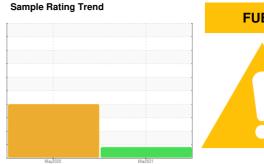


# **OIL ANALYSIS REPORT**



4476 Component **Diesel Engine** 

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





## **DIAGNOSIS**

### Recommendation

The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

All component wear rates are normal.

### Contamination

There is a moderate amount of fuel present in the oil. Tests confirm the presence of fuel in the oil.

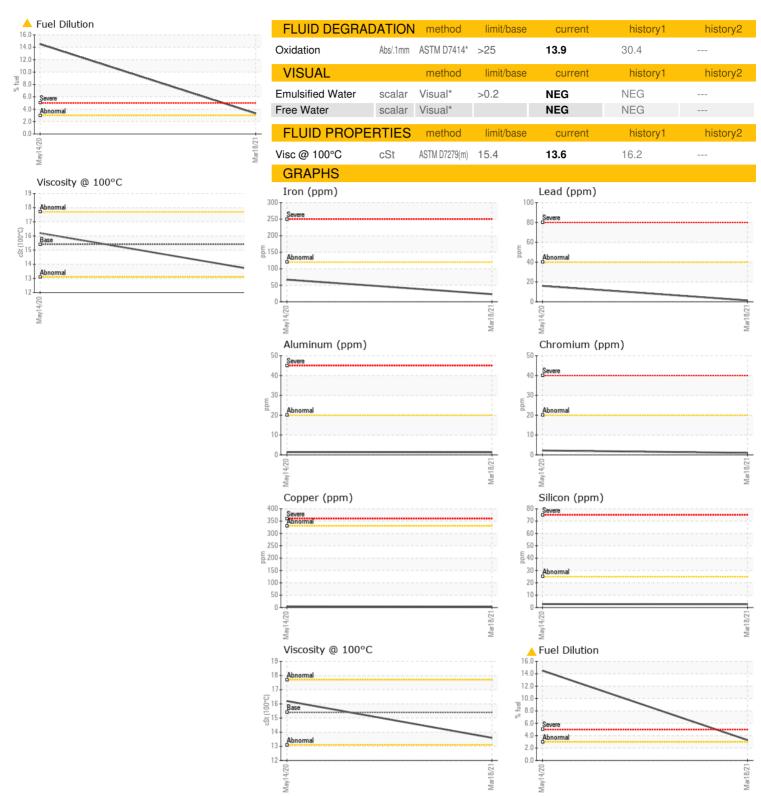
### **Fluid Condition**

The oil is no longer serviceable due to the presence of contaminants.

Sample Date   Client Info   18 Mar 2021   14 May 2020   14 Machine Age   hrs   Client Info   33224   31174   11	N 30P 13W40 (	- GAL)		May2020	Mar2021		
Sample Date   Client Info   18 Mar 2021   14 May 2020	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info	Sample Number		Client Info		GFL0014439	GFL0002533	
Dil Age	Sample Date		Client Info		18 Mar 2021	14 May 2020	
Dil Age	Machine Age	hrs	Client Info		33224		
Client Info		hrs	Client Info		500	500	
ABNORMAL   SEVERE	-		Client Info		Changed	Changed	
Water         WC Method         >0.2         NEG         NEG            WEAR METALS         method         limit/base         current         history1         history2           ron         ppm         ASTM D5185(m)         >120         23         67            Chromium         ppm         ASTM D5185(m)         >20         1         2            Vickel         ppm         ASTM D5185(m)         >5         0         <1            Siliver         ppm         ASTM D5185(m)         >2         <1         <1            Aluminum         ppm         ASTM D5185(m)         >2         <1         <1            Aluminum         ppm         ASTM D5185(m)         >20         1         1            Aluminum         ppm         ASTM D5185(m)         >40         1         16            Copper         ppm         ASTM D5185(m)         >40         1         16            Copper         ppm         ASTM D5185(m)         0         0         -1            Antimony         ppm         ASTM D5185(m)         0         0	Sample Status				_		
Calycol         WC Method         NEG         NEG            WEAR METALS         method         limit/base         current         history1         history2           ron         ppm         ASTM D5185(m)         >120         23         67            Chromium         ppm         ASTM D5185(m)         >20         1         2            Nickel         ppm         ASTM D5185(m)         >5         0         <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185(m)         >120         23         67            Chromium         ppm         ASTM D5185(m)         >20         1         2            Nickel         ppm         ASTM D5185(m)         >2         <1	Water		WC Method	>0.2	NEG	NEG	
Post	Glycol		WC Method		NEG	NEG	
Chromium	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	ron	ppm	ASTM D5185(m)	>120	23	67	
Description	Chromium	ppm	ASTM D5185(m)	>20	1	2	
Saliver	Nickel	ppm	ASTM D5185(m)	>5	0	<1	
Aluminum   ppm   ASTM D5185(m)   >20   1   1   1   Lead   ppm   ASTM D5185(m)   >40   1   16   Copper   ppm   ASTM D5185(m)   >330   4   5   Fin   ppm   ASTM D5185(m)   >15   <1   <1   Antimony   ppm   ASTM D5185(m)   0   <1   Vanadium   ppm   ASTM D5185(m)   0   0   0   Seryllium   ppm   ASTM D5185(m)   0   0   0   Cadmium   ppm   ASTM D5185(m)   0   0   0   Cadmium   ppm   ASTM D5185(m)   0   0   0    ADDITIVES   method   limit/base   current   history1   history2 Barium   ppm   ASTM D5185(m)   0   0   0   Molybdenum   ppm   ASTM D5185(m)   0   0   0   Manganese   ppm   ASTM D5185(m)   0   <1   <1   Manganesium   ppm   ASTM D5185(m)   1010   909   853   Calcium   ppm   ASTM D5185(m)   1070   998   995   Phosphorus   ppm   ASTM D5185(m)   1070   998   995   Sulfur   ppm   ASTM D5185(m)   1270   1153   1075   Sulfur   ppm   ASTM D5185(m)   2060   2527   2046   Lithium   ppm   ASTM D5185(m)   >25   3   3   CONTAMINANTS   method   limit/base   current   history1   history2 Silicon   ppm   ASTM D5185(m)   >20   0   <1   CONTAMINANTS   method   limit/base   current   history1   history2 Sodium   ppm   ASTM D5185(m)   >20   0   <1   INFRA-RED   method   limit/base   current   history1   history2 Sooto %   ASTM D784*   >4   2.1	Titanium	ppm	ASTM D5185(m)	>2	<1	<1	
Aluminum	Silver	ppm	ASTM D5185(m)	>2	0	0	
Copper	Aluminum	ppm	ASTM D5185(m)	>20	1	1	
Antimony   ppm   ASTM D5185(m)   >15   <1   <1	_ead	ppm	ASTM D5185(m)	>40	1	16	
Antimony   ppm   ASTM D5185(m)   0	Copper	ppm	ASTM D5185(m)	>330	4	5	
Vanadium         ppm         ASTM D5185(m)         0         0            Beryllium         ppm         ASTM D5185(m)         0         0            Cadmium         ppm         ASTM D5185(m)         0         0            ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         2         3            Barium         ppm         ASTM D5185(m)         0         0         0            Wolybdenum         ppm         ASTM D5185(m)         0         0         0            Wanganese         ppm         ASTM D5185(m)         0         <1         <1            Wanganesium         ppm         ASTM D5185(m)         1070         998         995            Phosphorus         ppm         ASTM D5185(m)         1070         998         995            Phosphorus         ppm         ASTM D5185(m)         1270         1153         1075            Sulfur         ppm         ASTM D5185(m)         2060         2527         2046	Γin	ppm	ASTM D5185(m)	>15	<1	<1	
Description	Antimony	ppm	ASTM D5185(m)		0	<1	
Cadmium         ppm         ASTM D5185(m)         0         0            ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         2         3            Barium         ppm         ASTM D5185(m)         0         0         0            Molybdenum         ppm         ASTM D5185(m)         60         54         52            Manganese         ppm         ASTM D5185(m)         0         <1	Vanadium	ppm	ASTM D5185(m)		0	0	
ADDITIVES	Beryllium	ppm	ASTM D5185(m)		0	0	
Boron   ppm   ASTM D5185(m)   0   2   3	Cadmium	ppm	ASTM D5185(m)		0	0	
Barium	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185(m)         60         54         52            Manganese         ppm         ASTM D5185(m)         0         <1	Boron	ppm	ASTM D5185(m)	0	2	3	
Manganese         ppm         ASTM D5185(m)         0         <1         <1            Magnesium         ppm         ASTM D5185(m)         1010         909         853            Calcium         ppm         ASTM D5185(m)         1070         998         995            Phosphorus         ppm         ASTM D5185(m)         1150         919         842            Zinc         ppm         ASTM D5185(m)         1270         1153         1075            Sulfur         ppm         ASTM D5185(m)         2060         2527         2046            Lithium         ppm         ASTM D5185(m)         20         21            CONTAMINANTS         method         limit/base         current         history1         history2           Golium         ppm         ASTM D5185(m)         >25         3         3            Potassium         ppm         ASTM D5185(m)         >20         0         <1	Barium	ppm	ASTM D5185(m)	0	0	0	
Magnesium         ppm         ASTM D5185(m)         1010         909         853            Calcium         ppm         ASTM D5185(m)         1070         998         995            Phosphorus         ppm         ASTM D5185(m)         1150         919         842            Zinc         ppm         ASTM D5185(m)         1270         1153         1075            Sulfur         ppm         ASTM D5185(m)         2060         2527         2046            Lithium         ppm         ASTM D5185(m)         2060         2527         2046            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         3         3            Potassium         ppm         ASTM D5185(m)         >20         0         <1	Molybdenum	ppm	ASTM D5185(m)	60	54	52	
Calcium         ppm         ASTM D5185(m)         1 070         998         995            Phosphorus         ppm         ASTM D5185(m)         1 150         919         842            Zinc         ppm         ASTM D5185(m)         1270         1153         1075            Sulfur         ppm         ASTM D5185(m)         2060         2527         2046            Lithium         ppm         ASTM D5185(m)         <1	Manganese	ppm	ASTM D5185(m)	0	<1	<1	
Phosphorus         ppm         ASTM D5185(m)         1 150         919         842            Zinc         ppm         ASTM D5185(m)         1270         1153         1075            Sulfur         ppm         ASTM D5185(m)         2060         2527         2046            Lithium         ppm         ASTM D5185(m)         <1	Magnesium	ppm	ASTM D5185(m)	1010	909	853	
Zinc	Calcium	ppm	ASTM D5185(m)	1070	998	995	
Sulfur         ppm         ASTM D5185(m)         2060         2527         2046            Lithium         ppm         ASTM D5185(m)         2060         2527         2046            CONTAMINANTS         method         limit/base         current         history1         history2           Solicon         ppm         ASTM D5185(m)         >25         3         3            Sodium         ppm         ASTM D5185(m)         2         <1            Potassium         ppm         ASTM D5185(m)         >20         0         <1            Fuel         %         ASTM D7593*         >3.0         3.3         14.5            INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         2.1         6.9            Nitration         Abs/cm         ASTM D7624*         >20         7.9         20.5	Phosphorus	ppm	ASTM D5185(m)	1150	919	842	
Lithium         ppm         ASTM D5185(m)         <1         <1            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         3         3            Sodium         ppm         ASTM D5185(m)         2         <1	Zinc	ppm	ASTM D5185(m)	1270	1153	1075	
Lithium         ppm         ASTM D5185(m)         <1         <1            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         3         3            Sodium         ppm         ASTM D5185(m)         2         <1	Sulfur	ppm	ASTM D5185(m)	2060	2527	2046	
Silicon         ppm         ASTM D5185(m)         >25         3         3            Sodium         ppm         ASTM D5185(m)         2         <1            Potassium         ppm         ASTM D5185(m)         >20         0         <1            Fuel         %         ASTM D7593*         >3.0         3.3         14.5            INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         2.1         6.9            Nitration         Abs/cm         ASTM D7624*         >20         7.9         20.5	Lithium	ppm	ASTM D5185(m)		<1	<1	
Sodium         ppm         ASTM D5185(m)         2         <1            Potassium         ppm         ASTM D5185(m)         >20         0         <1	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185(m)         >20         0         <1            Fuel         %         ASTM D7593*         >3.0         ▲ 3.3         ■ 14.5            INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         2.1         ● 6.9            Nitration         Abs/cm         ASTM D7624*         >20         7.9         20.5	Silicon	ppm	ASTM D5185(m)	>25	3	3	
Fuel         %         ASTM D7593*         >3.0         ▲ 3.3         ■ 14.5            INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         2.1         ● 6.9            Nitration         Abs/cm         ASTM D7624*         >20         7.9         20.5	Sodium	ppm	ASTM D5185(m)		2	<1	
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         2.1         ● 6.9            Nitration         Abs/cm         ASTM D7624*         >20         7.9         20.5	Potassium	ppm	ASTM D5185(m)	>20	0	<1	
Soot %       %       ASTM D7844*       >4       2.1       ● 6.9          Nitration       Abs/cm       ASTM D7624*       >20       7.9       20.5	Fuel	%	ASTM D7593*	>3.0	<b>△</b> 3.3	<b>14.5</b>	
Nitration   Abs/cm   ASTM D7624*   >20   <b>7.9</b>   20.5	INFRA-RED		method	limit/base	current	history1	history2
	Soot %	%	ASTM D7844*	>4	2.1	6.9	
Sulfation Abs/.1mm ASTM D7415* >30 <b>22.0</b> 66.6	Nitration	Abs/cm	ASTM D7624*	>20	7.9	20.5	
	Sulfation	Abs/.1mm	ASTM D7415*	>30	22.0	66.6	



## **OIL ANALYSIS REPORT**





CALA ISO 17025:2017 Accredited Laboratory

Laboratory Sample No. Lab Number

: GFL0014439 : 02410686

: WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 GFL Environmental - 9998 - Moved No Longer Used Units Recieved Diagnosed

Test denoted (\*) outside scope of accreditation, (m) method modified, (e) tested at external lab.

Validity of results and interpretation are based on the sample and information as supplied.

: 23 Mar 2021 : 24 Mar 2021

**CANADIAN UNITS** 

Unique Number : 5190163 Test Package : MOB 1 ( Additional Tests: PercentFuel )

Diagnostician : Wes Davis

CA Contact: Service Manager

To discuss this sample report, contact Customer Service at 1-800-268-2131.

F:

T: