

Charlestown

612

Component Diesel Engine

PETRO CANADA DURON SHP 10W30 (--- GAL)

RECOMMENDATION

We advise that you check for the source of the coolant leak. Check for low coolant level. We recommend that you drain the oil and perform a filter service on this component if not already done. We recommend an early resample to monitor this condition.

WEAR

All component wear rates are normal.

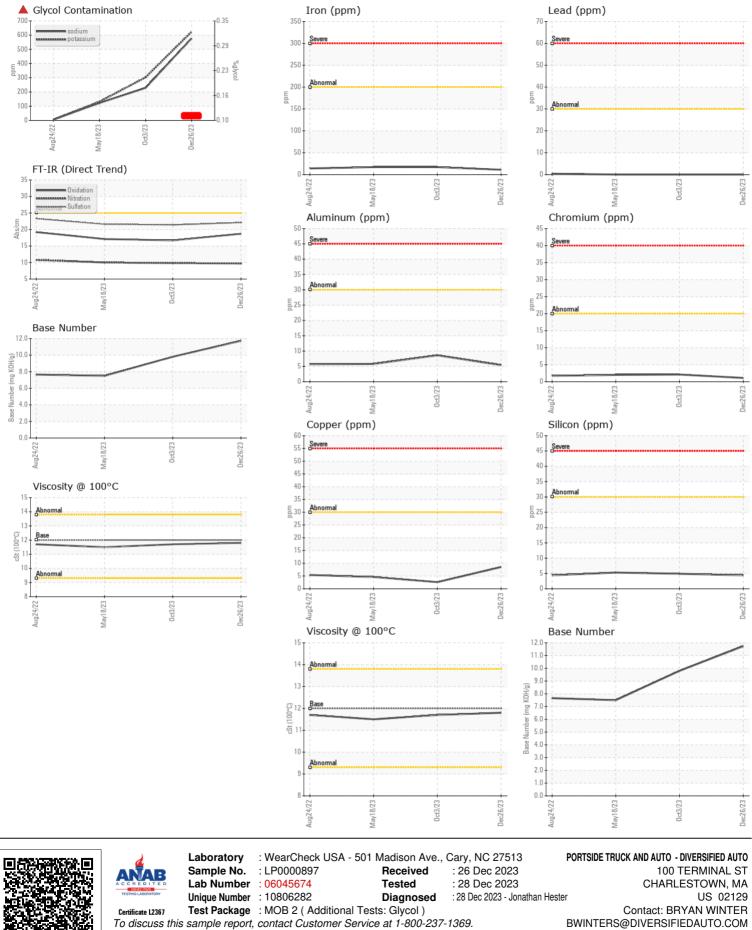
	INATION	

Sodium and/or potassium levels are high. There is a high concentration of glycol present in the oil.

FLUID CONDITION

The BN result indicates that there is suitable alkalinity remaining in the oil. The oil is no longer serviceable due to the presence of contaminants.

Sample Number Client Info LP0000897 LP000453 LP000 Sample Date Client Info 26 Dec 2023 03 Oct 2023 18 May Machine Age mls Client Info 0 0 0 Oil Age mls Client Info 0 0 0 0 Oil Changed Client Info 0 0 0 0 0 Oil Changed Client Info N/A N/A N/A N/A Filter Changed Client Info N/A N/A N/A N/A Sample Status - SEVERE ABNORMAL ABNOR Iron ppm ASTM D5185m<>20 11 2 2 Nickel ppm ASTM D5185m<>20 1 -1 3 -1 Silver ppm ASTM D5185m<>30 6 0 -1 -1 Vanadium ppm ASTM D5185m<>30 8 3 5 -1 -1 Vanadium ppm <t< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>							
Sample Date Client Info 26 Dec 2023 03 Oct 2023 18 May Machine Age mls Client Info 0 0 0 0 Oil Chage mls Client Info 0 0 0 0 0 Oil Chaged Client Info N/A N/A N/A N/A N/A Filter Changed Client Info N/A N/A N/A N/A N/A Sample Status Client Info N/A N/A N/A N/A N/A Iron ppm ASTM D5185m >20 11 1 7 1 Chromium ppm ASTM D5185m >2 0 <1 <1 1 Silver ppm ASTM D5185m >2 0 0 0 0 0 0 0 0 0 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 <t< th=""><th>Test</th><th>UOM</th><th>Method</th><th>Limit/Abn</th><th>Current</th><th>History1</th><th>History2</th></t<>	Test	UOM	Method	Limit/Abn	Current	History1	History2
Machine Age mls Client Info 0 0 0 0 Oil Age mls Client Info 0 0 0 0 Filter Age mls Client Info N/A N/A N/A N/A Filter Changed Client Info N/A N/A N/A N/A Sample Status SEVERE ABNORMAL ABNOR ABNOR Iron ppm ASTM D5185m >20 1 2 2 Nickel ppm ASTM D5185m >2 0 <1 <1 <1 Silver ppm ASTM D5185m >2 0 0 0 0 Aluminum ppm ASTM D5185m >30 0	Sample Number		Client Info		LP0000897	LP0000453	LP0000481
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Filter Age mis Client Info 0 0 0 0 Oil Changed Client Info N/A N/A N/A N/A Filter Changed Client Info N/A N/A N/A N/A Sample Status SEVERE ABNORMAL ABNOR Iron ppm ASTM D5185m >200 11 2 2 Nickel ppm ASTM D5185m >2 0 <1 <1 Titanium ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >2 0 0 0 Copper ppm ASTM D5185m >30 8 3 5 Tin ppm ASTM D5185m >30 8 3 5 Tin ppm ASTM D5185m >30 8 3 5 Tin ppm ASTM D5185m >30 4 5 5 Velow Metal scalar<*Vi	Machine Age	mls	Client Info		0	0	0
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Oil Changed Client Info N/A N/A N/A N/A Filter Changed Client Info N/A N/A N/A N/A Sample Status SEVERE ABNORMAL ABNOR Iron ppm ASTM D5185m >200 11 2 2 Nickel ppm ASTM D5185m >2 0 <1 <1 Titanium ppm ASTM D5185m >2 0 <1 <1 Silver ppm ASTM D5185m >2 0 0 0 Auminum ppm ASTM D5185m >30 5 9 6 Lead ppm ASTM D5185m >30 8 3 5 Tin ppm ASTM D5185m >30 8 3 5 Vanadium ppm ASTM D5185m >30 4 5 5 Potassium ppm ASTM D5185m >30 4 5 5 Silicon ppm <th>Filter Age</th> <th>mls</th> <th>Client Info</th> <th></th> <th>0</th> <th>0</th> <th>0</th>	Filter Age	mls	Client Info		0	0	0
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Iron ppm ASTM D5185m >200 11 17 17 Chromium ppm ASTM D5185m >20 1 2 2 Nickel ppm ASTM D5185m >2 0 <1 <1 3 <1 Titanium ppm ASTM D5185m >2 0 0 0 0 Aluminum ppm ASTM D5185m >30 5 9 6 Lead ppm ASTM D5185m >30 0 0 0 Copper ppm ASTM D5185m >30 8 3 5 Tin ppm ASTM D5185m >30 8 3 5 Tin ppm ASTM D5185m >15 0 <1 0 White Metal scalar *Visual NONE NONE NONE NORE Silicon ppm ASTM D5185m >20 623 302 13' Fuel WC Method >3.0	Sample Status				SEVERE	ABNORMAL	ABNORMAL
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Titanium ppm ASTM D5185m >2 <1	Chromium	ppm	ASTM D5185m	>20	1	2	2
Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >30 5 9 6 Lead ppm ASTM D5185m >30 0 0 0 Copper ppm ASTM D5185m >30 8 3 5 Tin ppm ASTM D5185m >15 0 <1	Nickel	ppm	ASTM D5185m	>2	0	<1	<1
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Lead ppm ASTM D5185m >30 0 0 0 0 Copper ppm ASTM D5185m >30 8 3 5 Tin ppm ASTM D5185m >15 0 <1 <1 Vanadium ppm ASTM D5185m >10 <1 0 White Metal scalar *Visual NONE NONE NONE NONE NONE Yellow Metal scalar *Visual NONE NONE NONE NONE NONE NONE Silicon ppm ASTM D5185m >20 ▲ 623 ▲ 302 ▲ 13 Fuel WC Method >3.0 <1.0 <1.0 <1.1 <1.0 Water WC Method >0.2 NEG NEG NEG NEG Soot % % *ASTM D7624 >20 9.7 9.8 10.5 Sulfation Abs/.1mm *ASTM D7624 >20 9.7 9.8 10.5 San	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper ppm ASTM D5185m >30 8 3 5 Tin ppm ASTM D5185m 0 <1 <1 Vanadium ppm ASTM D5185m 0 <1 0 White Metal scalar *Visual NONE NONE NONE NONE Yellow Metal scalar *Visual NONE NONE NONE NONE NONE Silicon ppm ASTM D5185m >20 ▲ 623 ▲ 302 ▲ 137 Fuel WC Method >3.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <td< th=""><th>Aluminum</th><th>ppm</th><th>ASTM D5185m</th><th>>30</th><th>5</th><th>9</th><th>6</th></td<>	Aluminum	ppm	ASTM D5185m	>30	5	9	6
Tin ppm ASTM D5185m >15 0 <1	Lead	ppm	ASTM D5185m	>30	0	0	0
Vanadium ppm ASTM D5185m 0 <1	Copper	ppm	ASTM D5185m	>30	8	3	5
White Metal scalar *Visual NONE NORE NONE NORE	Tin	ppm	ASTM D5185m	>15	0	<1	<1
Yellow Metal scalar *Visual NONE NONE NONE NONE NONE Silicon ppm ASTM D5185m >30 4 5 5 Potassium ppm ASTM D5185m >20 ▲ 623 ▲ 302 ▲ 133 Fuel WC Method >3.0 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG Glycol % *ASTM D2982 ▲ 0.12 NEG NEG Soot % % *ASTM D7624 >20 9.7 9.8 10.0 Sulfation Abs/rm *ASTM D7624 >20 9.7 9.8 10.0 Sulfation Abs/rm *ASTM D7644 >30 22.1 21.4 21.4 Silt scalar *Visual NONE NONE NONE NOR Debris scalar *Visual NONE NONE NONE NOR Appearance scalar *Visual NORML NORML NORML NOR Sodium ppm ASTM D5185m	Vanadium	ppm	ASTM D5185m		0	<1	0
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Sand/Dirtscalar*VisualNONENONENONENORAppearancescalar*VisualNORMLNORMLNORMLNORMLNORMLNOROdorscalar*VisualNORMLNORMLNORMLNORMLNOREmulsified Waterscalar*Visual>0.2NEGNEGNEGSodiumppmASTM D5185m21<14BoronppmASTM D5185m0000MolybdenumppmASTM D5185m5010184475ManganeseppmASTM D5185m9509111003100CalciumppmASTM D5185m10501137113PhosphorusppmASTM D5185m9959551043100				-	-	-	NONE
Appearance scalar *Visual NORML NOR Emulsified Water scalar *Visual >0.2 NEG NEG NEG NEG NEG Sodium ppm ASTM D5185m 2 1 <1 4 4 Barium ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 50 101 84 75 Manganese ppm ASTM D5185m 0 <11 <1<<<1 <1 Magnesium ppm ASTM D5185m 1050 1137 113 Phosphorus ppm ASTM D5185m 995					-		NONE
Odor scalar *Visual NORML NOR NOR<				-	-		NONE
Emulsified Water scalar *Visual >0.2 NEG NEG NEG Sodium ppm ASTM D5185m ▲ 577 ▲ 228 122 Boron ppm ASTM D5185m 2 1 <1 4 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 50 101 84 75 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 950 911 1003 1000 Calcium ppm ASTM D5185m 1050 1137 115 Phosphorus ppm ASTM D5185m 995 955 1043 105							NORML
Sodium ppm ASTM D5185m ▲ 577 ▲ 228 ▲ 122 Boron ppm ASTM D5185m 2 1 <1 4 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 50 101 84 75 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 950 911 1003 100 Calcium ppm ASTM D5185m 1050 1150 1137 115 Phosphorus ppm ASTM D5185m 995 955 1043 100					-		NORML
Boron ppm ASTM D5185m 2 1 <1	Emulsified water	scalar	" VISUAI	>0.2	NEG	NEG	NEG
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 50 101 84 75 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 950 911 1003 100 Calcium ppm ASTM D5185m 1050 1150 1137 115 Phosphorus ppm ASTM D5185m 995 955 1043 100	Sodium	ppm	ASTM D5185m		6 577	A 228	1 22
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 50 101 84 75 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 950 911 1003 100 Calcium ppm ASTM D5185m 1050 1150 1137 113 Phosphorus ppm ASTM D5185m 995 955 1043 100	Boron		ASTM D5185m	2	1	<1	4
Molybdenum ppm ASTM D5185m 50 101 84 75 Manganese ppm ASTM D5185m 0 <1	Barium		ASTM D5185m	0	0	0	0
Manganese ppm ASTM D5185m 0 <1	Molybdenum		ASTM D5185m	50	101	84	75
Calcium ppm ASTM D5185m 1050 1150 1137 115 Phosphorus ppm ASTM D5185m 995 955 1043 105	Manganese		ASTM D5185m	0	<1	<1	<1
Phosphorus ppm ASTM D5185m 995 955 1043 103	Magnesium	ppm	ASTM D5185m	950	911	1003	1001
Phosphorus ppm ASTM D5185m 995 955 1043 103	Calcium		ASTM D5185m	1050	1150	1137	1190
	Phosphorus		ASTM D5185m	995	955		1035
ZINC ppm ASIMU5185m 1180 1242 1309 132	Zinc	ppm	ASTM D5185m	1180	1242	1309	1328
	Sulfur		ASTM D5185m	2600	2961	3092	3401
			*ASTM D7414		18.7	16.7	17.1
	Base Number (BN)	mg KOH/g	ASTM D2896				7.5
	Visc @ 100°C		ASTM D445	12.00			11.5



* - 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)

T: 1(857)998-2229

F: