

OIL ANALYSIS REPORT

Machine Id 727105-310043 Component

Diesel Engine

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

DIAGNOSIS

Recommendation

Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

Wear

All component wear rates are normal.

Contamination

Sodium and/or potassium levels are high. Test for glycol is negative.

Fluid Condition

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



SAMPLE INFORI	MATION					history2		
Sample Number		Client Info		GFL0105192	GFL0105309	GFL0105263		
Sample Date		Client Info		19 Mar 2024	26 Feb 2024	14 Feb 2024		
Machine Age	hrs	Client Info		18636	18466	2323		
Oil Age	hrs	Client Info		600	200	600		
Oil Changed		Client Info		Changed	Not Change	Changed		
Sample Status				ATTENTION	MARGINAI	SEVERE		
Campio Claudo						OLVERE		
CONTAMINAT	ION	method	limit/base	current	history1	history2		
Fuel		WC Method	>5	<1.0	2 .8	1 8.4		
Water		WC Method	>0.2	NEG	NEG	NEG		
WEAR METALS method limit/base current history1 history2								
Iron	ppm	ASTM D5185m	>110	41	20	41		
Chromium	ppm	ASTM D5185m	>4	2	1	2		
Nickel	ppm	ASTM D5185m	>2	1	<1	<1		
Titanium	ppm	ASTM D5185m		<1	0	0		
Silver	ppm	ASTM D5185m	>2	0	0	0		
Aluminum	ppm	ASTM D5185m	>25	9	4	6		
Lead	ppm	ASTM D5185m	>45	<1	<1	2		
Copper	ppm	ASTM D5185m	>85	1	<1	3		
Tin	ppm	ASTM D5185m	>4	<1	<1	<1		
Vanadium	ppm	ASTM D5185m		<1	<1	0		
Cadmium	ppm	ASTM D5185m		0	0	0		
ADDITIVES						history2		
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current	history1 <1	history2 2		
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	limit/base 0 0	current <1 0	history1 <1 0	history2 2 0		
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 0 60	current <1 0 94	history1 <1 0 64	history2 2 0 44		
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 0 60 0	<pre>current <1 0 94 <1</pre>	history1 <1 0 64 <1	history2 2 0 44 <1		
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 0 60 0 1010	<1 <1 94 <1 1368	history1 <1 0 64 <1 1156	history2 2 0 44 <1 707		
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 0 60 0 1010 1070	<pre>current <1 0 94 <1 1368 1500</pre>	history1 <1 0 64 <1 1156 1261	history2 2 0 44 <1 707 748		
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 0 60 0 1010 1070 1150	<pre>current <1 0 94 <1 1368 1500 1436</pre>	history1 <1 0 64 <1 1156 1261 1177	history2 2 0 44 <1 707 748 738		
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 0 60 0 1010 1070 1150 1270	<pre>current <1 0 94 <1 1368 1500 1436 1789</pre>	history1 <1 0 64 <1 1156 1261 1177 1535	history2 2 0 44 <1 707 748 738 923		
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 0 60 0 1010 1070 1150 1270 2060	<pre>current <1 0 94 <1 1368 1500 1436 1789 4110</pre>	history1 <1 0 64 <1 1156 1261 1177 1535 3632	history2 2 0 44 <1 707 748 738 923 2142		
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 0 60 0 1010 1070 1150 1270 2060	<pre>current <1 0 94 <1 1368 1500 1436 1789 4110 current</pre>	history1 <1 0 64 <1 1156 1261 1177 1535 3632 history1	history2 2 0 44 <1 707 748 738 923 2142 history2		
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 0 60 0 1010 1070 1150 1270 2060 limit/base >30	<pre>current <1 0 94 <1 1368 1500 1436 1789 4110 current 12</pre>	history1 <1 0 64 <1 1156 1261 1177 1535 3632 history1 5	history2 2 0 44 <1 707 748 738 923 2142 history2 8		
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 0 60 0 1010 1070 1150 1270 2060 limit/base >30	 current <1 94 <1 1368 1500 1436 1789 4110 current 12 96 	history1 <1 0 64 <1 1156 1261 1177 1535 3632 history1 5 47	history2 2 0 44 <1 707 748 738 923 2142 history2 8 6		
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm TS	method ASTM D5185m ASTM D5185m	limit/base 0 0 60 0 1010 1070 1150 1270 2060 limit/base >30 >20	<pre>current </pre> <1 0 94 1 1368 1500 1436 1789 4110 current 12 96 11	history1 <1 0 64 <1 1156 1261 1177 1535 3632 history1 5 47 5	history2 2 0 44 <1 707 748 738 923 2142 history2 8 6 5		
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol	ppm ppm ppm ppm ppm ppm ppm ppm ppm TS	method ASTM D5185m ASTM D5185m	limit/base 0 0 60 0 1010 1070 1150 1270 2060 limit/base >30 >20	<pre>current </pre> <1 0 94 1 1368 1500 1436 1789 4110 current 12 96 11 NEG	history1 <1 0 64 <1 1156 1261 1177 1535 3632 history1 5 47 5 47 5 NEG	history2 2 0 44 <1 707 748 738 923 2142 history2 8 6 5 NEG		
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	method ASTM D5185m ASTM D2982	limit/base 0 0 60 0 1010 1070 1150 1270 2060 limit/base >30 >20 limit/base	current <1 0 94 <1 1368 1500 1436 1789 4110 current 12 96 11 NEG current	history1 <1 0 64 <1 1156 1261 1177 1535 3632 history1 5 47 5 47 5 NEG history1	history2 2 0 44 <1 707 748 738 923 2142 history2 8 6 5 NEG history2		
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m *ASTM D2982 method *ASTM D7844	limit/base 0 0 60 0 1010 1070 1150 1270 2060 limit/base >30 S20 limit/base >3	<pre>current </pre> <pre><1 0 94 </pre> <pre><1 1368 1500 1436 1789 4110 </pre> <pre>current 12 96 11 NEG current 1</pre>	history1 <1 0 64 <1 1156 1261 1177 1535 3632 history1 5 47 5 47 5 NEG history1 0.8	history2 2 0 44 <1 707 748 738 923 2142 history2 8 6 5 NEG history2 1 6		
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D2982 method *ASTM D7844 *ASTM D7824	limit/base 0 0 60 0 1010 1070 1150 1270 2060 limit/base >30 >20 limit/base >3 >20	current <1 0 94 <1 1368 1500 1436 1789 4110 current 12 96 11 NEG current 1 10,5	history1 <1 0 64 <1 1156 1261 1177 1535 3632 history1 5 47 5 47 5 NEG history1 0.8 9.7	history2 2 0 44 <1 707 748 738 923 2142 history2 8 6 5 NEG history2 1.6 13.7		
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D7844 *ASTM D7624	limit/base 0 0 60 0 1010 1070 1150 1270 2060 limit/base >30 >20 limit/base >3 >20 >30	current <1 0 94 <1 1368 1500 1436 1789 4110 current 12 96 11 NEG current 1 10.5 21.6	history1 <1 0 64 <1 1156 1261 1177 1535 3632 history1 5 47 5 NEG history1 0.8 9.7 20.4	history2 2 0 44 <1 707 748 738 923 2142 history2 8 6 5 NEG history2 1.6 13.7 23.6		
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m *ASTM D2982 method *ASTM D7844 *ASTM D7624 *ASTM D7415	limit/base 0 0 60 0 1010 1070 1150 1270 2060 limit/base >30 >20 limit/base >3 >20 Simit/base	current <1 0 94 <1 1368 1500 1436 1789 4110 current 12 96 11 NEG current 1 10.5 21.6	history1 <1 0 64 <1 1156 1261 1177 1535 3632 history1 5 47 5 47 5 NEG history1 0.8 9.7 20.4	history2 2 0 44 <1 707 748 738 923 2142 history2 8 6 5 NEG history2 1.6 13.7 23.6		
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m *ASTM D7844 *ASTM D7844 *ASTM D7415 method	limit/base 0 0 60 0 1010 1070 1150 1270 2060 limit/base >30 >20 limit/base >3 >20 >30 limit/base	current <1 0 94 <1 1368 1500 1436 1789 4110 current 12 96 11 NEG current 1 10.5 21.6	history1 <1 0 64 <1 1156 1261 1177 1535 3632 history1 5 47 5 47 5 NEG history1 0.8 9.7 20.4 history1	history2 2 0 44 <1 707 748 738 923 2142 history2 8 6 5 NEG history2 1.6 13.7 23.6 history2		
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE Oxidation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D7842 *ASTM D7624 *ASTM D7414	limit/base 0 0 60 0 1010 1070 1150 1270 2060 limit/base >30 >20 limit/base >3 >20 limit/base >3 >20 limit/base	current <1 0 94 <1 1368 1500 1436 1789 4110 current 12 96 11 NEG current 1 10.5 21.6 current 18.2	history1 <1 0 64 <1 1156 1261 1177 1535 3632 history1 5 47 5 47 5 47 5 9.7 20.4 history1 17.0	history2 2 0 44 <1 707 748 738 923 2142 history2 8 6 5 NEG history2 1.6 13.7 23.6 history2		



OIL ANALYSIS REPORT







VISUAL						
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
			11 11 11			
FLUID PROPE	RHES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	14.0	13.8	▲ 10.2
GRAPHS						

Ferrous Alloys 140 120 100 80 60 40 20 0. 8/20 Feb18/19 Dec31/22 Dec18 Non-ferrous Metals 400 350 lead 300 250 <u>특</u> 200 150 100 50 0 Dec31/22 an 18/74 Feb26/24 Feb 1 Dec1 Viscosity @ 100°C Base Number 19 16.0 18 14.0 17 (B/HOX Bul) , 16 Ba () 15 () 10 14 13 10.0 8.0 Jumber 6.0 ase 41 2.0 10 0.0 9 Feb18/19 Dec18/20 0ct19/23 Feb26/24 Oct19/23 Feb 26/24 Dec31/22 Jan 18/24 Feb18/19 Dec18/20 Dec31/22 Jan 18/24 : WearCheck USA - 501 Madison Ave., Cary, NC 27513 Laboratory GFL Environmental - 821 - Ozarks Hauling Sample No. : GFL0105192 Received : 22 Mar 2024 33924 Olath Drive Lab Number : 06126151 Tested : 26 Mar 2024 Lebanon, MO Unique Number : 10940302 Diagnosed : 26 Mar 2024 - Jonathan Hester US 65536 Test Package : FLEET (Additional Tests: Glycol) Contact: Landen Johnson To discuss this sample report, contact Customer Service at 1-800-237-1369. landen.johnson@gflenv.com



* - 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)

F:

T: (417)664-0010