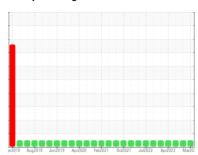


# **OIL ANALYSIS REPORT**

## Sample Rating Trend









PETRO CANADA DURON SHP 15W40 (36 GAL)

# DIAGNOSIS

### Recommendation

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

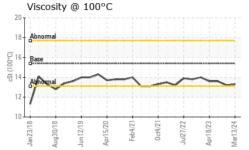
### **Fluid Condition**

The condition of the oil is acceptable for the time in service.

Sample Number   Client Info   GFL0094414   GFL0094380   GFL007730   Sample Date   Client Info   13 Mar 2024   30 Nov 2023   13 Jul 2023   1589   Client Info   14962   0   1589   Changed   Changed   Changed   Changed   Changed   Changed   Changed   NORMAL   N	SAMPLE INFORM	ΙΔΟΙΤΑΝ	method	limit/base	current	history1	history2
Sample Date		ALION		IIIIIIIIIII		•	•
Machine Age   hrs						C. 2000 .000	
Dil Age		In or a					
Colient Info							
NORMAL   NORMAL   NORMAL   NORMAL   CONTAMINATION   method   imit/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   <1.0	•	nrs					
CONTAMINATION	-		Client Info			Ü	Ü
Fuel	·				NORMAL	NORMAL	NORMAL
Water	CONTAMINATI	ON	method	limit/base	current	history1	history2
WEAR METALS   method   limit/base   current   history1   history2	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
	Glycol		WC Method		NEG	NEG	NEG
Chromium	WEAR METALS	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185(m)	>120	14	10	8
Description	Chromium	ppm	ASTM D5185(m)	>20	0	0	<1
Silver	Nickel	ppm	ASTM D5185(m)	>5	<1	<1	0
Aluminum	Titanium	ppm	ASTM D5185(m)	>2	0	0	0
Lead	Silver	ppm	ASTM D5185(m)	>2	<1	<1	<1
Copper	Aluminum	ppm	ASTM D5185(m)	>20	2	2	<1
Tin	Lead	ppm	ASTM D5185(m)	>40	<1	1	<1
Antimony         ppm         ASTM D5185(m)         0         0         0           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         8         5         2           Barium         ppm         ASTM D5185(m)         0         0         <1	Copper	ppm	ASTM D5185(m)	>330	5	8	2
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         8         5         2           Barium         ppm         ASTM D5185(m)         0         0         <1         0           Molybdenum         ppm         ASTM D5185(m)         0         0         <1         0           Manganese         ppm         ASTM D5185(m)         0         0         0         <1           Magnesium         ppm         ASTM D5185(m)         1010         931         910         957           Calcium         ppm         ASTM D5185(m)         1070         1069         1046         1032           Phosphorus         ppm         ASTM D5185(m)         1270         1142         1148         1174           Sulfur         ppm         ASTM D5185(m)         2060         2635         2480         <	Tin	ppm	ASTM D5185(m)	>15	<1	0	<1
Beryllium	Antimony	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         8         5         2           Barium         ppm         ASTM D5185(m)         0         0         <1	Vanadium	ppm	ASTM D5185(m)		0	0	0
ADDITIVES	Beryllium	ppm	ASTM D5185(m)		0	0	0
Boron	Cadmium	ppm	ASTM D5185(m)		0	0	0
Barium         ppm         ASTM D5185(m)         0         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185(m)         60         59         56         57           Manganese         ppm         ASTM D5185(m)         0         0         0         <1           Magnesium         ppm         ASTM D5185(m)         1010         931         910         957           Calcium         ppm         ASTM D5185(m)         1070         1069         1046         1032           Phosphorus         ppm         ASTM D5185(m)         1150         992         964         1032           Zinc         ppm         ASTM D5185(m)         1270         1142         1148         1174           Sulfur         ppm         ASTM D5185(m)         2060         2635         2480         2479           Lithium         ppm         ASTM D5185(m)         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         2         3         3           Sodium         ppm         ASTM D5185(m)         >20         1         1         1           INFRA-RED         method         limit/bas	Boron	ppm	ASTM D5185(m)	0	8	5	2
Manganese         ppm         ASTM D5185(m)         0         0         <1           Magnesium         ppm         ASTM D5185(m)         1010         931         910         957           Calcium         ppm         ASTM D5185(m)         1070         1069         1046         1032           Phosphorus         ppm         ASTM D5185(m)         1150         992         964         1032           Zinc         ppm         ASTM D5185(m)         1270         1142         1148         1174           Sulfur         ppm         ASTM D5185(m)         2060         2635         2480         2479           Lithium         ppm         ASTM D5185(m)         21         <1	Barium	ppm	ASTM D5185(m)	0	0	<1	0
Magnesium         ppm         ASTM D5185(m)         1010         931         910         957           Calcium         ppm         ASTM D5185(m)         1070         1069         1046         1032           Phosphorus         ppm         ASTM D5185(m)         1150         992         964         1032           Zinc         ppm         ASTM D5185(m)         1270         1142         1148         1174           Sulfur         ppm         ASTM D5185(m)         2060         2635         2480         2479           Lithium         ppm         ASTM D5185(m)         < 1         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         2         3         3           Sodium         ppm         ASTM D5185(m)         >20         1         1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         0.2         0.1         0.2           Nitration         Abs/cm	Molybdenum	ppm	ASTM D5185(m)	60	59	56	57
Calcium         ppm         ASTM D5185(m)         1070         1069         1046         1032           Phosphorus         ppm         ASTM D5185(m)         1150         992         964         1032           Zinc         ppm         ASTM D5185(m)         1270         1142         1148         1174           Sulfur         ppm         ASTM D5185(m)         2060         2635         2480         2479           Lithium         ppm         ASTM D5185(m)         <1	Manganese	ppm	ASTM D5185(m)	0	0	0	<1
Phosphorus         ppm         ASTM D5185(m)         1150         992         964         1032           Zinc         ppm         ASTM D5185(m)         1270         1142         1148         1174           Sulfur         ppm         ASTM D5185(m)         2060         2635         2480         2479           Lithium         ppm         ASTM D5185(m)         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         2         3         3           Sodium         ppm         ASTM D5185(m)         >20         1         1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         0.2         0.1         0.2           Nitration         Abs/cm         ASTM D7624*         >20         7.8         6.6         7.4	Magnesium	ppm	ASTM D5185(m)	1010	931	910	957
Zinc         ppm         ASTM D5185(m)         1270         1142         1148         1174           Sulfur         ppm         ASTM D5185(m)         2060         2635         2480         2479           Lithium         ppm         ASTM D5185(m)         <1	Calcium	ppm	ASTM D5185(m)	1070	1069	1046	1032
Sulfur         ppm         ASTM D5185(m)         2060         2635         2480         2479           Lithium         ppm         ASTM D5185(m)         2060         2635         2480         2479           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         2         3         3           Sodium         ppm         ASTM D5185(m)         20         1         1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         0.2         0.1         0.2           Nitration         Abs/cm         ASTM D7624*         >20         7.8         6.6         7.4	Phosphorus	ppm	ASTM D5185(m)	1150	992	964	1032
Lithium         ppm         ASTM D5185(m)         <1         <1         <1           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         2         3         3           Sodium         ppm         ASTM D5185(m)         2         3         3           Potassium         ppm         ASTM D5185(m)         >20         1         1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         0.2         0.1         0.2           Nitration         Abs/cm         ASTM D7624*         >20         7.8         6.6         7.4	Zinc	ppm	ASTM D5185(m)	1270	1142	1148	1174
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         2         3         3           Sodium         ppm         ASTM D5185(m)         2         3         3           Potassium         ppm         ASTM D5185(m)         >20         1         1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         0.2         0.1         0.2           Nitration         Abs/cm         ASTM D7624*         >20         7.8         6.6         7.4	Sulfur	ppm	ASTM D5185(m)	2060	2635	2480	2479
Silicon         ppm         ASTM D5185(m)         >25         2         3         3           Sodium         ppm         ASTM D5185(m)         2         3         3           Potassium         ppm         ASTM D5185(m)         >20         1         1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         0.2         0.1         0.2           Nitration         Abs/cm         ASTM D7624*         >20         7.8         6.6         7.4	Lithium	ppm	ASTM D5185(m)		<1	<1	<1
Sodium         ppm         ASTM D5185(m)         2         3         3           Potassium         ppm         ASTM D5185(m)         >20         1         1         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         0.2         0.1         0.2           Nitration         Abs/cm         ASTM D7624*         >20         7.8         6.6         7.4	CONTAMINAN	TS	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         0.2         0.1         0.2           Nitration         Abs/cm         ASTM D7624*         >20         7.8         6.6         7.4	Silicon	ppm	ASTM D5185(m)	>25	2	3	3
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >4         0.2         0.1         0.2           Nitration         Abs/cm         ASTM D7624*         >20         7.8         6.6         7.4	Sodium	ppm	ASTM D5185(m)		2	3	3
Soot %         %         ASTM D7844*         >4         0.2         0.1         0.2           Nitration         Abs/cm         ASTM D7624*         >20         7.8         6.6         7.4	Potassium	ppm	ASTM D5185(m)	>20	1	1	1
Nitration         Abs/cm         ASTM D7624*         >20         7.8         6.6         7.4	INFRA-RED		method	limit/base	current	history1	history2
	Soot %	%	ASTM D7844*	>4	0.2	0.1	0.2
Sulfation         Abs/.1mm         ASTM D7415*         >30         18.5         18.6         19.5	Nitration	Abs/cm	ASTM D7624*	>20	7.8	6.6	7.4
	Sulfation	Abs/.1mm	ASTM D7415*	>30	18.5	18.6	19.5



# **OIL ANALYSIS REPORT**



FLUID DEGRA	DATION	method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	ASTM D7414*	>25	14.2	14.5	14.9
VISUAL		method	limit/base	current	history1	history2
<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
Visc @ 100°C	cSt	ASTM D7279(m)	15.4	13.3	13.2	13.6

Visc @ 100°C	cSt	ASTM D7279(m)	15.4	13.3	13.2	13.6
GRAPHS						
Iron (ppm)				Lead (ppm)		
250 Severe				Severe		
200				60		
Abnormal				Abnormal		
100				20		
50				20		
Jan23/18 - Aug30/18 - Jun12/19 - Apr15/20 -	Feb4/21	Jui27/22	Mar13/24	Jan23/18 -	Apr15/20 -	0ct4/21 Jul27/22 Apr18/23
	£ 0	Jul	Mar		⋖	Jul Apr
Aluminum (ppm)				Chromium (	(ppm)	
Severe 40				40 - Severe		
_30				30-		
Abnormal				Abnormal 20		
10				10-		
		~~~		0		
Jan 23/18 Aug 30/18 Jun 12/19 Apr 15/20	Feb4/21	Jul27/22 Apr18/23	Mar13/24	Jan23/18 Aug30/18 Jun12/19	Apr15/20	0ct4/21 Jul27/22 Apr18/23
Copper (ppm)		7 4	Σ	್ ₹ ನ Silicon (ppn	⋖	7 & 8
500 T 3 - T - T - T - T - T - T - T - T - T		7777777		80 Severe	'/	
400 - Severe				70 + T		
300				50		
200				30 - Abnormal		
100				10		
0 8 8 6 0	21	3 2	45	0	12	22
Jan23/18 - Aug30/18 - Jun12/19 - Apr15/20 -	Feb4/21	Jul27/22 Apr18/23	Mar13/24	Jan23/18 - Aug30/18 - Jun12/19 -	Apr15/20	0ct4/21 Jul27/22 Apr18/23
Viscosity @ 100°C			_	Soot %		
20				7.0 Severe		
18 - Abnormal				5.0		
Sold Base  Base  Abhomal				24.0 - Abnormal 3.0		
Alphoemal Alphoemal		~~	_	2.0		
12				1.0-	<u></u>	
10 81/8	Feb4/21-	1/22	3/24	0.0	pr15/20 -	Oct4/21 Jul27/22 Apr18/23 Mar13/24
Jan23/18 Aug30/18 Jun12/19 Apr15/20	Feb.	Jul27/22	Mar13/24	Jan23/18 Aug30/18	Apr15/20 Feb4/21	0ct4/21 Jul27/22 Apr18/23 Mar13/24



**CALA** ISO 17025:2017 Accredited Laboratory

Laboratory Sample No.

: GFL0094414 Lab Number : 02621930 Unique Number : 5747049 Test Package : MOB 1

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

: 14 Mar 2024 : 14 Mar 2024 Diagnosed : 14 Mar 2024 - Wes Davis

GFL Environmental - 222 - Sandhill SANDHILL DISPOSAL & RECYCLING DIVIS, 19 COMMERCE ROAD

ORANGEVILLE, ON **CA L9W 3X5** Contact: GLENN COOK gcook@gflenv.com

T: (519)940-4167 F:

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.