

Machine Id **185** Component **Rear Diesel Engine** Fluid **ESSO XD-3 EXTRA 15W40 (--- GAL)**

RECOMMENDATION

The oil change at the time of sampling has been noted. Resample at the next service interval to monitor. No other corrective action is recommended at this time.

WEAR		

All component wear rates are normal.

CONTAMINATION

Light fuel dilution occurring. No other contaminants were detected in the oil.

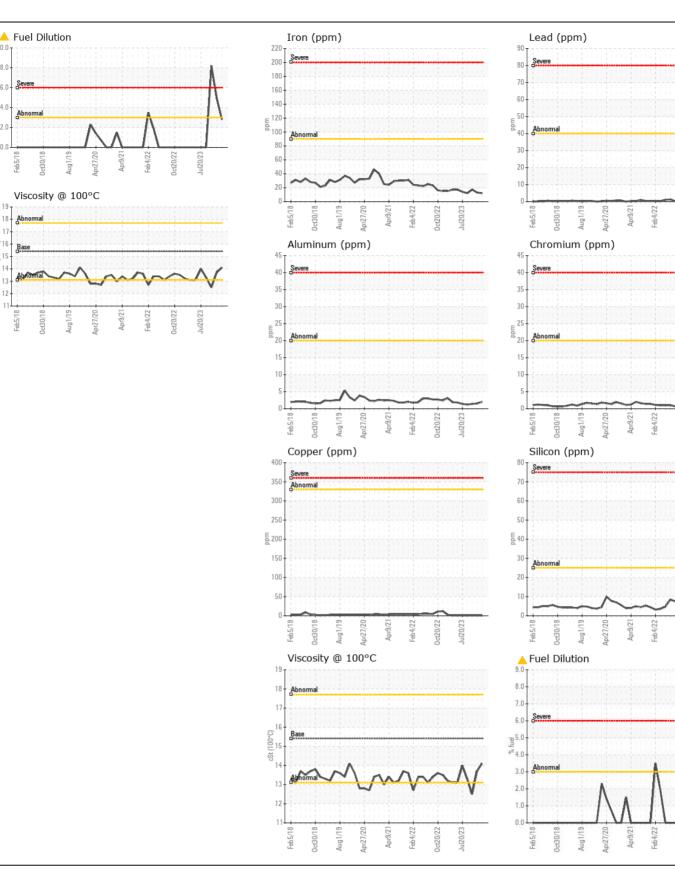
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FLUID CONDITION

The condition of the oil is acceptable for the time in service.

Sample Jack Sample Jack Machine AgeClient Info26 Feb 202422 Dec 202303 Nov 2023Machine AgekmsClient InfoJef 66922610320Oil AgekmsClient InfoJef 660922610320Filter AgekmsClient InfoJef 660922610320Oil ChangedClient InfoMAKnagedChangedChangedFilter ChangedClient InfoN/AN/AN/ASample StatusClient InfoN/AASMORIALSEVEREIronpmASTM051860>20<1<1<1NickelpmASTM051860>20<1<1<1NickelpmASTM051860>20<1<1<1NickelpmASTM051860>20<1<1<1ItaniumpmASTM051860>20<1<1<1AluminumpmASTM051860>20<1<1<1LeadpmASTM051860>330<1<1<1TinpmASTM051860>206<4<4Fuel%ASTM051860>206<4<4Fuel%ASTM051860>206<4<4GipconpmASTM051860>206<4<4CopperpmASTM051860>206<4<4Fuel%ASTM051860>206<4<4Soliconpm<	Test	UOM	Method	Limit/Abn	Current	History1	History2
Machine AgekmsClient Info000Oil AgekmsClient Info9660922610320Filter AgekmsClient InfoChangedChangedChangedOil ChangedClient InfoMANANASample StatusClient InfoNANASEVEREIronppmASTM0518/m92011213317ChromiumppmASTM0518/m920<1<1<1NickelppmASTM0518/m920<1<1<1NickelppmASTM0518/m220<00<1AluminumppmASTM0518/m>20<00<1LeadppmASTM0518/m>20<00<1ChopperppmASTM0518/m>20<00<1TinppmASTM0518/m>20<00<1LeadppmASTM0518/m>20<000SiliconppmASTM0518/m>20<0<0<1SiliconppmASTM0518/m>20<0<0<0SiliconppmASTM0518/m>20<6<14<4Fuel%ASTM0518/m>20<6<14<4Fuel%ASTM0518/m>20<6<14<4SiliconppmASTM0518/m>20<6<14<4Fuel%ASTM0518/m>20<16<16 <th>Sample Number</th> <th></th> <th>Client Info</th> <th></th> <th>WC0889123</th> <th>WC0889175</th> <th>WC0866460</th>	Sample Number		Client Info		WC0889123	WC0889175	WC0866460
Oil AgeKimsClient InfoSe660922610320Filter AgekmsClient InfoKangedChangedChangedChangedChangedFilter ChangedQClient InfoNANANASample StatusKimsSilverMARGINAABNORMALSEVEREIronppmASTMDS185(m) >90121317ChromiumppmASTMDS185(m) >20<	Sample Date		Client Info		26 Feb 2024	22 Dec 2023	03 Nov 2023
Filter AgekmsClient InfoG660922610320Oil ChangedClient InfoChangedChangedChangedChangedFilter ChangedClient InfoN/AN/AN/ASample StatusVMARGINALABNORMALSEVEREIronppmASTMD5185(m) >90121317ChromiumppmASTMD5185(m) >20<	Machine Age	kms	Client Info		0	0	0
Oli ChangedClient InoKhangedChangedChangedChangedChangedChangedFilter ChangedQClient InoN/AN/AN/ASEVEREIronppmASTMD5/65(m)S0121317ChromiumppmASTMD5/65(m)S2<	Oil Age	kms	Client Info		9660	9226	10320
Filter ChangedClient InfoIvAN/AN/ASample StatusClient InfoMARGINALABNORMALSEVEREIronppmASTM DS185(m>20111317ChromiumppmASTM DS185(m>20<1<1<1NickelppmASTM DS185(m>2<1<1<1NickelppmASTM DS185(m>200<1AluminumppmASTM DS185(m>200<1LeadppmASTM DS185(m>4000<1CopperppmASTM DS185(m>40000VanadiumppmASTM DS185(m>50000VanadiumppmASTM DS185(m>2677PotassiumppmASTM DS185(m>2677PotassiumppmASTM DS185(m>26144Fuel%ASTM DS185(m>26144Fuel%ASTM DS185(m>2612.2\$SoliconppmASTM DS185(m>2612.4\$SuiliconppmASTM DS185(m>2612.4\$SuiliconppmASTM DS185(m>2612.4\$SuiliconppmASTM DS185(m>2612.4\$SuiliconASTM DS185(m>2IE11.012.2SuiliconASTM DS185(m	Filter Age	kms	Client Info		9660	9226	10320
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IronppmASTM D5185(m>90121317ChromiumppmASTM D5185(m>20<1<1<1<1NickelppmASTM D5185(m>2<1<1<1<1TitaniumppmASTM D5185(m>20000SilverppmASTM D5185(m>200<1<1AluminumppmASTM D5185(m>2022211LeadppmASTM D5185(m>4000<1<1CopperppmASTM D5185(m>303<1<1<1<1TinppmASTM D5185(m>2566777PotassiumppmASTM D5185(m>206144Fuel%ASTM D5185(m>20661444Fuel%ASTM D5185(m>20661444Fuel%ASTM D5185(m>20REGNEGNEGGlycolWC Method>02NEG0.012.212.2Soto %%ASTM D7824>2010.511.012.2SulfationAbs/:mASTM D5185(m>19225.826.43.2Soto %%ASTM D7824>2010.511.012.2SulfationAbs/:mASTM D5185(m>19226.43.2SodiumppmASTM D5185(m>19226.43.23.6Boronp	Filter Changed		Client Info		N/A	N/A	N/A
ChromiumppmASTM D5186/m>20<1	Sample Status				MARGINAL	ABNORMAL	SEVERE
ChromiumppmASTM D5186/m>20<1	Iron	nom	ASTM D5185(m)	>90	12	13	17
NickelppmASTM D5185(m)>2<1	-						
TitaniumppmASTM D5185(m)>2000SilverppmASTM D5185(m)>200<1AluminumppmASTM D5185(m)>20221LeadppmASTM D5185(m)>4000<1<1CopperppmASTM D5185(m)>330<1<1<1TinppmASTM D5185(m)>15000VanadiumppmASTM D5185(m)>20661444Fuel%ASTM D5185(m)>20661444Fuel%ASTM D5185(m)>20AAAFuel%ASTM D5185(m)>20AAASoto %%ASTM D5185(m)>20AAASoto %%ASTM D5185(m)>20AAASoto %%ASTM D7624>20NEGNEGASoto %%ASTM D7145>3025.826.432.2SulfationAbs/rmASTM D5185(m)>1010.112.2SulfationppmASTM D5185(m)>102QAManganeseppmASTM D5185(m)>102Q3ManganeseppmASTM D5185(m)IQQIManganeseppmASTM D5185(m)IQQIManganeseppmASTM D5185(m)IQQQManganeseppmASTM D5							
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Lead ppm ASTM D5185(m) >40 0 0 <1			()				
Copper ppm ASTM D5185(m) >330 <1							
TinppmASTM D5185(m)>15000VanadiumppmASTM D5185(m)>25677PotassiumppmASTM D5185(m)>206144Fuel%ASTM D5185(m)>206144Fuel%ASTM D5185(m)>206144GlycolWCMethod>0.2NEGNEGNEGGlycolWC Method>0.2NEG0.0NEGSoot %%ASTM D7844*>60.60.60.7NitrationAbs/cmASTM D7624*>2010.511.012.2SulfationAbs/tmASTM D7624*>3025.826.432.2Fmulsfied WaterscalarVisual*>0.2NEGNEGNEGSodiumppmASTM D5185(m)>192223BoronppmASTM D5185(m)sol2000<1	-		()		-		
Vanadium ppm ASTM D5185(m) >25 0 0 0 Silicon ppm ASTM D5185(m) >25 6 7 7 Potassium ppm ASTM D5185(m) >20 6 14 4 Fuel % ASTM D7593 >3.0 ▲ 2.8 ▲ 5 ▲ 8.2 Water Q WC Method >0.2 NEG NEG NEG Glycol WC Method >0.2 NEG 0.0 NEG Soot % % ASTM D7844* >6 0.6 0.6 0.7 Nitration Abs/cm ASTM D7624* >20 10.5 111.0 12.2 Sulfation Abs/cm ASTM D7624* >20 10.5 11.0 12.2 Sulfation Abs/cm ASTM D7624* >20 NEG NEG 0.7 Sodium ppm ASTM D5185(m) >102 22 3 56 Barium ppm ASTM D5185(m) 192			\ /				
SiliconppmASTM D5185(m)>25677PotassiumppmASTM D5185(m)>206144Fuel%ASTM D5185(m)>206144Fuel%ASTM D5185(m)>20 a 2.8 a 58.2WaterImage: Marce Marc			()	, 10	-		
Potassium ppm ASTM D5185(m) >20 6 14 4 Fuel % ASTM D5185(m) >3.0 ▲ 2.8 ▲ 5 ▲ 8.2 Water // WC Method >0.2 NEG NEG NEG Glycol WC Method >0.2 NEG 0.0 NEG Soot % % ASTM D7844' >6 0.6 0.6 0.7 Nitration Abs/cm ASTM D7624' >20 10.5 11.0 12.2 Sulfation Abs/.1mm ASTM D7415' >30 25.8 26.4 32.2 Emulsified Water scalar Visual* >0.2 NEG NEG NEG Sodium ppm ASTM D5185(m) >192 2 2 3 Boron ppm ASTM D5185(m) >192 2 2 3 Boron ppm ASTM D5185(m) >192 2 1 0 Molybdenum ppm ASTM D5185(m) 1	Vanadiani						
Fuel % ASTM D7593* >3.0 ▲ 2.8 ▲ 5 ▲ 8.2 Water WC Method >0.2 NEG NEG NEG Glycol WC Method >0.2 NEG 0.0 NEG Soot % % ASTM D7844* >6 0.6 0.6 0.7 Nitration Abs/cm ASTM D7624* >20 10.5 11.0 12.2 Sulfation Abs/cm ASTM D7415* >30 25.8 26.4 32.2 Emulsified Water scalar Visual* >0.2 NEG NEG NEG Sodium ppm ASTM D5185(m) >102 21.2 3 Boron ppm ASTM D5185(m) >102 22 3 Boron ppm ASTM D5185(m) Sodium 0 0 <11	Silicon	ppm	ASTM D5185(m)	>25	6	7	7
Water WC Method >0.2 NEG NEG NEG Glycol WC Method NEG 0.0 NEG Soot % % ASTM D7844* >6 0.6 0.6 0.7 Nitration Abs/cm ASTM D7844* >20 10.5 11.0 12.2 Sulfation Abs/cm ASTM D7624* >20 10.5 11.0 12.2 Sulfation Abs/cm ASTM D7814* >30 25.8 26.4 32.2 Emulsified Water scalar Visual* >0.2 NEG NEG NEG Sodium ppm ASTM D5185(m) >192 2 2 3 Boron ppm ASTM D5185(m) >192 2 3 3 Molybdenum ppm ASTM D5185(m) >102 0 <1 0 Manganese ppm ASTM D5185(m) I 24 13 14 Calcium ppm ASTM D5185(m) 3780 2242	Potassium	ppm	ASTM D5185(m)	>20	6	14	4
GlycolWC MethodNEG0.0NEGSoot %%ASTM D7844*>60.60.60.7NitrationAbs/cmASTM D7624*>2010.511.012.2SulfationAbs/lmASTM D7415*>3025.826.432.2Emulsified WaterscalarVisual*>0.2NEGNEGNEGSodiumppmASTM D5185(m)>192223BoronppmASTM D5185(m)>19267769956BariumppmASTM D5185(m)C00<1MolybdenumppmASTM D5185(m)C000MagnesiumppmASTM D5185(m)3780224220982071PhosphorusppmASTM D5185(m)13709488599773ZincppmASTM D5185(m)150011331036994SulfurppmASTM D5185(m)3800293628522583OxidationAbs/lmmASTM D5185(m)3800224424.534.2	Fuel	%	ASTM D7593*	>3.0	4 2.8	5	▲ 8.2
Soot % % ASTM D7844* >6 0.6 0.6 0.7 Nitration Abs/cm ASTM D7624* >20 10.5 11.0 12.2 Sulfation Abs/cm ASTM D7614* >30 25.8 26.4 32.2 Emulsified Water scalar Visual* >0.2 NEG NEG NEG Sodium ppm ASTM D5185(m) >192 2 2 3 Boron ppm ASTM D5185(m) >192 2 3 56 Barium ppm ASTM D5185(m) >192 67 69 56 Barium ppm ASTM D5185(m) 1 0 0 <1 Molybdenum ppm ASTM D5185(m) 1 0 0 0 Magnesium ppm ASTM D5185(m) 3780 244 13 14 Calcium ppm ASTM D5185(m) 3780 2424 1036 94 Phosphorus ppm ASTM D	Water		WC Method	>0.2	NEG	NEG	NEG
Nitration Abs/cm ASTM D7624* >20 10.5 11.0 12.2 Sulfation Abs/.1mm ASTM D7624* >30 25.8 26.4 32.2 Emulsified Water scalar Visual* >0.2 NEG NEG NEG Sodium ppm ASTM D5185(m) >192 2 2 3 Boron ppm ASTM D5185(m) >192 2 2 3 Barium ppm ASTM D5185(m) >192 2 2 3 Molybdenum ppm ASTM D5185(m) <	Glycol		WC Method		NEG	0.0	NEG
Sulfation Abs/.1mm ASTM D7415* >30 25.8 26.4 32.2 Emulsified Water scalar Visual* >0.2 NEG NEG NEG Sodium ppm ASTM D5185(m) >192 2 2 3 Boron ppm ASTM D5185(m) >192 2 2 3 Barium ppm ASTM D5185(m) 67 69 56 Barium ppm ASTM D5185(m) 0 0 <1 Molybdenum ppm ASTM D5185(m) 24 13 0 Manganese ppm ASTM D5185(m) 3780 2242 2098 2071 Phosphorus ppm ASTM D5185(m) 3780 2242 2098 2071 Phosphorus ppm ASTM D5185(m) 1370 948 859 773 Zinc ppm ASTM D5185(m) 1500 1133 1036 994 Sulfur ppm ASTM D5185(m	Soot %	%	ASTM D7844*	>6	0.6	0.6	0.7
Emulsified WaterscalarVisual*>0.2NEGNEGNEGSodiumppmASTM D5185(m)>19223BoronppmASTM D5185(m)>19267769956BariumppmASTM D5185(m)00<1MolybdenumppmASTM D5185(m)102<10ManganeseppmASTM D5185(m)1000MagnesiumppmASTM D5185(m)3780224220982071PhosphorusppmASTM D5185(m)1370948859773ZincppmASTM D5185(m)150011331036994SulfurppmASTM D5185(m)3800293628522583OxidationAbs./1mmASTM D5185(m)3800224424.534.2	Nitration	Abs/cm	ASTM D7624*	>20	10.5	11.0	12.2
Sodium ppm ASTM D5185(m) >192 2 2 3 Boron ppm ASTM D5185(m) >192 67 69 56 Barium ppm ASTM D5185(m) C 0 0 <11		Abs/.1mm		>30	25.8		
Boron ppm ASTM D5185(m) 67 69 56 Barium ppm ASTM D5185(m) 0 0 <1 Molybdenum ppm ASTM D5185(m) 2 <1	Emulsified Water	scalar	Visual*	>0.2	NEG	NEG	NEG
Barium ppm ASTM D5185(m) 0 0 <1	Sodium	ppm	ASTM D5185(m)	>192	2	2	3
Molybdenum ppm ASTM D5185(m) 2 <1	Boron	ppm	ASTM D5185(m)		67	69	56
Manganese ppm ASTM D5185(m) 0 0 0 Magnesium ppm ASTM D5185(m) 24 13 14 Calcium ppm ASTM D5185(m) 3780 2242 2098 2071 Phosphorus ppm ASTM D5185(m) 1370 948 859 773 Zinc ppm ASTM D5185(m) 1500 1133 1036 994 Sulfur ppm ASTM D5185(m) 3800 2936 2852 2583 Oxidation Abs/.1mm ASTM D7414* >25 22.4 24.5 34.2	Barium	ppm	ASTM D5185(m)		0	0	<1
Magnesium ppm ASTM D5185(m) 24 13 14 Calcium ppm ASTM D5185(m) 3780 2242 2098 2071 Phosphorus ppm ASTM D5185(m) 1370 948 859 773 Zinc ppm ASTM D5185(m) 1500 1133 1036 994 Sulfur ppm ASTM D5185(m) 3800 2936 2852 2583 Oxidation Abs/.1mm ASTM D7414* >25 22.4 24.5 34.2	Molybdenum	ppm	ASTM D5185(m)		2	<1	0
Calcium ppm ASTM D5185(m) 3780 2242 2098 2071 Phosphorus ppm ASTM D5185(m) 1370 948 859 773 Zinc ppm ASTM D5185(m) 1500 1133 1036 994 Sulfur ppm ASTM D5185(m) 3800 2936 2852 2583 Oxidation Abs/.1mm ASTM D7414* >25 22.4 24.5 34.2	Manganese	ppm	ASTM D5185(m)		0	0	0
Phosphorus ppm ASTM D5185(m) 1370 948 859 773 Zinc ppm ASTM D5185(m) 1500 1133 1036 994 Sulfur ppm ASTM D5185(m) 3800 2936 2852 2583 Oxidation Abs/.1mm ASTM D7414* >25 22.4 24.5 34.2	Magnesium	ppm	ASTM D5185(m)		24	13	14
Zinc ppm ASTM D5185(m) 1500 1133 1036 994 Sulfur ppm ASTM D5185(m) 3800 2936 2852 2583 Oxidation Abs/.1mm ASTM D7414* >25 22.4 24.5 34.2	Calcium	ppm	ASTM D5185(m)	3780	2242	2098	2071
Sulfur ppm ASTM D5185(m) 3800 2936 2852 2583 Oxidation Abs/.1mm ASTM D7414* >25 22.4 24.5 34.2	Phosphorus	ppm	ASTM D5185(m)	1370	948	859	773
Oxidation Abs/.1mm ASTM D7414* >25 22.4 24.5 34.2	Zinc	ppm	ASTM D5185(m)	1500	1133	1036	994
	Sulfur	ppm	ASTM D5185(m)	3800	2936	2852	2583
Visc @ 100°C cSt ASTM D7279(m) 15.4 14.1 13.7 🔺 12.5	Oxidation	Abs/.1mm	ASTM D7414*	>25	22.4	24.5	34.2
	Visc @ 100°C	cSt	ASTM D7279(m)	15.4	14.1	13.7	1 2.5

Contact/Location: Sean Malcolm - CITTHU



CITY OF THUNDER BAY Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 CALA Sample No. : WC0889123 Received :04 Mar 2024 AUTO MAINTENANCE STORES, 570 FORT WILLIAM ROAD Lab Number : 02619536 THUNDER BAY, ON Tested : 05 Mar 2024 ISO 17025:2017 Unique Number : 5736646 Accredited : 05 Mar 2024 - Wes Davis CA P7B 2Z8 Diagnosed Laboratory Test Package : MOB 1 (Additional Tests: PercentFuel) Contact: Sean Malcolm sean.malcolm@thunderbay.ca To discuss this sample report, contact Customer Service at 1-800-268-2131. T: (807)684-2716 Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab. F: (807)344-0237 Validity of results and interpretation are based on the sample and information as supplied.

10.0

8 (

6.

0.0

19

18

cSt (100°C)

13

12

Feb5/18

Feb5/18

% fuel

Contact/Location: Sean Malcolm - CITTHU

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