

# **PROBLEM SUMMARY**

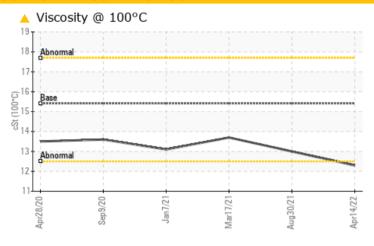
Sample Rating Trend **VISCOSITY** 

926017-9022

Component **Diesel Engine** 

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

## **COMPONENT CONDITION SUMMARY**



## RECOMMENDATION

Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

PROBLEMATIC TEST RESULTS							
Sample Status				MARGINAL	NORMAL	NORMAL	
Visc @ 100°C	cSt	ASTM D445	15.4	<b>12.3</b>	13.0	13.7	

Customer Id: GFL663 Sample No.: GFL0049581 Lab Number: 05524015 Test Package: FLEET

To manage this report scan the QR code

To discuss the diagnosis or test data: Jonathan Hester +1 919-379-4092 x4092 ihester@wearcheckusa.com

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

## **RECOMMENDED ACTIONS**

Action	Status	Date	Done By	Description
Change Fluid			?	Oil and filter change at the time of sampling has been noted.
Change Filter			?	Oil and filter change at the time of sampling has been noted.

## HISTORICAL DIAGNOSIS

30 Aug 2021 Diag: Wes Davis

#### NORMAL



Resample at the next service interval to monitor. All 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.



## 17 Mar 2021 Diag: Wes Davis

#### NORMAL



Resample at the next service interval to monitor. All 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

## 07 Jan 2021 Diag: Don Baldridge

#### NORMAL



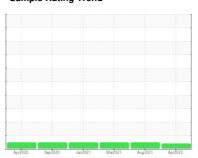
Resample at the next service interval to monitor. All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.





# **OIL ANALYSIS REPORT**

Sample Rating Trend



VISCOSITY



926017-9022

Component

**Diesel Engine** 

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

## **DIAGNOSIS**

## Recommendation

Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

## Wear

All component wear rates are normal.

## Contamination

Fuel content negligible. There is no indication of any contamination in the oil.

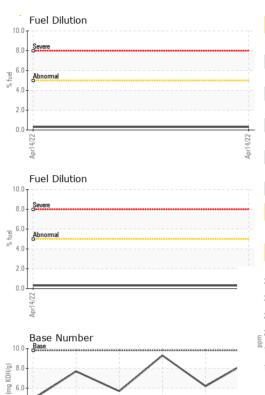
## Fluid Condition

The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil.

SAMPLE INFORMATION   method   limit/base   current   history1   history2	AL)		Apr2020	Sep2020 Jan202	Mar2021 Aug2021	Apr2022	
Sample Date	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         16516         15493         14924           Oil Age         hrs         Client Info         16516         0         0         0           Oil Changed         Client Info         Changed         Not Changd         Not Changd         Not Changd           Sample Status         Image: Client Info         Changed         Not Changd         Not Changd           CONTAMINATION         method         limit/base         current         history1         history2           Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >110         18         34         5           Chromium         ppm         ASTM D5185m         >2         0         0         0           Nickel         ppm         ASTM D5185m         >2         0         0         0           Titanium         ppm         ASTM D5185m         >5         5         2         2           Aluminum         ppm         ASTM D5185m         >45         1         7         <1	Sample Number		Client Info		GFL0049581	GFL0030996	GFL0022608
Machine Age         hrs         Client Info         16516         15493         14924           Oil Age         hrs         Client Info         16516         0         0         0           Oil Changed         Client Info         Changed         Not Changd         Not Changd         Not Changd           Sample Status         Image: Client Info         Changed         Not Changd         Not Changd           CONTAMINATION         method         limit/base         current         history1         history2           Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >110         18         34         5           Chromium         ppm         ASTM D5185m         >2         0         0         0           Nickel         ppm         ASTM D5185m         >2         0         0         0           Titanium         ppm         ASTM D5185m         >5         5         2         2           Aluminum         ppm         ASTM D5185m         >45         1         7         <1			Client Info		14 Apr 2022	30 Aug 2021	17 Mar 2021
Contamped   Client Info   Changed   MARGINAL   Northangd   North	•	hrs	Client Info		-		14924
MARGINAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2	Oil Age	hrs	Client Info		16516	0	0
MARGINAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2	-		Client Info		Changed	Not Changd	Not Changd
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >110         18         34         5           Chromium         ppm         ASTM D5185m         >4         <1	Sample Status				MARGINAL	NORMAL	NORMAL
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >110         18         34         5           Chromium         ppm         ASTM D5185m         >4         <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >4         <1         2         <1           Nickel         ppm         ASTM D5185m         >2         0         0         0           Titanium         ppm         ASTM D5185m         >2         1         <1	WEAR METAL	.S	method	limit/base	current	history1	history2
Nickel   ppm	Iron	ppm	ASTM D5185m	>110	18	34	5
Titanium	Chromium	ppm	ASTM D5185m	>4	<1	2	<1
Silver	Nickel	ppm	ASTM D5185m	>2	0	0	0
Aluminum	Titanium	ppm	ASTM D5185m		5	5	2
Lead	Silver	ppm	ASTM D5185m	>2	<1	<1	<1
Copper         ppm         ASTM D5185m         >85         <1         2         <1           Tin         ppm         ASTM D5185m         >4         <1	Aluminum	ppm	ASTM D5185m	>25	2	0	0
Tin	Lead	ppm	ASTM D5185m	>45	1	7	<1
Antimony	Copper	ppm	ASTM D5185m	>85	<1	2	<1
Vanadium         ppm         ASTM D5185m         0         <1         0           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         30         16         19           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         4         61         58           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         845         856         811           Calcium         ppm         ASTM D5185m         1070         1177         1185         1039           Phosphorus         ppm         ASTM D5185m         1270         1121         1214         1084           Sulfur         ppm         ASTM D5185m         2060         2658         2460         2580           CONTAMINANTS         method         limit/base         current         history1	Tin	ppm	ASTM D5185m	>4	<1	<1	<1
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         30         16         19           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         54         61         58           Manganese         ppm         ASTM D5185m         0         <1	Antimony	ppm	ASTM D5185m			0	0
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         30         16         19           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         54         61         58           Manganese         ppm         ASTM D5185m         0         <1	Vanadium	ppm	ASTM D5185m		0	<1	0
Boron	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         54         61         58           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         845         856         811           Calcium         ppm         ASTM D5185m         1070         1177         1185         1039           Phosphorus         ppm         ASTM D5185m         1150         999         1012         954           Zinc         ppm         ASTM D5185m         1270         1121         1214         1084           Sulfur         ppm         ASTM D5185m         2060         2658         2460         2580           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         6         7         2           Sodium         ppm         ASTM D5185m         >20         <1         3         1           Fuel         %         ASTM D5185m	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         54         61         58           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         845         856         811           Calcium         ppm         ASTM D5185m         1070         1177         1185         1039           Phosphorus         ppm         ASTM D5185m         1150         999         1012         954           Zinc         ppm         ASTM D5185m         1270         1121         1214         1084           Sulfur         ppm         ASTM D5185m         2060         2658         2460         2580           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         6         7         2           Sodium         ppm         ASTM D5185m         >20         <1         3         1           Fuel         %         ASTM D5185m         >20         <1         3         1           Fuel         % <t< td=""><td>Boron</td><td>ppm</td><td>ASTM D5185m</td><td>0</td><td>30</td><td>16</td><td>19</td></t<>	Boron	ppm	ASTM D5185m	0	30	16	19
Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         845         856         811           Calcium         ppm         ASTM D5185m         1070         1177         1185         1039           Phosphorus         ppm         ASTM D5185m         1150         999         1012         954           Zinc         ppm         ASTM D5185m         1270         1121         1214         1084           Sulfur         ppm         ASTM D5185m         2060         2658         2460         2580           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         6         7         2           Sodium         ppm         ASTM D5185m         7         6         2           Potassium         ppm         ASTM D5185m         >20         <1	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium         ppm         ASTM D5185m         1010         845         856         811           Calcium         ppm         ASTM D5185m         1070         1177         1185         1039           Phosphorus         ppm         ASTM D5185m         1150         999         1012         954           Zinc         ppm         ASTM D5185m         1270         1121         1214         1084           Sulfur         ppm         ASTM D5185m         2060         2658         2460         2580           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         6         7         2           Sodium         ppm         ASTM D5185m         >30         6         7         2           Sodium         ppm         ASTM D5185m         >20         <1	Molybdenum	ppm	ASTM D5185m	60	54	61	58
Calcium         ppm         ASTM D5185m         1070         1177         1185         1039           Phosphorus         ppm         ASTM D5185m         1150         999         1012         954           Zinc         ppm         ASTM D5185m         1270         1121         1214         1084           Sulfur         ppm         ASTM D5185m         2060         2658         2460         2580           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         6         7         2           Sodium         ppm         ASTM D5185m         >30         6         7         2           Potassium         ppm         ASTM D5185m         >20         <1	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus         ppm         ASTM D5185m         1150         999         1012         954           Zinc         ppm         ASTM D5185m         1270         1121         1214         1084           Sulfur         ppm         ASTM D5185m         2060         2658         2460         2580           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         6         7         2           Sodium         ppm         ASTM D5185m         >30         6         7         2           Sodium         ppm         ASTM D5185m         >20         <1	Magnesium	ppm	ASTM D5185m	1010	845	856	811
Zinc         ppm         ASTM D5185m         1270         1121         1214         1084           Sulfur         ppm         ASTM D5185m         2060         2658         2460         2580           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         6         7         2           Sodium         ppm         ASTM D5185m         7         6         2           Potassium         ppm         ASTM D5185m         >20         <1	Calcium	ppm	ASTM D5185m	1070	1177	1185	1039
Sulfur         ppm         ASTM D5185m         2060         2658         2460         2580           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         6         7         2           Sodium         ppm         ASTM D5185m         7         6         2           Potassium         ppm         ASTM D5185m         >20         <1	Phosphorus	ppm	ASTM D5185m	1150	999	1012	954
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         6         7         2           Sodium         ppm         ASTM D5185m         7         6         2           Potassium         ppm         ASTM D5185m         >20         <1	Zinc	ppm	ASTM D5185m	1270	1121	1214	1084
Silicon         ppm         ASTM D5185m         >30         6         7         2           Sodium         ppm         ASTM D5185m         7         6         2           Potassium         ppm         ASTM D5185m         >20         <1         3         1           Fuel         %         ASTM D3524         >5         0.3         <1.0         <1.0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.3         0.8         0.1           Nitration         Abs/cm         *ASTM D7624         >20         7.9         10.7         5.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.7         23         19.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.2         18.4         13.6	Sulfur	ppm	ASTM D5185m	2060	2658	2460	2580
Sodium         ppm         ASTM D5185m         7         6         2           Potassium         ppm         ASTM D5185m         >20         <1	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         <1         3         1           Fuel         %         ASTM D3524         >5         0.3         <1.0         <1.0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.3         0.8         0.1           Nitration         Abs/cm         *ASTM D7624         >20         7.9         10.7         5.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.7         23         19.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.2         18.4         13.6	Silicon	ppm	ASTM D5185m	>30	6	7	2
Fuel         %         ASTM D3524         >5         0.3         <1.0         <1.0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.3         0.8         0.1           Nitration         Abs/cm         *ASTM D7624         >20         7.9         10.7         5.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.7         23         19.1           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.2         18.4         13.6	Sodium	ppm	ASTM D5185m		7	6	2
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.3         0.8         0.1           Nitration         Abs/cm         *ASTM D7624         >20         7.9         10.7         5.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.7         23         19.1           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.2         18.4         13.6	Potassium	ppm	ASTM D5185m	>20	<1	3	1
Soot %         %         *ASTM D7844 >3         0.3         0.8         0.1           Nitration         Abs/cm         *ASTM D7624 >20         7.9         10.7         5.2           Sulfation         Abs/.1mm         *ASTM D7415 >30         19.7         23         19.1           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         14.2         18.4         13.6	Fuel	%	ASTM D3524	>5	0.3	<1.0	<1.0
Nitration         Abs/cm         *ASTM D7624         >20         7.9         10.7         5.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.7         23         19.1           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.2         18.4         13.6	INFRA-RED		method	limit/base	current	history1	history2
Nitration         Abs/cm         *ASTM D7624         >20         7.9         10.7         5.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.7         23         19.1           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.2         18.4         13.6	Soot %	%	*ASTM D7844	>3	0.3	0.8	0.1
Sulfation         Abs/.1mm         *ASTM D7415         >30         19.7         23         19.1           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.2         18.4         13.6			*AOTM D7004	> 20			5.2
Oxidation Abs/.1mm *ASTM D7414 >25 <b>14.2</b> 18.4 13.6	Nitration	Abs/cm	^ASTM D7624	>20	7.9	10.7	0.2
	Sulfation	Abs/.1mm	*ASTM D7415	>30	19.7	23	19.1
	Sulfation FLUID DEGRAI	Abs/.1mm	*ASTM D7415 method	>30 limit/base	19.7 current	23 history1	19.1 history2



# **OIL ANALYSIS REPORT**



Mar17/21

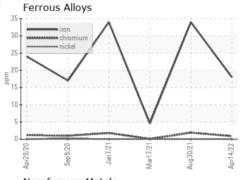
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

**12.3** 

13.0

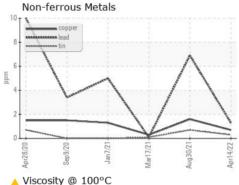
13.7

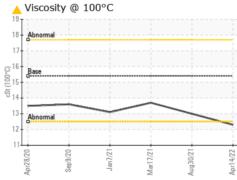
## Visc @ 100°C **GRAPHS**

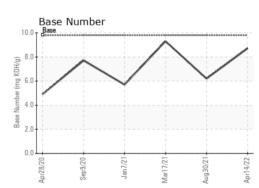


cSt

ASTM D445 15.4









Base

0.0



Laboratory Sample No. Lab Number Unique Number

: 05524015 : 9943295

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0049581

Received Diagnosed

: 20 Apr 2022 : 22 Apr 2022 Diagnostician : Jonathan Hester

**Test Package**: FLEET (Additional Tests: FuelDilution, PercentFuel)

17 Industrial Park Rd Lake Ariel, PA US 18436

GFL Environmental - 663 - Lake Ariel (Scranton Hauling)

Contact: Eric Merone emerone@countyrecycling.net

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)

T:

F: