

OIL ANALYSIS REPORT

VISCOSITY

4

Machine Id 3725

Component

Diesel Engine

PETRO CANADA DURON SHP 15W40 (11 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

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.

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SAMPLE INFORI	MATION	method			history1	history2
Sample Number		Client Info		GFL0106102	GFL0092474	GFL0083641
Sample Date		Client Info		26 Dec 2023	12 Oct 2023	30 Jun 2023
Machine Age	hrs	Client Info		17763	16874	16874
Oil Age	hrs	Client Info		0	91	383
Oil Changed		Client Info		Changed	Not Changd	Changed
Sample Status				ATTENTION	ABNORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	historv1	historv2
Iron	nnm	ACTM DE105m	. 75	24	10	20
Chromium	ppm	AGTM D5105m	>75	34	-1	20 ~1
Nickol	ppm	AGTM D5105m	>0	2	<1	0
Titonium	ppm	AGTM DE105m	>4	0	0	0
Silver	ppm	AGTM DE105m	>2	0	0	0
Aluminum	ppin	AGTM DE105m	>2	0	0	1
Aummum	ppin	AGTIM DE105m	>10	0	-1	0
Connor	ppm	ASTIVI DO 100III	>20	<1	<1	1
Copper	ppm		>100	0	<	1
l In Manadium	ppm	ASTM D5185m	>4	2	<	0
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		U	0	0
ADDITIVES		methou	mmbase	current	nistory i	TIIStOLYZ
Boron	ppm	ASTM D5185m	0	10	2	11
ADDITIVES Boron Barium	ppm ppm	ASTM D5185m ASTM D5185m	0	10 0	2 2	11 0
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	10 0 54	2 2 51	11 0 62
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	10 0 54 <1	2 2 51 <1	11 0 62 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	10 0 54 <1 823	2 2 51 <1 ▲ 632	11 0 62 <1 894
ADDITIVES 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	10 0 54 <1 823 900	2 2 51 <1 ▲ 632 ▲ 802	11 0 62 <1 894 1111
ADDITIVES 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 ASTM D5185m	0 0 60 0 1010 1070 1150	10 0 54 <1 823 900 964	2 2 51 <1 ▲ 632 4 802 775	11 0 62 <1 894 1111 992
ADDITIVES 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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270	10 0 54 <1 823 900 964 1138	2 2 51 <1 ▲ 632 ▲ 802 775 ▲ 897	11 0 62 <1 894 1111 992 1236
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	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 0 1010 1070 1150 1270 2060	10 0 54 <1 823 900 964 1138 2808	2 2 51 <1 ▲ 632 ▲ 802 775 ▲ 897 2285	11 0 62 <1 894 11111 992 1236 3540
ADDITIVES 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	0 0 60 0 1010 1070 1150 1270 2060 Limit/base	10 0 54 <1 823 900 964 1138 2808 current	2 2 51 <1 ▲ 632 ▲ 802 775 ▲ 897 2285 history1	11 0 62 <1 894 1111 992 1236 3540 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	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 0 60 0 1010 1070 1150 1270 2060 Limit/base	10 0 54 <1 823 900 964 1138 2808 current	2 2 51 <1 ▲ 632 ▲ 802 775 ▲ 897 2285 history1 4	11 0 62 <1 894 1111 992 1236 3540 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	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 0 60 0 1010 1070 1150 1270 2060 limit/base >25	10 0 54 <1 823 900 964 1138 2808 current 9 25	2 2 51 <1 ▲ 632 ▲ 802 775 ▲ 897 2285 history1 4 3	11 0 62 <1 894 1111 992 1236 3540 history2 5 5 58
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm 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	10 0 54 <1 823 900 964 1138 2808 current 9 25 1	2 2 51 <1 ▲ 632 ▲ 802 775 ▲ 897 2285 history1 4 3 1	11 0 62 <1 894 1111 992 1236 3540 history2 5 58 3
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Euel	ppm 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 >20 >3.0	10 0 54 <1 823 900 964 1138 2808 current 9 25 1 1 <1.0	2 2 51 <1 ▲ 632 ▲ 802 775 ▲ 897 2285 history1 4 3 1 ▲ 1.6	11 0 62 <1 894 1111 992 1236 3540 history2 5 58 3 <10
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel	ppm 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 <i>limit/base</i> >25 >20 >20 >3.0	10 0 54 <1 823 900 964 1138 2808 current 9 25 1 <1.0	2 2 51 <1 ▲ 632 ▲ 802 775 ▲ 897 2285 history1 4 3 1 ▲ 1.6	11 0 62 <1 894 1111 992 1236 3540 history2 5 58 3 <1.0
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel 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 <i>limit/base</i> >25 >20 >3.0	10 0 54 <1 823 900 964 1138 2808 current 9 25 1 <1.0 current	2 2 51 <1 ▲ 632 ▲ 802 775 ▲ 897 2285 history1 4 3 1 ▲ 1.6 history1	11 0 62 <1 894 1111 992 1236 3540 history2 5 58 3 <1.0 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D3524 method *ASTM D7844	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 >3.0 limit/base >6	10 0 54 <1 823 900 964 1138 2808 current 9 25 1 <1.0 current 0.8	2 2 51 <1 ▲ 632 ▲ 802 775 ▲ 897 2285 history1 4 3 1 ▲ 1.6 history1 0.5	11 0 62 <1 894 1111 992 1236 3540 history2 5 58 3 <1.0 history2 0.6
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 0 60 0 1010 1070 1150 1270 2060 limit/base >20 >3.0 limit/base >6 >20	10 0 54 <1 823 900 964 1138 2808 current 9 25 1 <1.0 current 0.8 9.2	2 2 51 <1 ▲ 632 ▲ 802 775 ▲ 897 2285 history1 4 3 1 ▲ 1.6 history1 0.5 5.7	11 0 62 <1 894 1111 992 1236 3540 history2 5 58 3 <1.0 history2 0.6 7.5
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7624 *ASTM D7415	0 0 0 60 0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 >20 >3.0 <i>limit/base</i> >6 >20 >20 >3.0	10 0 54 <1 823 900 964 1138 2808 current 9 25 1 <1.0 current 0.8 9.2 19.8	2 2 51 <1 ▲ 632 ▲ 802 775 ▲ 897 2285 history1 4 3 1 ▲ 1.6 history1 0.5 5.7 16.6	11 0 62 <1 894 1111 992 1236 3540 history2 5 58 3 <1.0 history2 0.6 7.5 19.4
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation FLUID DEGRAD	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7624 *ASTM D7415 Method	0 0 0 1010 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 >3.0 <i>limit/base</i> >6 >20 >30 <i>limit/base</i>	10 0 54 <1 823 900 964 1138 2808 current 9 25 1 <1.0 current 0.8 9.2 19.8	2 2 51 <1 ▲ 632 ▲ 802 775 ▲ 897 2285 history1 4 3 1 ▲ 1.6 history1 0.5 5.7 16.6 history1	11 0 62 <1 894 1111 992 1236 3540 history2 5 58 3 <1.0 history2 0.6 7.5 19.4
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE Oxidation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7414	0 0 0 60 0 1010 1070 1150 1270 2060 2060 2060 225 20 >20 >3.0 1imit/base >6 >20 >30 20 3.0 20 20 >3.0	10 0 54 <1 823 900 964 1138 2808 current 9 25 1 <1.0 current 0.8 9.2 19.8 current 15.5	2 2 51 <1 632 802 775 897 2285 history1 4 3 1 ▲1.6 history1 0.5 5.7 16.6 history1 10.9	11 0 62 <1 894 1111 992 1236 3540 history2 5 58 3 <1.0 history2 0.6 7.5 19.4 history2 13.9



OIL ANALYSIS REPORT







VISLIAI						
		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPE	RTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	11.7	1 1.6	13.8
Ferrous Alloys						
Ferrous Alloys	an3/20	m25/21 dc28/21	tf 2/23			



* - 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)

Submitted By: Darrell Welch

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