## **PROBLEM SUMMARY**



# Sample Rating Trend WEAR

# Machine Id 822026-1554

Component **Diesel Engine** Fluic PETRO CANADA DURON SHP 15W40 (--- GAL)

## COMPONENT CONDITION SUMMARY



## RECOMMENDATION

No corrective action is recommended at this time. Resample at the next service interval to monitor.

PROBLEMATIC	C TEST	RESULT	S			
Sample Status				ABNORMAL	ABNORMAL	ABNORMAL
Aluminum	ppm	ASTM D5185m	>20	<u> </u>	<u>    60</u>	<b>A</b> 37

Customer Id: GFL659 Sample No.: GFL0100154 Lab Number: 06016985 Test Package: FLEET



To discuss the diagnosis or test data: Sean Felton +1 919-379-4092 sfelton@wearcheckusa.com

To change component or sample information: Customer Service +1 1-800-237-1369 customerservice@wearcheck.com

#### **RECOMMENDED ACTIONS**

There are no recommended actions for this sample.

#### **HISTORICAL DIAGNOSIS**

#### 20 Sep 2023 Diag: Don Baldridge



Oil and filter change at the time of sampling has been noted. No corrective action is recommended at this time. Resample at the next service interval to monitor. The aluminum level is abnormal. All other component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.



No corrective action is recommended at this time. Resample at the next service interval to monitor. The aluminum level is abnormal. All other component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.



view report



#### 17 Jul 2023 Diag: Don Baldridge

No corrective action is recommended at this time. Resample at the next service interval to monitor. The aluminum level has decreased, but is still abnormal. All other component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.







## **OIL ANALYSIS REPORT**



# Machine Id 822026-1554

Component **Diesel Engine** Fluid PETRO CANADA DURON SHP 15W40 (--- GAL)

### DIAGNOSIS

#### Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

#### A Wear

The aluminum level is abnormal. All other 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.

SAMELE INFORM		method	limit/base	current	nistory i	nistory2
Sample Number		Client Info		GFL0100154	GFL0085130	GFL0090777
Sample Date		Client Info		20 Nov 2023	20 Sep 2023	21 Aug 2023
Machine Age	hrs	Client Info		16928	16928	16778
Oil Age	hrs	Client Info		16928	14995	14995
Oil Changed		Client Info		N/A	Changed	N/A
Sample Status				ABNORMAL	ABNORMAL	ABNORMAL
		un a the a al	line it /le e e e		late to work	la interne O
CONTAMINATI	UN	method	limit/base	current	nistory i	nistory2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS	S	method	limit/base	current	history1	history2
Iron	mqq	ASTM D5185m	>100	36	40	21
Chromium	mag	ASTM D5185m	>20	2	2	<1
Nickel	mag	ASTM D5185m	>4	2	<1	0
Titanium	ppm	ASTM D5185m		0	0	0
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>20	<u> </u>	<u> </u>	<b>A</b> 37
Lead	ppm	ASTM D5185m	>40	<1	<1	<1
Copper	ppm	ASTM D5185m	>330	2	2	<1
Tin	ppm	ASTM D5185m	>15	<1	0	0
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
		method	limit/base	current	history1	history2
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 6	history1 3	history2 4
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	limit/base 0 0	current 6 0	history1 3 0	history2 4 0
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 0 60	current 6 0 58	history1 3 0 62	history2 4 0 59
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 0 60 0	current 6 0 58 <1	history1 3 0 62 <1	history2 4 0 59 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 0 60 0 1010	current 6 0 58 <1 921	history1 3 0 62 <1 1037	history2 4 0 59 <1 1014
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 60 0 1010 1070	current 6 0 58 <1 921 1066	history1 3 0 62 <1 1037 1201	history2 4 0 59 <1 1014 1158
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 60 0 1010 1070 1150	current           6           0           58           <1           921           1066           1127	history1 3 0 62 <1 1037 1201 1121	history2 4 0 59 <1 1014 1158 1045
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 60 0 1010 1070 1150 1270	current           6           0           58           <1           921           1066           1127           1234	history1 3 0 62 <1 1037 1201 1121 1381	history2 4 0 59 <1 1014 1158 1045 1304
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 60 0 1010 1070 1150 1270 2060	current           6           0           58           <1           921           1066           1127           1234           3167	history1 3 0 62 <1 1037 1201 1121 1381 4166	history2 4 0 59 <1 1014 1158 1045 1304 3877
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 60 0 1010 1070 1150 1270 2060	current           6           0           58           <1           921           1066           1127           1234           3167           current	history1         3         0         62         <1         1037         1201         1121         1381         4166         history1	history2         4         0         59         <1         1014         1158         1045         1304         3877         history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b>	method           ASTM D5185m	limit/base 0 60 0 1010 1070 1150 1270 2060 limit/base >25	current           6           0           58           <1           921           1066           1127           1234           3167           current           6	history1         3         0         62         <1         1037         1201         1121         1381         4166         history1         6	history2         4         0         59         <1         1014         1158         1045         1304         3877         history2         5
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm TS	method           ASTM D5185m	limit/base 0 60 0 1010 1070 1150 1270 2060 limit/base >25	current           6           0           58           <1           921           1066           1127           1234           3167           current           6           6           6	history1         3         0         62         <1         1037         1201         1121         1381         4166         history1         6         7	history2         4         0         59         <1         1014         1158         1045         1304         3877         history2         5         2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Chosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b>	method           ASTM D5185m	limit/base 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20	current           6           0           58           <1           921           1066           1127           1234           3167           current           6           6           7	history1         3         0         62         <1         1037         1201         1121         1381         4166         history1         6         7         4	history2         4         0         59         <1         1014         1158         1045         1304         3877         history2         5         2         1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Solium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b> ppm	method           ASTM D5185m	limit/base 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20	current         6         0         58         <1         921         1066         1127         1234         3167         current         6         6         7         current	history1         3         0         62         <1         1037         1201         1121         1381         4166         history1         6         7         4         history1	history2         4         0         59         <1         1014         1158         1045         1304         3877         history2         5         2         1         history2
ADDITIVES 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	method           ASTM D5185m	limit/base 0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >3	current         6         0         58         <1         921         1066         1127         1234         3167         current         6         7         current         2.5	history1         3         0         62         <1         1037         1201         1121         1381         4166         history1         6         7         4         history1         2	history2         4         0         59         <1         1014         1158         1045         1304         3877         history2         5         2         1         history2         1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b> ppm ppm ppm	method           ASTM D5185m	limit/base 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >3 >20	current         6         0         58         <1         921         1066         1127         1234         3167         current         6         6         7         current         2.5         9.2	history1         3         0         62         <1         1037         1201         1121         1381         4166         history1         6         7         4         history1         2         8.1	history2         4         0         59         <1         1014         1158         1045         1304         3877         history2         5         2         1         history2         1         6.3
ADDITIVES 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 <b>TS</b> ppm ppm ppm ppm	method           ASTM D5185m           ASTM D7844           *ASTM D7624	limit/base 0 60 0 1010 1070 1150 1270 2060 limit/base >20 limit/base >3 >20 >30	current         6         0         58         <1         921         1066         1127         1234         3167         current         6         6         7         current         2.5         9.2         22.6	history1         3         0         62         <1         1037         1201         1121         1381         4166         history1         6         7         4         history1         2         8.1         21.1	history2         4         0         59         <1         1014         1158         1045         1304         3877         history2         5         2         1         history2         1         6.3         19.2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m           ASTM D5185m	limit/base 0 0 1010 1010 1070 1150 1270 2060 limit/base >20 limit/base >3 >20 >30	current         6         0         58         <1         921         1066         1127         1234         3167         current         6         6         7         current         2.5         9.2         22.6         current	history1         3         0         62         <1         1037         1201         1121         1381         4166         history1         6         7         4         history1         2         8.1         21.1         history1	history2         4         0         59         <1         1014         1158         1045         1304         3877         history2         5         2         1         history2         1.2         6.3         19.2         history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAD Oxidation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7415	limit/base 0 60 1010 1070 1150 1270 2060 limit/base >20 Sale >3 >20 Sale >30 limit/base >25	current         6         0         58         <1         921         1066         1127         1234         3167         current         6         7         current         2.5         9.2         22.6         current         14.4	history1         3         0         62         <1         1037         1201         1121         1381         4166         history1         6         7         4         history1         2         8.1         21.1         history1         13.4	history2         4         0         59         <1         1014         1158         1045         1304         3877         history2         5         2         1         history2         1         history2         1.2         6.3         19.2         history2         12.6
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAC Oxidation Base Number (BN)	ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b> ppm ppm ppm ppm ppm ppm ppm <b>Abs/cm</b> Abs/cm Abs/.1mm mg KOH/a	method         ASTM D5185m         ASTM D7414         *ASTM D7414         *ASTM D7414         *ASTM D7414         ASTM D2896	limit/base         0         60         0         1010         1070         1150         1270         2060         limit/base         >25         //>>20         limit/base         >3         >20         30         limit/base         >20         >30         limit/base         >25         9.8	current         6         0         58         <1         921         1066         1127         1234         3167         current         6         6         7         current         2.5         9.2         22.6         current         14.4         10.4	history1         3         0         62         <1         1037         1201         1121         1381         4166         history1         6         7         4         history1         2         8.1         21.1         history1         13.4         8.6	history2         4         0         59         <1         1014         1158         1045         1304         3877         history2         5         2         1         history2         5         2         1         history2         1.2         6.3         19.2         history2         12.6         9.4



## **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 PROPE	RTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.4	13.1	13.0
GRAPHS						
Ferrous Alloys						
140						
120						
100						
80						
40						
20						
	~		~			
let20/2 Vov3/2	u117/2	ag21/2	ov20/2			
Non-ferrous Metals	s	A S	2			
10 copper 1						
8-						
6						
4						
4						

Base Number

Nov3/22 -

Mar27/23 -

Jul17/23

12.0

10.

8.0

2 (

0.0

mber (mg KOH/g)

unu 4.0

Nov20/23 -

: 24 Nov 2023

: 28 Nov 2023



 Unique Number
 : 10756129
 Diagnostician
 : Sean Felton

 Certificate 12367
 Test Package
 : FLEET

 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)

Mar27/23

Aar77/7

Viscosity @ 100°C

ul17/23

Jul17/23 -

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

Received

Diagnosed

Aug21/23.

Sep20/23

0

19

18

17

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13 Abnor

12

Laboratory Sample No.

Lab Number

0ct20/22

Nov3/22

: GFL0100154

: 06016985

Aug21/23 -

Sen20/23

Submitted By: TECHNICIAN ACCOUNT

w20/23