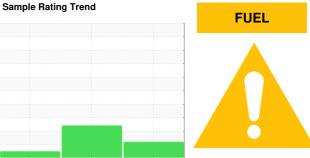


# **OIL ANALYSIS REPORT**





Machine Id **527015** Component **Diesel Engine** 

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

## **DIAGNOSIS**

### Recommendation

We advise that you check the fuel injection system. Resample at the next service interval to monitor.

All component wear rates are normal.

### Contamination

There is a moderate amount of fuel present in the oil.

### ▲ Fluid Condition

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

Machine Age         mls         Client Info         0         100733         100466           Oil Age         mls         Client Info         0         0         0         0           Oil Changed         Client Info         Not Changd         Not Changd         Changed           Sample Status         Method         Imitibase         current         history1         history2           Water         WC Method         NeG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >120         2         3         2           Chromium         ppm         ASTM D5185m         >120         2         3         2           Iron         ppm         ASTM D5185m         >20         0         0         0           Nickel         ppm         ASTM D5185m         >2         0         0         0           Javandium         ppm         ASTM D5185m         >2         0         0         0           Copper         ppm         ASTM D5185m         >40         <1	N SHP 15W40 (-	LIK)	Ap	r2022	Sep2023 Dec20	23	
Client Info   27 Dec 2023   19 Sep 2023   21 Apr 2022	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Machine Age   mls	Sample Number		Client Info		GFL0077766	GFL0065071	GFL0047396
Oil Age         mls         Client Info         Not Changd Not Changd Changed Changed Changed Sample Status         Colient Info         Not Changd ABNORMAL         Not Changd Changed Changed Changed Changed Changed Changed Sample Status         ABNORMAL         SEVERE         NORMAL           CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         >0.2         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >120         2         3         2           Chromium         ppm         ASTM D5185m         >20         0         0         0           Nickel         ppm         ASTM D5185m         >20         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Copper         ppm         ASTM D5185m         >300         <1	Sample Date		Client Info		27 Dec 2023	19 Sep 2023	21 Apr 2022
Colient Info	Machine Age	mls	Client Info		0	100733	100466
ABNORMAL   SEVERE   NORMAL	Oil Age	mls	Client Info		0	0	0
CONTAMINATION	Oil Changed		Client Info		Not Changd	Not Changd	Changed
Water         WC Method         >0.2         NEG         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >120         2         3         2           Chromium         ppm         ASTM D5185m         >20         0         0         0           Nickel         ppm         ASTM D5185m         >5         0         0         <1           Titanium         ppm         ASTM D5185m         >5         0         0         <1           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >20         <1         <1         <1           Copper         ppm         ASTM D5185m         >30         <1         <1         <1         <1           Vanadium         ppm         ASTM D5185m         >30         0         0         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1	Sample Status				ABNORMAL	SEVERE	NORMAL
Citycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >120         2         3         2           Chromium         ppm         ASTM D5185m         >20         0         0         0           Nickel         ppm         ASTM D5185m         >2         <1         <1         3           Silver         ppm         ASTM D5185m         >2         <1         <1         <1         <1           Aluminum         ppm         ASTM D5185m         >2         <1         <1         <1         <1           Lead         ppm         ASTM D5185m         >20         <1         <1         <1         <1           Lead         ppm         ASTM D5185m         >40         <1         <1         <1         <1         <1           Lead         ppm         ASTM D5185m         >3330         <1         <1         <1         <1           Copper         ppm         ASTM D5185m         0         0         0         <0         <0           Calcimium	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >120         2         3         2           Chromium         ppm         ASTM D5185m         >20         0         0         0           Nickel         ppm         ASTM D5185m         >20         1         <1	Water		WC Method	>0.2	NEG	NEG	NEG
Chromium	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         0         0         0           Nickel         ppm         ASTM D5185m         >5         0         0         <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	ron	ppm	ASTM D5185m	>120	2	3	2
Description	Chromium	ppm	ASTM D5185m	>20	0	0	0
Saliver	Nickel	ppm	ASTM D5185m	>5	0	0	<1
Aluminum ppm ASTM D5185m >20	Γitanium	ppm	ASTM D5185m	>2	<1	<1	3
Lead         ppm         ASTM D5185m         >40         <1         <1         0           Copper         ppm         ASTM D5185m         >330         <1         <1         <1           Tin         ppm         ASTM D5185m         >15         0         0         <1           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0         0         0           Barium         ppm         ASTM D5185m         0         0         0         0           Magnesium         ppm         ASTM D5185m         0         0         0         <1           Phosphorus         ppm         ASTM D5185m         1010         961         950         731           Zinc         ppm         ASTM D5185m         1270         1192         1217         942           Sulfur         ppm         ASTM D5185m         2060         2899         369	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper	Aluminum	ppm	ASTM D5185m	>20	<1	<1	<1
Trin	Lead	ppm	ASTM D5185m	>40	<1	<1	0
Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         2         2         2         10           Barium         ppm         ASTM D5185m         0         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         0         0         47           Manganese         ppm         ASTM D5185m         0         0         0         0         1           Magnesium         ppm         ASTM D5185m         1010         961         950         731           Calcium         ppm         ASTM D5185m         1070         1039         1085         926           Phosphorus         ppm         ASTM D5185m         1270         1192         1217         942           Sulfur         ppm         ASTM D5185m         1270         1192         1217         942           Sulfur         ppm         ASTM D5185m </td <td>Copper</td> <td>ppm</td> <td>ASTM D5185m</td> <td>&gt;330</td> <td>&lt;1</td> <td>&lt;1</td> <td>&lt;1</td>	Copper	ppm	ASTM D5185m	>330	<1	<1	<1
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         2         2         10           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         56         55         47           Manganese         ppm         ASTM D5185m         0         0         0         -1           Magnesium         ppm         ASTM D5185m         1010         961         950         731           Calcium         ppm         ASTM D5185m         1070         1039         1085         926           Phosphorus         ppm         ASTM D5185m         1150         959         973         811           Zinc         ppm         ASTM D5185m         1270         1192         1217         942           Sulfur         ppm         ASTM D5185m         2060         2899         3694         2297           CONTAMINANTS         method         limit/base         current <t< td=""><td>Γin</td><td>ppm</td><td>ASTM D5185m</td><td>&gt;15</td><td>0</td><td>0</td><td>&lt;1</td></t<>	Γin	ppm	ASTM D5185m	>15	0	0	<1
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         2         2         10           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         0         0         -1           Magnesium         ppm         ASTM D5185m         1010         961         950         731         -1	√anadium	ppm	ASTM D5185m		0	0	0
Boron	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         56         55         47           Manganese         ppm         ASTM D5185m         0         0         0         <1           Magnesium         ppm         ASTM D5185m         1010         961         950         731           Calcium         ppm         ASTM D5185m         1070         1039         1085         926           Phosphorus         ppm         ASTM D5185m         1150         959         973         811           Zinc         ppm         ASTM D5185m         1270         1192         1217         942           Sulfur         ppm         ASTM D5185m         2060         2899         3694         2297           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         2           Sodium         ppm         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D5185m         <	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         56         55         47           Manganese         ppm         ASTM D5185m         0         0         0         <1	Boron	ppm	ASTM D5185m	0	2	2	10
Manganese         ppm         ASTM D5185m         0         0         <1           Magnesium         ppm         ASTM D5185m         1010         961         950         731           Calcium         ppm         ASTM D5185m         1070         1039         1085         926           Phosphorus         ppm         ASTM D5185m         1150         959         973         811           Zinc         ppm         ASTM D5185m         1270         1192         1217         942           Sulfur         ppm         ASTM D5185m         2060         2899         3694         2297           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         2           Sodium         ppm         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D5185m         >20         0	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium         ppm         ASTM D5185m         1010         961         950         731           Calcium         ppm         ASTM D5185m         1070         1039         1085         926           Phosphorus         ppm         ASTM D5185m         1150         959         973         811           Zinc         ppm         ASTM D5185m         1270         1192         1217         942           Sulfur         ppm         ASTM D5185m         2060         2899         3694         2297           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         2           Sodium         ppm         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D5185m         >20         0         0         0           Soot %         %         *ASTM D7844         >4	Molybdenum	ppm	ASTM D5185m	60	56	55	47
Calcium         ppm         ASTM D5185m         1070         1039         1085         926           Phosphorus         ppm         ASTM D5185m         1150         959         973         811           Zinc         ppm         ASTM D5185m         1270         1192         1217         942           Sulfur         ppm         ASTM D5185m         2060         2899         3694         2297           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         2           Sodium         ppm         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D5185m         >20         0         0         6.3         <1.0	Manganese	ppm	ASTM D5185m	0	0	0	<1
Phosphorus         ppm         ASTM D5185m         1150         959         973         811           Zinc         ppm         ASTM D5185m         1270         1192         1217         942           Sulfur         ppm         ASTM D5185m         2060         2899         3694         2297           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         2           Sodium         ppm         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D3524         >3.0         46.6         6.3         <1.0	Magnesium	ppm	ASTM D5185m	1010	961	950	731
Zinc         ppm         ASTM D5185m         1270         1192         1217         942           Sulfur         ppm         ASTM D5185m         2060         2899         3694         2297           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         2           Sodium         ppm         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D3524         >3.0         46.6         6.3         <1.0	Calcium	ppm	ASTM D5185m	1070	1039	1085	926
Sulfur         ppm         ASTM D5185m         2060         2899         3694         2297           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         2           Sodium         ppm         ASTM D5185m         <1	Phosphorus	ppm	ASTM D5185m	1150	959	973	811
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         2           Sodium         ppm         ASTM D5185m         <1	Zinc	ppm	ASTM D5185m	1270	1192	1217	942
Silicon       ppm       ASTM D5185m       >25       3       3       2         Sodium       ppm       ASTM D5185m       <1       3       1         Potassium       ppm       ASTM D5185m       >20       0       2       0         Fuel       %       ASTM D3524       >3.0       ▲ 6.6       ♠ 6.3       <1.0         INFRA-RED       method       limit/base       current       history1       history2         Soot %       %       *ASTM D7844       >4       0       0       0         Nitration       Abs/cm       *ASTM D7624       >20       6.8       6.5       5.7         Sulfation       Abs/.1mm       *ASTM D7415       >30       18.1       17.5       18.1         FLUID DEGRADATION       method       limit/base       current       history1       history2         Oxidation       Abs/.1mm       *ASTM D7414       >25       15.9       13.7       13.2	Sulfur	ppm	ASTM D5185m	2060	2899	3694	2297
Sodium	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         0         2         0           Fuel         %         ASTM D3524         >3.0         ▲ 6.6         ♠ 6.3         <1.0           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0         0         0           Nitration         Abs/cm         *ASTM D7624         >20         6.8         6.5         5.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.1         17.5         18.1           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.9         13.7         13.2	Silicon	ppm	ASTM D5185m	>25	3	3	2
Fuel % ASTM D3524 >3.0	Sodium	ppm	ASTM D5185m		<1	3	1
INFRA-RED	Potassium	ppm	ASTM D5185m	>20	0	2	0
Soot %         %         *ASTM D7844 > 4         0         0         0           Nitration         Abs/cm         *ASTM D7624 > 20         6.8         6.5         5.7           Sulfation         Abs/.1mm         *ASTM D7415 > 30         18.1         17.5         18.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 > 25         15.9         13.7         13.2	Fuel	%	ASTM D3524	>3.0	<b>△</b> 6.6	<b>6.3</b>	<1.0
Nitration         Abs/cm         *ASTM D7624         >20         6.8         6.5         5.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.1         17.5         18.1           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.9         13.7         13.2	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         18.1         17.5         18.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.9         13.7         13.2	Soot %	%	*ASTM D7844	>4	0	0	0
Sulfation         Abs/.1mm         *ASTM D7415         >30         18.1         17.5         18.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.9         13.7         13.2	Vitration	Abs/cm	*ASTM D7624	>20	6.8	6.5	5.7
Oxidation	Sulfation	Abs/.1mm	*ASTM D7415	>30			
	FLUID DEGRAD	NOITAC	method	limit/base	current	history1	history2
	FLUID DEGRAD						



## **OIL ANALYSIS REPORT**







Laboratory Sample No. Lab Number **Unique Number** 

: GFL0077766 : 06049485

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

: 10810093

Recieved : 02 Jan 2024 Diagnosed : 04 Jan 2024

Diagnostician : Jonathan Hester

Test Package : FLEET ( Additional Tests: PercentFuel ) Certificate L2367 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)

GFL Environmental - 650 - West Point Hauling

7825 Parham Landing Road West Point, VA US 23181

Contact: Jason Smith jasonsmith@gflenv.com

T: F: