

OIL ANALYSIS REPORT

Sample Rating Trend





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.

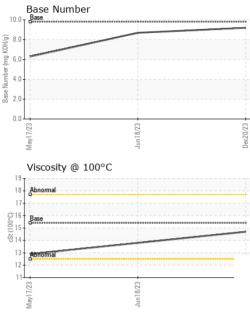
Fluid Condition

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		GFL0105849	GFL0069809	GFL0072943
Sample Date		Client Info		20 Dec 2023	18 Jun 2023	17 May 2023
Machine Age	hrs	Client Info		15280	15233	15172
Oil Age	hrs	Client Info		15280	600	520
Oil Changed		Client Info		Not Changd	Changed	Changed
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	0	2	31
Chromium	ppm	ASTM D5185m	>20	0	0	<1
Nickel	ppm	ASTM D5185m	>5	<1	0	<1
Titanium	ppm	ASTM D5185m	>2	0	0	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>20	<1	6	15
Lead	ppm	ASTM D5185m	>40	0	0	<1
Copper	ppm	ASTM D5185m	>330	<1	3	36
Tin	ppm	ASTM D5185m	>15	0	<1	<1
Vanadium	ppm	ASTM D5185m		0	0	<1
O I I						
Cadmium	ppm	ASTM D5185m		0	0	<1
ADDITIVES	ppm	ASTM D5185m method	limit/base	0 current	0 history1	<1 history2
	ppm ppm	method	limit/base		-	
ADDITIVES		method		current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	0	current 4	history1 6	history2 4
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	0 0 60	current 4 0	history1 6 0	history2 4 0
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	current 4 0 60	history1 6 0 54	history2 4 0 58
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	current 4 0 60 <1	history1 6 0 54 <1	history2 4 0 58 1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	Current 4 0 60 <1 949	history1 6 0 54 <1 946	history2 4 0 58 1 944
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	Current 4 0 60 <1 949 1037	history1 6 0 54 <1 946 1041	history2 4 0 58 1 944 1129
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	Current 4 0 60 <1 949 1037 1130	history1 6 0 54 <1 946 1041 1086	history2 4 0 58 1 944 1129 1011
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270	Current 4 0 60 <1 949 1037 1130 1291	history1 6 0 54 <1 946 1041 1086 1278	history2 4 0 58 1 944 1129 1011 1252
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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	Current 4 0 60 <1 949 1037 1130 1291 3247	history1 6 0 54 <1 946 1041 1086 1278 3199	history2 4 0 58 1 944 1129 1011 1252 3416
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 ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	Current 4 0 60 <1 949 1037 1130 1291 3247 Current	history1 6 0 54 <1 946 1041 1086 1278 3199 history1	history2 4 0 58 1 944 1129 1011 1252 3416 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	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	0 0 60 1010 1070 1150 1270 2060	Current 4 0 60 <1 949 1037 1130 1291 3247 Current 5	history1 6 0 54 <1 946 1041 1086 1278 3199 history1 3	history2 4 0 58 1 944 1129 1011 1252 3416 history2 6
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	0 0 60 1010 1070 1150 1270 2060 limit/base >25	Current 4 0 60 <1 949 1037 1130 1291 3247 Current 5 2 0 0	history1 6 0 54 <1 946 1041 1086 1278 3199 history1 3 <1 <1 ×1 ×1 ×1 ×1 ×1 ×1 ×1 history1	history2 4 0 58 1 944 1129 1011 1252 3416 history2 6 5 3 history2
ADDITIVES 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 TS	method ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 imit/base >20	Current 4 0 60 <1 949 1037 1130 1291 3247 current 5 2 0 current 0	history1 6 0 54 <1 946 1041 1086 1278 3199 history1 3 <1 <1 0.1	history2 4 0 58 1 944 1129 1011 1252 3416 history2 6 5 3 history2 0.2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 imit/base >20	Current 4 0 60 <1 949 1037 1130 1291 3247 Current 5 2 0 0	history1 6 0 54 <1 946 1041 1086 1278 3199 history1 3 <1 <1 ×1 ×1 ×1 ×1 ×1 ×1 ×1 history1	history2 4 0 58 1 944 1129 1011 1252 3416 history2 6 5 3 history2
ADDITIVES 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	method ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 imit/base >20	Current 4 0 60 <1 949 1037 1130 1291 3247 current 5 2 0 current 0	history1 6 0 54 <1 946 1041 1086 1278 3199 history1 3 <1 <1 0.1	history2 4 0 58 1 944 1129 1011 1252 3416 history2 6 5 3 history2 0.2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Silicon Sidium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >20	Current 4 0 60 <1 949 1037 1130 1291 3247 Current 5 2 0 current 0 44.2	history1 6 0 54 <1 946 1041 1086 1278 3199 history1 3 <1 -1 0.1 5.0	history2 4 0 58 1 944 1129 1011 1252 3416 history2 6 5 3 history2 0.2 8.5
ADDITIVES 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	method ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 25 20 220 20 20 20 20 20 20 20 20 20 20 20	Current 4 0 60 <1 949 1037 1130 1291 3247 current 5 2 0 current 0 4.2 17.1	history1 6 0 54 <1 946 1041 1086 1278 3199 history1 3 <1 <1 0.1 5.0 17.1	history2 4 0 58 1 944 1129 1011 1252 3416 history2 6 5 3 history2 0.2 8.5 19.9



OIL ANALYSIS REPORT



	VISUAL		method			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
					NONE	NONE	
23	Sand/Dirt	scalar	*Visual	NONE NORML	NORML	NORML	NONE
Dec20/23	Appearance	scalar	*Visual *Visual				
	Odor	scalar		NORML	NORML	NORML	NORML
	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
	Free Water	scalar	*Visual	1	NEG	NEG	NEG
	FLUID PROP Visc @ 100°C	cSt	method ASTM D445	limit/base	current	history1 13.8	history2 12.9
	GRAPHS	CSI	ASTM D445	15.4	14.7	13.0	12.9
	Ferrous Alloys						
	35						
	30 - chromium						
	25						
	E 20 15						
	15						
	10						
	5-	\mathbf{i}					
	0						
	May17/23	Jun18/23		Dec20/23			
	May	Jun		Dec			
	Non-ferrous Met	als					
	40 copper						
	35 - sessesses lead						
	30 - second lead						
	30 25						
	30 25 <u><u><u></u></u> 20</u>						
	30 30 25 20 15						
	30						
	30 30 25 20 15						
	sis and the second seco	¹²³		/23			
	30	un 18/23		Jec20/23			
	33 30 25 15 10 5 0 6 7 7 10 5 0 6 7 10 15			Dec20/23			
	sis and the second seco				Base Number	-	
	Solution (19) (100)				Base Number		
	15 0 Viscosity @ 100			10.1	Base		
	Solution (19) (10) (19) (10) (10) (10) (10) (10) (10) (10) (10			10.1	Base	-	
	Solution (19) (10) (19) (10) (10) (10) (10) (10) (10) (10) (10			10.1	Base		
	Solution (19) (10) (19) (10) (10) (10) (10) (10) (10) (10) (10			10.1	Base		
	Viscosity @ 100 ¹⁹ Abnormal Abnormal Base			10.1	Base	-	
	Viscosity @ 100'			10.1 (0, HOX) (0, MOH (0, MOH (0, MOH (0, MOH (0, MOH)) (0, MOH) (0, MOH) (Base		
	Abnormal			10.1 8.1 9.0 0 KOH(0) 9.8 Winnipe 8.8 Winnipe 8.2.1	Base	_	
	Viscosity @ 100'	°C		10.1 (b)HOX 60.1 (b)HOX 60.1 (b)HOX 60.1 (b)HOX 60.1 (c) Base 8 2.0 (c) (c) (c) (c) (c) (c) (c) (c) (c) (c)	Base		
	Abnormal			10.1 8.1 9.0 0 KOH(0) 9.8 Winnipe 8.8 Winnipe 8.2.1	Base	Junt 8/23	
	Viscosity @ 100'	۲ חווו 19/23		10.1 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1	Base EZULIARE W	Jun18/23	
	Viscosity @ 100 Viscosity @ 100 Base Units Control Con	°C		10.1 (PHOX Bull section 4.1 (PHOX Bell section 4.1) (PHOX Bell sect	Base EZULIARE W		
	Viscosity @ 100 ¹⁹ Abnormal CELLING Viscosity @ 100 ¹⁹ Base Example 100 ¹⁹ Base Example 100 ¹⁹ Base Example 100 ¹⁹ Base Example 100 ¹⁹ Base Example 100 ¹⁹ Example 100 ¹⁹	• C	d : 22	10.1 (PHOX Put 4.1 Put 3 agunn 4.1 2.1 0.1 ECC07290 Unry, NC 27511 Dec 2023	Base EZULIARE W	vironmental - 415	6200 Elmrid
	Viscosity @ 100 Viscosity @ 100 Base Units Control Con	- 501 Madia Recieved Diagnos	d : 22 ed : 26	10.1 (PHOX Bull section 4.1 (PHOX Bell section 4.1) (PHOX Bell sect	Base EZULIARE W	vironmental - 415	5 - Michigan E 6200 Elmrid ling Heights, US 483
r	Viscosity @ 100 Viscosity @ 100 Viscosity @ 100	• C	d : 22 ed : 26	10.1 (PHOX Put 4.1 (PHOX Put 4.1) (PHOX Put 4.1 (PHOX Put 4.1) (PHOX PUT 4.1) (Base EZULIARE W	vironmental - 415 Ster	6200 Elmrid ling Heights,
r ver ge	Viscosity @ 100 Viscosity @ 100 Viscosity @ 100	- 501 Madia Recieved Diagnos Diagnos	d : 22 ed : 26 tician : We	10.1 (Phyloy Bull 30 10.1 1	Base EZULIARE W	vironmental - 415 Ster Conta fwol	6200 Elmric ling Heights, US 483



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