

OIL ANALYSIS REPORT

Sample Rating Trend

NORMAL

424045-402329

Component Diesel Engine

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

SAMPLE INFORMATION method



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 Number		Client Info		GFL0099931	GFL0099896	GFL0095157
Sample Date		Client Info		02 Jan 2024	21 Nov 2023	28 Oct 2023
Machine Age	hrs	Client Info		21361	21131	20991
Oil Age	hrs	Client Info		0	0	0
Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<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	>120	5	14	2
Chromium	ppm	ASTM D5185m	>20	<1	1	0
Nickel	ppm	ASTM D5185m	>5	<1	<1	0
Titanium	ppm	ASTM D5185m	>2	<1	<1	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m		1	1	0
Lead	ppm	ASTM D5185m	>40	1	5	0
Copper	ppm	ASTM D5185m	>330	1	1	0
Tin	ppm	ASTM D5185m	>15	1	<1	0
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		0	<1	0
ADDITIVES		and the set		ourropt	In the American Market	history.0
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	3	nistory i 5	4
	ppm ppm					
Boron		ASTM D5185m	0	3	5	4
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	3 0	5 <1	4
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	3 0 62	5 <1 65	4 0 59
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	3 0 62 <1	5 <1 65 <1	4 0 59 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	3 0 62 <1 936	5 <1 65 <1 963	4 0 59 0 915
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	3 0 62 <1 936 1110	5 <1 65 <1 963 1155	4 0 59 0 915 1056
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	3 0 62 <1 936 1110 1024	5 <1 65 <1 963 1155 1028	4 0 59 0 915 1056 999
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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270	3 0 62 <1 936 1110 1024 1235	5 <1 65 <1 963 1155 1028 1248	4 0 59 0 915 1056 999 1234
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 ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	3 0 62 <1 936 1110 1024 1235 2937	5 <1 65 <1 963 1155 1028 1248 3398	4 0 59 0 915 1056 999 1234 3015
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 ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	3 0 62 <1 936 1110 1024 1235 2937 current	5 <1 65 <1 963 1155 1028 1248 3398 history1	4 0 59 0 915 1056 999 1234 3015 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 method ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	3 0 62 <1 936 1110 1024 1235 2937 current 4	5 <1 65 <1 963 1155 1028 1248 3398 history1 10	4 0 59 0 915 1056 999 1234 3015 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 method ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 kimit/base	3 0 62 <1 936 1110 1024 1235 2937 Current 4 6	5 <1 65 <1 963 1155 1028 1248 3398 history1 10 4	4 0 59 0 915 1056 999 1234 3015 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 limit/base >25	3 0 62 <1 936 1110 1024 1235 2937 Current 4 6 0	5 <1 65 <1 963 1155 1028 1248 3398 history1 10 4 5	4 0 59 0 915 1056 999 1234 3015 history2 4 3 0
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 ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 imit/base >20	3 0 62 <1 936 1110 1024 1235 2937 current 4 6 0 0	5 <1 65 <1 963 1155 1028 1248 3398 history1 10 4 5 5 history1	4 0 59 0 915 1056 999 1234 3015 history2 4 3 0 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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 imit/base >20	3 0 62 <1 936 1110 1024 1235 2937 current 4 6 0 0 current 0.2	5 <1 65 <1 963 1155 1028 1248 3398 history1 10 4 5 5 history1 0.4	4 0 59 0 915 1056 999 1234 3015 history2 4 3 0 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 ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 <i>limit/base</i> >4 >20	3 0 62 <1 936 1110 1024 1235 2937 current 4 6 0 0 current 0.2 7.1 18.6	5 <1 65 <1 963 1155 1028 1248 3398 history1 10 4 5 <u>history1</u> 0.4 9.4	4 0 59 0 915 1056 999 1234 3015 history2 4 3 0 history2 0.1 5.6
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 TS ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 20 220 20 20 20 20 20 20 20 20 20 20 20	3 0 62 <1 936 1110 1024 1235 2937 Current 4 6 0 Current 0.2 7.1 18.6	5 <1 65 <1 963 1155 1028 1248 3398 history1 10 4 5 history1 0.4 9.4 21.1 history1	4 0 59 0 915 1056 999 1234 3015 history2 4 3 0 0 history2 0.1 5.6 18.3 history2
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	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 imit/base >25 imit/base >20 imit/base >20	3 0 62 <1 936 1110 1024 1235 2937 current 4 6 0 0 current 0.2 7.1 18.6	5 <1 65 <1 963 1155 1028 1248 3398 history1 10 4 5 5 history1 0.4 9.4 21.1	4 0 59 0 915 1056 999 1234 3015 history2 4 3 0 history2 0.1 5.6 18.3

Contact/Location: See also GFL823, 834, 837, 840 - Robert Hart - GFL836



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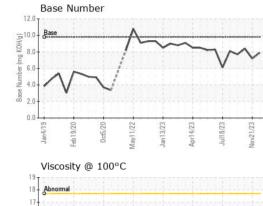
Jan4/19

Feb19/20

0ct5/20

OIL ANALYSIS REPORT

VISUAL



5	******	****	White Metal						NONE
-			Winto Wota	scalar	*Visual	NONE	NONE	NONE	NONL
	~	JM	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
		V	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
Jan 13/23	Apr1 4/23	Jul18/23 Nov21/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Jan	Apr	Jul. Novi	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	ERTIES	method	limit/ba	se current	history1	l history2
			Visc @ 100°C	cSt	ASTM D445	15.4	13.5	13.6	13.9
\sim	\sim	~~	GRAPHS						
			Ferrous Alloys						
Jan 13/23	Apr14/23	Jul16/23 -	40 35 30 E 22 20 15 10 5	~~		Λ.			
				Jan 13/23	Apr14/23	Nov21/23			
			8 - Research lead						
				Vavi 11/22	April 4/23	10v21/23			
			Viscosity @ 100°C		Apri 4/23	Nov21/23	Base Numb	per	
			Viscosity @ 100°C		April 4/23	100/21/23	Base Numb	ber	
			Viscosity @ 100°C		Puri 8/23		12.0 10.0 Base	per	
			Viscosity @ 100°C		Apri 4/23		12.0 10.0 Base	ber	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
			Viscosity @ 100°C		Apri4/23		12.0 10.0 Base	per	~~~~
			Viscosity @ 100°C		Apri4/23		12.0 10.0 Base	per	~~~~
			Viscosity @ 100°C		Pointage State		12.0 10.0 Base	per	~~~~
			Viscosity @ 100°C		Point 229 hours	Base Number from KOH(A)	12.0 10.0 Base	ber	~~~~
			Viscosity @ 100°C		~~~~	Rase Number (non KOH(A)	12.0 10.0 Base 6.0 6.0 4.0 2.0 0.0		~~~~
			Viscosity @ 100°C		~~~~	Rase Number (non KOH(A)	12.0 10.0 Base 6.0 6.0 4.0 2.0 0.0		
			Viscosity @ 100°C		Apri 4/23		12.0 10.0 Base 8.0 6.0 4.0 2.0	0d5/20	Apri 4/23
	Sa La Ur	aboratory ample No. ab Number nique Numbe	Viscosity @ 100°C Viscosity @ 100°C Uscosity @	May11/22 5	EZHIJION EZHIJION Son Ave., Ca 1 : 04 . ed : 04 .	Nov21/23	12.0 10.0 Base 8.0 6.0 4.0 2.0 0.0 EV5E 9.2 0.0 0.0 EV5E 9.2 0.0 0.0 EV5E 9.2 0.0 0.0 EV5E 9.2 0.0 0.0 EV5E 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	CICILIDA Environmental - 836 7801 F	5 - Kansas City Haul East Truman Ro Kansas City, M US 641
Ticate 12367	Sa La Ur Te	ample No. ab Number hique Numbe est Packag	Viscosity @ 100°C Viscosity @ 100°C Uscosity @	501 Madia Recieved Diagnost	EZH LUNG EZH LUNG EXH	ry, NC 27 Jan 2024 Jan 2024 s Davis	12.0 10.0 Base 8.0 6.0 4.0 2.0 0.0 EV5E 9.2 0.0 0.0 EV5E 9.2 0.0 0.0 EV5E 9.2 0.0 0.0 EV5E 9.2 0.0 0.0 EV5E 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	CICILIDA Environmental - 836 7801 F	5 - Kansas City Hau l East Truman Ro Kansas City, M

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