

# **OIL ANALYSIS REPORT**

### Sample Rating Trend

# NORMAL



Component

Natural Gas Engine

PETRO CANADA DURON GEO LD 15W40 (12 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.

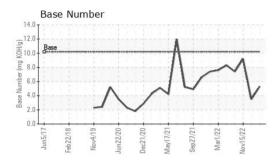
## Fluid Condition

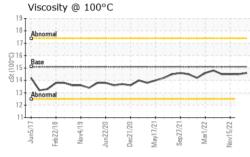
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORMATION     method     imit/base     current     history 1     history 2       Sample Number     Client Info     GFL0083302     GFL0069417     GFL0052729       Sample Date     Client Info     29 Jun 2023     09 May 2023     15 Nov 2022       Machine Age     hrs     Client Info     487     584     539       Oil Age     hrs     Client Info     N/A     N/A     Changed       Sample Status     Client Info     MR7     NSK     NORMAL     NORMAL     NORMAL       WEAR METALS     method     imit/base     current     history 1     history 2       Iron     ppm     ASTM 05185m     >50     2     4     4       Chromium     ppm     ASTM 05185m     >2     0     <1     0       Astm 05185m     >3     0     <1     0     3     Lead     ppm     ASTM 05185m     >30     0     <1     0       Astm 05185m     >4     0     <1     0     <1     0     0			in2017 Feb201	8 Nov2019 Jun2020 Det	2020 May2021 Sep2021 Mar2022	Nov2022	
Sample Date     Client Info     29 Jun 2023     09 May 2023     15 Nov 2022       Machine Age     hrs     Client Info     7691     7691     7691     7691       Oil Age     hrs     Client Info     487     584     539       Oil Changed     Client Info     N/A     N/A     NA     NORMAL     NORMAL       WEAR METALS     method     Imit/base     current     history 1     history 2       Iron     ppm     ASTM D5185m     >50     2     4     4       Chromium     ppm     ASTM D5185m     >2     0     <1	SAMPLE INFOR	MATION	method	limit/base	current	history 1	history 2
Machine Age     hrs     Client Info     7691     7691     7691     7691       Oil Age     hrs     Client Info     487     584     539       Oil Changed     Client Info     N/A     N/A     N/A     NAnged       Sample Status     rethod     Im/Vexe     NORMAL     NORMAL     NORMAL       WEAR METALS     method     Im/Vexe     current     Nistory 1     retory 2       Iron     ppm     ASTM D5185m     >4     0     <1     0       Nickel     ppm     ASTM D5185m     >2     0     <1     0       Silver     ppm     ASTM D5185m     >3     0     <1     0       Silver     ppm     ASTM D5185m     >3     0     <1     0       Aduminum     ppm     ASTM D5185m     >3     0     <1     0       Silver     ppm     ASTM D5185m     >3     0     <1     0       Cadmium     ppm     ASTM D5185m     50     9     10     40	Sample Number		Client Info		GFL0083302	GFL0069417	GFL0052729
Machine Age     hrs     Client Info     7691     7691     7691     7691       Oil Age     hrs     Client Info     487     584     539       Oil Changed     Client Info     N/A     N/A     N/A     NAnged       Sample Status     rethod     Im/Vexe     NORMAL     NORMAL     NORMAL       WEAR METALS     method     Im/Vexe     current     Nistory 1     retory 2       Iron     ppm     ASTM D5185m     >4     0     <1	Sample Date		Client Info		29 Jun 2023	09 May 2023	15 Nov 2022
Oil Changed Sample Status     Client Info     N/A     N/A     N/A     N/A     N/A     NORMAL       WEAR METALS     method     limit/base     current     history 1     history 2       Iron     ppm     ASTM D5185m     >50     2     4     4       Chromium     ppm     ASTM D5185m     >4     0     <1	Machine Age	hrs	Client Info		7691		7691
Oil Changed     Client Info     N/A     N/A     N/A     Changed       Sample Status     Image     Image     NORMAL     NORMAL     NORMAL       WEAR METALS     method     limit/base     current     history 1     history 2       Iron     ppm     ASTM D5185m     >50     2     4     4       Chromium     ppm     ASTM D5185m     >4     0     <1     <1       Nickel     ppm     ASTM D5185m     >2     0     <1     0       Silver     ppm     ASTM D5185m     >3     0     <1     0       Aluminum     ppm     ASTM D5185m     >3     0     <1     0       Aluminum     ppm     ASTM D5185m     >3     0     <1     0       Cadmium     ppm     ASTM D5185m     >3     0     <1     0       Cadmium     ppm     ASTM D5185m     50     9     10     40       Baron     ppm     ASTM D5185m     50     40     50     50	Oil Age	hrs	Client Info		487	584	539
Sample Status     Image: status     NORMAL     NORMAL     NORMAL     NORMAL       WEAR METALS     method     imit/base     current     history 1     history 2       Iron     ppm     ASTM D5185m     >50     2     4     4       Chromium     ppm     ASTM D5185m     >2     0     <1     0       Nickel     ppm     ASTM D5185m     >2     0     <1     0       Silver     ppm     ASTM D5185m     >3     0     <1     0       Aluminum     ppm     ASTM D5185m     >30     0     <1     0     3       Lead     ppm     ASTM D5185m     >30     0     <1     0     3       Vanadium     ppm     ASTM D5185m     >30     0     <1     0     0       Vanadium     ppm     ASTM D5185m     50     9     10     40       Barium     ppm     ASTM D5185m     50     40     50     50       Magnesium     ppm     ASTM D5185m <th>-</th> <th></th> <th>Client Info</th> <th></th> <th>N/A</th> <th>N/A</th> <th>Changed</th>	-		Client Info		N/A	N/A	Changed
Iron     ppm     ASTM D5185m     >50     2     4     4       Chromium     ppm     ASTM D5185m     >4     0     <1	-				NORMAL	NORMAL	NORMAL
Chromium     ppm     ASTM D5185m     >4     0     <1	WEAR METAL	S	method	limit/base	current	history 1	history 2
Nickel     ppm     ASTM D5185m     >2     0     <1     0       Titanium     ppm     ASTM D5185m     >3     0     <1	Iron	ppm	ASTM D5185m	>50	2	4	4
Titanium     ppm     ASTM D5185m     <1     0     <1       Silver     ppm     ASTM D5185m     >3     0     <1	Chromium	ppm	ASTM D5185m	>4	0	<1	<1
Silver     ppm     ASTM D5185m     >3     0     <1     0       Aluminum     ppm     ASTM D5185m     >9     <1     0     3       Lead     ppm     ASTM D5185m     >30     0     2     <1       Copper     ppm     ASTM D5185m     >35     <1     <1     <1     <1       Tin     ppm     ASTM D5185m     >4     0     <1     0       Vanadium     ppm     ASTM D5185m     >4     0     <1     0       Cadmium     ppm     ASTM D5185m     >4     0     <1     0       Cadmium     ppm     ASTM D5185m     50     9     10     40       Barium     ppm     ASTM D5185m     50     40     50     50       Magnesium     ppm     ASTM D5185m     50     40     50     50       Magnesium     ppm     ASTM D5185m     50     40     50     50       Magnesium     ppm     ASTM D5185m     50     40	Nickel	ppm	ASTM D5185m	>2	0	<1	0
Aluminum     ppm     ASTM D5185m     >9     <1     0     3       Lead     ppm     ASTM D5185m     >30     0     2     <1	Titanium	ppm	ASTM D5185m		<1	0	<1
Lead     ppm     ASTM D5185m     >30     0     2     <1       Copper     ppm     ASTM D5185m     >35     <1	Silver	ppm	ASTM D5185m	>3	0	<1	0
Copper     ppm     ASTM D5185m     >35     <1     <1     <1       Tin     ppm     ASTM D5185m     >4     0     <1	Aluminum	ppm	ASTM D5185m	>9	<1	0	3
Tin     ppm     ASTM D5185m     >4     0     <1     0       Vanadium     ppm     ASTM D5185m     0     0     0     0       Cadmium     ppm     ASTM D5185m     0     0     0     0       ADDITIVES     method     limit/base     current     history 1     history 2       Boron     ppm     ASTM D5185m     50     9     10     40       Barium     ppm     ASTM D5185m     50     9     10     40       Barium     ppm     ASTM D5185m     50     40     50     50       Magnese     ppm     ASTM D5185m     560     437     536     507       Calcium     ppm     ASTM D5185m     560     437     536     507       Calcium     ppm     ASTM D5185m     780     533     664     740       Zinc     ppm     ASTM D5185m     780     533     664     740       Sulfur     ppm     ASTM D5185m     2040     2215	Lead	ppm	ASTM D5185m	>30	0	2	<1
Vanadium     ppm     ASTM D5185m     0     <1     0       Cadmium     ppm     ASTM D5185m     0     0     0     0       ADDITIVES     method     limit/base     current     history 1     history 2       Boron     ppm     ASTM D5185m     50     9     10     40       Barium     ppm     ASTM D5185m     50     40     50     50       Magnaese     ppm     ASTM D5185m     50     40     533     664     740       Zinc     ppm     ASTM D5185m     780     5333     664     740       Zinc     ppm     ASTM D5185m     2040     2215     2801     2711       CONTAMINANTS     method     limit/base     current     his	Copper	ppm	ASTM D5185m	>35	<1	<1	<1
Vanadium     ppm     ASTM D5185m     0     <1     0       Cadmium     ppm     ASTM D5185m     0     0     0     0       ADDITIVES     method     limit/base     current     history 1     history 2       Boron     ppm     ASTM D5185m     50     9     10     40       Barium     ppm     ASTM D5185m     50     9     10     40       Barium     ppm     ASTM D5185m     50     9     10     40       Barium     ppm     ASTM D5185m     50     9     10     40       Magnesium     ppm     ASTM D5185m     50     40     50     50       Magnesium     ppm     ASTM D5185m     60     437     536     507       Calcium     ppm     ASTM D5185m     780     533     664     740       Jinco     ppm     ASTM D5185m     2040     2215     2801     2711       CONTAMINANTS     method     limit/base     current     history 1	Tin	ppm	ASTM D5185m	>4	0	<1	0
Cadmium     ppm     ASTM D5185m     0     0     0       ADDITIVES     rnethod     limit/base     current     history 1     history 2       Boron     ppm     ASTM D5185m     50     9     10     40       Barium     ppm     ASTM D5185m     50     9     10     40       Barium     ppm     ASTM D5185m     50     9     10     40       Barium     ppm     ASTM D5185m     50     9     10     40       Magnesium     ppm     ASTM D5185m     50     40     50     50       Magnesium     ppm     ASTM D5185m     560     437     536     507       Calcium     ppm     ASTM D5185m     560     437     536     507       Calcium     ppm     ASTM D5185m     780     533     664     740       Zinc     ppm     ASTM D5185m     870     771     962     905       Sulfur     ppm     ASTM D5185m     2400     2115     28	Vanadium		ASTM D5185m		0	<1	0
Boron     ppm     ASTM D5185m     50     9     10     40       Barium     ppm     ASTM D5185m     5     14     0     2       Molybdenum     ppm     ASTM D5185m     50     40     50     50       Manganese     ppm     ASTM D5185m     0     0     <1	Cadmium	ppm	ASTM D5185m		0	0	0
Barium     ppm     ASTM D5185m     5     14     0     2       Molybdenum     ppm     ASTM D5185m     50     40     50     50       Manganese     ppm     ASTM D5185m     0     0     <1     <1       Magnesium     ppm     ASTM D5185m     560     437     536     507       Calcium     ppm     ASTM D5185m     1510     1286     1569     1531       Phosphorus     ppm     ASTM D5185m     780     533     664     740       Zinc     ppm     ASTM D5185m     2040     2215     2801     2711       CONTAMINANTS     method     limit/base     current     history 1     history 2       Silicon     ppm     ASTM D5185m	ADDITIVES		method	limit/base	current	history 1	history 2
Molybdenum     ppm     ASTM D5185m     50     40     50     50       Manganese     ppm     ASTM D5185m     0     0     <1	Boron	ppm	ASTM D5185m	50	9	10	40
Manganese     ppm     ASTM D5185m     0     0     <1     <1       Magnesium     ppm     ASTM D5185m     560     437     536     507       Calcium     ppm     ASTM D5185m     1510     1286     1569     1531       Phosphorus     ppm     ASTM D5185m     780     533     664     740       Zinc     ppm     ASTM D5185m     870     771     962     905       Sulfur     ppm     ASTM D5185m     2040     2215     2801     2711       CONTAMINANTS     method     limit/base     current     history 1     history 2       Silicon     ppm     ASTM D5185m     >+100     2     4     11       Sodium     ppm     ASTM D5185m     >20     <1	Barium	ppm	ASTM D5185m	5	14	0	2
Magnesium     ppm     ASTM D5185m     560     437     536     507       Calcium     ppm     ASTM D5185m     1510     1286     1569     1531       Phosphorus     ppm     ASTM D5185m     780     533     664     740       Zinc     ppm     ASTM D5185m     870     771     962     905       Sulfur     ppm     ASTM D5185m     2040     2215     2801     2711       CONTAMINANTS     method     limit/base     current     history 1     history 2       Silicon     ppm     ASTM D5185m     >+100     2     4     11       Sodium     ppm     ASTM D5185m     >+20     <1	Molybdenum	ppm	ASTM D5185m	50	40	50	50
Calcium     ppm     ASTM D5185m     1510     1286     1569     1531       Phosphorus     ppm     ASTM D5185m     780     533     664     740       Zinc     ppm     ASTM D5185m     780     533     664     740       Zinc     ppm     ASTM D5185m     870     771     962     905       Sulfur     ppm     ASTM D5185m     2040     2215     2801     2711       CONTAMINANTS     method     limit/base     current     history 1     history 2       Silicon     ppm     ASTM D5185m     >+100     2     4     11       Sodium     ppm     ASTM D5185m     >+20     <1	Manganese	ppm	ASTM D5185m	0	0	<1	<1
Phosphorus     ppm     ASTM D5185m     780     533     664     740       Zinc     ppm     ASTM D5185m     870     771     962     905       Sulfur     ppm     ASTM D5185m     2040     2215     2801     2711       CONTAMINANTS     method     limit/base     current     history 1     history 2       Silicon     ppm     ASTM D5185m     >+100     2     4     11       Sodium     ppm     ASTM D5185m     >+20     2     4     11       Sodium     ppm     ASTM D5185m     >+20     2     4     11       Sodium     ppm     ASTM D5185m     >20     <1     2     2       Potassium     ppm     ASTM D5185m     >20     <1     0     0.1       Soot %     %     *ASTM D784     0.1     0     0.1     0     0.1       Nitration     Abs/.tmm     *ASTM D7624     >20     11.0     10.9     7.6       Sulfation     Abs/.tmm     *ASTM	Magnesium	ppm	ASTM D5185m	560	437	536	507
Zinc     ppm     ASTM D5185m     870     771     962     905       Sulfur     ppm     ASTM D5185m     2040     2215     2801     2711       CONTAMINANTS     method     limit/base     current     history 1     history 2       Silicon     ppm     ASTM D5185m     >+100     2     4     11       Sodium     ppm     ASTM D5185m     >+100     2     4     11       Sodium     ppm     ASTM D5185m     >+20     <1	Calcium	ppm	ASTM D5185m	1510	1286	1569	1531
Sulfur     ppm     ASTM D5185m     2040     2215     2801     2711       CONTAMINANTS     method     limit/base     current     history 1     history 2       Silicon     ppm     ASTM D5185m     >+100     2     4     11       Sodium     ppm     ASTM D5185m     >+100     2     4     11       Sodium     ppm     ASTM D5185m     >+100     5     7     2       Potassium     ppm     ASTM D5185m     >20     <1     2     2       INFRA-RED     method     limit/base     current     history 1     history 2       Soot %     %     *ASTM D7624     >20     11.0     0.0     0.1       Nitration     Abs/cm     *ASTM D7624     >20     11.0     10.9     7.6       Sulfation     Abs/.1mm     *ASTM D7624     >20     11.0     10.9     20.3       FLUID DEGRADATION     method     limit/base     current     history 1     history 2       Oxidation     Abs/.1mm     *	Phosphorus	ppm	ASTM D5185m	780	533	664	740
CONTAMINANTS     method     limit/base     current     history 1     history 2       Silicon     ppm     ASTM D5185m     >+100     2     4     11       Sodium     ppm     ASTM D5185m     >+100     2     4     11       Sodium     ppm     ASTM D5185m     >+100     5     7     2       Potassium     ppm     ASTM D5185m     >20     <1	Zinc	ppm	ASTM D5185m	870	771	962	905
Silicon     ppm     ASTM D5185m     >+100     2     4     11       Sodium     ppm     ASTM D5185m     >+100     5     7     2       Potassium     ppm     ASTM D5185m     >20     <1     2     2       INFRA-RED     method     limit/base     current     history 1     history 2       Soot %     %     *ASTM D7844     0.1     0     0.1       Nitration     Abs/cm     *ASTM D7624     >20     11.0     10.9     7.6       Sulfation     Abs/.1mm     *ASTM D7624     >20     11.0     10.9     7.6       Sulfation     Abs/.1mm     *ASTM D7415     >30     22.4     21.5     20.3       FLUID DEGRADATION     method     limit/base     current     history 1     history 2       Oxidation     Abs/.1mm     *ASTM D7414     >25     19.5     18.7     16.8	Sulfur	ppm	ASTM D5185m	2040	2215	2801	2711
Sodium     ppm     ASTM D5185m     5     7     2       Potassium     ppm     ASTM D5185m     >20     <1     2     2       INFRA-RED     method     limit/base     current     history 1     history 2       Soot %     %     *ASTM D7844     0.1     0     0.1       Nitration     Abs/cm     *ASTM D7624     >20     11.0     10.9     7.6       Sulfation     Abs/.1mm     *ASTM D7415     >30     22.4     21.5     20.3       FLUID DEGRADATION     method     limit/base     current     history 1     history 2       Oxidation     Abs/.1mm     *ASTM D7414     >25     19.5     18.7     16.8	CONTAMINAN	ITS	method	limit/base	current	history 1	history 2
Potassium     ppm     ASTM D5185m     >20     <1	Silicon	ppm	ASTM D5185m	>+100	2	4	11
INFRA-RED     method     limit/base     current     history 1     history 2       Soot %     %     *ASTM D7844     0.1     0     0.1       Nitration     Abs/cm     *ASTM D7624     >20     11.0     10.9     7.6       Sulfation     Abs/.1mm     *ASTM D7415     >30     22.4     21.5     20.3       FLUID DEGRADATION     method     limit/base     current     history 1     history 2       Oxidation     Abs/.1mm     *ASTM D7414     >25     19.5     18.7     16.8	Sodium	ppm	ASTM D5185m		5	7	2
Soot %     %     *ASTM D7844     0.1     0     0.1       Nitration     Abs/cm     *ASTM D7624     >20     11.0     10.9     7.6       Sulfation     Abs/.1mm     *ASTM D7615     >30     22.4     21.5     20.3       FLUID DEGRADATION     method     limit/base     current     history 1     history 2       Oxidation     Abs/.1mm     *ASTM D7414     >25     19.5     18.7     16.8	Potassium	ppm	ASTM D5185m	>20	<1	2	2
Nitration     Abs/cm     *ASTM D7624     >20     11.0     10.9     7.6       Sulfation     Abs/.tmm     *ASTM D7624     >30     22.4     21.5     20.3       FLUID DEGRADATION     method     limit/base     current     history 1     history 2       Oxidation     Abs/.tmm     *ASTM D7414     >25     19.5     18.7     16.8	INFRA-RED		method	limit/base	current	history 1	history 2
Sulfation     Abs/.1mm     *ASTM D7415     >30     22.4     21.5     20.3       FLUID DEGRADATION     method     limit/base     current     history 1     history 2       Oxidation     Abs/.1mm     *ASTM D7414     >25     19.5     18.7     16.8	Soot %	%	*ASTM D7844		0.1	0	0.1
FLUID DEGRADATION method limit/base current history 1 history 2   Oxidation Abs/.1mm *ASTM D7414 >25 19.5 18.7 16.8	Nitration	Abs/cm	*ASTM D7624	>20	11.0	10.9	7.6
Oxidation Abs/.1mm *ASTM D7414 >25 19.5 18.7 16.8	Sulfation	Abs/.1mm	*ASTM D7415	>30	22.4	21.5	20.3
	FLUID DEGRA	DATION	method	limit/base	current	history 1	history 2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	19.5	18.7	16.8
	Base Number (BN)	mg KOH/g	ASTM D2896	10.2			9.2

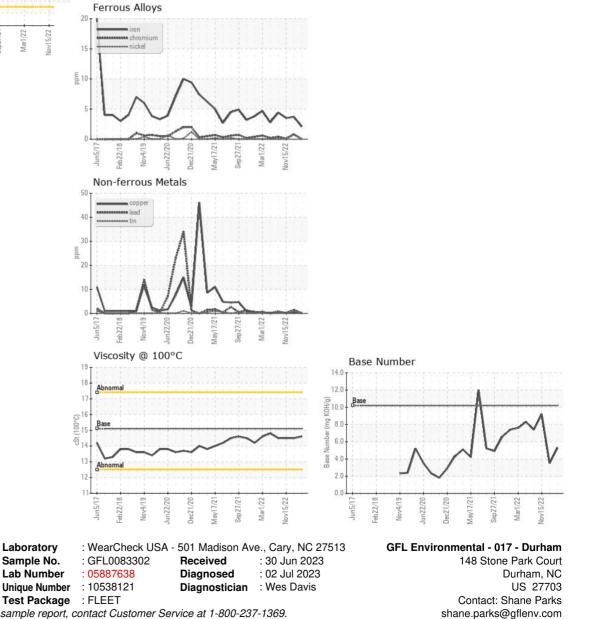


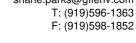
# **OIL ANALYSIS REPORT**





VISUAL		method	limit/base	current	history 1	history 2
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	LIGHT
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	>0.1	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPE	RTIES	method	limit/base	current	history 1	history 2
Visc @ 100°C	cSt	ASTM D445	15.1	14.6	14.5	14.5
GRAPHS						





Certificate L2367