

OIL ANALYSIS REPORT

Sample Rating Trend



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

DIAGNOSIS

Diesel Engine

Area [71304] Machine Id

5312

Recommendation

Resample at the next service interval to monitor. (Customer Sample Comment: Changed fluid and filters $\ensuremath{\mathsf{)}}$

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

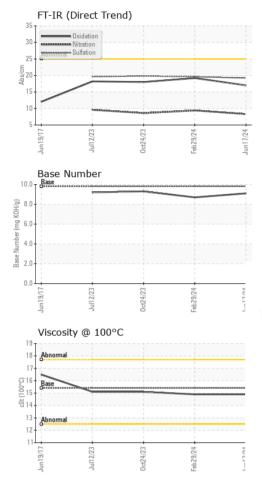
Fluid Condition

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		PCA0126255	PCA0086543	PCA0087055
Sample Date		Client Info		17 Jun 2024	29 Feb 2024	24 Oct 2023
Machine Age	hrs	Client Info		20532	20223	19852
Oil Age	hrs	Client Info		20532	20223	322
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
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	13	16	14
Chromium	ppm	ASTM D5185m	>20	1	<1	1
Nickel	ppm	ASTM D5185m	>4	<1	<1	<1
Titanium	ppm	ASTM D5185m		<1	0	0
Silver	ppm	ASTM D5185m	>3	<1	0	0
Aluminum	ppm	ASTM D5185m	>20	3	1	2
Lead	ppm	ASTM D5185m	>40	1	1	1
Copper	ppm	ASTM D5185m	>330	1	<1	1
Tin	ppm	ASTM D5185m	>15	<1	0	<1
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		<1	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 0	current 2	history1 2	history2 2
	ppm ppm					
Boron		ASTM D5185m	0	2	2 0 59	2 0 62
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	2 <1	2 0	2 0
Boron Barium Molybdenum Manganese Magnesium	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	2 <1 67	2 0 59 0 979	2 0 62
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	2 <1 67 <1	2 0 59 0	2 0 62 <1 965 1034
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	2 <1 67 <1 965 1127 997	2 0 59 0 979 1140 989	2 0 62 <1 965 1034 1065
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	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	2 <1 67 <1 965 1127 997 1264	2 0 59 0 979 1140 989 1234	2 0 62 <1 965 1034 1065 1265
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	0 0 60 0 1010 1070 1150	2 <1 67 <1 965 1127 997	2 0 59 0 979 1140 989	2 0 62 <1 965 1034 1065
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	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	2 <1 67 <1 965 1127 997 1264 2730 current	2 0 59 0 979 1140 989 1234 3298 history1	2 0 62 <1 965 1034 1065 1265
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	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	2 <1 67 <1 965 1127 997 1264 2730 current 4	2 0 59 0 979 1140 989 1234 3298 history1 3	2 0 62 <1 965 1034 1065 1265 2957 history2 4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	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 0 1010 1070 1150 1270 2060 limit/base >25	2 <1 67 <1 965 1127 997 1264 2730 current 4 <	2 0 59 0 979 1140 989 1234 3298 history1 3 2	2 0 62 <1 965 1034 1065 1265 2957 history2 4 2
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 ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	2 <1 67 <1 965 1127 997 1264 2730 current 4	2 0 59 0 979 1140 989 1234 3298 history1 3	2 0 62 <1 965 1034 1065 1265 2957 history2 4 2 2 4 2
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 60 0 1010 1070 1150 1270 2060 limit/base >25	2 <1 67 <1 965 1127 997 1264 2730 current 4 <1 2 2 current	2 0 59 0 979 1140 989 1234 3298 history1 3 2 0 0 history1	2 0 62 <1 965 1034 1065 1265 2957 history2 4 2 <1 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 ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >3	2 <1 67 <1 965 1127 997 1264 2730 current 4 <1 2 current 0.1	2 0 59 0 979 1140 989 1234 3298 history1 3 2 0 history1 0.2	2 0 62 <1 965 1034 1065 1265 2957 history2 4 2 <1 kistory2 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>imit/base</i> >25 >20 <i>imit/base</i> >3 >20	2 <1 67 <1 965 1127 997 1264 2730 current 4 <1 2 current 0.1 8.3	2 0 59 0 979 1140 989 1234 3298 history1 3 2 0 history1 0.2 9.4	2 0 62 <1 965 1034 1065 1265 2957 history2 4 2 2 4 2 2 <1 history2 0.1 8.6
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 ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >3	2 <1 67 <1 965 1127 997 1264 2730 current 4 <1 2 current 0.1	2 0 59 0 979 1140 989 1234 3298 history1 3 2 0 history1 0.2	2 0 62 <1 965 1034 1065 1265 2957 history2 4 2 <1 kistory2 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 ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 <i>imit/base</i> >25 >20 <i>imit/base</i> >3 >20	2 <1 67 <1 965 1127 997 1264 2730 current 4 <1 2 current 0.1 8.3	2 0 59 0 979 1140 989 1234 3298 history1 3 2 0 history1 0.2 9.4	2 0 62 <1 965 1034 1065 1265 2957 history2 4 2 2 4 2 2 <1 history2 0.1 8.6
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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 20 20 320 33 20 20 20	2 <1 67 <1 965 1127 997 1264 2730 current 4 <1 2 current 0.1 8.3 19.2	2 0 59 0 979 1140 989 1234 3298 history1 3 2 0 history1 0.2 9.4 19.6	2 0 62 <1 965 1034 1065 1265 2957 history2 4 2 <1 history2 0.1 8.6 19.8



OIL ANALYSIS REPORT



Sam Lab Uniqu	Laboratory Sample No. Lab Number Unique Number Test Package		Rece Teste Diagr	ived : 02 ed : 03 nosed : 03	Cary, NC 27513 : 02 Jul 2024 : 03 Jul 2024 : 03 Jul 2024 : 03 Jul 2024 - Don Baldridge		Kemp Quarries - Muskogee Sand 3395 W 50th St N Porter, Ol US 7445 Contact		
		12	0ct24/23 +	Feb29/24	8356 0.0	Jun 19/17	0ct24/23	Feb29/24	
		18 Abnormal			(b)HOX 8.0 (b)HOX (b) b) a 6.0 (b) a 6.0 (c) 6.0 (c) 6.0 (c) 6.0 (c) 7.0 (c) 7				
		²⁰				Base Numbe	er		
		ابتار بالمحالية		Feb	μη	-, -, -,		93 II	
		Jul12/23	0ct24/23	Feb29/24	Jun17/24	Jun19/17	0ct24/23 -	Feb29/24	
		100-			20	Abnormal			
		틆 200 -			튭.40				
		400 Severe Sbnonnal			60	Severe			
		Copper (ppm)	0	ŭ		Silicon (ppm	_	æ =	
		Jun19/17	0ct24/23 -	Feb29/24 -	Jun17/24	Jun 19/17	0ct24/23 -	Feb29/24 -	
Oct	Feb.	10			10				
0ct24/23	Feb29/24	20 - Abnormal			³⁰ 20	Abnormal			
	40 - Severe	1		40	Severe				
		Aluminum (ppm)			50	1	ppm)	· · · · · · · · · · · · · · · · · · ·	
		Jun 19/17 Jul 12/23	0ct24/23	Feb29/24	Jun17/24	Jun19/17 Jun12/23	0ct24/23	Feb29/24	
1			/23 +	/24 +	o		/23	/24	
		B 100 - Abnormal			40 20				
0ct24/23	Feb29/24	E 150 - Abaamal			E 60				
23 -	24	250 200 Severe			100	Severe	1 1		
		Iron (ppm)				Lead (ppm)			
		Visc @ 100°C GRAPHS	cSt	A3110 D443	15.4	14.9	14.9	15.1	
		FLUID PROPE		method ASTM D445	limit/base	current	history1	history2 15.1	
		Free Water	scalar	*Visual		NEG	NEG	NEG	
		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG	
0ct24/23	Feb29/24 Jun17/24	Odor	scalar	*Visual	NORML	NORML	NORML	NORML	
24	24	Sand/Dirt Appearance	scalar scalar	*Visual *Visual	NONE NORML	NONE NORML	NONE	NONE NORML	
	Debris	scalar	*Visual	NONE	NONE	NONE	NONE		
		Silt	scalar	*Visual	NONE	NONE	NONE	NONE	
1		Yellow Metal Precipitate	scalar scalar	*Visual *Visual	NONE	NONE	NONE	NONE	
		White Metal	scalar	*Visual	NONE	NONE	NONE	NONE NONE	

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