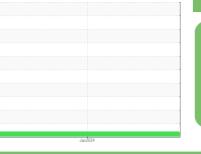


OIL ANALYSIS REPORT







Machine Id **413** Component **Diesel Engine** Fluid

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

DIAGNOSIS

Recommendation

Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

Fuel content negligible. There is no indication of any contamination in the oil.

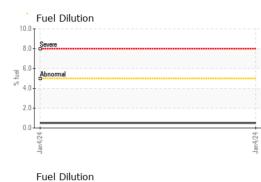
Fluid Condition

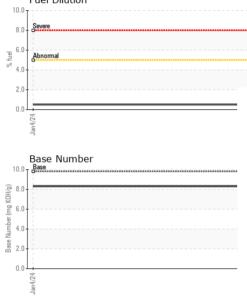
The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.

SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		PCA0066387		
Sample Date		Client Info		04 Jan 2024		
Machine Age	mls	Client Info		199952		
Oil Age	mls	Client Info		20000		
Oil Changed		Client Info		Changed		
Sample Status				ATTENTION		
CONTAMINAT	ION	method	limit/base	current	history1	history2
Water		WC Method	>0.2	NEG		
Glycol		WC Method		NEG		
WEAR METAL	c	method	limit/base	current	history1	history2
					Thistory I	TIISTOLAS
Iron	ppm	ASTM D5185m	>100	2		
Chromium	ppm	ASTM D5185m	>20	0		
Nickel	ppm	ASTM D5185m	>4	0		
Titanium	ppm	ASTM D5185m	0	0		
Silver	ppm	ASTM D5185m	>3	0		
Aluminum	ppm	ASTM D5185m	>20	<1		
Lead	ppm	ASTM D5185m	>40	0		
Copper	ppm	ASTM D5185m	>330	<1		
Tin	ppm	ASTM D5185m	>15	0		
Vanadium	ppm	ASTM D5185m		<1		
Cadmium	ppm	ASTM D5185m		0		
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	70		
Barium	ppm	ASTM D5185m	0	0		
Molybdenum	ppm	ASTM D5185m	60	40		
Manganese	ppm ppm	ASTM D5185m	0	0		
Manganese Magnesium	ppm ppm	ASTM D5185m ASTM D5185m	0 1010	0 253		
Manganese Magnesium Calcium	ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070	0 253 2036		
Manganese Magnesium Calcium Phosphorus	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070 1150	0 253 2036 1056		
Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070 1150 1270	0 253 2036 1056 1191		
Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070 1150	0 253 2036 1056		
Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070 1150 1270	0 253 2036 1056 1191		
Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070 1150 1270 2060 limit/base	0 253 2036 1056 1191 3581	 	
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070 1150 1270 2060 limit/base	0 253 2036 1056 1191 3581 current	 	
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070 1150 1270 2060 limit/base >25	0 253 2036 1056 1191 3581 <u>current</u> 5 <1 <1	 history1 	 history2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m	0 1010 1070 1150 1270 2060 limit/base >25	0 253 2036 1056 1191 3581 current 5 <	 history1 	 history2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070 1150 1270 2060 limit/base >25	0 253 2036 1056 1191 3581 <u>current</u> 5 <1 <1	 history1 	 history2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel	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 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 >5	0 253 2036 1056 1191 3581 <u>current</u> 5 <1 <1 <1 0.5	 history1 	 history2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED	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 ASTM D5185m ASTM D5185m	0 1010 1070 1150 1270 2060 limit/base >25 >20 >5 limit/base >3	0 253 2036 1056 1191 3581 current 5 <1 <1 <1 0.5 current	 history1 history1	 history2 history2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm %	ASTM D5185m ASTM D5185m	0 1010 1070 1150 1270 2060 limit/base >25 >20 >5 limit/base >3	0 253 2036 1056 1191 3581 current 5 <1 <1 <1 0.5 current 0.1	 history1 history1 history1	 history2 history2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	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 D3524 ASTM D3524 method *ASTM D7844	0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 >5 <i>limit/base</i> >3 >20	0 253 2036 1056 1191 3581 <u>current</u> 5 <1 <1 <1 0.5 <u>current</u> 0.1 5.0	 history1 history1 history1	 history2 history2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	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 ASTM D3524 ASTM D7844 *ASTM D7844 *ASTM D7844	0 1010 1070 1150 1270 2060 imit/base >25 >20 >5 imit/base >3 >20 >30	0 253 2036 1056 1191 3581 current 5 <1 <1 <1 0.5 current 0.1 5.0 17.1	 history1 history1 history1	 history2 history2 history2



OIL ANALYSIS REPORT





	VISUAL		method				history2
	White Metal	scalar	*Visual	NONE	NONE		
	Yellow Metal	scalar	*Visual	NONE	NONE		
	Precipitate	scalar	*Visual	NONE	NONE		
	Silt	scalar	*Visual	NONE	NONE		
	Debris	scalar	*Visual	NONE	NONE		
	Sand/Dirt	scalar	*Visual	NONE	NONE		
4/24	Appearance	scalar	*Visual	NORML	NORML		
Jan	Odor	scalar	*Visual	NORML	NORML		
	Emulsified Water	scalar	*Visual	>0.2	NEG		
	Free Water	scalar	*Visual		NEG		
	FLUID PROPE	ERTIES	method	limit/base	e current	history1	history2
	Visc @ 100°C	cSt	ASTM D445	15.4	11.5		
	GRAPHS						
	Iron (ppm)					1	
	250				Seulere		
	200				80		
	E 150-			ud	60-		
				-	40 4 0	**********	**********************
				24			
	Jan 4/			Jan4/	Jan4/		
	Aluminum (ppm)				Chromium	(mag)	
	⁵⁰ T				⁵⁰ T	(FF)	
	40 - Severe				40 - Severe		
	5 ³⁰				30		
	20 Abnormal		******	d	20 - Abnormal		*********
	10-				10		
	24 24			24	0		
	Jan 4/			Jan4/	Jan4//		
	Copper (ppm)				Silicon (ppn	1)	
	400 T Severe				80 Severe	,	
	300				60		
	E 200				40		
				-	Abnormal		
	100-				20		
	04			54	0		
	Jan 4/2			Jan 4/2	Jan 4/2		
	-	C		-		or	
	²⁰				Deve		
	18 Abnormal			B/HO>	8.0		
	0 16 - Base			(Bm)	6.0		
	5 14 Abaama			mber	4.0		
	12 - Abnormal			ase Nu	2.0		
	10				0.0		
	Jan4/24			Jan4/24	Jan4/24		
		Debris Sand/Dirt Appearance Odor Emulsified Water Free Water Fluid PROPE Visc @ 100°C GRAPHS Iron (ppm) 200 Bevere 150 Abnomal 50 50 50 50 50 50 50 50 50 50 50 50 50	Debris scalar Sand/Dirt scalar Appearance scalar Odor scalar Emulsified Water scalar Free Water scalar Free Water scalar Visc @ 100°C cSt GRAPHS Iron (ppm)	Debris scalar *Visual Sand/Dirt scalar *Visual Appearance scalar *Visual Odor scalar *Visual Emulsified Water scalar *Visual Free Water scalar *Visual Free Water scalar *Visual Free Water scalar *Visual FLUID PROPERTIES method Visc @ 100°C cSt ASTM D445 GRAPHS Iron (ppm)	Debris scalar *Visual NONE Sand/Dirt scalar *Visual NONE Appearance scalar *Visual NORML Odor scalar *Visual NORML Odor scalar *Visual NORML Emulsified Water scalar *Visual >0.2 Free Water scalar *Visual >0.2 Free Water scalar *Visual >0.2 Free Water scalar *Visual >0.4 FLUID PROPERTIES method imit/base Visc @ 100°C cSt ASTM D445 15.4 GRAPHS Iron (ppm)	Debris scalar *Visual NONE NONE Sand/Dirt scalar *Visual NONE NORML Appearance scalar *Visual NORML NORML Odor scalar *Visual NORML NORML Emulsified Water scalar *Visual >0.2 NEG Free Water scalar *Visual NORML NORML Visc @ 100°C cSt ASTM D445 15.4 A 11.5 CRAPHS Iron (ppm) Aluminum (ppm) Copper (ppm) Copper (ppm) Viscosity @ 100°C Viscosity @ 100°C Debris scalar *Visual NORML NORML Lead (ppm) Copper (ppm) Viscosity @ 100°C Silicon (ppm) Copper (ppm) Viscosity @ 100°C	Debris scalar 'Visual NONE NONE Sand/Dirt scalar 'Visual NORML NORML Appearance scalar 'Visual NORML NORML Coor scalar 'Visual NORML NORML Emulsified Water scalar 'Visual NORML NORML Free Water scalar 'Visual 'Normation Free Water scalar 'Visual 'Normation

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* - 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)

F:

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