

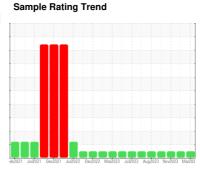
# **OIL ANALYSIS REPORT**



928028-1156

Component **Diesel Engine** 

PETRO CANADA DURON SHP 15W40 (38 QTS)





## 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

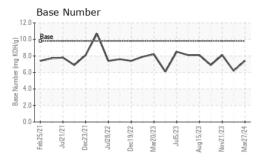
## **Fluid Condition**

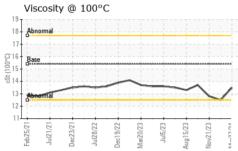
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Date	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 17902 17327 16893   Oil Age hrs Client Info 580 602 168   Oil Changed Changed Not Chansample Status Changed Not Chansample Status NorMAL	Sample Number		Client Info		GFL0110337	GFL0103049	GFL0090489
Oil Age	Sample Date		Client Info		27 Mar 2024	17 Jan 2024	21 Nov 2023
Oil Changed Sample Status Client Info Changed NORMAL 1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0 4.1.0	Machine Age	hrs	Client Info		17902	17327	16893
Sample Status	Oil Age	hrs	Client Info		580	602	168
CONTAMINATION method limit/base current history1 history1   Fuel WC Method >3.0 <1.0 <1.0 <1.0 <1.0   Water WC Method >0.2 NEG NEG NEG NEG   Glycol WC Method NEG NEG NEG NEG NEG   WEAR METALS method limit/base current history1 history1   Iron ppm ASTM D5185m >120 9 9 2   Chromium ppm ASTM D5185m >20 0 <1 0   Nickel ppm ASTM D5185m >2 0 0 <1    Silver ppm ASTM D5185m >2 0 0 <1     Lead ppm ASTM D5185m >20 3 4 2  <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	Oil Changed		Client Info		Changed	Changed	Not Changd
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
Water Glycol WC Method >0.2 NEG NEG NEG NEG   WEAR METALS method limit/base current history1 history1   Iron ppm ASTM D5185m >120 9 9 2   Chromium ppm ASTM D5185m >20 0 <1 0   Nickel ppm ASTM D5185m >5 0 0 <1   Silver ppm ASTM D5185m >2 0 0 <1   Aluminum ppm ASTM D5185m >2 0 0 <1   Lead ppm ASTM D5185m >40 0 0 <1 <1   Copper ppm ASTM D5185m >40 0 <1 <1  <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	CONTAMINATI	ON	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS method limit/base current history1 history1   Iron ppm ASTM D5185m >120 9 9 2   Chromium ppm ASTM D5185m >20 0 <1 0   Nickel ppm ASTM D5185m >5 0 0 <1   Titanium ppm ASTM D5185m >2 0 0 <1   Aluminum ppm ASTM D5185m >2 0 0 <1   Lead ppm ASTM D5185m >40 0 0 <1   Copper ppm ASTM D5185m >15 0 <1 <1   Tin ppm ASTM D5185m >15 0 <1 <1   Vanadium ppm ASTM D5185m 0 0 <1 <1   Vanadium ppm ASTM D5185m 0 0 <1 <1   Vanadium ppm ASTM D5185m 0 0 <1	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 0 <1	WEAR METALS	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>120	9	9	2
Titanium ppm ASTM D5185m >2 0 0 0   Silver ppm ASTM D5185m >2 0 0 <1	Chromium	ppm	ASTM D5185m	>20	0	<1	0
Silver	Nickel	ppm	ASTM D5185m	>5	0	0	<1
Silver ppm ASTM D5185m >2 0 0 <1   Aluminum ppm ASTM D5185m >20 3 4 2   Lead ppm ASTM D5185m >20 3 4 2   Copper ppm ASTM D5185m >40 0 0 <1   Copper ppm ASTM D5185m >330 <1 2 0   Vanadium ppm ASTM D5185m 0 <1 <1 <1   Vanadium ppm ASTM D5185m 0 0 0 0   Cadmium ppm ASTM D5185m 0 <1 7 10   Boron ppm ASTM D5185m 0 <1 7 10   Barium ppm ASTM D5185m 0 0 0 0 0   Molydenum ppm ASTM D5185m 0 0 59 55   Manguesium ppm ASTM D5185m 1010 993	Titanium	ppm	ASTM D5185m	>2	0	0	0
Aluminum	Silver				0	0	<1
Lead ppm ASTM D5185m >40 0 0 <1   Copper ppm ASTM D5185m >330 <1 2 0   Tin ppm ASTM D5185m >15 0 <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 <1 7 10   Barium ppm ASTM D5185m 0 0 0 0 0   Barium ppm ASTM D5185m 0 0 0 0 0   Manganese ppm ASTM D5185m 0 0 <1 <1    Magnesium ppm ASTM D5185m 0 0 <1 <1 <1   Calcium ppm ASTM D5185m	Aluminum	ppm	ASTM D5185m	>20	3	4	2
Copper ppm ASTM D5185m >330 <1 2 0   Tin ppm ASTM D5185m >15 0 <1	Lead			>40	0	0	<1
Tin ppm ASTM D5185m >15 0 <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 <1 7 10   Barium ppm ASTM D5185m 0 0 0 0 0   Molybdenum ppm ASTM D5185m 0 0 0 0 0   Manganese ppm ASTM D5185m 0 0 <1 <1   Magnesium ppm ASTM D5185m 1070 11559 974 1009   Phosphorus ppm ASTM D5185m 1070 11559 974 1009   Sulfur ppm ASTM D5185m 1270 1260 1113 1112   Sulfur ppm ASTM D5185m	Copper		ASTM D5185m	>330	<1	2	0
Vanadium ppm ASTM D5185m 0 0 0   Cadmium ppm ASTM D5185m 0 0 0   ADDITIVES method limit/base current history1 history1   Boron ppm ASTM D5185m 0 <1 7 10   Barium ppm ASTM D5185m 0 0 0 0   Molybdenum ppm ASTM D5185m 0 0 0 0   Magnesium ppm ASTM D5185m 0 0 <1 <1   Magnesium ppm ASTM D5185m 1010 993 823 814   Calcium ppm ASTM D5185m 1070 1159 974 1009   Phosphorus ppm ASTM D5185m 1270 1260 1113 1112   Sulfur ppm ASTM D5185m 2060 3662 2610 2854   CONTAMINANTS method limit/base current history1 <t< td=""><td></td><td></td><td></td><td></td><th>0</th><td>&lt;1</td><td>&lt;1</td></t<>					0	<1	<1
Cadmium ppm ASTM D5185m 0 0 0   ADDITIVES method limit/base current history1 history1   Boron ppm ASTM D5185m 0 <1	Vanadium		ASTM D5185m			0	0
Boron					-		
Barium ppm ASTM D5185m 0 0 0 0   Molybdenum ppm ASTM D5185m 60 60 59 55   Manganese ppm ASTM D5185m 0 0 <1 <1   Magnesium ppm ASTM D5185m 1010 993 823 814   Calcium ppm ASTM D5185m 1070 1159 974 1009   Phosphorus ppm ASTM D5185m 1070 1159 974 1009   Phosphorus ppm ASTM D5185m 1150 1057 820 982   Zinc ppm ASTM D5185m 1270 1260 1113 1112   Sulfur ppm ASTM D5185m 2060 3662 2610 2854   CONTAMINANTS method limit/base current history1 history1   Silicon ppm ASTM D5185m >25 3 4 3   Sodium ppm ASTM D5	ADDITIVES		method	limit/base	current	history1	history2
Barium ppm ASTM D5185m 0 0 0 0   Molybdenum ppm ASTM D5185m 60 60 59 55   Manganese ppm ASTM D5185m 0 0 <1	Boron	ppm	ASTM D5185m	0	<1	7	10
Manganese ppm ASTM D5185m 0 0 <1 <1   Magnesium ppm ASTM D5185m 1010 993 823 814   Calcium ppm ASTM D5185m 1070 1159 974 1009   Phosphorus ppm ASTM D5185m 1150 1057 820 982   Zinc ppm ASTM D5185m 1270 1260 1113 1112   Sulfur ppm ASTM D5185m 2060 3662 2610 2854   CONTAMINANTS method limit/base current history1 history1   Silicon ppm ASTM D5185m >25 3 4 3   Sodium ppm ASTM D5185m >20 <1	Barium		ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 993 823 814   Calcium ppm ASTM D5185m 1070 1159 974 1009   Phosphorus ppm ASTM D5185m 1150 1057 820 982   Zinc ppm ASTM D5185m 1270 1260 1113 1112   Sulfur ppm ASTM D5185m 2060 3662 2610 2854   CONTAMINANTS method limit/base current history1 history1   Silicon ppm ASTM D5185m >25 3 4 3   Sodium ppm ASTM D5185m >20 <1	Molybdenum	ppm	ASTM D5185m	60	60	59	55
Magnesium ppm ASTM D5185m 1010 993 823 814   Calcium ppm ASTM D5185m 1070 1159 974 1009   Phosphorus ppm ASTM D5185m 1150 1057 820 982   Zinc ppm ASTM D5185m 1270 1260 1113 1112   Sulfur ppm ASTM D5185m 2060 3662 2610 2854   CONTAMINANTS method limit/base current history1 history1   Silicon ppm ASTM D5185m >25 3 4 3   Sodium ppm ASTM D5185m >20 <1	•		ASTM D5185m	0	0	<1	<1
Calcium ppm ASTM D5185m 1070 1159 974 1009   Phosphorus ppm ASTM D5185m 1150 1057 820 982   Zinc ppm ASTM D5185m 1270 1260 1113 1112   Sulfur ppm ASTM D5185m 2060 3662 2610 2854   CONTAMINANTS method limit/base current history1 history1   Silicon ppm ASTM D5185m >25 3 4 3   Sodium ppm ASTM D5185m 9 11 6   Potassium ppm ASTM D5185m >20 <1	-		ASTM D5185m	1010	993	823	814
Phosphorus ppm ASTM D5185m 1150 1057 820 982   Zinc ppm ASTM D5185m 1270 1260 1113 1112   Sulfur ppm ASTM D5185m 2060 3662 2610 2854   CONTAMINANTS method limit/base current history1 history   Silicon ppm ASTM D5185m >25 3 4 3   Sodium ppm ASTM D5185m 9 11 6   Potassium ppm ASTM D5185m >20 <1	-		ASTM D5185m	1070	1159	974	1009
Zinc ppm ASTM D5185m 1270 1260 1113 1112   Sulfur ppm ASTM D5185m 2060 3662 2610 2854   CONTAMINANTS method limit/base current history1 history   Silicon ppm ASTM D5185m >25 3 4 3   Sodium ppm ASTM D5185m 9 11 6   Potassium ppm ASTM D5185m >20 <1	Phosphorus		ASTM D5185m	1150	1057	820	982
Sulfur ppm ASTM D5185m 2060 3662 2610 2854   CONTAMINANTS method limit/base current history1 history1   Silicon ppm ASTM D5185m >25 3 4 3   Sodium ppm ASTM D5185m 9 11 6   Potassium ppm ASTM D5185m >20 <1			ASTM D5185m	1270	1260	1113	1112
Silicon ppm ASTM D5185m >25 3 4 3   Sodium ppm ASTM D5185m 9 11 6   Potassium ppm ASTM D5185m >20 <1 0 2   INFRA-RED method limit/base current history1 history1 history1   Soot % % *ASTM D7844 >4 0.4 0.5 0.2   Nitration Abs/cm *ASTM D7624 >20 8.9 9.3 6.2   Sulfation Abs/.1mm *ASTM D7415 >30 18.3 18.5 17.7   FLUID DEGRADATION method limit/base current history1 history1   Oxidation Abs/.1mm *ASTM D7414 >25 15.0 14.6 13.3	Sulfur		ASTM D5185m	2060		2610	2854
Sodium ppm ASTM D5185m 9 11 6   Potassium ppm ASTM D5185m >20 <1 0 2   INFRA-RED method limit/base current history1 history1   Soot % % *ASTM D7844 >4 0.4 0.5 0.2   Nitration Abs/cm *ASTM D7624 >20 8.9 9.3 6.2   Sulfation Abs/.1mm *ASTM D7415 >30 18.3 18.5 17.7   FLUID DEGRADATION method limit/base current history1 history   Oxidation Abs/.1mm *ASTM D7414 >25 15.0 14.6 13.3	CONTAMINAN	TS	method	limit/base	current	history1	history2
Sodium ppm ASTM D5185m 9 11 6   Potassium ppm ASTM D5185m >20 <1	Silicon	ppm	ASTM D5185m	>25	3	4	3
Potassium ppm ASTM D5185m >20 <1 0 2   INFRA-RED method limit/base current history1 history1   Soot % % *ASTM D7844 >4 0.4 0.5 0.2   Nitration Abs/cm *ASTM D7624 >20 8.9 9.3 6.2   Sulfation Abs/.1mm *ASTM D7415 >30 18.3 18.5 17.7   FLUID DEGRADATION method limit/base current history1 history   Oxidation Abs/.1mm *ASTM D7414 >25 15.0 14.6 13.3		• •					
Soot % % *ASTM D7844 >4 0.4 0.5 0.2   Nitration Abs/cm *ASTM D7624 >20 8.9 9.3 6.2   Sulfation Abs/.1mm *ASTM D7415 >30 18.3 18.5 17.7   FLUID DEGRADATION method limit/base current history1 history   Oxidation Abs/.1mm *ASTM D7414 >25 15.0 14.6 13.3	Potassium	ppm	ASTM D5185m	>20	<1	0	2
Nitration Abs/cm *ASTM D7624 >20 8.9 9.3 6.2   Sulfation Abs/.1mm *ASTM D7415 >30 18.3 18.5 17.7   FLUID DEGRADATION method limit/base current history1 history1 history1   Oxidation Abs/.1mm *ASTM D7414 >25 15.0 14.6 13.3	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 18.3 18.5 17.7   FLUID DEGRADATION method limit/base current history1 history1   Oxidation Abs/.1mm *ASTM D7414 >25 15.0 14.6 13.3	Soot %	%	*ASTM D7844	>4	0.4	0.5	0.2
Sulfation Abs/.1mm *ASTM D7415 >30 18.3 18.5 17.7   FLUID DEGRADATION method limit/base current history1 history1   Oxidation Abs/.1mm *ASTM D7414 >25 15.0 14.6 13.3	Nitration	Abs/cm	*ASTM D7624	>20	8.9	9.3	6.2
Oxidation Abs/.1mm *ASTM D7414 >25 <b>15.0</b> 14.6 13.3	Sulfation		*ASTM D7415	>30			
	FLUID DEGRAD	ATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.0	14.6	13.3
DUSC MULLION (DIN) HIGHORY ACTIVIDES OF 1.4 U.C. (). [	Base Number (BN)	mg KOH/g			7.4	6.2	8.1



# **OIL ANALYSIS REPORT**

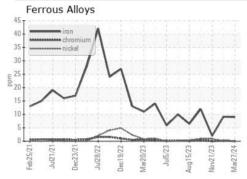


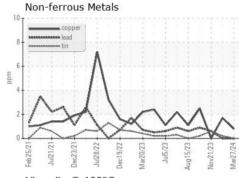


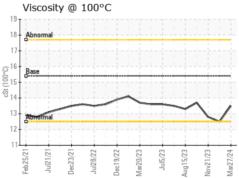
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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

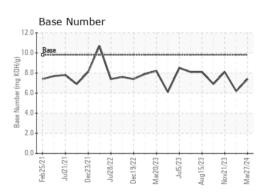
FLUID PROPI	ERTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.5	12.5	12.8

## **GRAPHS**













Certificate L2367

Laboratory Sample No.

Lab Number : 06135541

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0110337

**Tested** Unique Number : 10955006 Diagnosed Test Package : FLEET

Received : 01 Apr 2024 : 02 Apr 2024

: 02 Apr 2024 - Wes Davis

GFL Environmental - 622 - Traverse City Hauling

160 Hughes Dr Traverse City, MI US 49686

Contact: GARY BREWER

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)

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F: