

OIL ANALYSIS REPORT

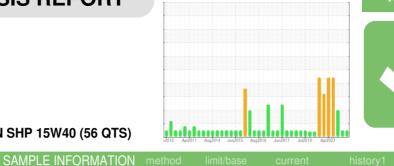
Sample Rating Trend





Component Diesel Engine Fluid

PETRO CANADA DURON SHP 15W40 (56 QTS)



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.

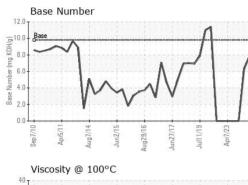
Fluid Condition

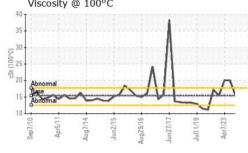
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

		0				
Sample Number		Client Info		GFL0099821	GFL0080542	GFL0066862
Sample Date		Client Info		28 Dec 2023	04 Oct 2023	21 Jun 2023
Machine Age	mls	Client Info		1073066	1073066	1073066
Oil Age	mls	Client Info		1073066	1073066	1073066
Oil Changed		Client Info		N/A	Changed	Changed
Sample Status				NORMAL	NORMAL	ABNORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>120	78	67	79
Chromium	ppm	ASTM D5185m	>20	3	2	2
Nickel	ppm	ASTM D5185m	>5	<1	<1	1
Titanium	ppm	ASTM D5185m	>2	<1	<1	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>20	3	2	<1
Lead	ppm	ASTM D5185m	>40	3	1	3
Copper	ppm	ASTM D5185m	>330	4	4	5
Tin	ppm	ASTM D5185m	>15	1	<1	1
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
	ppin			•	0	0
						history?
ADDITIVES	nnm	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	3	5	1
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	3 0	5 0	1 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	3 0 57	5 0 57	1 0 62
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	3 0 57 <1	5 0 57 <1	1 0 62 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	3 0 57 <1 930	5 0 57 <1 958	1 0 62 <1 898
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	3 0 57 <1 930 1058	5 0 57 <1 958 1065	1 0 62 <1 898 1096
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	3 0 57 <1 930 1058 1037	5 0 57 <1 958 1065 1004	1 0 62 <1 898 1096 978
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270	3 0 57 <1 930 1058 1037 1177	5 0 57 <1 958 1065 1004 1230	1 0 62 <1 898 1096 978 1203
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	3 0 57 <1 930 1058 1037	5 0 57 <1 958 1065 1004	1 0 62 <1 898 1096 978
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270	3 0 57 <1 930 1058 1037 1177	5 0 57 <1 958 1065 1004 1230	1 0 62 <1 898 1096 978 1203
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	3 0 57 <1 930 1058 1037 1177 2884	5 0 57 <1 958 1065 1004 1230 2888	1 0 62 <1 898 1096 978 1203 3129
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	3 0 57 <1 930 1058 1037 1177 2884 current	5 0 57 <1 958 1065 1004 1230 2888 history1	1 0 62 <1 898 1096 978 1203 3129 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	3 0 57 <1 930 1058 1037 1177 2884 current 8	5 0 57 <1 958 1065 1004 1230 2888 history1 8	1 0 62 <1 898 1096 978 1203 3129 history2 5
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 Limit/base >25	3 0 57 <1 930 1058 1037 1177 2884 <u>current</u> 8 1	5 0 57 <1 958 1065 1004 1230 2888 history1 8 2	1 0 62 <1 898 1096 978 1203 3129 history2 5 0
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25	3 0 57 <1 930 1058 1037 1177 2884 current 8 1 0	5 0 57 <1 958 1065 1004 1230 2888 history1 8 2 0	1 0 62 <1 898 1096 978 1203 3129 history2 5 0 1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 Limit/base >20	3 0 57 <1 930 1058 1037 1177 2884 <u>current</u> 8 1 0 <u>current</u> 3.3	5 0 57 <1 958 1065 1004 1230 2888 history1 8 2 0 0 history1	1 0 62 <1 898 1096 978 1203 3129 history2 5 0 1 1 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 Limit/base >20	3 0 57 <1 930 1058 1037 1177 2884 <i>current</i> 8 1 0 <i>current</i>	5 0 57 <1 958 1065 1004 1230 2888 history1 8 2 0 history1 3.6	1 0 62 <1 898 1096 978 1203 3129 history2 5 0 1 1 history2 ↓ 4.6
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 25 20 220 imit/base >4 >20 >4 >20	3 0 57 <1 930 1058 1037 1177 2884 <i>current</i> 8 1 0 <i>current</i> 3.3 10.0 24.2	5 0 57 <1 958 1065 1004 1230 2888 history1 8 2 2 0 history1 3.6 10.3 24.8	1 0 62 <1 898 1096 978 1203 3129 history2 5 0 1 1 history2 ▲ 4.6 12.4 27.8
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm ppm Abs/cm	ASTM D5185m ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 2060 225 220 220 220 220 220 220 230 20 20 20 20 20 20 20 20 20 20 20 20 20	3 0 57 <1 930 1058 1037 1177 2884 Current 8 1 0 Current 3.3 10.0 24.2 Current	5 0 57 <1 958 1065 1004 1230 2888 history1 8 2 2 0 history1 3.6 10.3 24.8 history1	1 0 62 <1 898 1096 978 1203 3129 history2 5 0 1 1 history2 ▲ 4.6 12.4 27.8 bistory2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 25 20 220 imit/base >4 >20 >4 >20	3 0 57 <1 930 1058 1037 1177 2884 <i>current</i> 8 1 0 <i>current</i> 3.3 10.0 24.2	5 0 57 <1 958 1065 1004 1230 2888 history1 8 2 2 0 history1 3.6 10.3 24.8	1 0 62 <1 898 1096 978 1203 3129 history2 5 0 1 1 history2 ▲ 4.6 12.4 27.8



OIL ANALYSIS REPORT





		VISUAL		method	limit/base	current	history1	history2
	Λ	White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
					NONE		NONE	
	211	Yellow Metal	scalar	*Visual		NONE		NONE
. \/		Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
MAV		Silt	scalar	*Visual	NONE	NONE	NONE	NONE
V		Debris	scalar	*Visual	NONE	NONE	NONE	NONE
		Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Jun2/15 Aug29/16 Jun27/17	Juli 1/19 Apr7/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Aun	Ju	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
°C		Emulsified Water	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 D445	15.4	14.4	14.6	15.3
	~	GRAPHS						
		Ferrous Alloys						
		300		10000000000				
Jun2/15 Aug29/16 Jun27/17	Juli 1/19 Apr7/23	250 - chromium			A			
Jun Jun	Ap	200 -						
		§ 150 -		11	-			
		100-						
		50	A A		5			
		50-	N	MJ				
				- 6 m	2816-0000			
		Sep7/10 Apr5/11 Aug7/14 Jun2/15	Aug29/16 -	Jun27/17 Jul11/19 Aor7/23	65 • 7			
		2007 NO 100 8 2040		טור אר א				
		Non-ferrous Meta	IS					
		copper		1000				
		100 - management lead						
		80-						
	3	E 60 -						
		40-		1/	1			
		20	1n	V/	1			
		and	AL	A ZN				
			//16	un27/17 Jul11/19 Aor7/23				
		Sep7/10 Apr5/11 Aug7/14 Jun2/15	Aug29/16	Jun27/17 Jul11/19 Aor7/23	15			
		Viscosity @ 100°C	2			Base Number		
		40 T		1	12.0			000000000000000000000000000000000000000
		35		1000000000	10.0	Base		Λ
		30				\sim		
		30 -		RODOCODELS	Q 8.0			
		0		a second second				111
		25 -			E 6.0		Λ.	r' l
		(25 00) 25 45 20	٨		.0.9 Minuper		$\sim \Lambda$	
		20 - Abnormal Base	~ 1		a 6.0-	h	N	
		Abnormal Base	$ \wedge $		qum	p	W	
		Abnormal Base Abnormal			0.0	h	W	
		Abnormal Base Abnormal	A - 91/61		0.0	11/10 12/11 12/14	12/15 19/16 17/17	dilia
		20 - Abnormal 15 - Abnormal	Aug ^{29/16}	Juli 1/19	0.0	Sep7/10	Jun2/15 Aug29/16 Jun2/17	Jul1/18 Ap7/23
		20 Abnormal 15 Abnormal 10 10 10 10 10 10 10 10 10 10	A		0.0			
4	Laboratory	20 Abnormal Base Abnormal 10 U/Ldw : WearCheck USA - 5	501 Madis	son Ave., Ca	2.0. 0.0.		vironmental - 01	8 - Fayetteville
ANAB	Laboratory Sample No.	20 Abnormal 15 Abnormal 10 U/Lies 20 WearCheck USA - 5 20 GFL0099821	501 Madis Recieved	son Ave., Ca 1 : 08 、	2.0. 0.0. ry, NC 27513 Jan 2024		vironmental - 01 4621	8 - Fayetteville Marracco Drive
	Laboratory Sample No. Lab Number	20 40-0000000 10 40-0000000000000000000000000000000000	501 Madia Recieved	son Ave., Ca 1 : 08 v ed : 09 v	ry, NC 27513 Jan 2024 Jan 2024		vironmental - 01 4621	8 - Fayetteville Marracco Drive Hope Mills, NC
	Laboratory Sample No. Lab Number Unique Number	20 40-0000000 10 10 10 10 10 10 10 10	501 Madis Recieved	son Ave., Ca 1 : 08 v ed : 09 v	2.0. 0.0. ry, NC 27513 Jan 2024		vironmental - 01 4621	8 - Fayetteville Marracco Drive Hope Mills, NC US 28348
Certificate L2367 To discuss this	Laboratory Sample No. Lab Number Unique Number Test Package	20 40-0000000 10 10 10 10 10 10 10 10	501 Madia Recieved Diagnose Diagnose	son Ave., Ca 1 : 08 d ed : 09 d ician : Wes	2.0. 0.0. ry, NC 27513 Jan 2024 Jan 2024 s Davis		vironmental - 01 4621 I Contact	8 - Fayetteville Marracco Drive Hope Mills, NC US 28348 : Robert Carter
To discuss this * - Denotes tes	Laboratory Sample No. Lab Number Unique Number Test Package sample report, st methods that a	20 40-0000000 10 10 10 10 10 10 10 10	501 Madis Recieved Diagnos Diagnost vice at 1-8 7025 sco	son Ave., Ca d : 08 c ed : 09 c ician : Wes 200-237-1365 upe of accred	ry, NC 27513 Jan 2024 Jan 2024 s Davis D. <i>Litation.</i>	GFL En	vironmental - 01 4621 I Contact robert.carte T:	8 - Fayetteville Marracco Drive Hope Mills, NC US 28348

Ξi