

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id 412042

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.

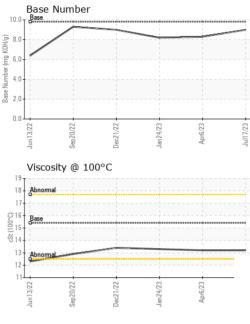
Fluid Condition

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		GFL0077501	GFL0068194	GFL0060746
Sample Date		Client Info		17 Jul 2023	06 Apr 2023	24 Jan 2023
Machine Age	hrs	Client Info		4178	3589	3239
Oil Age	hrs	Client Info		589	350	726
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>2.0	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	13	8	16
Chromium	ppm	ASTM D5185m	>20	<1	<1	1
Nickel	ppm	ASTM D5185m	>4	<1	0	0
Titanium	ppm	ASTM D5185m		<1	0	0
Silver	ppm	ASTM D5185m	>3	0	0	<1
Aluminum	ppm	ASTM D5185m	>20	3	0	3
Lead	ppm	ASTM D5185m	>40	<1	<1	<1
Copper	ppm	ASTM D5185m	>330	<1	<1	<1
Tin	ppm	ASTM D5185m	>15	<1	<1	1
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 2	history1 3	history2 5
	ppm ppm		0			
Boron		ASTM D5185m	0	2	3	5
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0 0 60	2 0	3 2	5 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	2 0 63	3 2 58	5 0 64
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	2 0 63 <1	3 2 58 <1	5 0 64 <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	2 0 63 <1 1014	3 2 58 <1 915	5 0 64 <1 910
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	2 0 63 <1 1014 1155	3 2 58 <1 915 1078	5 0 64 <1 910 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 1010 1070 1150	2 0 63 <1 1014 1155 1033	3 2 58 <1 915 1078 1011	5 0 64 <1 910 1096 973
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	2 0 63 <1 1014 1155 1033 1301	3 2 58 <1 915 1078 1011 1215	5 0 64 <1 910 1096 973 1192
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	2 0 63 <1 1014 1155 1033 1301 3736	3 2 58 <1 915 1078 1011 1215 2898	5 0 64 <1 910 1096 973 1192 3469
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	2 0 63 <1 1014 1155 1033 1301 3736 current	3 2 58 <1 915 1078 1011 1215 2898 history1	5 0 64 <1 910 1096 973 1192 3469 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 1010 1070 1150 1270 2060 imit/base >25	2 0 63 <1 1014 1155 1033 1301 3736 current 3	3 2 58 <1 915 1078 1011 1215 2898 history1 3	5 0 64 <1 910 1096 973 1192 3469 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 ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 imit/base >25	2 0 63 <1 1014 1155 1033 1301 3736 current 3 3 3	3 2 58 <1 915 1078 1011 1215 2898 history1 3 3 3	5 0 64 <1 910 1096 973 1192 3469 history2 4 3
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	2 0 63 <1 1014 1155 1033 1301 3736 current 3 3 3 3 3	3 2 58 <1 915 1078 1011 1215 2898 history1 3 3 3 3	5 0 64 <1 910 1096 973 1192 3469 history2 4 3 6
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 imit/base >25 -20	2 0 63 <1 1014 1155 1033 1301 3736 current 3 3 3 3 3 Current	3 2 58 <1 915 1078 1011 1215 2898 history1 3 3 3 3 3	5 0 64 <1 910 1096 973 1192 3469 history2 4 3 6 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	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 Imit/base >25 >20 Imit/base >3	2 0 63 <1 1014 1155 1033 1301 3736 <u>current</u> 3 3 3 3 <u>current</u> 0.4	3 2 58 <1 915 1078 1011 1215 2898 history1 3 3 3 3 history1 0.2	5 0 64 <1 910 1096 973 1192 3469 history2 4 3 6 history2 0.4
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	2 0 63 <1 1014 1155 1033 1301 3736 current 3 3 3 3 current 0.4 8.1	3 2 58 <1 915 1078 1011 1215 2898 history1 3 3 3 3 history1 0.2 6.2	5 0 64 <1 910 1096 973 1192 3469 history2 4 3 6 history2 0.4 8.2
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 imit/base >25 imit/base >3 >20 >30	2 0 63 <1 1014 1155 1033 1301 3736 <u>current</u> 3 3 3 3 <u>3</u> <u>current</u> 0.4 8.1 19.5	3 2 58 <1 915 1078 1011 1215 2898 history1 3 3 3 3 3 history1 0.2 6.2 17.7	5 0 64 <1 910 1096 973 1192 3469 history2 4 3 6 <u>history2</u> 0.4 8.2 18.8
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 ppm	ASTM D5185m ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 2260 225 220 220 imit/base >3 >20 >30 imit/base	2 0 63 <1 1014 1155 1033 1301 3736 current 3 3 3 3 current 0.4 8.1 19.5 current	3 2 58 <1 915 1078 1011 1215 2898 history1 3 3 3 3 history1 0.2 6.2 17.7 history1	5 0 64 <1 910 1096 973 1192 3469 history2 4 3 6 history2 0.4 8.2 18.8 history2



OIL ANALYSIS REPORT



		VISUAL		method				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
Dec21/22 Jan24/23	Apr6/23 -	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Jan	Ar	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		Free Water	scalar	*Visual		NEG	NEG	NEG
		FLUID PROPI		method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445	15.4	13.2	13.2	13.3
		GRAPHS						
		Ferrous Alloys						
23	23	iron						
Dec21/22 Jan24/23	Apr6/23	50 - nickel						
		40						
		<u> 특</u> 30						
		20						
		10						
			23		53			
		Jun 13/22 Sep 20/22	Dec21/22 Jan24/23	Apr6/23	Jul17/23			
		⊸ ∽ Non-ferrous Meta			,			
		¹⁰ T						
		copper						
		DESI ARABARARAR						
		8 - energy tin						
		6						
		6						
		6						
			22	23	23			
			0ec21/22 +	Apr6/23	Jul17/23			
		udd 2 0 2202 deg	. ,	Apr6/23	Juli 7/23			
			. ,	Apr6/23	-	Base Number		
		Viscosity @ 100°	. ,	Apr6/23	EZ/LIIPr 10.0			
		Viscosity @ 100°	. ,	Apr6/23	10.0	Base		
		Viscosity @ 100°	. ,	Apr6/23	10.0	Base		
		Viscosity @ 100°	. ,	Aphiliza	10.0	Base		
		Viscosity @ 100°	. ,	Apt6/23	10.0	Base		
		Viscosity @ 100° Abnomal Abnomal Abnomal Abnomal	. ,	Apr6/23	0.0 8.0 KOH(Q) 0.0 0.0 0.0 0.0	Base		
		Viscosity @ 100°	. ,	Apf6/23	10.0 (0)HOX BUL PQUID BUL PQUID BUL PQUID BUL PQUID BUL BUL BUL BUL BUL BUL BUL BUL BUL BUL	Base		
		Viscosity @ 100° Abnomal 17 18 4 4 2 0 220 220 200 200 200 2	C		10.0 (0)HOX Bul HOX BU	Base		23
		Viscosity @ 100° Abnomal 17 18 4 4 2 0 220 220 200 200 200 2	C		10.0 (0)HOX Bul HOX BU	Base		Apr6/23
		Viscosity @ 100° Abnomal 17 16 Base 12 11 10 10 10 10 10 10 10 10 10	. ,		10.0 (0)HOX BUL PQUID BUL PQUID BUL PQUID BUL PQUID BUL BUL BUL BUL BUL BUL BUL BUL BUL BUL	Base	Dec21/22	Apr6/23
	Laboratory	Viscosity @ 100° Viscosity @ 100° Control of the second	C C 501 Madia	ECIGURY Son Ave., Ca	10.0 (0HO) 6.0 bu) Jaquin 4.0 cc/Lling cc/Lling rry, NC 27513	Jun 13/22 Sep 20/22	Dec2/1/23 7au/24/1/3 ironmental - 625 -	Harrison Hauling
	Sample No.	Viscosity @ 100° Viscosity @ 100° Control of the second	C C 501 Madia Received	son Ave., Ca	10.0 (PHO) Bull Bull 2023	Jun 13/22 Sep 20/22	Dec2/1/23 7au/24/1/3 ironmental - 625 -	Harrison Hauling
	Sample No. Lab Number	Viscosity @ 100° Viscosity @ 100° Viscosity @ 100° Control of the second sec	C C 501 Madia Received Diagnos	son Ave., Ca d : 18 . ed : 19 .	10.0 (PHO) Bull Solution (PHO) Bull Solution (Jun 13/22 Sep 20/22	Dec2/1/23 7au/24/1/3 ironmental - 625 -	Harrison Hauling Industrial Pkwy Harrison, M
	Sample No. Lab Number Unique Number	Viscosity @ 100° Viscosity @ 100° Viscosity @ 100°	C C 501 Madia Received	son Ave., Ca d : 18 . ed : 19 .	10.0 (PHO) Bull Bull 2023	Jun 13/22 Sep 20/22	27/12040 EZ/12040 ironmental - 625 - 4102	Harrison Hauling Industrial Pkwy Harrison, M US 48625
Certificate L2367 o discuss thi	Sample No. Lab Number Unique Number Test Package	Viscosity @ 100° Viscosity @ 100° Viscosity @ 100°	C C 501 Madia Received Diagnos Diagnos	son Ave., Ca d : 18 , ed : 19 , tician : We	10.0 (PHO) Bull 30 (PHO) Bull 30 (PHO) Bull 30 (PHO) Bull 30 (PHO) Bull 4.0 (PHO) Bull 4.0 (PHO) Bull 4.0 (PHO) Bull 4.0 (PHO) Bull 4.0 (PHO) Bull 30 (PHO)	Jun 13/22 Sep 20/22	27/12390 EZ/1/2390 ironmental - 625 - 4102 Contact: 0	Harrison Hauling Industrial Pkwy Harrison, M

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Submitted By: also GFL632 and GFL638 - Glenda Standen