

OIL ANALYSIS REPORT

Sample Rating Trend





Machine Id 4579M Component Diesel Engine

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

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.

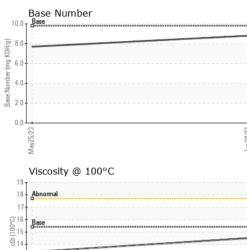
SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0069825	GFL0069849	
Sample Date		Client Info		20 Jun 2023	25 May 2023	
Machine Age	hrs	Client Info		5848	5631	
Oil Age	hrs	Client Info		600	600	
Oil Changed		Client Info		Changed	Changed	
Sample Status				NORMAL	NORMAL	
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0	<1.0	
Glycol		WC Method		NEG	NEG	
-	0		11 11 11			
WEAR METAL		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>90	5	17	
Chromium	ppm	ASTM D5185m	>20	<1	<1	
Nickel	ppm	ASTM D5185m	>2	0	0	
Titanium	ppm	ASTM D5185m	>2	0	0	
Silver	ppm	ASTM D5185m	>2	0	0	
Aluminum	ppm	ASTM D5185m	>20	2	<1	
Lead	ppm	ASTM D5185m	>40	0	1	
Copper	ppm	ASTM D5185m	>330	0	<1	
Tin	ppm	ASTM D5185m	>15	0	0	
Vanadium	ppm	ASTM D5185m		0	0	
Cadmium	ppm	ASTM D5185m		0	0	
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 4	history1 1	history2
	ppm ppm					
Boron		ASTM D5185m	0	4	1	
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	4 0	1 0	
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	4 0 59	1 0 56	
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	4 0 59 <1	1 0 56 <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	4 0 59 <1 977	1 0 56 <1 907	
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	4 0 59 <1 977 1075	1 0 56 <1 907 1053	
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	4 0 59 <1 977 1075 1119	1 0 56 <1 907 1053 967	
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	4 0 59 <1 977 1075 1119 1343	1 0 56 <1 907 1053 967 1207	
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 1010 1070 1150 1270 2060	4 0 59 <1 977 1075 1119 1343 3226	1 0 56 <1 907 1053 967 1207 3443	
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	4 0 59 <1 977 1075 1119 1343 3226 current	1 0 56 <1 907 1053 967 1207 3443 history1	
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	4 0 59 <1 977 1075 1119 1343 3226 current 2	1 0 56 <1 907 1053 967 1207 3443 history1 2	 history2
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	4 0 59 <1 977 1075 1119 1343 3226 current 2 6	1 0 56 <1 907 1053 967 1207 3443 history1 2 16	 history2
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 60 0 1010 1070 1150 1270 2060 limit/base >25 >20	4 0 59 <1 977 1075 1119 1343 3226 current 2 6 2	1 0 56 <1 907 1053 967 1207 3443 history1 2 16 7	 history2
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 Limit/base >20	4 0 59 <1 977 1075 1119 1343 3226 current 2 6 2 2 6 2	1 0 56 <1 907 1053 967 1207 3443 history1 2 16 7 history1 0.5	 history2 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 2060 225 >25 >20 Limit/base >20	4 0 59 <1 977 1075 1119 1343 3226 <u>current</u> 2 6 2 2 6 2 2	1 0 56 <1 907 1053 967 1207 3443 history1 2 16 7 history1	 history2 history2
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> >6 >20	4 0 59 <1 977 1075 1119 1343 3226 <u>current</u> 2 6 2 2 6 2 2 0.3 7.3	1 0 56 <1 907 1053 967 1207 3443 history1 2 16 7 history1 0.5 10.5	 history2 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 ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 2060 225 20 220 220 20 20 20 20 20 20 20 20 20 2	4 0 59 <1 977 1075 1119 1343 3226 current 2 6 2 6 2 current 0.3 7.3 18.1	1 0 56 <1 907 1053 967 1207 3443 history1 2 16 7 history1 0.5 10.5 21.6	 history2 history2 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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 20 imit/base >6 >20 20	4 0 59 <1 977 1075 1119 1343 3226 <u>current</u> 2 6 2 2 <u>current</u> 0.3 7.3 18.1	1 0 56 <1 907 1053 967 1207 3443 history1 2 16 7 history1 0.5 10.5 21.6 history1	 history2 history2 history2 history2



13 Abnormal 12 11 May25/23

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	VISUAL		method	limit/base	current	history1	history2
	White Metal	scalar	*Visual	NONE	NONE	NONE	
	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	
	Precipitate	scalar	*Visual	NONE	NONE	NONE	
	Silt	scalar	*Visual	NONE	NONE	NONE	
	Debris	scalar	*Visual	NONE	NONE	NONE	
	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	
0/23 -	Appearance	scalar	*Visual	NORML	NORML	NORML	
Jun20/23	Odor	scalar	*Visual	NORML	NORML	NORML	
)°C	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	
J-C	Free Water	scalar	*Visual		NEG	NEG	
	FLUID PROPE	RTIES	method	limit/base	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445	15.4	14.5	13.4	
	GRAPHS						
	Ferrous Alloys						
	¹⁸ T						
	16 - iron chromium						
	14 nickel						
	E10-						
	8						
	6						
	4 2						
	May25/23			Jun20/23			
	May			unp			
	Non-ferrous Metal	S					
	10 copper						
	8 - measurement lead						
	u dd						
	4						
	2						
	L.						
	0			2			
	ay25/23			un20/23			
	W			٦٢			
	Viscosity @ 100°C	, 			Base Number		
	18 - Abnormal			10.0	Base		
	17			_@ 8.0·			
	© ¹⁶ Base			6.0 6.0 4.0 4.0			
	G 16 Base 15 3 14			Lo U.U			
	³ 14			4.0-			
	13 Abnormal			2.0·			
	12						
	114			-0.0	53		23 +
	May25/23			Jun20/23	May25/23		Jun20/23
Laboratory	: WearCheck USA - 5				GFL Envi	ronmental - 418	
Sample No. Lab Number		Received Diagnose		Oct 2023 Oct 2023		220	01 Hoover Dr Warren, MI
TESTING LABORATORY Unique Number		Diagnost		s Davis			US 48089
Certificate L2367 Test Package	: FLEET	-					act: JIM HESS
To discuss this sample report,						jhes	s@gflenv.com
* - Denotes test methods that a Statements of conformity to spec					ICGM 106.2012)		T: F:
Statements of comornity to spec	Singalong are pased off li	Jimple	2000pian08 L				1.

Contact/Location: JIM HESS - GFL418