

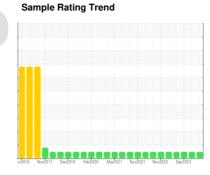
# **OIL ANALYSIS REPORT**

# G.LOPES CONSTRUCTION INC./On-Road

301

Component
Diesel Engine

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





## 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

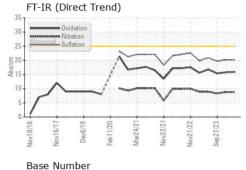
## **Fluid Condition**

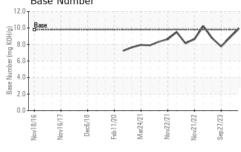
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

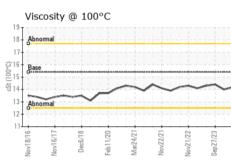
Sample Number   Client Info   PCA0110068   PCA0109673   PCA0104762   PCA0109673   PCA0104762   PCA0109673   PCA0104762   PCA0109673   PCA0104762   PCA0104762							
Sample Date	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age         mls         Client Info         228000         2000         22000         210         21.0         41.0         NCR         NCR         NCR         NEG         NEG <t< th=""><th>Sample Number</th><th></th><th>Client Info</th><th></th><th>PCA0110068</th><th>PCA0109673</th><th>PCA0104762</th></t<>	Sample Number		Client Info		PCA0110068	PCA0109673	PCA0104762
Oil Age         mls         Client Info         228000         228000         228000           Oil Changed         Client Info         N/A         N/A         N/A         N/A           Sample Status         NoRMAL         NORMAL         NORMAL         NORMAL         NORMAL           CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >5         <1.0	Sample Date		Client Info		22 May 2024	30 Jan 2024	27 Sep 2023
Cilichanged   Cilichanged   Cilichanged   N/A   NORMAL   NORMAL   NORMAL	Machine Age	mls	Client Info		228000	228000	228000
CONTAMINATION	Oil Age	mls	Client Info		228000	228000	228000
CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >5         <1.0         <1.0         <1.0         <1.0           Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         Imitition         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         12         19         11           Chromium         ppm         ASTM D5185m         >20         1         2         <1           Nickel         ppm         ASTM D5185m         >4         <1         1         0           Silver         ppm         ASTM D5185m         >3         1         <1         <1         <1           Silver         ppm         ASTM D5185m         >3         1         <1         0            Silver         ppm         ASTM D5185m         >40         <1         2         0            Copper         ppm         ASTM D5185m         >330	Oil Changed		Client Info		N/A	N/A	N/A
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         Imit/base         current         history1         history2           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         12         19         11           Chromium         ppm         ASTM D5185m         >20         1         2         <1           Nickel         ppm         ASTM D5185m         >4         <1         1         0           Silver         ppm         ASTM D5185m         >4         <1         1         0           Aluminum         ppm         ASTM D5185m         >40         <1         2         0           Copper         ppm         ASTM D5185m         >330         2         5         2           Tin         ppm         ASTM D5185m         >15         <1         1         0           Cadmium         ppm         ASTM D5185m         <1         <1         0         0           Boron         ppm         ASTM D5185m         0         6         6         6	CONTAMINATI	ON	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>5	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         1         2            Nickel         ppm         ASTM D5185m         >4         <1         1         0           Titanium         ppm         ASTM D5185m         >3         1         <1         <1           Sliver         ppm         ASTM D5185m         >3         1         <1         0           Aluminum         ppm         ASTM D5185m         >3         1         <1         0           Aluminum         ppm         ASTM D5185m         >40         <1         2         0           Copper         ppm         ASTM D5185m         >40         <1         2         0           Copper         ppm         ASTM D5185m         >15         <1         1         0           Vanadium         ppm         ASTM D5185m         >15         <1         1         0           Cadmium         ppm         ASTM D5185m         <1         <1         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         6         6	WEAR METALS	3	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	12	19	11
Titanium	Chromium	ppm	ASTM D5185m	>20	1	2	<1
Silver         ppm         ASTM D5185m         >3         1         <1         0           Aluminum         ppm         ASTM D5185m         >20         4         8         9           Lead         ppm         ASTM D5185m         >40         <1         2         0           Copper         ppm         ASTM D5185m         >330         2         5         2           Tin         ppm         ASTM D5185m         >15         <1         1         0           Vanadium         ppm         ASTM D5185m         >15         <1         1         0           Cadmium         ppm         ASTM D5185m         <1         <1         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         6         6         6         0           Barium         ppm         ASTM D5185m         0         <1         0         0           Molybdenum         ppm         ASTM D5185m         0         <1         2         0           Magnesium         ppm         ASTM D5185m         1010         903	Nickel	ppm	ASTM D5185m	>4	<1	1	0
Aluminum         ppm         ASTM D5185m         >20         4         8         9           Lead         ppm         ASTM D5185m         >40         <1         2         0           Copper         ppm         ASTM D5185m         >330         2         5         2           Tin         ppm         ASTM D5185m         >15         <1         1         0           Vanadium         ppm         ASTM D5185m         <1         <1         0         0           Cadmium         ppm         ASTM D5185m         <1         <1         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1         0	Titanium	ppm	ASTM D5185m		<1	<1	<1
Lead         ppm         ASTM D5185m         >40         <1         2         0           Copper         ppm         ASTM D5185m         >330         2         5         2           Tin         ppm         ASTM D5185m         >15         <1         1         0           Vanadium         ppm         ASTM D5185m         <1         <1         0           Cadmium         ppm         ASTM D5185m         <1         <1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         6         6         6         0           Barium         ppm         ASTM D5185m         0         <1         0         0           Barium         ppm         ASTM D5185m         0         <1         2         0           Molybdenum         ppm         ASTM D5185m         0         <1         2         0           Manganese         ppm         ASTM D5185m         0         <1         2         0           Magnesium         ppm         ASTM D5185m         1070         998         1011         1137	Silver	ppm	ASTM D5185m	>3	1	<1	0
Copper         ppm         ASTM D5185m         >330         2         5         2           Tin         ppm         ASTM D5185m         >15         <1         1         0           Vanadium         ppm         ASTM D5185m         <1         <1         0           Cadmium         ppm         ASTM D5185m         <1         <1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         6         6         0           Barium         ppm         ASTM D5185m         0         <1         0         0           Molybdenum         ppm         ASTM D5185m         0         <1         0         0           Manganese         ppm         ASTM D5185m         0         <1         2         0           Magnesium         ppm         ASTM D5185m         1010         903         919         1014           Calcium         ppm         ASTM D5185m         1070         998         1011         1137           Phosphorus         ppm         ASTM D5185m         1270         1143         1228         1321 <th>Aluminum</th> <th>ppm</th> <th>ASTM D5185m</th> <th>&gt;20</th> <th>4</th> <th>8</th> <th>9</th>	Aluminum	ppm	ASTM D5185m	>20	4	8	9
Tin	Lead	ppm	ASTM D5185m	>40	<1	2	0
Vanadium         ppm         ASTM D5185m         <1	Copper	ppm	ASTM D5185m	>330	2	5	2
Cadmium         ppm         ASTM D5185m         <1         <1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         6         6         0           Barium         ppm         ASTM D5185m         0         <1	Tin	ppm	ASTM D5185m	>15	<1	1	0
ADDITIVES	Vanadium	ppm	ASTM D5185m		<1	<1	0
Boron	Cadmium	ppm	ASTM D5185m		<1	<1	0
Barium         ppm         ASTM D5185m         0         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         56         61         63           Manganese         ppm         ASTM D5185m         0         <1	Boron	ppm	ASTM D5185m	0	6	6	0
Manganese         ppm         ASTM D5185m         0         <1	Barium	ppm	ASTM D5185m	0	<1	0	0
Magnesium         ppm         ASTM D5185m         1010         903         919         1014           Calcium         ppm         ASTM D5185m         1070         998         1011         1137           Phosphorus         ppm         ASTM D5185m         1150         887         979         1049           Zinc         ppm         ASTM D5185m         1270         1143         1228         1321           Sulfur         ppm         ASTM D5185m         2060         2904         2740         2972           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         5         4           Sodium         ppm         ASTM D5185m         >20         3         5         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         *ASTM D7844         >3         0.8         0.7         0.7           Nitration         Abs/cm         *ASTM D7624         >20         8.8         8.8         8.3           Sulfation         Abs/.1mm         *ASTM D7415         >	Molybdenum	ppm	ASTM D5185m	60	56	61	63
Calcium         ppm         ASTM D5185m         1070         998         1011         1137           Phosphorus         ppm         ASTM D5185m         1150         887         979         1049           Zinc         ppm         ASTM D5185m         1270         1143         1228         1321           Sulfur         ppm         ASTM D5185m         2060         2904         2740         2972           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         5         4           Sodium         ppm         ASTM D5185m         >20         3         5         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.8         0.7         0.7           Nitration         Abs/.1mm         *ASTM D7624         >20         8.8         8.8         8.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.2         20.2         19.7           FLUID DEGRADATION         method         <	Manganese	ppm	ASTM D5185m	0	<1	2	0
Phosphorus         ppm         ASTM D5185m         1150         887         979         1049           Zinc         ppm         ASTM D5185m         1270         1143         1228         1321           Sulfur         ppm         ASTM D5185m         2060         2904         2740         2972           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         5         4           Sodium         ppm         ASTM D5185m         >20         3         5         1           Potassium         ppm         ASTM D5185m         >20         3         5         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.8         0.7         0.7           Nitration         Abs/cm         *ASTM D7624         >20         8.8         8.8         8.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.2         20.2         19.7           FLUID DEGRADATION         method	Magnesium	ppm	ASTM D5185m	1010	903	919	1014
Zinc         ppm         ASTM D5185m         1270         1143         1228         1321           Sulfur         ppm         ASTM D5185m         2060         2904         2740         2972           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         5         4           Sodium         ppm         ASTM D5185m         >20         3         5         1           Potassium         ppm         ASTM D5185m         >20         3         5         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.8         0.7         0.7           Nitration         Abs/cm         *ASTM D7624         >20         8.8         8.8         8.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.2         20.2         19.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm	Calcium	ppm	ASTM D5185m	1070	998	1011	1137
Sulfur         ppm         ASTM D5185m         2060         2904         2740         2972           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         5         4           Sodium         ppm         ASTM D5185m         >20         3         5         1           Potassium         ppm         ASTM D5185m         >20         3         5         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.8         0.7         0.7           Nitration         Abs/cm         *ASTM D7624         >20         8.8         8.8         8.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.2         20.2         19.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.9         15.8         15.4	Phosphorus	ppm	ASTM D5185m	1150	887	979	1049
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         5         4           Sodium         ppm         ASTM D5185m         6         4         1           Potassium         ppm         ASTM D5185m         >20         3         5         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.8         0.7         0.7           Nitration         Abs/cm         *ASTM D7624         >20         8.8         8.8         8.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.2         20.2         19.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.9         15.8         15.4	Zinc	ppm	ASTM D5185m	1270	1143	1228	1321
Silicon         ppm         ASTM D5185m         >25         4         5         4           Sodium         ppm         ASTM D5185m         6         4         1           Potassium         ppm         ASTM D5185m         >20         3         5         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.8         0.7         0.7           Nitration         Abs/cm         *ASTM D7624         >20         8.8         8.8         8.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.2         20.2         19.7           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.9         15.8         15.4	Sulfur	ppm	ASTM D5185m	2060	2904	2740	2972
Sodium         ppm         ASTM D5185m         6         4         1           Potassium         ppm         ASTM D5185m         >20         3         5         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.8         0.7         0.7           Nitration         Abs/cm         *ASTM D7624         >20         8.8         8.8         8.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.2         20.2         19.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.9         15.8         15.4	CONTAMINAN	ΓS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         3         5         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.8         0.7         0.7           Nitration         Abs/cm         *ASTM D7624         >20         8.8         8.8         8.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.2         20.2         19.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.9         15.8         15.4	Silicon	ppm	ASTM D5185m	>25	4	5	4
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.8         0.7         0.7           Nitration         Abs/cm         *ASTM D7624         >20         8.8         8.8         8.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.2         20.2         19.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.9         15.8         15.4	Sodium	ppm	ASTM D5185m		6	4	1
Soot %         %         *ASTM D7844 >3         0.8         0.7         0.7           Nitration         Abs/cm         *ASTM D7624 >20         8.8         8.8         8.3           Sulfation         Abs/.1mm         *ASTM D7415 >30         20.2         20.2         19.7           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         15.9         15.8         15.4	Potassium	ppm	ASTM D5185m	>20	3	5	1
Nitration         Abs/cm         *ASTM D7624         >20         8.8         8.8         8.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         20.2         20.2         19.7           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.9         15.8         15.4	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415 >30         20.2         20.2         19.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         15.9         15.8         15.4	Soot %	%	*ASTM D7844	>3	8.0	0.7	0.7
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.9 15.8 15.4	Nitration	Abs/cm	*ASTM D7624	>20	8.8	8.8	8.3
Oxidation Abs/.1mm *ASTM D7414 >25 <b>15.9</b> 15.8 15.4	Sulfation	Abs/.1mm	*ASTM D7415	>30	20.2	20.2	19.7
	FLUID DEGRAD	ATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.9	15.8	15.4
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	9.93	8.86	7.75



## **OIL ANALYSIS REPORT**





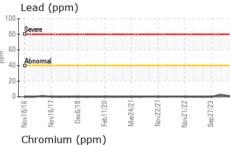


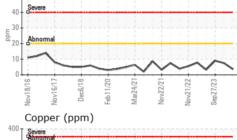
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

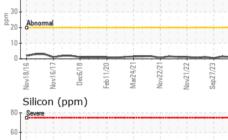
FLUID PROPI	ERIIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	14.2	14.0	14.4

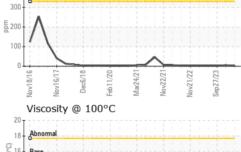
Severe	1 1						
0							
Abnorma	(						
°†							
0 1	- 0		02	21+	21	22	- 53
Nov18/16	Dec6/18		Feb 11/	Mar24/2	Nov22/	Nov21/22	Sep27/23
2 2	2 -		뽄	Σ	ž	Š	S
Alumi	num (	ppm	)				
Severe				7777			
0 + Severe							

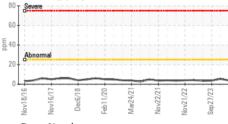
**GRAPHS** 

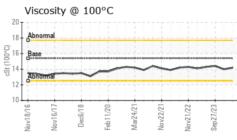


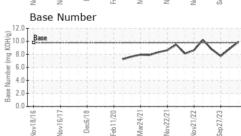
















Certificate 12367

Laboratory Sample No.

Lab Number : 06191238 Unique Number : 11047990

: PCA0110068

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 24 May 2024 **Tested** : 29 May 2024

Diagnosed : 29 May 2024 - Wes Davis

Test Package : MOB 2 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)

**G LOPES CONSTRUCTION** 

565 WINTHROP ST TAUNTON, MA US 02780

Contact: BUTCH MCGRATH bmcgrath@glopes.com

Submitted By: MATT MANOLI

T: F: