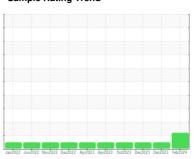


OIL ANALYSIS REPORT

Sample Rating Trend



FUEL

Machine Id **411027**

Component **Diesel Engine**

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

DIAGNOSIS

Recommendation

We advise that you check the fuel injection system. We recommend an early resample to monitor this condition. Please note that this is a corrected copy for diagnostic comment updates.

Wear

All component wear rates are normal.

Contamination

There is a moderate amount of fuel present in the

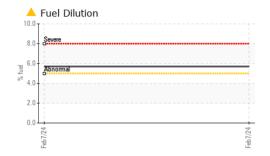
Fluid Condition

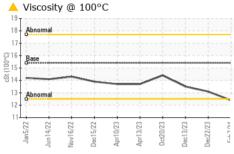
The BN result indicates that there is suitable alkalinity remaining in the oil. Fuel is present in the oil and is lowering the viscosity.

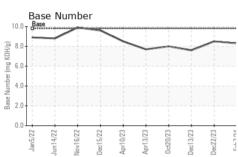
GAL)		Jan2022 Jun2	022 Nov2022 Dec2022 Apr2	023 Apr2023 Oct2023 Dec2023 Dec2	023 Feb2024	
SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0109278	GFL0093564	GFL0093587
Sample Date		Client Info		07 Feb 2024	22 Dec 2023	13 Dec 2023
Machine Age	hrs	Client Info		6268	6203	6071
Oil Age	hrs	Client Info		542	477	345
Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Sample Status				ABNORMAL	NORMAL	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	>100	6	1	15
Chromium	ppm	ASTM D5185m	>20	<1	<1	1
Nickel	ppm	ASTM D5185m	>4	0	0	0
Titanium	ppm	ASTM D5185m		19	19	<1
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>20	3	2	10
Lead	ppm	ASTM D5185m	>40	0	0	<1
Copper	ppm	ASTM D5185m	>330	<1	<1	<1
Tin	ppm	ASTM D5185m	>15	<1	0	0
Vanadium	ppm	ASTM D5185m		<1	<1	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 24	history1 29	history2 0
	ppm	ASTM D5185m				
Boron		ASTM D5185m	0	24	29	0
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	24 0	29 <1	0 0 55 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	24 0 43	29 <1 43	0 0 55
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	24 0 43 <1	29 <1 43 <1	0 0 55 0
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	24 0 43 <1 788	29 <1 43 <1 778	0 0 55 0 1001
Boron Barium Molybdenum Manganese Magnesium Calcium	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	24 0 43 <1 788 1103	29 <1 43 <1 778 1097	0 0 55 0 1001 1100
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 ASTM D5185m	0 0 60 0 1010 1070 1150	24 0 43 <1 788 1103 958	29 <1 43 <1 778 1097 988	0 0 55 0 1001 1100 1048
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 1270	24 0 43 <1 788 1103 958 1154	29 <1 43 <1 778 1097 988 1142	0 0 55 0 1001 1100 1048 1193
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	24 0 43 <1 788 1103 958 1154 3112	29 <1 43 <1 778 1097 988 1142 2950	0 0 55 0 1001 1100 1048 1193 2843
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	24 0 43 <1 788 1103 958 1154 3112 current	29 <1 43 <1 778 1097 988 1142 2950 history1	0 0 55 0 1001 1100 1048 1193 2843 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25	24 0 43 <1 788 1103 958 1154 3112 current 5	29 <1 43 <1 778 1097 988 1142 2950 history1 4	0 0 55 0 1001 1100 1048 1193 2843 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25	24 0 43 <1 788 1103 958 1154 3112 current 5 2	29 <1 43 <1 778 1097 988 1142 2950 history1 4 5	0 0 55 0 1001 1100 1048 1193 2843 history2 4
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	24 0 43 <1 788 1103 958 1154 3112 current 5 2 5	29 <1 43 <1 778 1097 988 1142 2950 history1 4 5	0 0 55 0 1001 1100 1048 1193 2843 history2 4 3 23
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 >5	24 0 43 <1 788 1103 958 1154 3112 current 5 2 5 \$\times 5.7	29 <1 43 <1 778 1097 988 1142 2950 history1 4 5 6 <1.0	0 0 55 0 1001 1100 1048 1193 2843 history2 4 3 23 <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 1070 1150 1270 2060 limit/base >25 >20 >5	24 0 43 <1 788 1103 958 1154 3112 current 5 2 5 5 15.7	29 <1 43 <1 778 1097 988 1142 2950 history1 4 5 6 <1.0 history1	0 0 55 0 1001 1100 1048 1193 2843 history2 4 3 23 <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 1070 1150 1270 2060 limit/base >25 >20 >5	24 0 43 <1 788 1103 958 1154 3112 current 5 2 5 ▲ 5.7 current 0.5	29 <1 43 <1 778 1097 988 1142 2950 history1 4 5 6 <1.0 history1 0.4	0 0 55 0 1001 1100 1048 1193 2843 history2 4 3 23 <1.0 history2 1.4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm	ASTM D5185m ASTM D3524 method *ASTM D7844 *ASTM D7624 *ASTM D7624	0 0 60 0 1010 1150 1270 2060 limit/base >25 >20 >5 limit/base	24 0 43 <1 788 1103 958 1154 3112 current 5 2 5 5.7 current 0.5 6.9	29 <1 43 <1 778 1097 988 1142 2950 history1 4 5 6 <1.0 history1 0.4 6.3	0 0 55 0 1001 1100 1048 1193 2843 history2 4 3 23 <1.0 history2 1.4 10.0
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 D7624 *ASTM D7624	0 0 60 0 1010 1150 1270 2060 limit/base >25 >20 >5 limit/base >3 >20 >30	24 0 43 <1 788 1103 958 1154 3112 current 5 2 5 15 10.5 6.9 18.8 current	29 <1 43 <1 778 1097 988 1142 2950 history1 4 5 6 <1.0 history1 0.4 6.3 18.7 history1	0 0 55 0 1001 1100 1048 1193 2843 history2 4 3 23 <1.0 history2 1.4 10.0 21.5
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm	ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D78185m ASTM D7824 *ASTM D7844 *ASTM D7844 *ASTM D7844 *ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 >5 limit/base >3 >20 >30 limit/base	24 0 43 <1 788 1103 958 1154 3112 current 5 2 5 ▲ 5.7 current 0.5 6.9 18.8	29 <1 43 <1 778 1097 988 1142 2950 history1 4 5 6 <1.0 history1 0.4 6.3 18.7	0 0 55 0 1001 1100 1048 1193 2843 history2 4 3 23 <1.0 history2 1.4 10.0 21.5 history2



OIL ANALYSIS REPORT





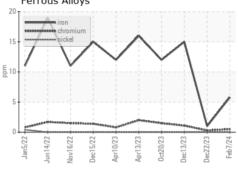


VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	LIGHT	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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

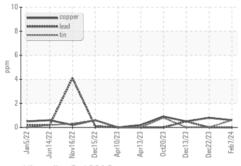
FLUID PROP	ERHES	method	limit/base	current	history1	history
Visc @ 100°C	cSt	ASTM D445	15.4	<u> </u>	13.1	13.5

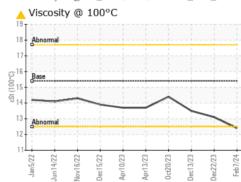
GRAPHS

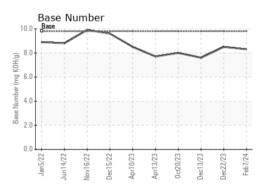
Ferrous Alloys















Laboratory Sample No. Lab Number : 06084264 Unique Number : 10871709

: GFL0109278

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 08 Feb 2024 **Tested** : 13 Feb 2024

Diagnosed : 13 Feb 2024 - Doug Bogart **Test Package**: FLEET (Additional Tests: FuelDilution, PercentFuel)

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

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)

Report Id: GFL891 [WUSCAR] 06084264 (Generated: 02/13/2024 14:25:22) Rev: 3

Submitted By: Andy Smith