

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id 524018

Component Diesel Engine

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

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Wear

Metal levels are typical for a new component breaking in.

Contamination

There is no indication of any contamination in the oil.

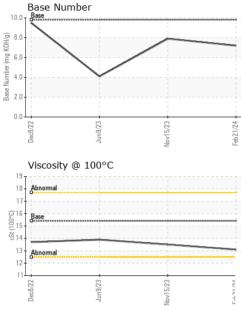
Fluid Condition

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

·		Dec202	2 Jun2023	Nov2023 Fr		
SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0092825	GFL0092805	GFL0080785
Sample Date		Client Info		21 Feb 2024	15 Nov 2023	09 Jun 2023
Machine Age	hrs	Client Info		600	600	0
Oil Age	hrs	Client Info		600	600	0
Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
U				NORMAL	NORMAL	NORMAL
Sample Status				NORMAL		NORIVIAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>6.0	<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	>100	31	30	7
Chromium	ppm	ASTM D5185m	>20	<1	1	<1
Nickel		ASTM D5185m	>2	0	0	0
	ppm		>C		0	<1
Titanium	ppm	ASTM D5185m	0	<1		
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>25	4	8	<1
Lead	ppm	ASTM D5185m	>40	0	0	<1
Copper	ppm	ASTM D5185m	>330	2	3	<1
Tin	ppm	ASTM D5185m	>15	<1	<1	<1
Vanadium	ppm	ASTM D5185m		0	0	<1
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 6	history1 <1	history2 12
	ppm ppm		0			
Boron Barium	ppm	ASTM D5185m	0	6	<1	12
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	6 <1 65	<1 0	12 0
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	6 <1 65 1	<1 0 65 <1	12 0 65 <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	6 <1 65 1 875	<1 0 65 <1 1045	12 0 65 <1 973
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	6 <1 65 1 875 1039	<1 0 65 <1 1045 1145	12 0 65 <1 973 1394
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	6 <1 65 1 875 1039 935	<1 0 65 <1 1045 1145 1080	12 0 65 <1 973 1394 1020
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	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	6 <1 65 1 875 1039 935 1106	<1 0 65 <1 1045 1145 1080 1369	12 0 65 <1 973 1394 1020 1346
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	6 <1 65 1 875 1039 935	<1 0 65 <1 1045 1145 1080	12 0 65 <1 973 1394 1020 1346 3789
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	6 <1 65 1 875 1039 935 1106	<1 0 65 <1 1045 1145 1080 1369	12 0 65 <1 973 1394 1020 1346
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 0 1010 1070 1150 1270 2060	6 <1 65 1 875 1039 935 1106 2630	<1 0 65 <1 1045 1145 1080 1369 3125	12 0 65 <1 973 1394 1020 1346 3789
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	6 <1 65 1 875 1039 935 1106 2630 current	<1 0 65 <1 1045 1145 1080 1369 3125 history1	12 0 65 <1 973 1394 1020 1346 3789 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	6 <1 65 1 875 1039 935 1106 2630 current 5	<1 0 65 <1 1045 1145 1080 1369 3125 history1 5	12 0 65 <1 973 1394 1020 1346 3789 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 ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base	6 <1 65 1 875 1039 935 1106 2630 current 5 6	<1 0 65 <1 1045 1145 1080 1369 3125 history1 5 8	12 0 65 <1 973 1394 1020 1346 3789 history2 4 2
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 limit/base >25 >20	6 <1 65 1 875 1039 935 1106 2630 current 5 6 4	<1 0 65 <1 1045 1145 1080 1369 3125 history1 5 8 8 14	12 0 65 <1 973 1394 1020 1346 3789 history2 4 2 2 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base	6 <1 65 1 875 1039 935 1106 2630 current 5 6 4 4 current 0.5	<1 0 65 <1 1045 1145 1080 1369 3125 history1 5 8 14 14 history1 0.8	12 0 65 <1 973 1394 1020 1346 3789 history2 4 2 <1 2 <1 history2 0.1
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 TS 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	6 <1 65 1 875 1039 935 1106 2630 <i>current</i> 5 6 4 <i>current</i> 0.5 9.3	<1 0 65 <1 1045 1145 1080 1369 3125 history1 5 8 14 14 history1 0.8 10.1	12 0 65 <1 973 1394 1020 1346 3789 history2 4 2 <1 kistory2 0.1 13.6
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 20 20 3 20 20 20 20 20 20 20 20 20 20 20 20 20	6 <1 65 1 875 1039 935 1106 2630 <i>current</i> 5 6 4 4 <i>current</i> 0.5 9.3 20.2	<1 0 65 <1 1045 1145 1080 1369 3125 history1 5 8 14 5 8 14 0.8 10.1 20.9	12 0 65 <1 973 1394 1020 1346 3789 history2 4 2 <1 kistory2 0.1 13.6 27.4
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	6 <1 65 1 875 1039 935 1106 2630 <i>current</i> 5 6 4 <i>current</i> 0.5 9.3	<1 0 65 <1 1045 1145 1080 1369 3125 history1 5 8 14 14 history1 0.8 10.1	12 0 65 <1 973 1394 1020 1346 3789 history2 4 2 <1 kistory2 0.1 13.6
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 20 20 3 20 20 20 20 20 20 20 20 20 20 20 20 20	6 <1 65 1 875 1039 935 1106 2630 <i>current</i> 5 6 4 4 <i>current</i> 0.5 9.3 20.2	<1 0 65 <1 1045 1145 1080 1369 3125 history1 5 8 14 5 8 14 0.8 10.1 20.9	12 0 65 <1 973 1394 1020 1346 3789 history2 4 2 <1 history2 0.1 13.6 27.4
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 *ASTM D7844	0 0 0 1010 1070 1150 2260 225 220 220 imit/base >3 >20 >30 imit/base	6 <1 65 1 875 1039 935 1106 2630 Current 5 6 4 Current 0.5 9.3 20.2 Current	<1 0 65 <1 1045 1145 1080 1369 3125 history1 5 8 14 history1 0.8 10.1 20.9 history1	12 0 65 <1 973 1394 1020 1346 3789 history2 4 2 <1 history2 0.1 13.6 27.4 history2



OIL ANALYSIS REPORT



		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
		Silt	scalar	*Visual	NONE	NONE	NONE	NONE
		Debris	scalar	*Visual	NONE	NONE	NONE	NONE
		Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Nov15/23	Feb21/24	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Nov	멸	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		Free Water	scalar	*Visual		NEG	NEG	NEG
		FLUID PRO			limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445	15.4	13.1	13.5	13.9
		GRAPHS						
		Ferrous Alloys						
Nov15/23 -	ACT FO	30 - chromium						
Nov	E.4.21	25 - nickel	/					
		e ²⁰	/					
		₽ ²⁰ -	/					
		10	/					
		5-	/					
		0	**************************************					
		Dec8/22	57/C	Nov15/23	Feb21/24			
		Dec		Nov1	Feb2			
		Non-ferrous M	etals					
		10 copper 1						
		10 copper						
		copper						
		8 - copper lead						
		copper						
		8 - copper lead						
		8 - copper lead						
		8 6 4 2						
		8 6 4 2		5/23	1/24			
		s copper s lead	CZICUTO	Nov15/23	Feb21/24			
		8 6 4 2	CZICUTO	Nov15/23		Base Number	r	
		viscosity @ 10	CZICUTO	Nov15/23	E4021/274		r	
		viscosity @ 10	CZICUTO	Nov15/23	10.0	Base	r	
		viscosity @ 10	CZICUTO	Novi 5/23	10.0	Base	r	
		viscosity @ 10	CZICUTO	Nov15/23	10.0	Base	r	
		viscosity @ 10	CZICUTO	Nov15/23	10.0		r	
		viscosity @ 10	CZICUTO	Nov15/23	10.0 (b)HO KO (b)HO K		r	
		viscosity @ 10	CZICUTO	Port SZ3	10.0 (0)HO (0)HO (0) HO (0) HO (0) HO (0) HO (0) HO	D T Base	r	
		viscosity @ 10	0°C		10.1 (b)HOX 60.1 (b)HOX 60.1 (b)HOX 60.1 (b)HOX 60.1 (c) 4.1 (c) 4.1 (
		viscosity @ 10 Base Abnormal	0°C	Nov15/23	10.0 (0)HO (0)HO (0) HO (0) HO (0) HO (0) HO (0) HO	D T Base		Novi 5/23
		viscosity @ 10 Base Comper Comper Sead Comper Comper Sead Comper Comp	0°C	Nov15/23	10.0 1.8 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9	Base 	Jung/23	
	Laboratory Sample No.	Viscosity @ 10 Base Viscosity @ 10 Second Second	0°C	EZISING Don Ave., Cary	10.0 1.8 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9	Base 	EZGung FL Environmer	ntal - 455 - Fli
	Laboratory Sample No. Lab Number	Viscosity @ 10 Base Viscosity @ 10 Construction Constr	0°C	EZSIMU on Ave., Cary ived : 26	10.0 (0)HOX 00, 6.1 (0)HOX 00, 6.1 (Base 	EZEmp FL Environmer 203	n tal - 455 - Fli 51 W. Bristol F
	Sample No.	Copper Copper	0°C 501 Madisc Recei Teste	m Ave., Cary ived : 26 ed : 27	10.0 (0)HOX Bull 3900 Bull 39000N 86.1 9000 Bull 39000N 868 2.1 0.1 +721(2994) 0.1 5 Feb 2024	G	EZGump FL Environmer 201 Fli	

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Submitted By: MARK WOMBLE

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