normal.

Contamination

There is an abnormal amount of solids and carbon present in the oil.

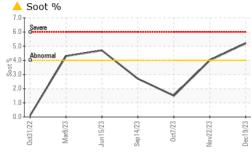
Fluid Condition

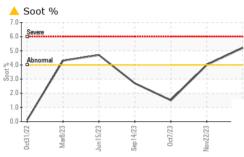
The BN level is low.

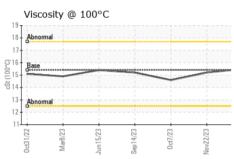
				Sep2023 Oct2023 Nov2023		
SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0077268	GFL0093556	GFL0077239
Sample Date		Client Info		19 Dec 2023	22 Nov 2023	07 Oct 2023
Machine Age	hrs	Client Info		44821	44646	44329
Oil Age	hrs	Client Info		663	458	141
Oil Changed		Client Info		Changed	Not Changd	Not Changd
Sample Status				ABNORMAL	ABNORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>120	49	32	17
Chromium	ppm	ASTM D5185m	>20	2	1	<1
Nickel	ppm	ASTM D5185m	>5	0	0	0
Titanium	ppm	ASTM D5185m	>2	3	<1	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>20	3	2	0
Lead	ppm	ASTM D5185m	>40	4	2	1
Copper	ppm	ASTM D5185m	>330	2	2	<1
Tin	ppm	ASTM D5185m	>15	<1	0	<1
Vanadium	ppm	ASTM D5185m		<1	<1	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
7.00011110		method	IIIIIII Dasc	Current	Thistory I	
Boron	ppm	ASTM D5185m	0	4	0	<1
	ppm		0			
Boron Barium	• • •	ASTM D5185m	0	4	0	<1
Boron	ppm	ASTM D5185m ASTM D5185m	0 0 60	4 0	0	<1 <1
Boron Barium Molybdenum	ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	4 0 56	0 0 58	<1 <1 62
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	4 0 56 <1	0 0 58 <1	<1 <1 62 <1
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	4 0 56 <1 868	0 0 58 <1 985	<1 <1 62 <1 885
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	4 0 56 <1 868 1003	0 0 58 <1 985 1054	<1 <1 62 <1 885 1026
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	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	4 0 56 <1 868 1003 904	0 0 58 <1 985 1054 925	<1 <1 62 <1 885 1026 1001
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 ASTM D5185m	0 0 60 0 1010 1070 1150	4 0 56 <1 868 1003 904 1100	0 0 58 <1 985 1054 925 1286	<1 <1 62 <1 885 1026 1001 1207
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	4 0 56 <1 868 1003 904 1100 2640	0 0 58 <1 985 1054 925 1286 2980	<1 <1 62 <1 885 1026 1001 1207 3279
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 0 1010 1070 1150 1270 2060	4 0 56 <1 868 1003 904 1100 2640	0 0 58 <1 985 1054 925 1286 2980 history1	<1 <1 62 <1 885 1026 1001 1207 3279 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	4 0 56 <1 868 1003 904 1100 2640 current	0 0 58 <1 985 1054 925 1286 2980 history1	<1 <1 62 <1 885 1026 1001 1207 3279 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25	4 0 56 <1 868 1003 904 1100 2640 current 11	0 0 58 <1 985 1054 925 1286 2980 history1 8	<1 <1 62 <1 885 1026 1001 1207 3279 history2 9 0
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25	4 0 56 <1 868 1003 904 1100 2640 current 11 2 2	0 0 58 <1 985 1054 925 1286 2980 history1 8 <1	<1 <1 62 <1 885 1026 1001 1207 3279 history2 9 0 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel	ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 >3.0	4 0 56 <1 868 1003 904 1100 2640 current 11 2 2 <1.0	0 0 58 <1 985 1054 925 1286 2980 history1 8 <1 1	<1 <1 62 <1 885 1026 1001 1207 3279 history2 9 0 2 <1.0
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED	ppm	ASTM D5185m	0 0 60 0 1010 1150 1270 2060 limit/base >25 >20 >3.0	4 0 56 <1 868 1003 904 1100 2640 current 11 2 2 <1.0 current	0 0 58 <1 985 1054 925 1286 2980 history1 8 <1 1 <1.0 history1	<1 <1 62 <1 885 1026 1001 1207 3279 history2 9 0 2 <1.0 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot %	ppm	ASTM D5185m	0 0 60 0 1010 1150 1270 2060 limit/base >25 >20 >3.0 limit/base	4 0 56 <1 868 1003 904 1100 2640 current 11 2 2 <1.0 current 5.2	0 0 58 <1 985 1054 925 1286 2980 history1 8 <1 1 <1.0 history1	<1 <1 62 <1 885 1026 1001 1207 3279 history2 9 0 2 <1.0 history2 1.5
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7624	0 0 60 0 1010 1150 1270 2060 limit/base >25 >20 >3.0 limit/base	4 0 56 <1 868 1003 904 1100 2640 current 11 2 2 <1.0 current 4 5.2 13.0	0 0 58 <1 985 1054 925 1286 2980 history1 8 <1 1 <1.0 history1 4 10.1	<1 <1 <1 62 <1 885 1026 1001 1207 3279 history2 9 0 2 <1.0 history2 1.5 5.8
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7624	0 0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 >3.0 limit/base >4 >20 >30	4 0 56 <1 868 1003 904 1100 2640	0 0 58 <1 985 1054 925 1286 2980 history1 8 <1 1 <1.0 history1 4 10.1 26.0	<1 <1 62 <1 885 1026 1001 1207 3279 history2 9 0 2 <1.0 history2 1.5 5.8 18.9
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm	ASTM D5185m ASTM D78185m ASTM D7844 *ASTM D7624 *ASTM D7624 *ASTM D7415 method	0 0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 >3.0 limit/base >4 >20 >30 limit/base	4 0 56 <1 868 1003 904 1100 2640	0 0 58 <1 985 1054 925 1286 2980 history1 8 <1 1 <1.0 history1 4 10.1 26.0 history1	<1 <1 <1 62 <1 885 1026 1001 1207 3279 history2 9 0 2 <1.0 history2 1.5 5.8 18.9 history2



OIL ANALYSIS REPORT



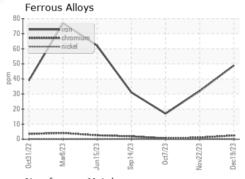


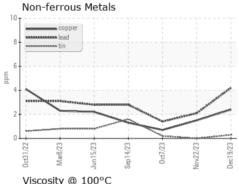


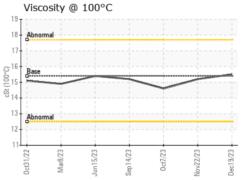
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

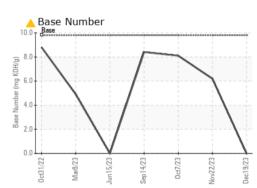
FLUID PROPERTIES		method	limit/base	current	history1	history2	
Visc @ 100°C	cSt	ASTM D445	15.4	15.5	15.2	14.6	

GRAPHS













Laboratory Sample No. Lab Number

: 06040320 Unique Number : 10795549

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0077268 Recieved Diagnosed

: 22 Dec 2023 Diagnostician : Jonathan Hester

: 20 Dec 2023

Test Package : FLEET (Additional Tests: FT-IR(Diff), FuelDilution) To discuss this sample report, contact Customer Service at 1-800-237-1369.

* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

GFL Environmental - 891 - Oklahoma City Hauling

1001 South Rockwell Oklahoma City, OK US 73128

Contact: Andy Smith andrew.smith@gflenv.com

T: (405)306-1651