

## **OIL ANALYSIS REPORT**

Sample Rating Trend





Machine Id 923006-9922

Component Diesel Engine Fluid

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

Sample Number     Client Info     GFL0091812     GFL0074379     GFL0074       Sample Date     hrs     Client Info     29 Sep 2023     06 Jun 2023     05 Jun 20       Machine Age     hrs     Client Info     23288     23004     23002       Oil Age     hrs     Client Info     Not Changd     Not Changd     Not Changd       Sample Status     Client Info     Not Changd     Not Changd     Not Changd     Nor MAL       CONTAMINATION     method     Imit/base     current     history1     history1       Fuel     WC Method     >3.0     <1.0     <1.0     2.2       Giycol     WC Method     NEG     NEG     NEG       VEAR METALS     method     Imit/base     current     history1     history1       Iron     ppm     ASTM 05185m     >2.0     <1     2     <1       Nickel     ppm     ASTM 05185m     >2.0     0     0     0       Aluminum     ppm     ASTM 05185m     >3.0     1     2     1     1		LTR)	JUI2020 N6V2	.ozo marzuzi rebzuzz Marz	UZZ MayzUZZ MarzUZ3 JunzUZ3 Jun	1023 OBPENZS	
Sample Date     Client Info     29 Sep 2023     06 Jun 2023     05 Jun 20       Machine Age     hrs     Client Info     23288     23004     23002       Oil Age     hrs     Client Info     0     0     0     0       Oil Changed     Client Info     Not Changd     Not Changd     Nor MAL     NORMAL       CONTAMINATION     method     imit/base     current     historyl     historyl       Fuel     WC Method     >3.0     <1.0     <1.0     2.2       Glycol     WC Method     >3.0     <1     2     1       Fuel     WC Method     >2.0     <1     2     1       Iron     ppm     ASTM D5185     >2     0     <1     2     2       Itanium     ppm     ASTM D5185     >20     0     0     0     0       Silver     ppm     ASTM D5185     >20     1     1     2     1     1     1     1     1     1     1     1     1     1	SAMPLE INFOR	RMATION	method	limit/base	current	history1	history2
Machine Age     hrs     Client Info     23288     23004     23002       Oil Age     hrs     Client Info     0     0     0       Sample Status     I     Image     Not Change     Not Change       Sample Status     I     Imit/base     current     Not Change       Fuel     WC Method     >3.0     <1.0	Sample Number		Client Info		GFL0091812	GFL0074379	GFL0074364
Oil AgehrsClient Info000Oil ChangedClient InfoNot ChangdNot	Sample Date		Client Info		29 Sep 2023	06 Jun 2023	05 Jun 2023
Oil Changed Sample Status Client Info Not Changd NORMAL Not Changd NORMAL Not Changd NORMAL Not Changd NORMAL   CONTAMINATION method limit/base current history1 history1   Fuel WC Method >3.0 <1.0 <1.0 2.2   Glycol WC Method >3.0 <1.0 <1.0 2.2   WEAR METALS method limit/base current history1 history1   Iron ppm ASTM D5165m >20 <1 2 2   Iron ppm ASTM D5165m >20 <1 2 2   Titanium ppm ASTM D5165m >20 <1 166 2   Silver ppm ASTM D5165m >20 1 166 2   Lead ppm ASTM D5165m >20 1 166 2   Lead ppm ASTM D5165m >30 1 2 1   Tin ppm ASTM D5165m >5 <1 2 1   Gopper ppm ASTM D5165m 0 0 0   Camadium ppm ASTM D5165m 0 0 0   Gopper ppm ASTM D5165m </td <td>Machine Age</td> <td>hrs</td> <td>Client Info</td> <td></td> <th>23288</th> <td>23004</td> <td>23002</td>	Machine Age	hrs	Client Info		23288	23004	23002
Sample Status     NORMAL     NORMAL     NORMAL     NORMAL     NORMAL       CONTAMINATION     method     imit/base     current     history1     history1       Fuel     WC Method     >3.0     <1.0     <1.0     2.2       Glycol     WC Method     >3.0     <1.0     <1.0     2.2       Glycol     WC Method     NEG     NEG     NEG       VEAR METALS     method     limit/base     current     history1     history1       Iron     ppm     ASTM D5185m     >20     <1     2     <1       Nickel     ppm     ASTM D5185m     >20     o     <1     <1       Silver     ppm     ASTM D5185m     >20     1     16     2       Lead     ppm     ASTM D5185m     >20     1     21     1       Vanadium     ppm     ASTM D5185m     >30     1     2     1       Imit     ppm     ASTM D5185m     >30     1     2     1     1       Vanadi	Oil Age	hrs	Client Info		0	0	0
CONTAMINATION     method     limit/base     current     history1     history1       Fuel     WC Method     >3.0     <1.0	Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
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     <1.0     <1.0     <1.0     <1.0     <1.0     <1.0     <1.0     <1.0	Sample Status				NORMAL	NORMAL	NORMAL
Glycol     WC Method     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history1       Iron     ppm     ASTM D5185m     >120     5     22     15       Chromium     ppm     ASTM D5185m     >20     <1	CONTAMINA	TION	method	limit/base	current	history1	history2
WEAR METALS     method     limit/base     current     history1     history1       Iron     ppm     ASTM D5185m     >120     5     22     15       Chromium     ppm     ASTM D5185m     >20     <1	Fuel		WC Method	>3.0	<1.0	<1.0	2.2
Iron     ppm     ASTM D5185m     >120     5     22     15       Chromium     ppm     ASTM D5185m     >20     <1	Glycol		WC Method		NEG	NEG	NEG
Chromium     ppm     ASTM D5185m     >20     <1     2     <1       Nickel     ppm     ASTM D5185m     >5     <1	WEAR META	LS	method	limit/base	current	history1	history2
Nickel     ppm     ASTM D5185m     >5     <1     2     2       Titanium     ppm     ASTM D5185m     >2     0     <1	Iron	ppm	ASTM D5185m	>120	5	22	15
Nickel     ppm     ASTM D5185m     >5     <1     2     2       Titanium     ppm     ASTM D5185m     >2     0     <1	Chromium	ppm	ASTM D5185m	>20	<1	2	<1
Titanium     ppm     ASTM D5185m     >2     0     <1     <1       Silver     ppm     ASTM D5185m     >2     0     0     0       Aluminum     ppm     ASTM D5185m     >20     1     16     2       Lead     ppm     ASTM D5185m     >40     <1	Nickel		ASTM D5185m	>5	<1	2	2
Silver     ppm     ASTM D5185m     >2     0     0     0       Aluminum     ppm     ASTM D5185m     >20     1     16     2       Lead     ppm     ASTM D5185m     >40     <1	Titanium		ASTM D5185m	>2	0	<1	<1
Aluminum     ppm     ASTM D5185m     >20     1     16     2       Lead     ppm     ASTM D5185m     >40     <1	Silver		ASTM D5185m	>2		0	0
Lead     ppm     ASTM D5185m     >40     <1     0     0       Copper     ppm     ASTM D5185m     >330     1     2     1       Tin     ppm     ASTM D5185m     >15     <1	Aluminum		ASTM D5185m	>20		16	2
Copper     ppm     ASTM D5185m     >330     1     2     1       Tin     ppm     ASTM D5185m     >15     <1	Lead					0	
Tin     ppm     ASTM D5185m     >15     <1     <1     <1     <1       Vanadium     ppm     ASTM D5185m     0     0     0     0       Cadmium     ppm     ASTM D5185m     0     4     10     1       Boron     ppm     ASTM D5185m     0     4     10     1       Barium     ppm     ASTM D5185m     0     0     0     0       Molybdenum     ppm     ASTM D5185m     0     0     0     0       Magnesse     ppm     ASTM D5185m     0     <1	Copper						
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     4     10     1       Barium     ppm     ASTM D5185m     0     <1     <1     <1     <1       Magnesium     ppm     ASTM D5185m     1010     992     952     907       Calcium     ppm     ASTM D5185m     1070     1055     1115     1054       Phosphorus     ppm     ASTM D5185m     1270     1296     1233     1185       Sulfur     ppm     ASTM D5185m     2060							<1
Cadmium     ppm     ASTM D5185m     0     0     0       ADDITIVES     method     limit/base     current     history1     history1       Boron     ppm     ASTM D5185m     0     4     10     1       Barium     ppm     ASTM D5185m     0     0     0     0     0       Molybdenum     ppm     ASTM D5185m     0     4     10     1       Magnesium     ppm     ASTM D5185m     0     <1     <1     <1     <1       Magnesium     ppm     ASTM D5185m     0     <1     <1     <1     <1       Phosphorus     ppm     ASTM D5185m     1010     992     952     907       Calcium     ppm     ASTM D5185m     1070     1047     985     949       Zinc     ppm     ASTM D5185m     1270     1296     1233     1185       Sulfur     ppm     ASTM D5185m     2060     3208     3662     3422       CONTAMINANTS     method <thi< td=""><td></td><td></td><td></td><td></td><th></th><td></td><td></td></thi<>							
Boron     ppm     ASTM D5185m     0     4     10     1       Barium     ppm     ASTM D5185m     0     0     0     0     0       Molybdenum     ppm     ASTM D5185m     60     59     59     56       Manganese     ppm     ASTM D5185m     0     <1							
Barium     ppm     ASTM D5185m     0     0     0     0     0       Molybdenum     ppm     ASTM D5185m     60 <b>59</b> 59     56       Manganese     ppm     ASTM D5185m     0     <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum     ppm     ASTM D5185m     60     59     59     56       Manganese     ppm     ASTM D5185m     0     <1	Boron	ppm	ASTM D5185m	0	4	10	1
Manganese     ppm     ASTM D5185m     0     <1     <1     <1     <1       Magnesium     ppm     ASTM D5185m     1010     992     952     907       Calcium     ppm     ASTM D5185m     1070     1055     1115     1054       Phosphorus     ppm     ASTM D5185m     1150     1047     985     949       Zinc     ppm     ASTM D5185m     1270     1296     1233     1185       Sulfur     ppm     ASTM D5185m     2060     3208     3662     3422       CONTAMINANTS     method     limit/base     current     history1     history1       Silicon     ppm     ASTM D5185m     >25     5     14     4       Sodium     ppm     ASTM D5185m     >20     2     <1	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium     ppm     ASTM D5185m     1010     992     952     907       Calcium     ppm     ASTM D5185m     1070     1055     11115     1054       Phosphorus     ppm     ASTM D5185m     1150     1047     985     949       Zinc     ppm     ASTM D5185m     1270     1296     1233     1185       Sulfur     ppm     ASTM D5185m     2060     3208     3662     3422       CONTAMINANTS     method     limit/base     current     history1     histor       Silicon     ppm     ASTM D5185m     >25     5     14     4       Sodium     ppm     ASTM D5185m     >20     2     <1	Molybdenum	ppm	ASTM D5185m	60	59	59	56
Calcium     ppm     ASTM D5185m     1070     1055     1115     1054       Phosphorus     ppm     ASTM D5185m     1150     1047     985     949       Zinc     ppm     ASTM D5185m     11270     1296     1233     1185       Sulfur     ppm     ASTM D5185m     2060     3208     3662     3422       CONTAMINANTS     method     limit/base     current     history1     history1       Silicon     ppm     ASTM D5185m     >25     5     14     4       Sodium     ppm     ASTM D5185m     >20     2     <1	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus     ppm     ASTM D5185m     1150     1047     985     949       Zinc     ppm     ASTM D5185m     1270     1296     1233     1185       Sulfur     ppm     ASTM D5185m     2060     3208     3662     3422       CONTAMINANTS     method     limit/base     current     history1     histor       Silicon     ppm     ASTM D5185m     >25     5     14     4       Sodium     ppm     ASTM D5185m     >25     5     14     4       Sodium     ppm     ASTM D5185m     >20     2     <1	Magnesium	ppm	ASTM D5185m	1010	992	952	907
Zinc     ppm     ASTM D5185m     1270     1296     1233     1185       Sulfur     ppm     ASTM D5185m     2060     3208     3662     3422       CONTAMINANTS     method     limit/base     current     history1     histor       Silicon     ppm     ASTM D5185m     >25     5     14     4       Sodium     ppm     ASTM D5185m     >20     2     <1	Calcium	ppm	ASTM D5185m	1070	1055	1115	1054
Zinc     ppm     ASTM D5185m     1270     1296     1233     1185       Sulfur     ppm     ASTM D5185m     2060     3208     3662     3422       CONTAMINANTS     method     limit/base     current     history1     histor       Silicon     ppm     ASTM D5185m     >25     5     14     4       Sodium     ppm     ASTM D5185m     >20     2     <1	Phosphorus	ppm	ASTM D5185m	1150	1047	985	949
Sulfur     ppm     ASTM D5185m     2060     3208     3662     3422       CONTAMINANTS     method     limit/base     current     history1     history       Silicon     ppm     ASTM D5185m     >25     5     14     4       Sodium     ppm     ASTM D5185m     >20     2     <1		ppm	ASTM D5185m	1270	1296	1233	1185
Silicon     ppm     ASTM D5185m     >25     5     14     4       Sodium     ppm     ASTM D5185m     3     3     1       Potassium     ppm     ASTM D5185m     >20     2     <1     0       INFRA-RED     method     limit/base     current     history1     history1       Soot %     %     *ASTM D7844     >4     0.2     0.1     0.2       Nitration     Abs/cm     *ASTM D7624     >20     5.6     6.1     9.1       Sulfation     Abs/.tmm     *ASTM D7415     >30     17.8     18.4     18.2       FLUID DEGRADATION     method     limit/base     current     history1     history1       Oxidation     Abs/.tmm     *ASTM D7414     >25     13.9     14.5     16.9	Sulfur		ASTM D5185m	2060	3208	3662	3422
Sodium     ppm     ASTM D5185m     3     3     1       Potassium     ppm     ASTM D5185m     >20     2     <1	CONTAMINAI	NTS	method	limit/base	current	history1	history2
Potassium     ppm     ASTM D5185m     >20     2     <1     0       INFRA-RED     method     limit/base     current     history1     histor       Soot %     %     *ASTM D7844     >4     0.2     0.1     0.2       Nitration     Abs/cm     *ASTM D7624     >20     5.6     6.1     9.1       Sulfation     Abs/.1mm     *ASTM D7415     >30     17.8     18.4     18.2       FLUID DEGRADATION     method     limit/base     current     history1     histor       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.9     14.5     16.9	Silicon	ppm	ASTM D5185m	>25	5	14	4
INFRA-RED     method     limit/base     current     history1     histor       Soot %     %     *ASTM D7844     >4     0.2     0.1     0.2       Nitration     Abs/cm     *ASTM D7624     >20     5.6     6.1     9.1       Sulfation     Abs/.1mm     *ASTM D7415     >30     17.8     18.4     18.2       FLUID DEGRADATION     method     limit/base     current     history1     history       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.9     14.5     16.9	Sodium	ppm	ASTM D5185m		3	3	1
Soot %     %     *ASTM D7844     >4     0.2     0.1     0.2       Nitration     Abs/cm     *ASTM D7624     >20     5.6     6.1     9.1       Sulfation     Abs/.1mm     *ASTM D7415     >30     17.8     18.4     18.2       FLUID DEGRADATION     method     limit/base     current     history1     histor       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.9     14.5     16.9	Potassium	ppm	ASTM D5185m	>20	2	<1	0
Nitration     Abs/cm     *ASTM D7624     >20     5.6     6.1     9.1       Sulfation     Abs/.1mm     *ASTM D7615     >30     17.8     18.4     18.2       FLUID DEGRADATION     method     limit/base     current     history1     histor       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.9     14.5     16.9	INFRA-RED		method	limit/base	current	history1	history2
Sulfation     Abs/.1mm     *ASTM D7415     >30     17.8     18.4     18.2       FLUID DEGRADATION     method     limit/base     current     history1     histor       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.9     14.5     16.9	Soot %	%	*ASTM D7844	>4	0.2	0.1	0.2
Sulfation     Abs/.1mm     *ASTM D7415     >30     17.8     18.4     18.2       FLUID DEGRADATION     method     limit/base     current     history1     histor       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.9     14.5     16.9	Nitration	Abs/cm	*ASTM D7624	>20	5.6	6.1	9.1
Oxidation     Abs/.1mm     *ASTM D7414     >25     13.9     14.5     16.9						18.4	18.2
	FLUID DEGRA		method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	13.9	14.5	16.9

### DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

#### Contamination

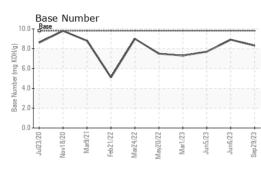
There is no indication of any contamination in the oil.

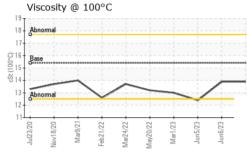
#### Fluid Condition

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

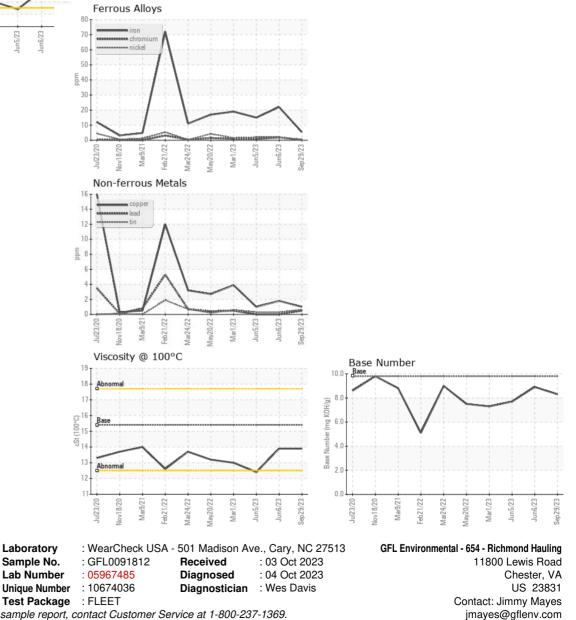


# **OIL ANALYSIS REPORT**





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	RTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.9	13.9	12.4
GRAPHS						





T:

F:

Certificate L2367