

# **OIL ANALYSIS REPORT**

**Sample Rating Trend** 



NORMAL



Machine Id
3426
Component
Diesel Engine

## PETRO CANADA DURON SHP 15W40 (34 QTS)

## 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

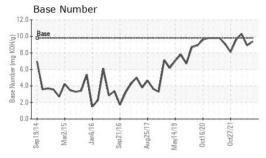
## **Fluid Condition**

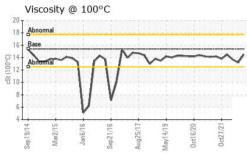
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Number   Client Info   GFL0091166   GFL0064949   GFL0064045   Gample Date   Client Info   28 Sep 2023   27 Oct 2022   27 Oct 2023   2	x10)		32014 Mar20	15 Jan 2016 Sep 2016	Aug2017 May2019 Oct2020	0ct2021	
Sample Date	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Date	Sample Number		Client Info		GFL0091166	GFL0064949	GFL0046455
Machine Age         mls         Client Info         600         143807         143807         143807           Oil Age         mls         Client Info         600         0         600			Client Info		28 Sep 2023	06 Apr 2023	27 Oct 2022
Oil Changed   Client Info   Not Changed   Not Changed   NoRMAL   NORMAL   NORMAL	Machine Age	mls	Client Info		-	143807	143807
Sample Status	Oil Age	mls	Client Info		600	0	600
CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >3.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0	Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
WEAR METALS	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >4         1         0         2           Nickel         ppm         ASTM D5185m         >4         <1         0         <1           Tittanium         ppm         ASTM D5185m         >2         0         0         <1           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >15         3         2         7           Lead         ppm         ASTM D5185m         >50         4         0         2           Copper         ppm         ASTM D5185m         >55         3         <1         4           Tin         ppm         ASTM D5185m         >4         <1         0         <1           Antimory         ppm         ASTM D5185m         <1         0         <1            Vanadium         ppm         ASTM D5185m         <1         0         <1         <1           Cadmium         ppm         ASTM D5185m         0         0         0         0         <1           Barium         ppm         ASTM D5185m         0         5         5 </th <th>WEAR METAL</th> <th>S</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel         ppm         ASTM D5185m         >4         <1	Iron	ppm	ASTM D5185m	>90	36	8	62
Titanium         ppm         ASTM D5185m         >2         0         0         <1	Chromium	ppm	ASTM D5185m	>4	1	0	2
Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >15         3         2         7           Lead         ppm         ASTM D5185m         >50         4         0         2           Copper         ppm         ASTM D5185m         >55         3         <1	Nickel	ppm	ASTM D5185m	>4	<1	0	<1
Aluminum	Titanium	ppm	ASTM D5185m	>2	0	0	<1
Lead	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper         ppm         ASTM D5185m         >555         3         <1	Aluminum	ppm	ASTM D5185m	>15	3	2	7
Tin         ppm         ASTM D5185m         >4         <1	Lead	ppm	ASTM D5185m	>50	4	0	2
Antimony         ppm         ASTM D5185m	Copper	ppm	ASTM D5185m	>55	3	<1	4
Vanadium         ppm         ASTM D5185m         <1	Tin	ppm	ASTM D5185m	>4	<1	0	<1
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         5         5         9           Barium         ppm         ASTM D5185m         0         0         0         2           Molybdenum         ppm         ASTM D5185m         60         69         53         66           Manganese         ppm         ASTM D5185m         0         <1         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         1109         810         975         1220           Calcium         ppm         ASTM D5185m         1070         1289         977         1220         120	Antimony	ppm	ASTM D5185m				
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         5         5         9           Barium         ppm         ASTM D5185m         0         0         0         2           Molybdenum         ppm         ASTM D5185m         60         69         53         66           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         1109         810         975           Calcium         ppm         ASTM D5185m         1070         1289         977         1220           Phosphorus         ppm         ASTM D5185m         1150         1185         897         1096           Zinc         ppm         ASTM D5185m         1270         1485         1044         1308           Sulfur         ppm         ASTM D5185m         2060         3565         2708         3404           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m	Vanadium	ppm	ASTM D5185m		<1	0	<1
Boron         ppm         ASTM D5185m         0         5         5         9           Barium         ppm         ASTM D5185m         0         0         0         2           Molybdenum         ppm         ASTM D5185m         60         69         53         66           Manganese         ppm         ASTM D5185m         0         <1	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         0         0         0         2           Molybdenum         ppm         ASTM D5185m         60         69         53         66           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         1109         810         975           Calcium         ppm         ASTM D5185m         1070         1289         977         1220           Phosphorus         ppm         ASTM D5185m         1150         1185         897         1096           Zinc         ppm         ASTM D5185m         1270         1485         1044         1308           Sulfur         ppm         ASTM D5185m         2060         3565         2708         3404           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         6         4         13           Sodium         ppm         ASTM D5185m         >20         5         0         2           INFRA-RED         method         limit/base	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         69         53         66           Manganese         ppm         ASTM D5185m         0         <1	Boron	ppm	ASTM D5185m	0	5	5	9
Manganese         ppm         ASTM D5185m         0         <1	Barium	ppm	ASTM D5185m	0	0	0	2
Magnesium         ppm         ASTM D5185m         1010         1109         810         975           Calcium         ppm         ASTM D5185m         1070         1289         977         1220           Phosphorus         ppm         ASTM D5185m         1150         1185         897         1096           Zinc         ppm         ASTM D5185m         1270         1485         1044         1308           Sulfur         ppm         ASTM D5185m         2060         3565         2708         3404           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         6         4         13           Sodium         ppm         ASTM D5185m         5         3         8           Potassium         ppm         ASTM D5185m         >20         5         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         10.4         7.7         11.3           Sulfation         Abs/.1mm         *ASTM D7415	Molybdenum	ppm	ASTM D5185m	60	69	53	66
Calcium         ppm         ASTM D5185m         1070         1289         977         1220           Phosphorus         ppm         ASTM D5185m         1150         1185         897         1096           Zinc         ppm         ASTM D5185m         1270         1485         1044         1308           Sulfur         ppm         ASTM D5185m         2060         3565         2708         3404           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         6         4         13           Sodium         ppm         ASTM D5185m         5         3         8           Potassium         ppm         ASTM D5185m         >20         5         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         10.4         7.7         11.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         22.6         20.0         23.8           FLUID DEGRADATION         method		ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus         ppm         ASTM D5185m         1150         1185         897         1096           Zinc         ppm         ASTM D5185m         1270         1485         1044         1308           Sulfur         ppm         ASTM D5185m         2060         3565         2708         3404           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         6         4         13           Sodium         ppm         ASTM D5185m         5         3         8           Potassium         ppm         ASTM D5185m         >20         5         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         1.1         0.3         0.7           Nitration         Abs/.mm         *ASTM D7415         >30         22.6         20.0         23.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414	Magnesium	ppm	ASTM D5185m	1010	1109	810	975
Zinc         ppm         ASTM D5185m         1270         1485         1044         1308           Sulfur         ppm         ASTM D5185m         2060         3565         2708         3404           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         6         4         13           Sodium         ppm         ASTM D5185m         5         3         8           Potassium         ppm         ASTM D5185m         >20         5         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         1.1         0.3         0.7           Nitration         Abs/cm         *ASTM D7624         >20         10.4         7.7         11.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         22.6         20.0         23.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM	Calcium	ppm	ASTM D5185m	1070	1289	977	1220
Sulfur         ppm         ASTM D5185m         2060         3565         2708         3404           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         6         4         13           Sodium         ppm         ASTM D5185m         5         3         8           Potassium         ppm         ASTM D5185m         >20         5         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         1.1         0.3         0.7           Nitration         Abs/cm         *ASTM D7624         >20         10.4         7.7         11.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         22.6         20.0         23.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         18.8         16.6         20.4		ppm		1150		897	1096
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         6         4         13           Sodium         ppm         ASTM D5185m         5         3         8           Potassium         ppm         ASTM D5185m         >20         5         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         1.1         0.3         0.7           Nitration         Abs/cm         *ASTM D7624         >20         10.4         7.7         11.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         22.6         20.0         23.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         18.8         16.6         20.4		ppm	ASTM D5185m	1270	1485	1044	1308
Silicon         ppm         ASTM D5185m         >15         6         4         13           Sodium         ppm         ASTM D5185m         5         3         8           Potassium         ppm         ASTM D5185m         >20         5         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         1.1         0.3         0.7           Nitration         Abs/cm         *ASTM D7624         >20         10.4         7.7         11.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         22.6         20.0         23.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         18.8         16.6         20.4			ASTM D5185m	2060	3565		
Sodium         ppm         ASTM D5185m         5         3         8           Potassium         ppm         ASTM D5185m         >20         5         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         1.1         0.3         0.7           Nitration         Abs/cm         *ASTM D7624         >20         10.4         7.7         11.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         22.6         20.0         23.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         18.8         16.6         20.4	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         5         0         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         1.1         0.3         0.7           Nitration         Abs/cm         *ASTM D7624         >20         10.4         7.7         11.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         22.6         20.0         23.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         18.8         16.6         20.4				>15			
INFRA-RED	Sodium	ppm	ASTM D5185m		5	3	8
Soot %         %         *ASTM D7844 >6         1.1         0.3         0.7           Nitration         Abs/cm         *ASTM D7624 >20         10.4         7.7         11.3           Sulfation         Abs/.1mm         *ASTM D7415 >30         22.6         20.0         23.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         18.8         16.6         20.4	Potassium	ppm	ASTM D5185m	>20	5	0	2
Nitration         Abs/cm         *ASTM D7624         >20         10.4         7.7         11.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         22.6         20.0         23.8           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         18.8         16.6         20.4	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         22.6         20.0         23.8           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         18.8         16.6         20.4	Soot %	%	*ASTM D7844	>6	1.1	0.3	
FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     18.8     16.6     20.4	Nitration	Abs/cm	*ASTM D7624	>20	10.4	7.7	11.3
Oxidation	Sulfation	Abs/.1mm	*ASTM D7415	>30	22.6	20.0	23.8
	FLUID DEGRA	OATION	method	limit/base	current	history1	history2
Base Number (BN)         mg KOH/g         ASTM D2896         9.8         9.4         8.9         10.3	Oxidation	Abs/.1mm	*ASTM D7414	>25	18.8	16.6	20.4
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	9.4	8.9	10.3



# **OIL ANALYSIS REPORT**

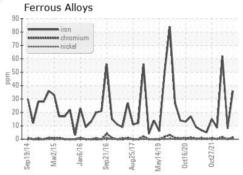


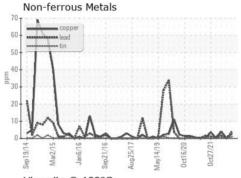


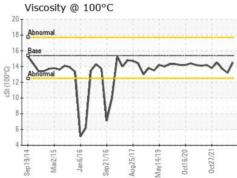
VISUAL		method				history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	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

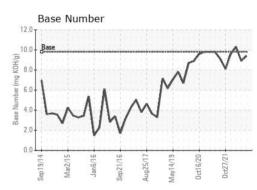
FLUID PROPE	ERTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	14.5	13.2	13.7

## **GRAPHS**













Certificate L2367

Laboratory Sample No. Lab Number Unique Number : 10674044 Test Package : FLEET

: GFL0091166 : 05967493

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 03 Oct 2023

Diagnosed : 04 Oct 2023 Diagnostician : Wes Davis

GFL Environmental - 020 - Alamance

703 East Gilbreath St Graham, NC US 27253

Contact:

F: (336)229-0526

richard.belcher@gflenv.com T: (800)207-6618

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)