

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id 558 Component

Diesel Engine

PETRO CANADA DURON SHP 10W30 (--- 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		PCA0088517	PCA0088524	
Sample Date		Client Info		18 Sep 2023	11 May 2023	
Machine Age	mls	Client Info		191123	177324	
Oil Age	mls	Client Info		14838	177324	
Oil Changed		Client Info		Changed	Changed	
Sample Status				NORMAL	NORMAL	
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	
Glycol		WC Method		NEG	NEG	
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	31	68	
Chromium	ppm	ASTM D5185m	>20	<1	2	
Nickel	ppm	ASTM D5185m	>4	0	0	
Titanium	ppm	ASTM D5185m		0	0	
Silver	ppm	ASTM D5185m	>3	0	0	
Aluminum	ppm	ASTM D5185m	>20	3	5	
Lead	ppm	ASTM D5185m	>40	0	0	
Copper	ppm	ASTM D5185m	>330	2	2	
Tin	ppm	ASTM D5185m	>15	<1	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 5	history1 24	history2
	ppm ppm					
Boron		ASTM D5185m	2	5	24	
Boron Barium	ppm	ASTM D5185m ASTM D5185m	2 0	5 0	24 0	
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50	5 0 56	24 0 25	
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0	5 0 56 <1	24 0 25 0	
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0 950	5 0 56 <1 901	24 0 25 0 828	
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0 950 1050	5 0 56 <1 901 1146	24 0 25 0 828 1520	
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	2 0 50 0 950 1050 995	5 0 56 <1 901 1146 997	24 0 25 0 828 1520 869	
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	2 0 50 0 950 1050 995 1180	5 0 56 <1 901 1146 997 1141	24 0 25 0 828 1520 869 1045	
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	2 0 50 0 950 1050 995 1180 2600	5 0 56 <1 901 1146 997 1141 2877	24 0 25 0 828 1520 869 1045 3226	
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	2 0 50 950 1050 995 1180 2600	5 0 56 <1 901 1146 997 1141 2877 current	24 0 25 0 828 1520 869 1045 3226 history1	 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	2 0 50 950 1050 995 1180 2600	5 0 56 <1 901 1146 997 1141 2877 current 5	24 0 25 0 828 1520 869 1045 3226 history1 9	 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 method ASTM D5185m	2 0 50 950 1050 995 1180 2600 limit/base >25	5 0 56 <1 901 1146 997 1141 2877 current 5 3	24 0 25 0 828 1520 869 1045 3226 history1 9 4	 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	2 0 50 950 1050 995 1180 2600 limit/base >25	5 0 56 <1 901 1146 997 1141 2877 current 5 3 3 3	24 0 25 0 828 1520 869 1045 3226 history1 9 4 9	 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	ASTM D5185m ASTM D5185m	2 0 50 0 950 1050 995 1180 2600 limit/base >25 >20 limit/base	5 0 56 <1 901 1146 997 1141 2877 current 5 3 3 3 Current	24 0 25 0 828 1520 869 1045 3226 history1 9 4 9 9 4	 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 ppm ppm	ASTM D5185m ASTM D5185m	2 0 50 0 950 1050 995 1180 2600 limit/base >25 >20 limit/base >3	5 0 56 <1 901 1146 997 1141 2877 <u>current</u> 5 3 3 3 <u>current</u> 0.6	24 0 25 0 828 1520 869 1045 3226 history1 9 4 9 4 9 history1 1.1	 history2 history2 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	2 0 50 950 1050 995 1180 2600 <i>imit/base</i> >25 >20 <i>imit/base</i> >3 >20	5 0 56 <1 901 1146 997 1141 2877 current 5 3 3 3 current 0.6 12.2	24 0 25 0 828 1520 869 1045 3226 history1 9 4 9 history1 1.1 1.0	 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	2 0 50 0 950 1050 995 1180 2600 imit/base >25 imit/base >3 >20	5 0 56 <1 901 1146 997 1141 2877 current 5 3 3 3 Current 0.6 12.2 25.1	24 0 25 0 828 1520 869 1045 3226 history1 9 4 9 9 1.1 1.1 1.1 16.0 34.8	 history2 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 TS ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844	2 0 0 50 0 950 1050 995 1180 2600 2600 25 20 220 20 20 20 20 20 20 30 20 20 20	5 0 56 <1 901 1146 997 1141 2877 current 5 3 3 3 current 0.6 12.2 25.1 current	24 0 25 0 828 1520 869 1045 3226 history1 9 4 9 4 9 history1 1.1 1.6.0 34.8 history1	 history2 history2 history2 history2



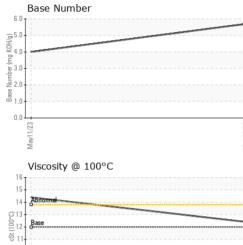
10 Abnormal

> 8 May11/23

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OIL ANALYSIS REPORT

VISUAL



	VISUAL		memou	IIIIII/Dase	current	TIIStOLA	THSTOLYZ
	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	
- 52	Appearance	scalar	*Visual	NORML	NORML	NORML	
Sep 18/23	Odor	scalar	*Visual	NORML	NORML	NORML	
C	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	
	Free Water	scalar	*Visual		NEG	NEG	
	FLUID PROPE	RTIES	method				history2
	Visc @ 100°C	cSt	ASTM D445	12.00	12.4	14.4	
	GRAPHS						
	Ferrous Alloys						
	⁷⁰						
	60 - chromium						
	50 - nickel						
	_ 40						
	E 30			/			
	20-						
	10						
	0	*************		53			
	//11//e			Sep 18/23			
	₩			S			
	Non-ferrous Metal	S					
	copper						
	8 - measurement lead						
	6- E						
	ā 4-						
	2						
	1/23			8/23			
	May11/23			Sep 18/23			
	Viscosity @ 100°C	2			D 1		
	¹⁶			6.0	Base Number		
	15						
	14 Abnormal			5.0			
	G ¹³			(0)HOX Buy HOX Buy Nump a 3.0 Bay 22.0 Bage Bage Charles Charl			
	G_012 83 11			 			
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	10			≥ 2.0	1		
	Abnormal			⁶⁰ 1.0			
	8			0.0	L;		
	11/23			Sep18/23	11/23		Sep 18/23
	May11/23			Sep 1	May11/23		Sep1
Laboratory Sample No. Lab Number Unique Number Test Package To discuss this sample report,	: 05994044 : 10722404 : FLEET	Received Diagnos Diagnosi	d : 31 (ed : 01 l tician : Dor	Oct 2023 Nov 2023 n Baldridge	3 N	2169 MOU Contact	TOR EXPRESS MUSTANG DR NDS VIEW, MN US 55112 : FRANK DIETZ z@mmeinc.com
* - Denotes test methods that a							: (763)225-6382
Statements of conformity to spec					JCGM 106:2012)	I	F: x: