

OIL ANALYSIS REPORT





Machine Id 10594

Component **Diesel Engine**

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

DIAGNOSIS

Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

Light fuel dilution occurring. No other contaminants were detected 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.



,		32017 Jun20		Mar2020 Jan2023 Jun2023 (Det2023	
SAMPLE INFORM	ATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0100437	GFL0100436	GFL0103484
Sample Date		Client Info		20 Dec 2023	08 Dec 2023	29 Nov 2023
Machine Age	hrs	Client Info		15268	15178	15105
Oil Age	hrs	Client Info		0	0	0
Oil Changed		Client Info		N/A	Changed	N/A
Sample Status				MARGINAL	SEVERE	SEVERE
CONTAMINATIO	ON	method	limit/base	current	history1	history2
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	8	19	27
Chromium	ppm	ASTM D5185m	>20	<1	1	2
Nickel	ppm	ASTM D5185m	>4	0	<1	<1
	ppm	ASTM D5185m		0	0	<1
Silver	ppm	ASTM D5185m	>3	0	0	0
	ppm	ASTM D5185m	>20	3	3	3
	ppm	ASTM D5185m	>40	0	0	<1
	ppm	ASTM D5185m	>330	0	<1	1
	ppm	ASTM D5185m	>15	0	0	<1
	ppm	ASTM D5185m		0	0	<1
	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	3	3	2
				-		
	ppm	ASTM D5185m	0	0	<1	0
Barium	ppm ppm	ASTM D5185m ASTM D5185m	0 60	0 58	<1 57	0 58
Barium Molybdenum			60	-		
Barium Molybdenum Manganese	ppm	ASTM D5185m	60	58	57	58
Barium Molybdenum Manganese Magnesium	ppm ppm	ASTM D5185m ASTM D5185m	60 0	58 0	57 <1	58 <1
Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	60 0 1010	58 0 835	57 <1 833	58 <1 875
Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	60 0 1010 1070	58 0 835 950	57 <1 833 890	58 <1 875 922
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	60 0 1010 1070 1150	58 0 835 950 844	57 <1 833 890 924	58 <1 875 922 932
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	60 0 1010 1070 1150 1270	58 0 835 950 844 1086	57 <1 833 890 924 1094	58 <1 875 922 932 1153
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	60 0 1010 1070 1150 1270 2060	58 0 835 950 844 1086 2937	57 <1 833 890 924 1094 2593	58 <1 875 922 932 1153 2472
Barium Molybdenum Manganese Magnesium Calcium Chosphorus Zinc Sulfur CONTAMINANT Silicon	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	60 0 1010 1070 1150 1270 2060	58 0 835 950 844 1086 2937 current	57 <1 833 890 924 1094 2593 history1	58 <1 875 922 932 1153 2472 history2
Barium Molybdenum Manganese Magnesium Calcium Chosphorus Zinc Sulfur CONTAMINANT Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m Method ASTM D5185m	60 0 1010 1070 1150 1270 2060	58 0 835 950 844 1086 2937 current 5	57 <1 833 890 924 1094 2593 history1 4	58 <1 875 922 932 1153 2472 history2 5
Barium Molybdenum Manganese Magnesium Calcium Chosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm S	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	60 0 1010 1070 1150 1270 2060 limit/base >25	58 0 835 950 844 1086 2937 current 5 3	57 <1 833 890 924 1094 2593 history1 4 6	58 <1 875 922 932 1153 2472 history2 5 6
Barium Molybdenum Manganese Magnesium Calcium Chosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium	ppm ppm 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	60 0 1010 1070 1150 1270 2060 limit/base >25	58 0 835 950 844 1086 2937 <u>current</u> 5 3 3	57 <1 833 890 924 1094 2593 history1 4 6 3	58 <1 875 922 932 1153 2472 history2 5 6 3
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium Fuel INFRA-RED	ppm ppm 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 ASTM D5185m	60 0 1010 1070 1150 1270 2060 limit/base >25 >20 >5	58 0 835 950 844 1086 2937 current 5 3 3 3 3 3 3 3 3.7 current	57 <1 833 890 924 1094 2593 history1 4 6 3 3 € 8.7	58 <1 875 922 932 1153 2472 history2 5 6 3 ↓ 11.4
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium Fuel INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D3524 method	60 0 1010 1070 1150 1270 2060 limit/base >20 >5 limit/base >3	58 0 835 950 844 1086 2937 current 5 3 3 3 3 3 3 3 3 3 2 2 3 3 3 3 3 3 3 3	57 <1 833 890 924 1094 2593 history1 4 6 3 3 ● 8.7 history1 0.6	58 <1 875 922 932 1153 2472 history2 5 6 3 3 ↓ 11.4 history2 0.5
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	60 0 1010 1070 1150 1270 2060 limit/base >25 >20 >5	58 0 835 950 844 1086 2937 current 5 3 3 3 3 3 3 3 3.7 current	57 <1 833 890 924 1094 2593 history1 4 6 3 3 € 8.7 history1	58 <1 875 922 932 1153 2472 history2 5 6 3 3 € 11.4 history2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D3524 ASTM D3524 *ASTM D7844	60 0 1010 1070 1150 1270 2060 bimit/base >25 >20 >5 bimit/base >3 >20	58 0 835 950 844 1086 2937 current 5 3 3 3 3 3 3 3 3 3 3 2 0.3 6.9	57 <1 833 890 924 1094 2593 history1 4 6 3 € 8.7 history1 0.6 10.6	58 <1 875 922 932 1153 2472 history2 5 6 3 ↓ 11.4 history2 0.5 10.2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm % % Abs/cm Abs/cm Abs/1mm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D3524 ASTM D3524 *ASTM D7844 *ASTM D7624 *ASTM D7415	60 0 1010 1070 1150 2060 2060 >25 20 >20 >5 20 >3 >20 >30 20 >30	58 0 835 950 844 1086 2937 current 5 3 3 3 3 3 3 3.7 current 0.3 6.9 18.3 current	57 <1 833 890 924 1094 2593 history1 4 6 3 ● 8.7 history1 0.6 10.6 21.1 history1	58 <1 875 922 932 1153 2472 history2 5 6 3 ↓ 11.4 history2 0.5 10.2 20.2 history2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation CLUID DEGRADA	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D51854 ASTM D51854 *ASTM D7824 *ASTM D7824	60 0 1010 1070 1150 2060 2060 225 20 >25 20 >5 20 >3 20 >3 20 30 20 30 20 20 20 20 20 20 20 20 20 20 20 20 20	58 0 835 950 844 1086 2937 current 5 3 3 3 3 3 3 3 3 3.7 current 0.3 6.9 18.3	57 <1 833 890 924 1094 2593 history1 4 6 3 3 € 8.7 history1 0.6 10.6 21.1	58 <1 875 922 932 1153 2472 history2 5 6 3 € 11.4 history2 0.5 10.2 20.2

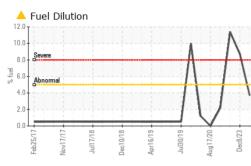


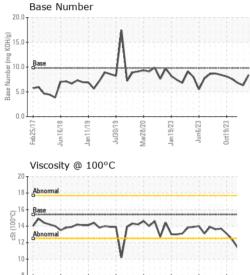
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OIL ANALYSIS REPORT





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	VISUAL		method	limit/base	current	history1	history2
	White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
1	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
1	Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
1	Silt	scalar	*Visual	NONE	NONE	NONE	NONE
	Debris	scalar	*Visual	NONE	NONE	NONE	NONE
	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Dec8/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Dec	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	13.1	▲ 11.6	▲ 11.4
1	GRAPHS						
	Ferrous Alloys						
-	300 iron						
	250 - newspace chromium						
	200 -						
m	150-						
8	100-						
	50-	0.00					
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	Feb25/17 Jun16/18 Jan11/19 Jul30/19	Mar28/20	Jan 19/23 - Jun 6/23 Oct 19/23				
	Viscosity @ 100°C		9.632		Base Numbe	r	
	19 18 Abnormal			18.			
	18 Automa			16.		1112	
	10			(B/H	D	1	
C.	Dasc			(0,14.) HOX but 12.) but 10. but 10. B	0 - Base	1	
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Feb25/17 -Oct19/23 -Feb25/17 -Jan 11/19 Jan 19/23 Jun6/23 Jan 11/19 Jun6/23 0ct19/23 Jan 19/23 Jun 16/18 ul30/19 Mar28/20 Jun 16/18 Vlar28/20 : WearCheck USA - 501 Madison Ave., Cary, NC 27513 GFL Environmental - 868 - Childersburg Fines Hauling (Alpine) Laboratory 13737 Plant Rd Sample No. : GFL0100437 Recieved : 27 Dec 2023 Lab Number : 06046557 Diagnosed : 29 Dec 2023 Childersburg, AL Unique Number : 10807165 Diagnostician : Sean Felton US 35044 Test Package : FLEET (Additional Tests: PercentFuel) Contact: JONATHAN WILLIAMS Certificate L2367 To discuss this sample report, contact Customer Service at 1-800-237-1369. jonathan.williams@gflenv.com * - Denotes test methods that are outside of the ISO 17025 scope of accreditation. Т: Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012) F: