

## **OIL ANALYSIS REPORT**

# MONTGOMERY HINO 229059

Component **Diesel Engine** 

Fluid PETRO CANADA DURON SHP 15W40 (--- LTR)

### DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor.

#### Wear

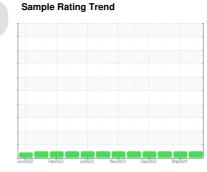
All component wear rates are normal.

#### 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.





NORMAL

SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0115602	GFL0115595	GFL0081896
Sample Date		Client Info		27 Mar 2024	13 Mar 2024	31 Jan 2024
Machine Age	hrs	Client Info		10171	10124	237533
Oil Age	hrs	Client Info		518	0	227880
Oil Changed		Client Info		Not Changd	Not Changd	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
Water		WC Method		NEG	NEG	NEG
Glycol		WC Method	20.L	NEG	NEG	NEG
WEAR METAL	c	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	8	10	3
Chromium	ppm	ASTM D5185m	>20	<1	<1	0
Nickel	ppm	ASTM D5185m	>4	<1	<1	0
Titanium	ppm	ASTM D5185m		0	<1	0
Silver	ppm	ASTM D5185m	>3	<1	0	0
Aluminum	ppm	ASTM D5185m	>20	6	5	2
Lead	ppm	ASTM D5185m	>40	1	1	<1
Copper	ppm	ASTM D5185m	>330	1	3	1
Tin	ppm	ASTM D5185m	>15	<1	<1	<1
Vanadium	ppm	ASTM D5185m		0	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 3	history1 3	history2 2
	ppm ppm		0			
Boron		ASTM D5185m	0	3	3	2
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0 0 60	3 0	3 0	2 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	3 0 59	3 0 65	2 0 59
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	3 0 59 <1	3 0 65 <1	2 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 59 <1 938	3 0 65 <1 972	2 0 59 <1 981
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 59 <1 938 1058	3 0 65 <1 972 1133	2 0 59 <1 981 1018
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 59 <1 938 1058 1033	3 0 65 <1 972 1133 1076	2 0 59 <1 981 1018 1093
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 59 <1 938 1058 1033 1291	3 0 65 <1 972 1133 1076 1338	2 0 59 <1 981 1018 1093 1313
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 1010 1070 1150 1270 2060 limit/base	3 0 59 <1 938 1058 1033 1291 3560	3 0 65 <1 972 1133 1076 1338 3485	2 0 59 <1 981 1018 1093 1313 3326
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 limit/base	3 0 59 <1 938 1058 1033 1291 3560 current	3 0 65 <1 972 1133 1076 1338 3485 history1	2 0 59 <1 981 1018 1093 1313 3326 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	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> ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base	3 0 59 <1 938 1058 1033 1291 3560 current 5	3 0 65 <1 972 1133 1076 1338 3485 history1 6	2 0 59 <1 981 1018 1093 1313 3326 history2 4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	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> ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25	3 0 59 <1 938 1058 1033 1291 3560 current 5 4	3 0 65 <1 972 1133 1076 1338 3485 history1 6 2	2 0 59 <1 981 1018 1093 1313 3326 history2 4 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20	3 0 59 <1 938 1058 1033 1291 3560 current 5 4 5	3 0 65 <1 972 1133 1076 1338 3485 history1 6 2 6	2 0 59 <1 981 1018 1093 1313 3326 history2 4 2 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >3	3 0 59 <1 938 1058 1033 1291 3560 current 5 4 5 5 4 5 5 current	3 0 65 <1 972 1133 1076 1338 3485 history1 6 2 6 6 2 6	2 0 59 <1 981 1018 1093 1313 3326 history2 4 2 3 3
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 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >3	3 0 59 <1 938 1058 1033 1291 3560 current 5 4 5 4 5 5 4 0.9	3 0 65 <1 972 1133 1076 1338 3485 history1 6 2 6 2 6 history1 0.8	2 0 59 <1 981 1018 1093 1313 3326 history2 4 2 3 history2 0.5
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 60 0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 <i>limit/base</i> >3 >20	3 0 59 <1 938 1058 1033 1291 3560 <i>current</i> 5 4 5 4 5 <i>current</i> 0.9 11.7	3 0 65 <1 972 1133 1076 1338 3485 history1 6 2 6 2 6 history1 0.8 10.8	2 0 59 <1 981 1018 1093 1313 3326 history2 4 2 3 history2 0.5 7.8
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 >20 imit/base >3 >20 >30	3 0 59 <1 938 1058 1033 1291 3560 current 5 4 5 5 4 5 5 0.9 11.7 20.0	3 0 65 <1 972 1133 1076 1338 3485 history1 6 2 6 2 6 <b>history1</b> 0.8 10.8 19.6	2 0 59 <1 981 1018 1093 1313 3326 history2 4 2 3 <b>history2</b> 0.5 7.8 18.3
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 D7844	0 0 0 1010 1070 1150 1270 2060 imit/base >25 imit/base >3 >20 30 imit/base >3	3 0 59 <1 938 1058 1033 1291 3560 current 5 4 5 5 4 5 5 current 0.9 11.7 20.0	3 0 65 <1 972 1133 1076 1338 3485 history1 6 2 6 2 6 history1 0.8 10.8 10.8 19.6 history1	2 0 59 <1 981 1018 1093 1313 3326 history2 4 2 3 history2 0.5 7.8 18.3 history2



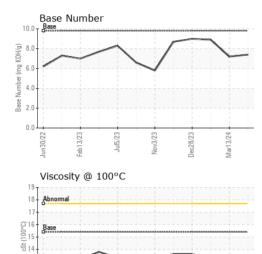
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Jun30/22

Feb 13/23

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## **OIL ANALYSIS REPORT**



Vov3/23

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 PROPE	RTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	12.8	13.0	13.2
GRAPHS						

Ferrous Alloys 25 Dec28/73 Mar13/24 20 1 10 0. Feb13/23 Jul5/23 Nov3/23 Dec28/23 Aar13/24 Non-ferrous Metals 10 ul5/23 Aar13/24 Der 28/7 eb1 Viscosity @ 100°C Base Number 19 10.0 18 17 8. (mg KOH/g) ()-16 ()-00 () 15 () 14 B 6 | Number ( 4 ( Base 12 11-0.0 Nov3/23 Nov3/23 Feb13/23 Jul5/23 Dec28/23 Mar13/24 Feb13/23 Jul5/23 Mar13/24 1020/072 lun30/77 Dec28/23 : WearCheck USA - 501 Madison Ave., Cary, NC 27513 GFL Environmental - 955 - Montgomery Laboratory Sample No. : GFL0115602 Received : 29 Mar 2024 1121 Wilbanks St Lab Number : 06133114 Tested : 31 Mar 2024 Montgomery, AL Unique Number : 10952579 Diagnosed : 31 Mar 2024 - Wes Davis US 36108 Test Package : FLEET Contact: LISA REEVES 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)

Certificate L2367