

OIL ANALYSIS REPORT

Sample Rating Trend

NORMAL

723023-361636

Component Diesel Engine

Fluid

PETRO CANADA DURON SHP 15W40 (--- 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.

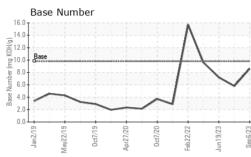
Fluid Condition

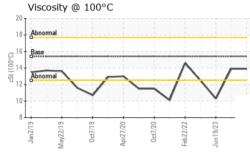
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0090660	GFL0083751	GFL0083799
Sample Date		Client Info		06 Sep 2023	18 Jul 2023	19 Jun 2023
Machine Age	hrs	Client Info		29546	24267	24076
Oil Age	hrs	Client Info		600	0	600
Oil Changed		Client Info		Changed	Not Changd	Changed
Sample Status				NORMAL	MARGINAL	SEVERE
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	4.1	16.4
Glycol		WC Method	20	NEG	NEG	NEG
-						
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	7	48	14
Chromium	ppm	ASTM D5185m	>20	<1	2	<1
Nickel	ppm	ASTM D5185m	>4	0	<1	0
Titanium	ppm	ASTM D5185m		0	0	0
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>20	<1	6	0
Lead	ppm	ASTM D5185m	>40	0	1	0
Copper	ppm	ASTM D5185m	>330	0	1	<1
Tin	ppm	ASTM D5185m	>15	0	0	0
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		and the second	12			
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	limit/base	current 32	history1 0	nistory2 0
	ppm ppm					
Boron		ASTM D5185m	0	32	0	0
Boron Barium	ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0	32 0	0 2	0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	32 0 57	0 2 66	0 0 48
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	32 0 57 <1	0 2 66 <1	0 0 48 0
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	32 0 57 <1 835	0 2 66 <1 951	0 0 48 0 770
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	32 0 57 <1 835 1271	0 2 66 <1 951 1136	0 0 48 0 770 821
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	32 0 57 <1 835 1271 949	0 2 66 <1 951 1136 1018	0 0 48 0 770 821 811
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	0 0 60 0 1010 1070 1150 1270	32 0 57 <1 835 1271 949 1144	0 2 66 <1 951 1136 1018 1260	0 0 48 0 770 821 811 974
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	0 0 60 1010 1070 1150 1270 2060	32 0 57 <1 835 1271 949 1144 3426	0 2 66 <1 951 1136 1018 1260 3017	0 0 48 0 770 821 811 974 2833
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	0 0 60 1010 1070 1150 1270 2060	32 0 57 <1 835 1271 949 1144 3426 current	0 2 66 <1 951 1136 1018 1260 3017 history1	0 0 48 0 770 821 811 974 2833 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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25	32 0 57 <1 835 1271 949 1144 3426 current 3	0 2 66 <1 951 1136 1018 1260 3017 history1 0	0 0 48 0 770 821 811 974 2833 history2 4
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 method ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25	32 0 57 <1 835 1271 949 1144 3426 current 3 11	0 2 66 <1 951 1136 1018 1260 3017 history1 0 7	0 0 48 0 770 821 811 974 2833 history2 4 28
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 Imit/base >25	32 0 57 <1 835 1271 949 1144 3426 current 3 11 0	0 2 66 <1 951 1136 1018 1260 3017 history1 0 7 8	0 0 48 0 770 821 811 974 2833 history2 4 28 33
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 Limit/base >20	32 0 57 <1 835 1271 949 1144 3426 current 3 11 0	0 2 66 <1 951 1136 1018 1260 3017 history1 0 7 8 8 history1	0 0 48 0 770 821 811 974 2833 history2 4 28 <1 28 <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 TS ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 Limit/base >20	32 0 57 <1 835 1271 949 1144 3426 <u>current</u> 3 11 0 <u>current</u> 0.4	0 2 66 <1 951 1136 1018 1260 3017 history1 0 7 8 <u>history1</u> 1.1	0 0 48 0 770 821 811 974 2833 history2 4 28 <1 28 <1 history2 0.6
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 <i>limit/base</i> >3 >20	32 0 57 <1 835 1271 949 1144 3426 current 3 11 0 current 0.4 6.1	0 2 66 <1 951 1136 1018 1260 3017 history1 0 7 8 <u>history1</u> 1.1 1.2.9	0 0 48 0 770 821 811 974 2833 history2 4 28 28 3 4 28 <1 history2 0.6 8.6
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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 20 imit/base >3 20 20	32 0 57 <1 835 1271 949 1144 3426 <u>current</u> 3 11 0 <u>current</u> 0.4 6.1 18.1	0 2 66 <1 951 1136 1018 1260 3017 history1 0 7 8 8 history1 1.1 1.2.9 26.0	0 0 48 0 770 821 811 974 2833 history2 4 28 <1 28 <1 history2 0.6 8.6 21.8
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 ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 20 220 20 3 20 20 20 20 20 20 20 20 20 20 20 20 20	32 0 57 <1 835 1271 949 1144 3426 current 3 11 0 current 0.4 6.1 18.1	0 2 66 <1 951 1136 1018 1260 3017 history1 0 7 8 <u>history1</u> 1.1 12.9 26.0 history1	0 0 48 0 770 821 811 974 2833 history2 4 28 33 history2 4 28 <1 history2 0.6 8.6 21.8 history2



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	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
\sim	Silt	scalar	*Visual	NONE	NONE	NONE	NONE
	Debris	scalar	*Visual	NONE	NONE	NONE	NONE
_	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Jun 19/23 Sep6/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Jun Se	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
	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	13.9	13.9	• 10.3
	GRAPHS						
$\mathbf{\nabla}$	Ferrous Alloys						
2	50 iron			A			
Jun 19/23	40 - nickel			Λ			
-	30						
	Edd			1			
	20-	1	41	-+-			
	10	T	λ				
			Y I	1			
		50 Z0	53	53			
	Jan2/19 . May22/19 . Oct7/19 .	Apr2//20 0ct7/20	Feb22/22 Jun19/23	Sep6/23			
	≥ Non-ferrous Metal	28	μ ,				
	12 T	A					
	10 - copper	Λ					
	tin	/					
	E 6	1					
	4		1				
	2		~				
			11	\sim			
	Jan2/19 . May22/19 .	Apr21/20 -	Feb22/22	Sep6/23 -			
	Jan May2 Oct	April	Feb22/22 Jun19/23	Sep			
	Viscosity @ 100°C				Base Number		
	19 18 Abnormal			16.0			A
	17-			14.0			Λ
	16 Base			응 12.0	Dese		1
1000	515- B ₁₄		٨	Ē 10.0	Base		
11 40	2 15- 14- 3 13- Abnomal		Λ				
	12	\sim	1×1	())H12.0 DHDy Bull aq 8.0 Will be 8.0 Bull Bage 4.0	\sim		
			V V	2.0		~~	
	10			0.0			
	Jan 2/19	Apr2//20 0ct7/20	Feb22/22 Jun19/23	Sep6/23	Jan 2/19 . May 22/19 . Oct7/19 .	Apr27/20 0ct7/20	Feb22/22 - Jun19/23 - Sep6/23 -
		- 0		0.5			
	lay ver	Ap 0	Ju Fe	05	o yay	O O	Sel Jun Sel

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 GFL Environmental - 837 - Harrison TS Laboratory Sample No. : GFL0090660 Received : 13 Sep 2023 22820 S State Route 291 Lab Number : 05949841 Diagnosed : 15 Sep 2023 Harrisonville, MO Unique Number : 10645800 Diagnostician : Wes Davis US 64701 Test Package : FLEET Contact: BRYAN SWANSON Certificate L2367 To discuss this sample report, contact Customer Service at 1-800-237-1369. bryanswanson@gflenv.com T: * - 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)

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