

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id 525014-7014

Component Diesel Engine

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

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

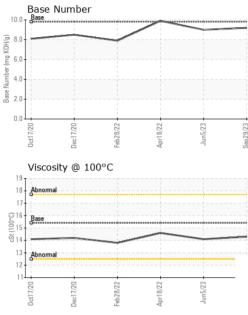
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI	MAT <u>IO</u> N	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0091771	GFL0074330	GFL0039681
Sample Date		Client Info		29 Sep 2023	05 Jun 2023	18 Apr 2022
Machine Age	hrs	Client Info		13386	2086	366550
Oil Age	hrs	Client Info		13386	0	366550
Oil Changed		Client Info		Not Changd	Not Changd	N/A
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>110	9	14	5
Chromium	ppm	ASTM D5185m	>4	<1	1	<1
Nickel	ppm	ASTM D5185m	>2	0	0	0
Titanium	ppm	ASTM D5185m		0	<1	0
Silver	ppm	ASTM D5185m	>2	0	0	<1
Aluminum	ppm	ASTM D5185m	>25	7	7	2
Lead	ppm	ASTM D5185m	>45	<1	<1	<1
Copper	ppm	ASTM D5185m	>85	1	2	<1
Tin	ppm	ASTM D5185m	>4	<1	1	<1
Antimony	ppm	ASTM D5185m				
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 0	current 3	history1 3	history2 9
	ppm ppm					
Boron		ASTM D5185m	0 0 60	3 0 62	3	9
Boron Barium Molybdenum Manganese	ppm	ASTM D5185m ASTM D5185m	0 0 60 0	3 0 62 0	3 0 61 <1	9 0 60 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	3 0 62 0 928	3 0 61	9 0 60 <1 987
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	3 0 62 0 928 1030	3 0 61 <1 971 1106	9 0 60 <1 987 1127
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	3 0 62 0 928 1030 1048	3 0 61 <1 971 1106 1007	9 0 60 <1 987 1127 1061
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	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	3 0 62 0 928 1030 1048 1247	3 0 61 <1 971 1106 1007 1252	9 0 60 <1 987 1127 1061 1218
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	3 0 62 0 928 1030 1048	3 0 61 <1 971 1106 1007	9 0 60 <1 987 1127 1061
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 1010 1070 1150 1270 2060	3 0 62 0 928 1030 1048 1247 3404 current	3 0 61 <1 971 1106 1007 1252 3569 history1	9 0 60 <1 987 1127 1061 1218 2727 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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	3 0 62 0 928 1030 1048 1247 3404 <i>current</i> 4	3 0 61 <1 971 1106 1007 1252 3569 history1 5	9 0 60 <1 987 1127 1061 1218 2727 history2 3
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 method ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base >30	3 0 62 0 928 1030 1048 1247 3404 <u>current</u> 4 1	3 0 61 <1 971 1106 1007 1252 3569 history1 5 1	9 0 60 <1 987 1127 1061 1218 2727 history2 3 1
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 limit/base >30	3 0 62 0 928 1030 1048 1247 3404 <i>current</i> 4	3 0 61 <1 971 1106 1007 1252 3569 history1 5	9 0 60 <1 987 1127 1061 1218 2727 history2 3
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 method ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base >30	3 0 62 0 928 1030 1048 1247 3404 <u>current</u> 4 1	3 0 61 <1 971 1106 1007 1252 3569 history1 5 1	9 0 60 <1 987 1127 1061 1218 2727 history2 3 1
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	0 0 0 1010 1070 1150 1270 2060 Imit/base >30 >20 Imit/base	3 0 62 0 928 1030 1048 1247 3404 <i>current</i> 4 1 7 <i>current</i> 0.2	3 0 61 <1 971 1106 1007 1252 3569 history1 5 1 12 12 history1 0.3	9 0 60 <1 987 1127 1061 1218 2727 history2 3 1 3 1 3 <i>history2</i> 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 TS ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <i>limit/base</i> >30 <i>limit/base</i> >20	3 0 62 0 928 1030 1048 1247 3404 <i>current</i> 4 1 7 <i>current</i> 0.2 5.9	3 0 61 <1 971 1106 1007 1252 3569 history1 5 1 12 12 history1 0.3 7.8	9 0 60 <1 987 1127 1061 1218 2727 history2 3 1 3 1 3 <i>history2</i> 0.1 6.4
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	0 0 0 1010 1070 1150 1270 2060 Imit/base >30 >20 Imit/base	3 0 62 0 928 1030 1048 1247 3404 <i>current</i> 4 1 7 <i>current</i> 0.2	3 0 61 <1 971 1106 1007 1252 3569 history1 5 1 12 12 history1 0.3	9 0 60 <1 987 1127 1061 1218 2727 history2 3 1 3 1 3 <i>history2</i> 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 D5185m	0 0 0 1010 1070 1150 1270 2060 <i>limit/base</i> >30 <i>limit/base</i> >20	3 0 62 0 928 1030 1048 1247 3404 <i>current</i> 4 1 7 <i>current</i> 0.2 5.9	3 0 61 <1 971 1106 1007 1252 3569 history1 5 1 12 12 history1 0.3 7.8	9 0 60 <1 987 1127 1061 1218 2727 history2 3 1 3 1 3 <i>history2</i> 0.1 6.4
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 imit/base >30 imit/base >3 20	3 0 62 0 928 1030 1048 1247 3404 <i>current</i> 4 1 7 <i>current</i> 0.2 5.9 18.0	3 0 61 <1 971 1106 1007 1252 3569 history1 5 1 12 5 1 12 history1 0.3 7.8 19.5	9 0 60 <1 987 1127 1061 1218 2727 history2 3 1 3 1 3 history2 0.1 6.4 19.2
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 2060 2060 200 200 200 200 20	3 0 62 0 928 1030 1048 1247 3404 <i>current</i> 4 1 7 <i>current</i> 0.2 5.9 18.0	3 0 61 <1 971 1106 1007 1252 3569 history1 5 1 12 5 1 12 bistory1 0.3 7.8 19.5 history1	9 0 60 <1 987 1127 1061 1218 2727 history2 3 1 3 1 3 <i>history2</i> 0.1 6.4 19.2 <i>history2</i>



OIL ANALYSIS REPORT

VISUAL



ACC REDITED	Laboratory Sample No. Lab Number Unique Number Test Package		ronmental - 654 - Richmond Hauling 11800 Lewis Road Chester, VA US 23831 Contact: Jimmy Mayes jmayes@gflenv.com					
		13 Abnormal 12 11 07/L [390] 07/L [390]	Feb28/22	Jun5/23	Sep 29/23		Feb28/22 +	Jun5/23
		18 Abnormal			8 9 9 9 9 9 9	.0 -	<u> </u>	
		Viscosity @ 100	l°C		10	Base Number		
		0ct17/20 Dec17/20	Feb28/22		Sep29/23			
		8 - Ead 6						
		Non-ferrous Me						
		0ect17/20	Feb28/22 Apr18/22	Jun 5/23	Sep29/23			
				/				
reo.zo/.zz	Jun5/23	Ferrous Alloys	\land	\wedge				
		GRAPHS	001		10.4	14.0	1-1.1	14.0
		FLUID PROP Visc @ 100°C	PERTIES cSt	method ASTM D445	limit/base	current 14.3	history1 14.1	history2 14.6
		Emulsified Water Free Water	scalar scalar	*Visual *Visual	>0.2	NEG NEG	NEG NEG	NEG NEG
reb 20/22 Apr1 8/22	Jun5/23 Sep29/23	Appearance Odor	scalar scalar	*Visual *Visual	NORML		NORML	NORML
22	3 23	Sand/Dirt	scalar scalar	*Visual *Visual	NONE	NONE	NONE	NONE
		Silt Debris	scalar	*Visual	NONE	NONE	NONE	NONE
		Yellow Metal Precipitate	scalar scalar	*Visual *Visual	NONE NONE	NONE	NONE	NONE

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