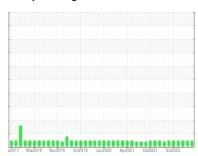


# **OIL ANALYSIS REPORT**

Sample Rating Trend







Area 166 Machine Id 10710 Component

**Diesel Engine** 

PETRO CANADA DURON SHP 15W40 (11 GAL)

## 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.

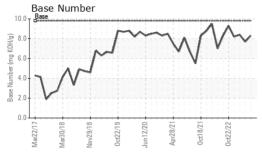
### **Fluid Condition**

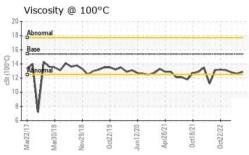
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORMATION   method   limit/bass   current   history1   history2	GAL)  *2017 Mad2018 Nav2018 0-x2019 Jun-2020 Apr2021 0-x2022						
Sample Date   Client Info   13 Sep 2023   10 Jul 2023   30 Mar 2023   Machine Age   hrs   Client Info   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   18795   153   153   18795   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   153   15	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Oil Age         hrs         Client Info         600         400         589           Oil Changed Sample Status         Client Info         Changed North Changed Changed North Changed							
Client Info	Machine Age	hrs	Client Info		18795	153	18795
NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2	Oil Age	hrs	Client Info		600	400	589
Fuel	Oil Changed		Client Info		Changed	Not Changd	Changed
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
WEAR METALS	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>5	<1.0	<1.0	<1.0
Irron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185n         >4         <1         <1         <1           Nickel         ppm         ASTM D5185n         >2         <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>110	6	7	6
Description	Chromium	ppm	ASTM D5185m	>4	<1	<1	<1
Silver	Nickel	ppm	ASTM D5185m	>2	<1	0	<1
Aluminum	Titanium	ppm	ASTM D5185m		0	0	0
Lead	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper         ppm         ASTM D5185m         >85         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1	Aluminum	ppm	ASTM D5185m	>25	8	5	5
Tin	Lead	ppm	ASTM D5185m	>45	0	0	0
Trin	Copper	ppm	ASTM D5185m	>85	<1	<1	<1
Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         <1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         7         10         6           Barium         ppm         ASTM D5185m         0         2         0         0           Molybdenum         ppm         ASTM D5185m         0         65         69         64           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         841         925         898           Calcium         ppm         ASTM D5185m         1070         1068         1090         1109           Phosphorus         ppm         ASTM D5185m         1270         1159         1223         1244           Sulfur         ppm         ASTM D5185m         2060         3191         3284         3651           CONTAMINANTS         method         limit/base         current         history		ppm	ASTM D5185m	>4	0	0	0
ADDITIVES	Vanadium		ASTM D5185m		0	0	0
Boron   ppm   ASTM D5185m   0   7   10   6	Cadmium	ppm	ASTM D5185m		0	<1	0
Barium         ppm         ASTM D5185m         0         2         0         0           Molybdenum         ppm         ASTM D5185m         60         65         69         64           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         841         925         898           Calcium         ppm         ASTM D5185m         1070         1068         1090         1109           Phosphorus         ppm         ASTM D5185m         1150         986         1117         1007           Zinc         ppm         ASTM D5185m         1270         1159         1223         1244           Sulfur         ppm         ASTM D5185m         2060         3191         3284         3651           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         4         4         3           Sodium         ppm         ASTM D5185m         >20         1         1         2           INFRA-RED         method         limit/base<	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         65         69         64           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         841         925         898           Calcium         ppm         ASTM D5185m         1070         1068         1090         1109           Phosphorus         ppm         ASTM D5185m         1150         986         1117         1007           Zinc         ppm         ASTM D5185m         1270         1159         1223         1244           Sulfur         ppm         ASTM D5185m         2060         3191         3284         3651           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         4         4         3           Sodium         ppm         ASTM D5185m         >20         1         1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         *ASTM D7414         >3<	Boron	ppm	ASTM D5185m	0	7	10	6
Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         841         925         898           Calcium         ppm         ASTM D5185m         1070         1068         1090         1109           Phosphorus         ppm         ASTM D5185m         1150         986         1117         1007           Zinc         ppm         ASTM D5185m         1270         1159         1223         1244           Sulfur         ppm         ASTM D5185m         2060         3191         3284         3651           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         4         4         3           Sodium         ppm         ASTM D5185m         >20         1         1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         6.0         5.9         6.8           Sulfation         Abs/:mm         *ASTM	Barium	ppm	ASTM D5185m	0	2	0	0
Magnesium         ppm         ASTM D5185m         1010         841         925         898           Calcium         ppm         ASTM D5185m         1070         1068         1090         1109           Phosphorus         ppm         ASTM D5185m         1150         986         1117         1007           Zinc         ppm         ASTM D5185m         1270         1159         1223         1244           Sulfur         ppm         ASTM D5185m         2060         3191         3284         3651           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         4         4         3           Sodium         ppm         ASTM D5185m         >20         1         1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         6.0         5.9         6.8           Sulfation         Abs/.1mm <t< td=""><td>Molybdenum</td><td>ppm</td><td>ASTM D5185m</td><td>60</td><th>65</th><td>69</td><td>64</td></t<>	Molybdenum	ppm	ASTM D5185m	60	65	69	64
Calcium         ppm         ASTM D5185m         1070         1068         1090         1109           Phosphorus         ppm         ASTM D5185m         1150         986         1117         1007           Zinc         ppm         ASTM D5185m         1270         1159         1223         1244           Sulfur         ppm         ASTM D5185m         2060         3191         3284         3651           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         4         4         3           Sodium         ppm         ASTM D5185m         >20         1         1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         6.0         5.9         6.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         16.8         17.3         17.9           FLUID DEGRADATION         <	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus         ppm         ASTM D5185m         1150         986         1117         1007           Zinc         ppm         ASTM D5185m         1270         1159         1223         1244           Sulfur         ppm         ASTM D5185m         2060         3191         3284         3651           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         4         4         3           Sodium         ppm         ASTM D5185m         0         0         <1	Magnesium	ppm	ASTM D5185m	1010	841	925	898
Zinc         ppm         ASTM D5185m         1270         1159         1223         1244           Sulfur         ppm         ASTM D5185m         2060         3191         3284         3651           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         4         4         3           Sodium         ppm         ASTM D5185m         0         0         <1	Calcium	ppm	ASTM D5185m	1070	1068	1090	1109
Sulfur         ppm         ASTM D5185m         2060         3191         3284         3651           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         4         4         3           Sodium         ppm         ASTM D5185m         0         0         <1	Phosphorus	ppm	ASTM D5185m	1150	986	1117	1007
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >30         4         4         3           Sodium         ppm         ASTM D5185m         0         0         <1	Zinc	ppm	ASTM D5185m	1270	1159	1223	1244
Silicon         ppm         ASTM D5185m         >30         4         4         3           Sodium         ppm         ASTM D5185m         0         0         <1           Potassium         ppm         ASTM D5185m         >20         1         1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         6.0         5.9         6.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         16.8         17.3         17.9           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.4         13.4         13.4	Sulfur	ppm	ASTM D5185m	2060	3191	3284	3651
Sodium         ppm         ASTM D5185m         0         0         <1           Potassium         ppm         ASTM D5185m         >20         1         1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         6.0         5.9         6.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         16.8         17.3         17.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.4         13.4         13.4	CONTAMINAN	NTS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         1         1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         6.0         5.9         6.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         16.8         17.3         17.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.4         13.4         13.4	Silicon	ppm	ASTM D5185m	>30	4	4	3
INFRA-RED	Sodium	ppm	ASTM D5185m		0	0	<1
Soot %         %         *ASTM D7844         >3         0.2         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         6.0         5.9         6.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         16.8         17.3         17.9           FLUID DEGRADATION method limit/base current         bistory1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.4         13.4         13.4	Potassium	ppm	ASTM D5185m	>20	1	1	2
Nitration         Abs/cm         *ASTM D7624         >20         6.0         5.9         6.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         16.8         17.3         17.9           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.4         13.4         13.4	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         16.8         17.3         17.9           FLUID DEGRADATION method limit/base current         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         12.4         13.4         13.4	Soot %	%	*ASTM D7844	>3	0.2	0.2	0.2
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 12.4 13.4 13.4	Nitration	Abs/cm	*ASTM D7624	>20	6.0	5.9	6.8
Oxidation Abs/.1mm *ASTM D7414 >25 <b>12.4</b> 13.4 13.4	Sulfation	Abs/.1mm	*ASTM D7415	>30			17.9
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 9.8 <b>8.3</b> 7.7 8.4	Oxidation	Abs/.1mm	*ASTM D7414	>25	12.4	13.4	13.4
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.3	7.7	8.4



# **OIL ANALYSIS REPORT**

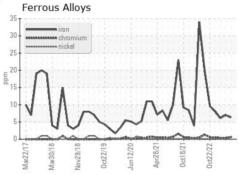


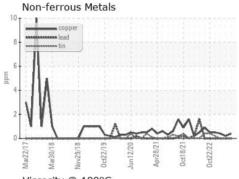


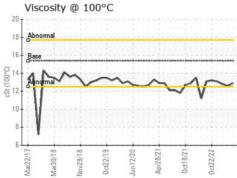
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

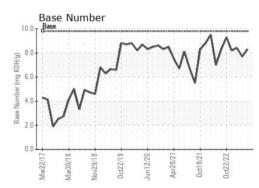
FLUID PROPE	ERTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	12.9	12.6	12.8

### **GRAPHS**













Certificate L2367

Laboratory Sample No. Lab Number

Unique Number : 10654978

: GFL0087888 : 05953765 Test Package : FLEET

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 18 Sep 2023 Diagnosed : 19 Sep 2023

Diagnostician : Wes Davis

GFL Environmental - 166 - Phenix City

18 Old Brickyard Rd Phenix City, AL US 36869

Contact: DEAN PEACE JR dean.peace@gflenv.com

T:

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)

F: