

# **OIL ANALYSIS REPORT**

(TE6320) 812015

Diesel Engine

PETRO CANADA DURON SHP 15W40 (38 QTS)

# Sample Rating Trend





# DIAGNOSIS

# Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

# Contamination

There is no indication of any contamination in the

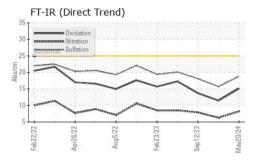
# **Fluid Condition**

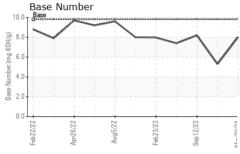
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

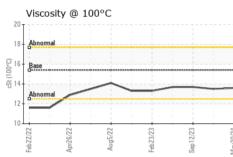
Sample Number   Client Info   CFL0094900   GFL0090134   GFL006188   Sample Date   Client Info   20 May 2024   15 Feb 2024   12 Sep 202   Machine Age   hrs   Client Info   5975   5389   4177   Oil Age   hrs   Client Info   5975   5389   4177   Oil Changed   Client Info   5975   643   4177   Oil Changed   Client Info   Changed   Changed   Changed   Changed   Changed   NORMAL   N	) (S)		Feb 2022	Apr2022 Aug2022	Feb2023 Sep2023	May2024	
Sample Date   Client Info   20 May 2024   15 Feb 2024   12 Sep 202   Machine Age   hrs   Client Info   5975   5389   4177	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Date	Sample Number		Client Info		GFL0094900	GFL0090134	GFL0061885
Machine Age         hrs         Client Info         5975         638         4177           Oil Age         hrs         Client Info         5975         643         4177           Oil Changed         Client Info         Changed         Changed         Changed         Changed         Changed         Changed         Changed         NORIMAL         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			Client Info		20 May 2024	15 Feb 2024	12 Sep 2023
Oil Changed Sample Status         Client Info NoRMAL         Changed NORMAL         Changed NeG         Change NEG         Change NEG         Change	Machine Age	hrs	Client Info		5975	5389	4177
Sample Status         NORMAL         NORMAL         NORMAL           CONTAMINATION         method         limit/base         current         history1         history1           Fuel         WC Method         >3.0         <1.0	Oil Age	hrs	Client Info		5975	643	4177
CONTAMINATION         method         limit/base         current         history1         history1           Fuel         WC Method         >3.0         <1.0	Oil Changed		Client Info		Changed	Changed	Changed
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
Water Glycol         WC Method         >0.2         NEG         Netory         Netory         Netory         Netor         Netor <th>CONTAMINAT</th> <th>ION</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	CONTAMINAT	ION	method	limit/base	current	history1	history2
Second   WC Method   NEG   NEG   NEG   NEG	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >5         <1         <1         <1           Nickel         ppm         ASTM D5185m         >4         0         <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel         ppm         ASTM D5185m         >4         0         <1         0           Titanium         ppm         ASTM D5185m         >2         0         <1	Iron	ppm	ASTM D5185m	>75	12	12	14
Titanium         ppm         ASTM D5185m         >2         0         <1         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >15         12         15         8           Lead         ppm         ASTM D5185m         >25         0         0         0         0           Copper         ppm         ASTM D5185m         >100         3         1         <1	Chromium	ppm	ASTM D5185m	>5	<1	<1	<1
Silver	Nickel	ppm	ASTM D5185m	>4	0	<1	0
Aluminum         ppm         ASTM D5185m         >15         12         15         8           Lead         ppm         ASTM D5185m         >25         0         0         0           Copper         ppm         ASTM D5185m         >100         3         1         <1	Titanium	ppm	ASTM D5185m	>2	0	<1	0
Lead         ppm         ASTM D5185m         >25         0         0         0           Copper         ppm         ASTM D5185m         >100         3         1         <1           Tin         ppm         ASTM D5185m         >4         <1         <1         <1           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         Imit/base         current         history1         history1           Boron         ppm         ASTM D5185m         0         2         <1         5           Barium         ppm         ASTM D5185m         0         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         0         0         0           Magnesium         ppm         ASTM D5185m         0         <1         0         <1           Magnesium         ppm         ASTM D5185m         1070         1079         1000         1181           Phosphorus         ppm         ASTM D5185m         1270	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper         ppm         ASTM D5185m         >100         3         1         <1           Tin         ppm         ASTM D5185m         >4         <1	Aluminum	ppm	ASTM D5185m	>15	12	15	8
Tin         ppm         ASTM D5185m         >4         <1         <1         <1           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history1           Boron         ppm         ASTM D5185m         0         2         <1         5           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         <1         0         <1           Magnesium         ppm         ASTM D5185m         1010         981         916         1008           Calcium         ppm         ASTM D5185m         1070         1079         1000         1181           Phosphorus         ppm         ASTM D5185m         1270         1298         1207         1309           Sulfur         ppm         ASTM D5185m         220         1298         1207         1309           Sulfur         ppm         ASTM D5185m         >25	Lead	ppm	ASTM D5185m	>25	0	0	0
Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history1           Boron         ppm         ASTM D5185m         0         2         <1         5           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         61         55         63           Manganese         ppm         ASTM D5185m         0         <1         0         <1           Magnesium         ppm         ASTM D5185m         1070         1079         1000         1181           Phosphorus         ppm         ASTM D5185m         1070         1079         1000         1181           Phosphorus         ppm         ASTM D5185m         1270         1298         1207         1309           Sulfur         ppm         ASTM D5185m         2060         3550         2920         3752           CONTAMINANTS         method         limit/base         cu	Copper	ppm	ASTM D5185m	>100	3	1	<1
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         2         <1	Tin	ppm	ASTM D5185m	>4	<1	<1	<1
ADDITIVES	Vanadium	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         61         55         63           Manganese         ppm         ASTM D5185m         0         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         61         55         63           Manganese         ppm         ASTM D5185m         0         <1         0         <1           Magnesium         ppm         ASTM D5185m         1010         981         916         1008           Calcium         ppm         ASTM D5185m         1070         1079         1000         1181           Phosphorus         ppm         ASTM D5185m         1150         1068         977         1058           Zinc         ppm         ASTM D5185m         1270         1298         1207         1309           Sulfur         ppm         ASTM D5185m         2060         3550         2920         3752           CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         5         4         4           Potassium         ppm         ASTM D5185m         >20         19         25         18           INFRA-RED         method         limit/base         current<	Boron	ppm	ASTM D5185m	0	2	<1	5
Manganese         ppm         ASTM D5185m         0         <1         0         <1           Magnesium         ppm         ASTM D5185m         1010         981         916         1008           Calcium         ppm         ASTM D5185m         1070         1079         1000         1181           Phosphorus         ppm         ASTM D5185m         1150         1068         977         1058           Zinc         ppm         ASTM D5185m         1270         1298         1207         1309           Sulfur         ppm         ASTM D5185m         2060         3550         2920         3752           CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         >20         19         25         18           INFRA-RED         method         limit/base         current         history1         history1           Soot %         %         *ASTM D7624         >20         8.2         6.3         7.9           Sulfation         Abs/.1mm         *ASTM D7415 <td></td> <td>ppm</td> <td>ASTM D5185m</td> <td>0</td> <th>0</th> <td>0</td> <td>0</td>		ppm	ASTM D5185m	0	0	0	0
Magnesium         ppm         ASTM D5185m         1010         981         916         1008           Calcium         ppm         ASTM D5185m         1070         1079         1000         1181           Phosphorus         ppm         ASTM D5185m         1150         1068         977         1058           Zinc         ppm         ASTM D5185m         1270         1298         1207         1309           Sulfur         ppm         ASTM D5185m         2060         3550         2920         3752           CONTAMINANTS         method         limit/base         current         history1         history1           Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         5         4         4           Potassium         ppm         ASTM D5185m         >20         19         25         18           INFRA-RED         method         limit/base         current         history1         history           Soot %         %         *ASTM D7624         >20         8.2         6.3         7.9           Sulfation         Abs/.1mm         *ASTM D7414	Molybdenum	ppm	ASTM D5185m	60	61	55	63
Calcium         ppm         ASTM D5185m         1070         1079         1000         1181           Phosphorus         ppm         ASTM D5185m         1150         1068         977         1058           Zinc         ppm         ASTM D5185m         1270         1298         1207         1309           Sulfur         ppm         ASTM D5185m         2060         3550         2920         3752           CONTAMINANTS         method         limit/base         current         history1         history           Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         5         4         4           Potassium         ppm         ASTM D5185m         >20         19         25         18           INFRA-RED         method         limit/base         current         history1         history           Soot %         %         *ASTM D7624         >20         8.2         6.3         7.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.8         15.7         18.1           FLUID DEGRADATION         method         l	-	ppm	ASTM D5185m		<1	0	<1
Phosphorus         ppm         ASTM D5185m         1150         1068         977         1058           Zinc         ppm         ASTM D5185m         1270         1298         1207         1309           Sulfur         ppm         ASTM D5185m         2060         3550         2920         3752           CONTAMINANTS         method         limit/base         current         history1         history           Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         5         4         4           Potassium         ppm         ASTM D5185m         >20         19         25         18           INFRA-RED         method         limit/base         current         history1         history           Soot %         %         *ASTM D7624         >20         8.2         6.3         7.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.8         15.7         18.1           FLUID DEGRADATION         method         limit/base         current         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414	Magnesium	ppm	ASTM D5185m	1010	981	916	1008
Zinc         ppm         ASTM D5185m         1270         1298         1207         1309           Sulfur         ppm         ASTM D5185m         2060         3550         2920         3752           CONTAMINANTS         method         limit/base         current         history1         history           Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         5         4         4           Potassium         ppm         ASTM D5185m         >20         19         25         18           INFRA-RED         method         limit/base         current         history1         history           Soot %         %         *ASTM D7844         >6         0.4         0.3         0.4           Nitration         Abs/cm         *ASTM D7624         >20         8.2         6.3         7.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.8         15.7         18.1           FLUID DEGRADATION         method         limit/base         current         history1         history1           Oxidation         Abs/.1mm         *ASTM D7	Calcium	ppm	ASTM D5185m	1070	1079	1000	1181
Sulfur         ppm         ASTM D5185m         2060         3550         2920         3752           CONTAMINANTS         method         limit/base         current         history1         history           Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         5         4         4           Potassium         ppm         ASTM D5185m         >20         19         25         18           INFRA-RED         method         limit/base         current         history1         history           Soot %         %         *ASTM D7844         >6         0.4         0.3         0.4           Nitration         Abs/cm         *ASTM D7624         >20         8.2         6.3         7.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.8         15.7         18.1           FLUID DEGRADATION         method         limit/base         current         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.1         11.5         13.7	Phosphorus	ppm	ASTM D5185m	1150	1068	977	1058
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         5         4         4           Potassium         ppm         ASTM D5185m         >20         19         25         18           INFRA-RED         method         limit/base         current         history1         history           Soot %         %         *ASTM D7844         >6         0.4         0.3         0.4           Nitration         Abs/cm         *ASTM D7624         >20         8.2         6.3         7.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.8         15.7         18.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.1         11.5         13.7	Zinc	ppm	ASTM D5185m	1270	1298	1207	1309
Silicon         ppm         ASTM D5185m         >25         4         3         4           Sodium         ppm         ASTM D5185m         5         4         4           Potassium         ppm         ASTM D5185m         >20         19         25         18           INFRA-RED         method         limit/base         current         history1         history1           Soot %         %         *ASTM D7844         >6         0.4         0.3         0.4           Nitration         Abs/cm         *ASTM D7624         >20         8.2         6.3         7.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.8         15.7         18.1           FLUID DEGRADATION method         limit/base         current         history1         history           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.1         11.5         13.7			ASTM D5185m	2060	3550	2920	3752
Sodium         ppm         ASTM D5185m         5         4         4           Potassium         ppm         ASTM D5185m         >20         19         25         18           INFRA-RED         method         limit/base         current         history1         history1           Soot %         %         *ASTM D7844         >6         0.4         0.3         0.4           Nitration         Abs/cm         *ASTM D7624         >20         8.2         6.3         7.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.8         15.7         18.1           FLUID DEGRADATION         method         limit/base         current         history1         history           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.1         11.5         13.7	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         19         25         18           INFRA-RED         method         limit/base         current         history1         history           Soot %         %         *ASTM D7844         >6         0.4         0.3         0.4           Nitration         Abs/cm         *ASTM D7624         >20         8.2         6.3         7.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.8         15.7         18.1           FLUID DEGRADATION         method         limit/base         current         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.1         11.5         13.7		ppm	ASTM D5185m	>25	4	3	4
INFRA-RED	Sodium	ppm	ASTM D5185m		5	4	4
Soot %         %         *ASTM D7844 >6         0.4         0.3         0.4           Nitration         Abs/cm         *ASTM D7624 >20         8.2         6.3         7.9           Sulfation         Abs/.1mm         *ASTM D7415 >30         18.8         15.7         18.1           FLUID DEGRADATION method limit/base current history1         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414 >25         15.1         11.5         13.7	Potassium	ppm	ASTM D5185m	>20	19	25	18
Nitration         Abs/cm         *ASTM D7624         >20         8.2         6.3         7.9           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.8         15.7         18.1           FLUID DEGRADATION method limit/base current         history1         history1         history           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.1         11.5         13.7	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         18.8         15.7         18.1           FLUID DEGRADATION method limit/base current history1         history1         history1           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.1         11.5         13.7	Soot %	%	*ASTM D7844	>6	0.4	0.3	0.4
FLUID DEGRADATION method limit/base current history1 history  Oxidation Abs/.1mm *ASTM D7414 >25 15.1 11.5 13.7	Nitration	Abs/cm	*ASTM D7624	>20	8.2	6.3	7.9
Oxidation Abs/.1mm *ASTM D7414 >25 <b>15.1</b> 11.5 13.7	Sulfation	Abs/.1mm	*ASTM D7415	>30	18.8	15.7	18.1
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
<b>Base Number (BN)</b> mg KOH/g ASTM D2896 9.8 <b>8.0</b> 5.3 8.2	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.1	11.5	13.7
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.0	5.3	8.2



# **OIL ANALYSIS REPORT**



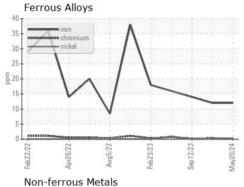


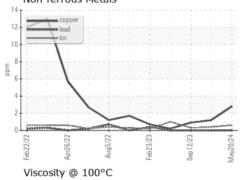


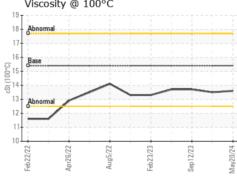
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

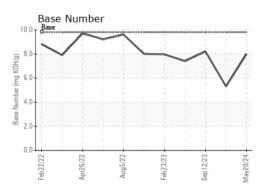
FLUID PROPI	ERIIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.6	13.5	13.7

# **GRAPHS**













Certificate 12367

Laboratory Sample No.

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0094900 Lab Number : 06185826 Unique Number : 11042578

Test Package : FLEET

Received **Tested** Diagnosed

: 21 May 2024 : 22 May 2024 : 22 May 2024 - Wes Davis

GFL Environmental - 044 - Elizabeth City 657 Old US 17 Elizabeth City, NC

US 27909 Contact: TOM BAIRD tom.baird@gflenv.com T: (252)562-2645

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)

Report Id: GFL044 [WUSCAR] 06185826 (Generated: 05/22/2024 11:41:56) Rev: 1

Submitted By: TOM BAIRD

F: (252)264-4411