

OIL ANALYSIS REPORT

Sample Rating Trend





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.

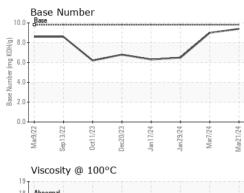
Fluid Condition

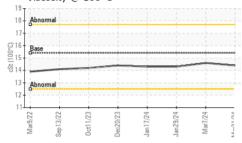
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0095309	GFL0109324	GFL0093567
Sample Date		Client Info		21 Mar 2024	07 Mar 2024	29 Jan 2024
Machine Age	hrs	Client Info		18449	18331	18329
Oil Age	hrs	Client Info		650	2	597
Oil Changed		Client Info		Changed	Not Changd	Changed
Sample Status				NORMAL	NORMAL	ABNORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<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	8	13	42
Chromium	ppm	ASTM D5185m	>20	1	1	3
Nickel	ppm	ASTM D5185m	>4	<1	<1	<1
Titanium	ppm	ASTM D5185m		8	7	1
Silver	ppm	ASTM D5185m	>3	<1	0	0
Aluminum	ppm	ASTM D5185m	>20	2	3	4
Lead	ppm	ASTM D5185m	>40	1	0	4
Copper	ppm	ASTM D5185m	>330	<1	0	4
Tin	ppm	ASTM D5185m	>15	1	<1	<1
Vanadium	ppm	ASTM D5185m		<1	<1	0
Cadmium	ppm	ASTM D5185m		<1	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 13	history1 13	history2 5
	ppm ppm					
Boron		ASTM D5185m	0	13	13	5
Boron Barium	ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0	13 1	13 0	5 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	13 1 59	13 0 54	5 0 75
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	13 1 59 1	13 0 54 <1	5 0 75 <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	13 1 59 1 900	13 0 54 <1 886	5 0 75 <1 971
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	13 1 59 1 900 1121	13 0 54 <1 886 1037	5 0 75 <1 971 1152
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	13 1 59 1 900 1121 1012	13 0 54 <1 886 1037 1013	5 0 75 <1 971 1152 918
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	13 1 59 1 900 1121 1012 1211	13 0 54 <1 886 1037 1013 1247	5 0 75 <1 971 1152 918 1281
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 0 1010 1070 1150 1270 2060	13 1 59 1 900 1121 1012 1211 3305	13 0 54 <1 886 1037 1013 1247 3165	5 0 75 <1 971 1152 918 1281 3106
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	13 1 59 1 900 1121 1012 1211 3305 current	13 0 54 <1 886 1037 1013 1247 3165 history1	5 0 75 <1 971 1152 918 1281 3106 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	13 1 59 1 900 1121 1012 1211 3305 current 4	13 0 54 <1 886 1037 1013 1247 3165 history1 6	5 0 75 <1 971 1152 918 1281 3106 history2 10
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	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 method ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 Limit/base >25	13 1 59 1 900 1121 1012 1211 3305 current 4 20 27	13 0 54 <1 886 1037 1013 1247 3165 history1 6 31	5 0 75 <1 971 1152 918 1281 3106 history2 10 ▲ 214
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20	13 1 59 1 900 1121 1012 1211 3305 current 4 20 27	13 0 54 <1 886 1037 1013 1247 3165 history1 6 31 30	5 0 75 <1 971 1152 918 1281 3106 history2 10 ▲ 214 ▲ 65
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 2060 225 >25	13 1 59 1 900 1121 1012 1211 3305 current 4 20 27 current	13 0 54 <1 886 1037 1013 1247 3165 history1 6 31 30 history1	5 0 75 <1 971 1152 918 1281 3106 history2 10 ▲ 214 ▲ 65 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	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20	13 1 59 1 900 1121 1012 1211 3305 current 4 20 27 current 0.1	13 0 54 <1 886 1037 1013 1247 3165 history1 6 31 30 history1 0.1	5 0 75 <1 971 1152 918 1281 3106 history2 10 ▲ 214 ▲ 214 ▲ 65 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 D51854 ASTM D7844 *ASTM D7624	0 0 0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 <i>limit/base</i> >3 >20	13 1 59 1 900 1121 1012 1211 3305 Current 4 20 27 Current 0.1 5.0	13 0 54 <1 886 1037 1013 1247 3165 history1 6 31 30 history1 0.1 5.3	5 0 75 <1 971 1152 918 1281 3106 history2 10 ▲ 214 ▲ 65 history2 0.4 10.4
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 D7624 *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 2060 225 20 220 220 20 3 20 20 3 3 20 20 3 3 20 20 20 20 20 20 20 20 20 20 20 20 20	13 1 59 1 900 1121 1012 1211 3305 Current 4 20 27 Current 0.1 5.0 17.4 Current	13 0 54 <1 886 1037 1013 1247 3165 history1 6 31 30 history1 0.1 5.3 17.7 history1	5 0 75 <1 971 1152 918 1281 3106 history2 10 ▲ 214 ▲ 65 history2 0.4 10.4 22.7 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 ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >25 imit/base >3 >20 >3 >20	13 1 59 1 900 1121 1012 1211 3305 <u>current</u> 4 20 27 <u>current</u> 0.1 5.0 17.4	13 0 54 <1 886 1037 1013 1247 3165 history1 6 31 30 history1 0.1 5.3 17.7	5 0 75 <1 971 1152 918 1281 3106 history2 10 ▲ 214 ▲ 65 history2 0.4 10.4 22.7



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	VISUAL		method						history
	White Metal	scalar	*Visual	NONE	NONE	Ν	ONE	N	ONE
	Yellow Metal	scalar	*Visual	NONE	NONE	N	ONE	N	ONE
	Precipitate	scalar	*Visual	NONE	NONE	N	ONE		ONE
	Silt	scalar	*Visual	NONE	NONE	N	ONE		ONE
	Debris	scalar	*Visual	NONE	NONE		IGHT		ONE
	Sand/Dirt	scalar	*Visual	NONE	NONE		ONE		ONE
/24	Appearance	scalar	*Visual	NORML	NORML		ORML		ORML
Mar21/24	Odor	scalar	*Visual	NORML	NORML		ORML		ORML
	Emulsified Water	scalar	*Visual	>0.2	NEG		EG		EG
	Free Water	scalar	*Visual	>0.2	NEG		EG		EG
	FLUID PROP		method	limit/base	current		history1		history
	Visc @ 100°C	cSt	ASTM D445	15.4	14.4	14	4.6	1	4.3
	GRAPHS								
	Ferrous Alloys								
	50	\wedge							
010	40 - chromium	\sim	1						
N.			\sim						
	30 Ed								
	20								
	10								
			No. of Concession, Name						
	1/22 - 1/23 -)/23 -	3/24 -	/24					
	Mar9/22 Sep13/22 Oct11/23	Dec20/23 Jan 17/24	Jan 29/24 Mar 7/24	Mar21/24					
		_ /							
	Non-forrous Mot	ale		-					
	Non-ferrous Met	als							
	10 copper	als							
	¹⁰ T	als							
	10 copper	als							
	8 6	als							
	10 copper	als							
	10 8 6 4	als	~						
	8 6	als	~						
	10 8 6 4 2 0								
	10 8 6 4 2 0		4206						
	10 8 6 4 2 - - - - - - - - - - - - -	Jan17/24	Jan 29/24	Mar21/24					
	10 copper tin copper tin copper tin copper copper tin copper	Dec20/23 +	Jan29/24 Mar7/24		Bace Num	- Per			
	Mart9/22 Sep13/22 Oct 1/23 Oct 1/23	Dec20/23 +	Jan29/24	Mai21/24	Base Numl	per			
	10 copper tin copper tin copper tin copper copper tin copper	Dec20/23 +	Jan29/24 Mar71/24	Mai21/24		ber			
	10 10 10 10 10 10 10 10 10 10	Dec20/23 +	4ar29/24	421124 10.0	Base	per			
	U CCOPPER Lead U COPPER Lead U CCOPPER Lead U CCOPPER Lead CCOPPER Lead CCOPPER CCOPPE	Dec20/23 +	42/B2/me/	421124 10.0	Base	ber			
	U CCOPPER Lead U COPPER Lead U CCOPPER Lead U CCOPPER Lead CCOPPER Lead CCOPPER CCOPPE	Dec20/23 +	4262mel	421124 10.0	Base	ber			
	Copper a bead bead bead bead bead bead bead bead bead copper bead bead copper copper bead copper cop	Dec20/23 +	42/62/meF	421124 10.0	D T Base	per			
	10 10 10 10 10 10 10 10 10 10	Dec20/23 +	42/62/mef	10.0 (0)HOQ KUNUPELIVICA 10.0 (0)HOQ KUNUPELIV	D =	ber			
	10 10 10 10 10 10 10 10 10 10	Dec20/23 +	P2/G2ue/	10.1 ber (ma K0H(0)	D =	ber			
	10 6 6 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7	Dec20/23 +	Parise Pa	10.1 (b) HOX but Base Number Base S T		per			
	U Copper d d d d d d d d d d d d d	Jan17/24		10.0 Humper (m0 KOH(0) Base Number (m0 KOH(0) Base Number (m0 KOH(0) 10.0		-	1/24	924	124
	10 6 6 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7	Dec20/23 +	Jan 29/24 Jan 29/24 Jan 29/24 Mai 7/24 Mai 7/24	10.1 (b) HOX but Base Number Base S T		Detr 1/23	UBC20/23 Jan17/24	42/02/unp	Mai7/24
	10 6 6 6 10 10 10 10 10 10 10 10 10 10	Dec20/23	Jan29/24	10.1 (6)(X)(X)(X)(X)(X)(X)(X)(X)(X)(X)(X)(X)(X)	Sep 13/22	0ct11/23			
atory	¹⁰ ¹⁰ ¹⁰ ¹⁰ ¹⁰ ¹⁰ ¹⁰ ¹⁰	Dec20129 +52/0129 01 Madisc	brZt/zuer brZt/zuer on Ave., Cary	10.0 +b21(2)rew 10.0 (b)HOX bu) Jaquinny ese 2.0 +b21(2)rew 0.0 0.1 0.1 0.1 0.1 0.1 0.1 0.1	Sep 13/22	0ct11/23	ntal - 891 -	Oklahoma	City Hau
e No.	Uscosity @ 1000 Viscosity @ 1000 Uscosity @ 1000 Uscos	+52/L1uer 01 Madisco Rece	brZtgruer brZtgruer br Ave., Cary ived : 25	10.0 +b21(2)rew 10.0 (b)HOX bu) Jaquing area 2.0 +b21(2)rew 0.0 0.1 0.1 0.1 0.1 0.1 0.1 0.1	Sep 13/22	0ct11/23	ntal - 891 - 100	Oklahoma)1 South	i City Hau i Rockv
e No. umber	Uicosity @ 1000 Viscosity @ 1000 Viscosity @ 1000 Uicosity @ 10000 Uicosity @ 10000 Uicosity @ 10000 Uicosity @ 10000	+FZ/L[1uer C 01 Madisco Rece Teste	bn Ave., Cary ived : 25	10.0 (b)HOX bu) Jaquing ese 2.0 (b)HOX bu) Jaquing ese 2.0 (b)HOX bu) Jaquing ese 2.0 (c) HOX bu) HOX bu) HOX bu) HOX bu) HOX bu) HOX bu) HOX	GFL E	0ct11/23	ntal - 891 - 100	Oklahoma)1 South Oklahom	n City Hau n Rockv a City, f
e No. umber Number	Uscosity @ 1000 Viscosity @ 1000 Uscosity @ 1000 Uscos	+FZ/L[1uer C 01 Madisco Rece Teste	bn Ave., Cary ived : 25	10.0 +b21(2)rew 10.0 (b)HOX bu) Jaquing area 2.0 +b21(2)rew 0.0 0.1 0.1 0.1 0.1 0.1 0.1 0.1	GFL E	0ct11/23	ntal - 891 - 100 O	Oklahoma)1 South Oklahom	n City Hau n Rockv a City, f JS 731

To discuss this sample repo * - 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)

Certificate L2367

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