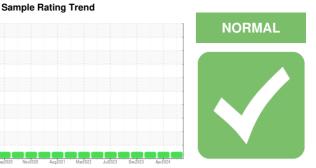


# **OIL ANALYSIS REPORT**







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

# DIAGNOSIS

#### Recommendation

Confirm the source of the lubricant being utilized for top-up/fill. 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

Additive levels indicate the addition of a different brand, or type of oil. The condition of the oil is acceptable for the time in service.

Sample Date   Client Info   11 Jul 2024   15 Apr 2024   13 Feb 2024   Machine Age   kms   Client Info   0	1011-1011	,					
Sample Date   Client Info   11 Jul 2024   15 Apr 2024   13 Feb 2024   Machine Age   kms   Client Info   394607   384057   16895   16	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age   kms	Sample Number		Client Info		GFL0112000	GFL0111989	GFL0090408
Dil Age	Sample Date		Client Info		11 Jul 2024	15 Apr 2024	13 Feb 2024
Contained   Client Info   Changed   NORMAL   N	Machine Age	kms	Client Info		394607	384057	16895
NORMAL   NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2   history2   Mater   WC Method   >3.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.	Oil Age	kms	Client Info		0	0	0
CONTAMINATION	Oil Changed		Client Info		Changed	Changed	N/A
Water	Sample Status				NORMAL	NORMAL	NORMAL
Water Glycol         WC Method WC Method         >0.2         NEG NEG NEG NEG         NEG NEG NEG           WEAR METALS         method limit/base         current current         history1         history2           Iron         ppm ASTM D5185(m)         >120         8         13         10           Chromium         ppm ASTM D5185(m)         >20         0         0         0           Nickel         ppm ASTM D5185(m)         >5         0         <1         <1           Tittanium         ppm ASTM D5185(m)         >2         0         0         0           Siliver         ppm ASTM D5185(m)         >2         0         0         0           Aluminum         ppm ASTM D5185(m)         >20         2         2         2         2           Lead         ppm ASTM D5185(m)         >40         <1         1         1         1           Copper         ppm ASTM D5185(m)         >15         0         0         0         0           Antimony         ppm ASTM D5185(m)         15         0         0         0         0           Vanadium         ppm ASTM D5185(m)         0         0         0         0         0           Beryllium	CONTAMINAT	ION	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         history2           Iron         ppm         ASTM D5185(m)         >120         8         13         10           Chromium         ppm         ASTM D5185(m)         >20         0         0         0           Nickel         ppm         ASTM D5185(m)         >2         0         0         0           Silver         ppm         ASTM D5185(m)         >2         0         0         0           Aluminum         ppm         ASTM D5185(m)         >2         0         0         0           Aluminum         ppm         ASTM D5185(m)         >20         2         2         2         2           Lead         ppm         ASTM D5185(m)         >20         2         2         2         2           Lead         ppm         ASTM D5185(m)         >20         0         0         0           Copper         ppm         ASTM D5185(m)         >15         0         0         0           Vanadium         ppm         ASTM D5185(m)         0         0         0         0           Deary Illium         ppm         ASTM D5185(m)	Water		WC Method	>0.2	NEG	NEG	NEG
Second   S	Glycol		WC Method		NEG	NEG	NEG
Chromium	WEAR METAL	.S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185(m)	>120	8	13	10
Description	Chromium	ppm	ASTM D5185(m)	>20	0	0	0
Silver	Nickel	ppm	ASTM D5185(m)	>5	0	<1	<1
Aluminum	Titanium	ppm	ASTM D5185(m)	>2	0	0	0
Lead	Silver	ppm	ASTM D5185(m)	>2	0	0	0
Copper	Aluminum	ppm	ASTM D5185(m)	>20	2	2	2
Tin	Lead	ppm	ASTM D5185(m)	>40	<1	1	1
Antimony	Copper	ppm	ASTM D5185(m)	>330	<1	2	1
Vanadium         ppm         ASTM D5185(m)         0         0         0           Beryllium         ppm         ASTM D5185(m)         0         0         0           Cadmium         ppm         ASTM D5185(m)         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         16         3         2           Barium         ppm         ASTM D5185(m)         0         0         0         0           Molybdenum         ppm         ASTM D5185(m)         0         0         0         0           Manganese         ppm         ASTM D5185(m)         0         <1         <1         0           Magnesium         ppm         ASTM D5185(m)         1010         585         981         977           Calcium         ppm         ASTM D5185(m)         1070         1526         1067         1068           Phosphorus         ppm         ASTM D5185(m)         1270         1188         1208         1208           Sulfur         ppm         ASTM D5185(m)         2060         2832         2398         <	Tin	ppm	ASTM D5185(m)	>15		0	0
Description	Antimony	ppm	ASTM D5185(m)		<1	0	0
Cadmium         ppm         ASTM D5185(m)         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         16         3         2           Barium         ppm         ASTM D5185(m)         0         0         0         0           Molybdenum         ppm         ASTM D5185(m)         60         71         59         59           Manganese         ppm         ASTM D5185(m)         0         <1	Vanadium	ppm	ASTM D5185(m)		0	0	0
ADDITIVES	Beryllium	ppm	ASTM D5185(m)		0	0	0
Boron   ppm   ASTM D5185(m)   0   16   3   2	Cadmium	ppm	ASTM D5185(m)		0	0	0
Barium	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185(m)         60         71         59         59           Manganese         ppm         ASTM D5185(m)         0         <1	Boron	ppm	ASTM D5185(m)	0	16	3	2
Manganese         ppm         ASTM D5185(m)         0         <1         <1         0           Magnesium         ppm         ASTM D5185(m)         1010         585         981         977           Calcium         ppm         ASTM D5185(m)         1070         1526         1067         1068           Phosphorus         ppm         ASTM D5185(m)         1150         942         989         1030           Zinc         ppm         ASTM D5185(m)         1270         1188         1208         1208           Sulfur         ppm         ASTM D5185(m)         2060         2832         2398         2740           Lithium         ppm         ASTM D5185(m)         <1	Barium	ppm	ASTM D5185(m)	0	0	0	0
Magnesium         ppm         ASTM D5185(m)         1010         585         981         977           Calcium         ppm         ASTM D5185(m)         1070         1526         1067         1068           Phosphorus         ppm         ASTM D5185(m)         1150         942         989         1030           Zinc         ppm         ASTM D5185(m)         1270         1188         1208         1208           Sulfur         ppm         ASTM D5185(m)         2060         2832         2398         2740           Lithium         ppm         ASTM D5185(m)         <1	Molybdenum	ppm	ASTM D5185(m)	60	71	59	59
Calcium         ppm         ASTM D5185(m)         1070         1526         1067         1068           Phosphorus         ppm         ASTM D5185(m)         1150         942         989         1030           Zinc         ppm         ASTM D5185(m)         1270         1188         1208         1208           Sulfur         ppm         ASTM D5185(m)         2060         2832         2398         2740           Lithium         ppm         ASTM D5185(m)         <1	Manganese	ppm	ASTM D5185(m)	0	<1	<1	0
Phosphorus         ppm         ASTM D5185(m)         1150         942         989         1030           Zinc         ppm         ASTM D5185(m)         1270         1188         1208         1208           Sulfur         ppm         ASTM D5185(m)         2060         2832         2398         2740           Lithium         ppm         ASTM D5185(m)         <1         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         4         1         2           Sodium         ppm         ASTM D5185(m)         >20         <1         1         1           Potassium         ppm         ASTM D5185(m)         >20         <1         1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         0         1.2         0.4           Nitration         Abs/cm         ASTM D7624*         >20         1.9         8.8         7.9	Magnesium	ppm	ASTM D5185(m)	1010	585	981	977
Zinc   ppm   ASTM D5185(m)   1270   1188   1208   1208   Sulfur   ppm   ASTM D5185(m)   2060   2832   2398   2740   274	Calcium	ppm	ASTM D5185(m)	1070	1526	1067	1068
Sulfur         ppm         ASTM D5185(m)         2060         2832         2398         2740           Lithium         ppm         ASTM D5185(m)         2060         2832         2398         2740           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         4         1         2           Sodium         ppm         ASTM D5185(m)         4         6         2           Potassium         ppm         ASTM D5185(m)         >20         <1         1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         0         1.2         0.4           Nitration         Abs/cm         ASTM D7624*         >20         1.9         8.8         7.9	Phosphorus	ppm	ASTM D5185(m)	1150	942	989	1030
Lithium         ppm         ASTM D5185(m)         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         4         1         2           Sodium         ppm         ASTM D5185(m)         4         6         2           Potassium         ppm         ASTM D5185(m)         >20         <1	Zinc	ppm	ASTM D5185(m)	1270	1188	1208	1208
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         4         1         2           Sodium         ppm         ASTM D5185(m)         4         6         2           Potassium         ppm         ASTM D5185(m)         >20         <1	Sulfur	ppm		2060			
Silicon         ppm         ASTM D5185(m)         >25         4         1         2           Sodium         ppm         ASTM D5185(m)         4         6         2           Potassium         ppm         ASTM D5185(m)         >20         <1	Lithium	ppm	ASTM D5185(m)		<1	<1	<1
Sodium         ppm         ASTM D5185(m)         4         6         2           Potassium         ppm         ASTM D5185(m)         >20         <1         1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         0         1.2         0.4           Nitration         Abs/cm         ASTM D7624*         >20         1.9         8.8         7.9	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185(m)         >20         <1         1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         0         1.2         0.4           Nitration         Abs/cm         ASTM D7624*         >20         1.9         8.8         7.9	Silicon	ppm	ASTM D5185(m)	>25	4		
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         0         1.2         0.4           Nitration         Abs/cm         ASTM D7624*         >20         1.9         8.8         7.9	Sodium	ppm	ASTM D5185(m)		4	6	2
Soot %         %         ASTM D7844*         >4         0         1.2         0.4           Nitration         Abs/cm         ASTM D7624*         >20         1.9         8.8         7.9	Potassium	ppm	ASTM D5185(m)	>20	<1	1	1
Nitration         Abs/cm         ASTM D7624*         >20         1.9         8.8         7.9	INFRA-RED		method	limit/base	current	history1	history2
	Soot %	%	ASTM D7844*	>4	0	1.2	0.4
Sulfation         Abs/.1mm         ASTM D7415*         >30         6.6         19.4         19.6	Nitration	Abs/cm	ASTM D7624*	>20	1.9	8.8	7.9
	Sulfation	Abs/.1mm	ASTM D7415*	>30	6.6	19.4	19.6

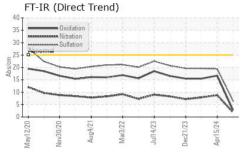


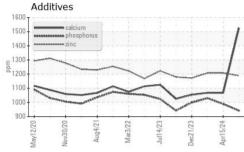
## **OIL ANALYSIS REPORT**

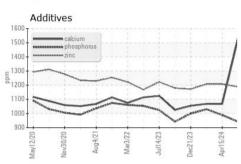
cSt

ASTM D7279(m) 15.4

Visc @ 100°C







FLUID DEGRA	NOITAC	method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	ASTM D7414*	>25	2.8	16.7	15.5
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	Visual*	NONE	NONE		
Yellow Metal	scalar	Visual*	NONE	NONE		
Precipitate	scalar	Visual*	NONE	NONE		
Silt	scalar	Visual*	NONE	NONE		
Debris	scalar	Visual*	NONE	NONE		
Sand/Dirt	scalar	Visual*	NONE	NONE		
Appearance	scalar	Visual*	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 PROPE	RTIES	method	limit/base	current	history1	history2

14.1

14.0

14.2

	GRAPI	HS						_
200	Iron (pp	m)					Lead (ppm)	
300	Severe						100   Severe	
200 Ed	i i						E 60 Abnomal	
100	Abnormal						20	
(			-	-	-			_
	May12/20 Nov30/20	Aug4/21	Mar3/22	Jul14/23	Dec21/23	Apr15/24	May12/20 Nov30/20 Aug4/21 Mar3/22 Jul14/23 Apr15/24	
	≅ ≥ Aluminu			7	ă	A	Chromium (ppm)	
50	Severe	тт (рртт	,				50	
- 40 - 30							40 Severe	
E 30	Abnormal						E 20 Abnormal	-
10	1 1 1						10	
(		Aug4/21-	Mar3/22 -	Jul14/23	Dec21/23	Apr15/24	May12/20 The Mov30/20 The Mag4/21 The Mag4/21 The Mag4/21 The Mag4/21 The Mag4/21 The Mag4/23 The Mag4	
	May12/20 Nov30/20	Aug	Mar	Jul	Dec2	Apr1	_	
400	Copper	(ppm)					Silicon (ppm) 80 <sub>T.</sub> Severe	
300	Abnormal						60	
든 200							E 40	
100							Abnormal Abnormal	-
(		21	2		23	55	33 - 27	
	May12/20 Nov30/20	Aug4/21	Mar3/22	Jul14/23	Dec21/23	Apr15/24	May12/20 Nov30/20 Aug4/21 Mar3/22 Jul14/23 Apr15/24	
	Viscosity	@ 100°	,C	-		4	Soot %	
20	Time i						8.0	
cSt (100°C)	Abnormal		<del> </del>		<del> </del>		6.0 Severe	
E) 10	Base		*************	-	***************************************	-	8	-
<sup>30</sup> 14	Abnormal		$\overline{}$				2.0	T
1.	May12/20	Aug4/21	Mar3/22 -	Jul14/23	Dec21/23 -	Apr15/24	May12/20 Nov30/20 Aug4/21 Mar3/22 Jul14/23 -	_
	May! Nov3	Au	Ma	Jul	Decz	Apri	Mayi Novî Aui Jull	

: 16 Jul 2024 - Wes Davis



CALA ISO 17025:2017 Accredited Laboratory

Laboratory

Sample No.

Lab Number : 02648085 Unique Number : 5813637

: GFL0112000

: WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 Received : 16 Jul 2024 **Tested** : 16 Jul 2024

Diagnosed Test Package : MOB 1 ( Additional Tests: Visual )

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

GFL Environmental - 216M

2475 Beryl Drive Oakville, ON CA L6J 7X4 Contact: Matthew Gunness mgunness@gflenv.com

> T: F:

Submitted By: Dora Viron