

Machine Id  
**WESTERN STAR ST01**  
Component  
**Diesel Engine**  
Fluid  
**PETRO CANADA DURON HP 15W40 (--- GAL)**

**RECOMMENDATION**

We advise that you check for the source of the coolant leak. We advise that you monitor for an abnormal oil pressure drop and noise. The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		<b>PC0082858</b>	PC0065016	PC0023988
Sample Date		Client Info		<b>10 Oct 2023</b>	05 Oct 2022	28 Aug 2020
Machine Age	kms	Client Info		<b>145903</b>	145519	140841
Oil Age	kms	Client Info		<b>384</b>	0	7349
Filter Age	kms	Client Info		<b>384</b>	0	7349
Oil Changed		Client Info		<b>Changed</b>	Changed	Changed
Filter Changed		Client Info		<b>Changed</b>	Changed	Changed
Sample Status				<b>SEVERE</b>	ABNORMAL	MARGINAL

**WEAR**

Copper ppm levels are severe. Lead ppm levels are abnormal. Bearing wear is indicated.

Iron	ppm	ASTM D5185(m)	>86	<b>34</b>	8	45
Chromium	ppm	ASTM D5185(m)	>3	<b>&lt;1</b>	0	<1
Nickel	ppm	ASTM D5185(m)	>3	<b>0</b>	<1	<1
Titanium	ppm	ASTM D5185(m)	>2	<b>0</b>	<1	<1
Silver	ppm	ASTM D5185(m)	>2	<b>&lt;1</b>	0	0
Aluminum	ppm	ASTM D5185(m)	>15	<b>2</b>	<1	2
Lead	ppm	ASTM D5185(m)	>16	<b>▲ 17</b>	3	11
Copper	ppm	ASTM D5185(m)	>250	<b>▲ 565</b>	122	424
Tin	ppm	ASTM D5185(m)	>2	<b>&lt;1</b>	<1	<1
Vanadium	ppm	ASTM D5185(m)		<b>0</b>	0	0
White Metal	scalar	Visual*	NONE	<b>VLITE</b>	---	LIGHT
Yellow Metal	scalar	Visual*	NONE	<b>NONE</b>	---	NONE

**CONTAMINATION**

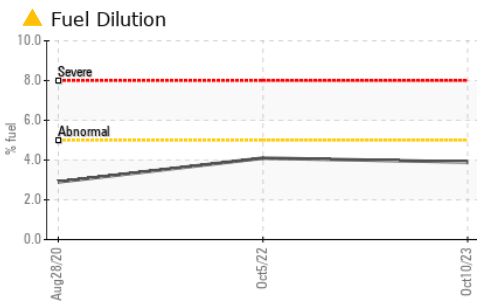
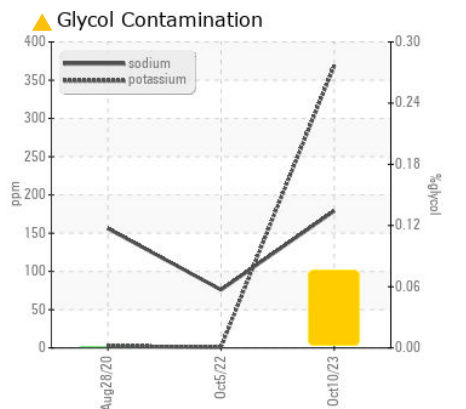
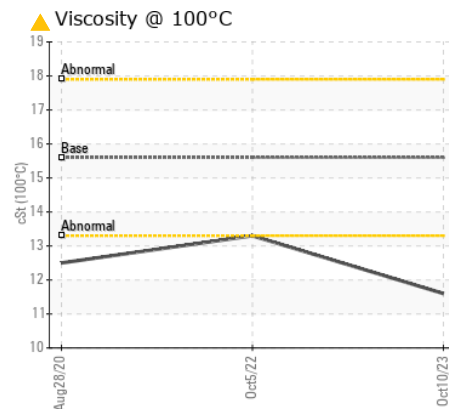
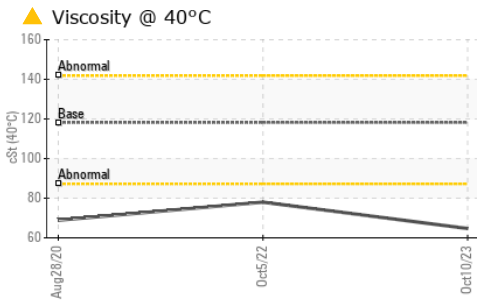
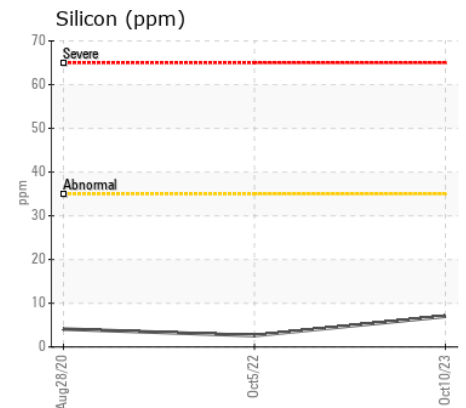
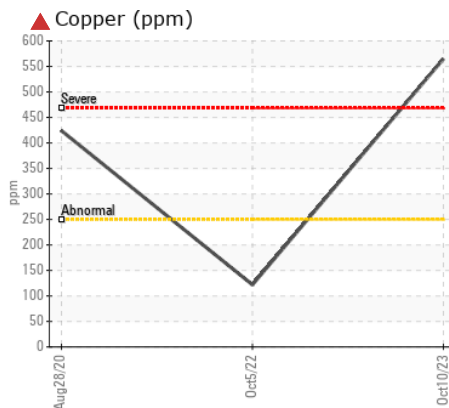
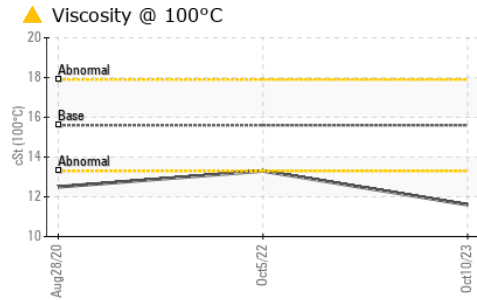
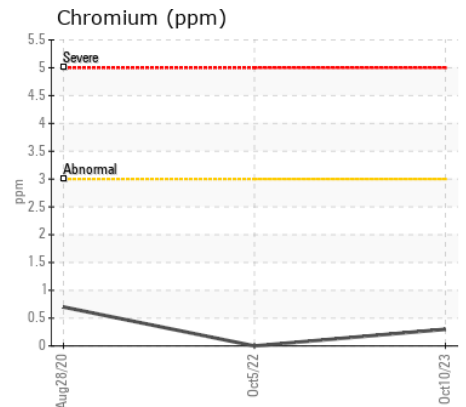
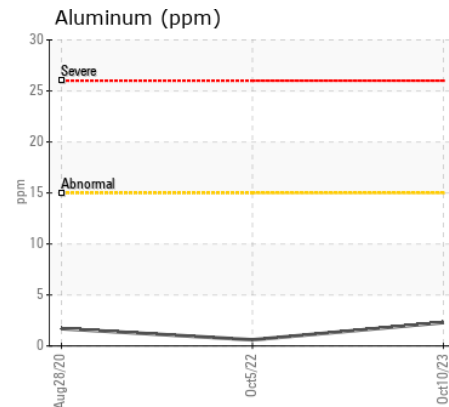
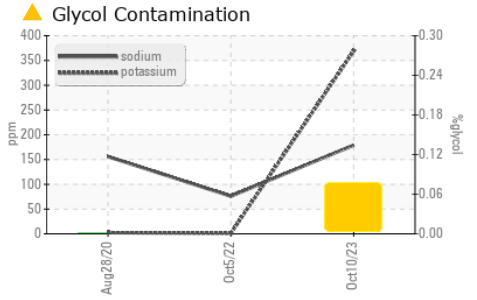
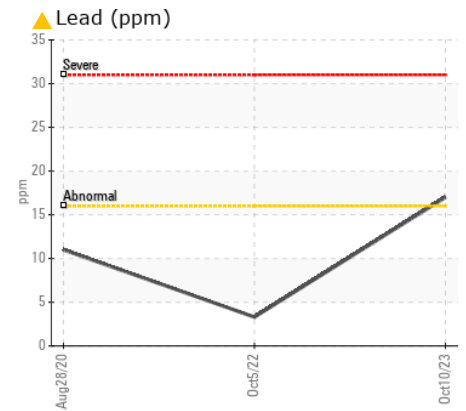
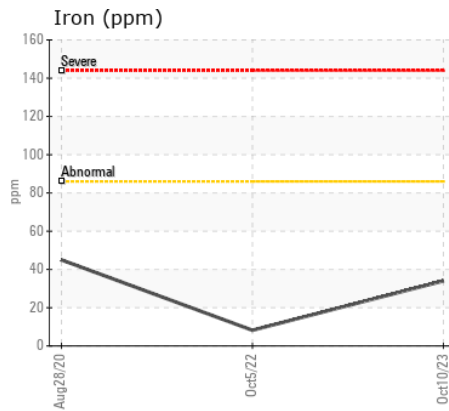
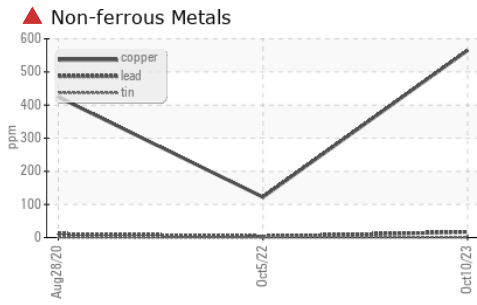
Test for glycol is positive. Light fuel dilution occurring. There is a moderate concentration of glycol present in the oil.

Silicon	ppm	ASTM D5185(m)	>35	<b>7</b>	3	4
Potassium	ppm	ASTM D5185(m)	>20	<b>▲ 369</b>	1	2
Fuel	%	ASTM D7593*	>5	<b>▲ 3.9</b>	<b>▲ 4.1</b>	<b>▲ 2.9</b>
Water		WC Method	>0.2	<b>NEG</b>	NEG	NEG
Glycol	%	ASTM D7922*		<b>▲ 0.076</b>	NEG	0.0
Soot %	%	ASTM D7844*	>3	<b>0.2</b>	0	0.2
Nitration	Abs/cm	ASTM D7624*	>20	<b>10.9</b>	6.7	9.3
Sulfation	Abs/.1mm	ASTM D7415*	>30	<b>23.4</b>	16.5	20.2
Silt	scalar	Visual*	NONE	<b>LIGHT</b>	---	NONE
Debris	scalar	Visual*	NONE	<b>NONE</b>	---	NONE
Sand/Dirt	scalar	Visual*	NONE	<b>NONE</b>	---	NONE
Appearance	scalar	Visual*	NORML	<b>NORML</b>	---	NORML
Odor	scalar	Visual*	NORML	<b>NORML</b>	NORML	NORML
Emulsified Water	scalar	Visual*	>0.2	<b>NEG</b>	NEG	NEG

**FLUID CONDITION**

Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

Sodium	ppm	ASTM D5185(m)		<b>● 179</b>	76	156
Boron	ppm	ASTM D5185(m)	0	<b>19</b>	2	3
Barium	ppm	ASTM D5185(m)	0	<b>&lt;1</b>	0	0
Molybdenum	ppm	ASTM D5185(m)	60	<b>136</b>	8	81
Manganese	ppm	ASTM D5185(m)	0	<b>0</b>	<1	<1
Magnesium	ppm	ASTM D5185(m)	1010	<b>578</b>	43	943
Calcium	ppm	ASTM D5185(m)	1070	<b>1387</b>	2145	989
Phosphorus	ppm	ASTM D5185(m)	1150	<b>959</b>	914	975
Zinc	ppm	ASTM D5185(m)	1270	<b>1105</b>	960	1202
Sulfur	ppm	ASTM D5185(m)	2060	<b>2555</b>	2951	2373
Oxidation	Abs/.1mm	ASTM D7414*	>25	<b>21.9</b>	9.8	16.8
Visc @ 40°C	cSt	ASTM D7279(m)	118.2	<b>▲ 64.7</b>	<b>▲ 78</b>	68.9
Visc @ 100°C	cSt	ASTM D7279(m)	15.6	<b>▲ 11.6</b>	13.3	12.5
Viscosity Index (VI)	Scale	ASTM D2270*	139	<b>▲ 176</b>	173	182



**Laboratory** : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9  
**Sample No.** : PC0082858  
**Lab Number** : 02589239  
**Unique Number** : 5658305  
**Test Package** : MOB 1 ( Additional Tests: FuelDilution, Glycol, KV40, PercentFuel, VI, Visua

**RENEWABLE FOREST PRODUCTS**  
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To discuss this sample report, contact Customer Service at 1-800-268-2131.  
 Test denoted (\*) outside scope of accreditation, (m) method modified, (e) tested at external lab.  
 Validity of results and interpretation are based on the sample and information as supplied.