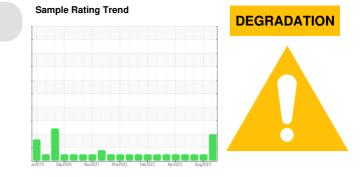


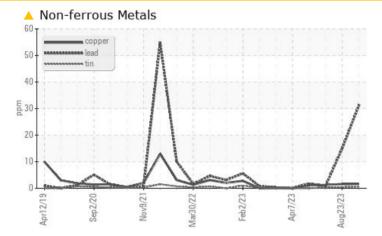
Machine Id 3842C

# **PROBLEM SUMMARY**



#### Component Natural Gas Engine Fluid PETRO CANADA DURON GEO LD 15W40 (46 GAL)

## COMPONENT CONDITION SUMMARY



### RECOMMENDATION

Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

PROBLEMATIC TEST RESULTS								
Sample Status				ABNORMAL	NORMAL	NORMAL		
Lead	ppm	ASTM D5185m	>30	<u> </u>	15	<1		
Base Number (BN)	mg KOH/g	ASTM D2896	10.2	<b>A</b> 2.9	4.1	5.0		

Customer Id: GFL018 Sample No.: GFL0080527 Lab Number: 05982250 Test Package: FLEET



To manage this report scan the QR code

*To discuss the diagnosis or test data:* Jonathan Hester +1 919-379-4092 x4092 <u>jhester@wearcheckusa.com</u>

*To change component or sample information:* Customer Service +1 1-800-237-1369 <u>customerservice@wearcheck.com</u>

RECOMMENDED ACTIONS						
Action	Status	Date	Done By	Description		
Change Fluid			?	Oil and filter change at the time of sampling has been noted.		
Change Filter			?	Oil and filter change at the time of sampling has been noted.		

### HISTORICAL DIAGNOSIS



### 23 Aug 2023 Diag: Don Baldridge

Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.



view report

### 21 Jun 2023 Diag: Wes Davis



Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

#### 02 Jun 2023 Diag: Wes Davis





Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the oil. 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**

Sample Rating Trend

DEGRADATION

# Machine Id 3842C

Component
Natural Gas Engine

Fluid

### PETRO CANADA DURON GEO LD 15W40 (46 GAL)

## DIAGNOSIS

### Recommendation

Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

### 🔺 Wear

The lead level is abnormal. All other component wear rates are normal.

### Contamination

There is no indication of any contamination in the oil.

### Fluid Condition

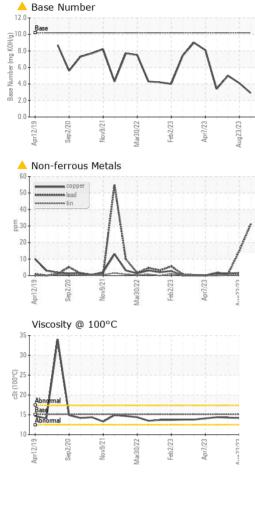
The BN level is low.

Machine Age         hrs         Client Info         4996         4996         4996         4996           Oil Age         hrs         Client Info         4996         4996         4996           Oil Changed         Client Info         ABNORMAL         NORMAL         NORMAL           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >50         11         11         7           Chromium         ppm         ASTM D5185m         >2         0         0         <1           Nickel         ppm         ASTM D5185m         >3         0         0         0           Aluminum         ppm         ASTM D5185m         >3         0         0         0           Aluminum         ppm         ASTM D5185m         >3         2         2         1         1           Nandum         ppm         ASTM D5185m         >30         A         31         15         <1           Vanadium         ppm         ASTM D5185m         >35         2         2         1         1           Tin         ppm         ASTM D5185m         50	SAMPLE INFORM	<b>IATION</b>	method	limit/base	current	history1	history2
Sample Date         Image         Client Info         Image         Pres         Client Info         4996         4996         4996           Oil Age         hrs         Client Info         4996         4996         4996           Oil Changed         Client Info         Changed         Changed	Sample Number		Client Info		GFL0080527	GFL0080566	GFL0066849
Oil Age         hrs         Client Info         4996         4996         4996         4996           Oil Changed         Client Info         Changed         Changed         Changed         Changed           Sample Status         I         Imit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >50         11         11         7           Chromium         ppm         ASTM D5185m         >2         0         0         <1	Sample Date		Client Info		17 Oct 2023	23 Aug 2023	21 Jun 2023
Oil Changed Sample Status     Client Info     Changed ABNORMAL     Changed NORMAL     NORMAL     NORMAL       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >50     11     11     7       Chromium     ppm     ASTM D5185m     >2     0     0     <1	Machine Age	hrs	Client Info		4996	4996	4996
Sample Status         Image of the status         Image of the status         NORMAL         NORMAL         NORMAL           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >50         11         11         7           Chromium         ppm         ASTM D5185m         >2         0         0         <1	Oil Age	hrs	Client Info		4996	4996	4996
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >50         11         11         7           Chromium         ppm         ASTM D5185m         >2         0         0         <1	Oil Changed		Client Info		Changed	Changed	Changed
Iron         ppm         ASTM D5185m         >50         11         11         7           Chromium         ppm         ASTM D5185m         >4         2         1         <1	Sample Status				ABNORMAL	NORMAL	NORMAL
Chromium         ppm         ASTM D5185m         >4         2         1         <1	WEAR METALS	5	method	limit/base	current	history1	history2
Nickel         ppm         ASTM D5185m         >2         0         0         <1           Titanium         ppm         ASTM D5185m         >3         0         0         <1	Iron	ppm	ASTM D5185m	>50	11	11	7
Titanium         ppm         ASTM D5185m         >3         0         0         <1           Silver         ppm         ASTM D5185m         >3         0         0         0           Aluminum         ppm         ASTM D5185m         >9         5         6         2           Lead         ppm         ASTM D5185m         >30         A 31         15         <1	Chromium	ppm	ASTM D5185m	>4	2	1	<1
Silver         ppm         ASTM D5185m         >3         0         0         0           Aluminum         ppm         ASTM D5185m         >9         5         6         2           Lead         ppm         ASTM D5185m         >30         A         31         15         <1           Copper         ppm         ASTM D5185m         >35         2         2         1           Tin         ppm         ASTM D5185m         >4         <1         <1         <1           Vanadium         ppm         ASTM D5185m         >4         <1         <1         <1           Vanadium         ppm         ASTM D5185m         50         7         11         12           Boron         ppm         ASTM D5185m         50         77         59         70           Magnese         ppm         ASTM D5185m         50         57         59         70           Magnesium         ppm         ASTM D5185m         50         57         59         70           Magnesium         ppm         ASTM D5185m         50         651         700         695           Calcium         ppm         ASTM D5185m         1510         1	Nickel	ppm	ASTM D5185m	>2	0	0	<1
AluminumppmASTM D5185m>9562LeadppmASTM D5185m>303115<1	Titanium	ppm	ASTM D5185m		0	0	<1
Lead         ppm         ASTM D5185m         >30         A 31         15         <1           Copper         ppm         ASTM D5185m         >35         2         2         1           Tin         ppm         ASTM D5185m         >4         <1	Silver	ppm	ASTM D5185m	>3	0	0	0
Copper         ppm         ASTM D5185m         >35         2         2         1           Tin         ppm         ASTM D5185m         >4         <1	Aluminum	ppm	ASTM D5185m	>9		6	2
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         history2           Boron         ppm         ASTM D5185m         50         7         11         12           Barium         ppm         ASTM D5185m         50         57         59         70           Magnese         ppm         ASTM D5185m         560         651         700         695           Calcium         ppm         ASTM D5185m         780         835         857         903           Zinc         ppm         ASTM D5185m         780         835         857         903           Sulfur         pm         ASTM D5185m         780         835         857         903           Sulfur         ppm         ASTM D5185m         780         838         857         903           Sulfur         ppm         ASTM D5185m         2040         2429	Lead	ppm	ASTM D5185m	>30	<b>A</b> 31	15	<1
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         50         7         11         12           Barium         ppm         ASTM D5185m         50         7         11         12           Barium         ppm         ASTM D5185m         50         7         59         70           Maganese         ppm         ASTM D5185m         50         57         59         70           Marganesum         ppm         ASTM D5185m         560         651         700         695           Calcium         ppm         ASTM D5185m         780         8335         857         903           Zinc         ppm         ASTM D5185m         780         8335         857         903           Sulfur         ppm         ASTM D5185m         700         1047         1102         1211           Sulfur         ppm         ASTM D5185m         2040         2429         3082 <t< td=""><td>Copper</td><td>ppm</td><td>ASTM D5185m</td><td>&gt;35</td><th>2</th><td>2</td><td>1</td></t<>	Copper	ppm	ASTM D5185m	>35	2	2	1
Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         50         7         11         12           Barium         ppm         ASTM D5185m         50         7         11         12           Barium         ppm         ASTM D5185m         50         7         11         12           Barium         ppm         ASTM D5185m         50         57         59         70           Magnesium         ppm         ASTM D5185m         560         651         700         695           Calcium         ppm         ASTM D5185m         560         651         700         695           Calcium         ppm         ASTM D5185m         780         835         857         903           Zinc         ppm         ASTM D5185m         700         1047         1102         1211           Sulfur         ppm         ASTM D5185m         >+100         100         8         9           Sodium         ppm         ASTM D5185m         >20         4		ppm		>4			
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         50         7         11         12           Barium         ppm         ASTM D5185m         50         7         11         12           Barium         ppm         ASTM D5185m         50         57         59         70           Manganese         ppm         ASTM D5185m         50         651         700         695           Calcium         ppm         ASTM D5185m         560         651         700         695           Calcium         ppm         ASTM D5185m         780         835         857         903           Zinc         ppm         ASTM D5185m         780         835         857         903           Zinc         ppm         ASTM D5185m         780         835         857         903           Sulfur         ppm         ASTM D5185m         2040         2429         3082         3408           CONTAMINANTS         method         limit/base         current         history1         history2           Sodium         ppm         ASTM D5185m         >20	Vanadium	ppm	ASTM D5185m		0	0	0
Boron         ppm         ASTM D5185m         50         7         11         12           Barium         ppm         ASTM D5185m         5         <1         0         0           Molybdenum         ppm         ASTM D5185m         50         57         59         70           Manganese         ppm         ASTM D5185m         0         <1         <1         <1         <1           Magnesium         ppm         ASTM D5185m         500         57         59         70           Magnesium         ppm         ASTM D5185m         0         <1         <11         <12           Magnesium         ppm         ASTM D5185m         560         651         700         695           Calcium         ppm         ASTM D5185m         1510         1610         1784         1954           Phosphorus         ppm         ASTM D5185m         780         835         857         903           Zinc         ppm         ASTM D5185m         70         1047         1102         1211           Sulfur         ppm         ASTM D5185m         >100         10         8         9           Sodium         ppm         ASTM D5185m	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         5         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         50         57         59         70           Manganese         ppm         ASTM D5185m         0         <1	Boron	ppm	ASTM D5185m	50	7	11	12
Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         560         651         700         695           Calcium         ppm         ASTM D5185m         1510         1610         1784         1954           Phosphorus         ppm         ASTM D5185m         780         835         857         903           Zinc         ppm         ASTM D5185m         870         1047         1102         1211           Sulfur         ppm         ASTM D5185m         2040         2429         3082         3408           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         10         8         9           Sodium         ppm         ASTM D5185m         >20         4         <1	Barium	ppm	ASTM D5185m	5	<1	0	0
Magnesium         ppm         ASTM D5185m         560         651         700         695           Calcium         ppm         ASTM D5185m         1510         1610         1784         1954           Phosphorus         ppm         ASTM D5185m         780         835         857         903           Zinc         ppm         ASTM D5185m         780         835         857         903           Zinc         ppm         ASTM D5185m         700         1047         1102         1211           Sulfur         ppm         ASTM D5185m         2040         2429         3082         3408           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         10         8         9           Sodium         ppm         ASTM D5185m         >20         4         <1	Molybdenum	ppm	ASTM D5185m	50	57	59	70
Calcium         ppm         ASTM D5185m         1510         1610         1784         1954           Phosphorus         ppm         ASTM D5185m         780         835         857         903           Zinc         ppm         ASTM D5185m         870         1047         1102         1211           Sulfur         ppm         ASTM D5185m         2040         2429         3082         3408           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         10         8         9           Sodium         ppm         ASTM D5185m         >+20         4         <1	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus         ppm         ASTM D5185m         780         835         857         903           Zinc         ppm         ASTM D5185m         870         1047         1102         1211           Sulfur         ppm         ASTM D5185m         2040         2429         3082         3408           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         10         8         9           Sodium         ppm         ASTM D5185m         >+100         10         8         9           Sodium         ppm         ASTM D5185m         >20         4         <1	Magnesium	ppm	ASTM D5185m	560	651	700	695
Zinc         ppm         ASTM D5185m         870         1047         1102         1211           Sulfur         ppm         ASTM D5185m         2040         2429         3082         3408           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >+100         10         8         9           Sodium         ppm         ASTM D5185m         >+100         10         8         9           Sodium         ppm         ASTM D5185m         >+20         4         <1	Calcium	ppm	ASTM D5185m	1510	1610	1784	1954
SulfurppmASTM D5185m2040242930823408CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>+1001089SodiumppmASTM D5185m>+1001077PotassiumppmASTM D5185m>204<10	Phosphorus	ppm	ASTM D5185m	780	835	857	903
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>+1001089SodiumppmASTM D5185m>+100107PotassiumppmASTM D5185m>204<1	Zinc	ppm	AOTH DEADE				
Silicon         ppm         ASTM D5185m         >+100         10         8         9           Sodium         ppm         ASTM D5185m         >+100         19         10         7           Potassium         ppm         ASTM D5185m         >20         4         <1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0.1         0         0.1           Nitration         Abs/cm         *ASTM D7624         >20         12.1         11.5         11.3           Sulfation         Abs/.1mm         *ASTM D7615         >30         27.7         26.1         22.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         24.5         21.8         18.6		pp	ASTM D5185m	870	1047	1102	1211
Sodium         ppm         ASTM D5185m         19         10         7           Potassium         ppm         ASTM D5185m         >20         4         <1	Sulfur				-		
Potassium         ppm         ASTM D5185m         >20         4         <1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0.1         0         0.1           Nitration         Abs/cm         *ASTM D7624         >20         12.1         11.5         11.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         27.7         26.1         22.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         24.5         21.8         18.6		ppm	ASTM D5185m	2040	2429	3082	3408
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0.1         0         0.1           Nitration         Abs/cm         *ASTM D7624         >20         12.1         11.5         11.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         27.7         26.1         22.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         24.5         21.8         18.6	CONTAMINAN	ppm TS	ASTM D5185m method	2040 limit/base	2429 current	3082 history1	3408 history2 9
Soot %         %         *ASTM D7844         0.1         0         0.1           Nitration         Abs/cm         *ASTM D7624         >20         12.1         11.5         11.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         27.7         26.1         22.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         24.5         21.8         18.6	CONTAMINAN	ppm TS ppm	ASTM D5185m method ASTM D5185m	2040 limit/base	2429 current 10	3082 history1 8	3408 history2 9
Nitration         Abs/cm         *ASTM D7624         >20         12.1         11.5         11.3           Sulfation         Abs/.1mm         *ASTM D7624         >30         27.7         26.1         22.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         24.5         21.8         18.6	CONTAMINAN Silicon Sodium	ppm TS ppm ppm	ASTM D5185m method ASTM D5185m ASTM D5185m	2040 limit/base >+100	2429 current 10 19	3082 history1 8 10	3408 history2 9 7
Sulfation         Abs/.1mm         *ASTM D7415         >30         27.7         26.1         22.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         24.5         21.8         18.6	CONTAMINAN Silicon Sodium Potassium	ppm TS ppm ppm	ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D5185m	2040 limit/base >+100 >20	2429 current 10 19 4	3082 history1 8 10 <1	3408 history2 9 7 2
FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     24.5     21.8     18.6	CONTAMINAN Silicon Sodium Potassium	ppm TS ppm ppm ppm	ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D5185m method	2040 limit/base >+100 >20	2429 current 10 19 4 current	3082 history1 8 10 <1 history1	3408 history2 9 7 2 history2
Oxidation Abs/.1mm *ASTM D7414 >25 24.5 21.8 18.6	CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm FS ppm ppm ppm %	ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D5185m method	2040 limit/base >+100 >20 limit/base	2429 current 10 19 4 current 0.1	3082 history1 8 10 <1 history1 0	3408 history2 9 7 2 history2 0.1
	CONTAMINANT Silicon Sodium Potassium INFRA-RED Soot %	ppm TS ppm ppm ppm ppm % Abs/cm	ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D7844 *ASTM D7624	2040 limit/base >+100 >20 limit/base >20	2429 current 10 19 4 current 0.1 12.1	3082 history1 8 10 <1 history1 0 11.5	3408 history2 9 7 2 history2 0.1 11.3
Base Number (BN) mg KOH/g ASTM D2896 10.2 🔺 2.9 4.1 5.0	CONTAMINANT Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm FS ppm ppm ppm ppm % Abs/cm Abs/.1mm	ASTM D5185m method ASTM D5185m ASTM D5185m *ASTM D7844 *ASTM D7824 *ASTM D7415	2040 limit/base >+100 >20 limit/base >20 >30	2429 current 10 19 4 current 0.1 12.1 27.7	3082 history1 8 10 <1 history1 0 11.5 26.1	3408 history2 9 7 2 history2 0.1 11.3 22.8
	CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm % Abs/cm Abs/cm Abs/.1mm	ASTM D5185m method ASTM D5185m ASTM D5185m *ASTM D7844 *ASTM D7844 *ASTM D7624 *ASTM D7415	2040 limit/base >+100 >20 limit/base >20 >30 limit/base	2429 current 10 19 4 current 0.1 12.1 27.7 current	3082 history1 8 10 <1 history1 0 11.5 26.1 history1	3408 history2 9 7 2 history2 0.1 11.3 22.8 history2



Report Id: GFL018 [WUSCAR] 05982250 (Generated: 10/22/2023 20:26:26) Rev: 1

# **OIL ANALYSIS REPORT**



VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	LIGHT	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	>0.1	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.1	14.0	14.2	14.3
GRAPHS						
Ferrous Alloys						

