

## WEAR ABNORMAL CONTAMINATION NORMAL FLUID CONDITION NORMAL



LIEBHERR LH22M 137772-1525

Front Left Wheel Hub

SAE 75W90 (--- GAL)

RECOMMENDATION

The oil change at the time of sampling has been noted. Confirm the source of the lubricant being utilized for top-up/fill. We recommend an early resample to monitor this condition.

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Copper ppm levels are abnormal. Bearing and/or bushing wear is indicated.

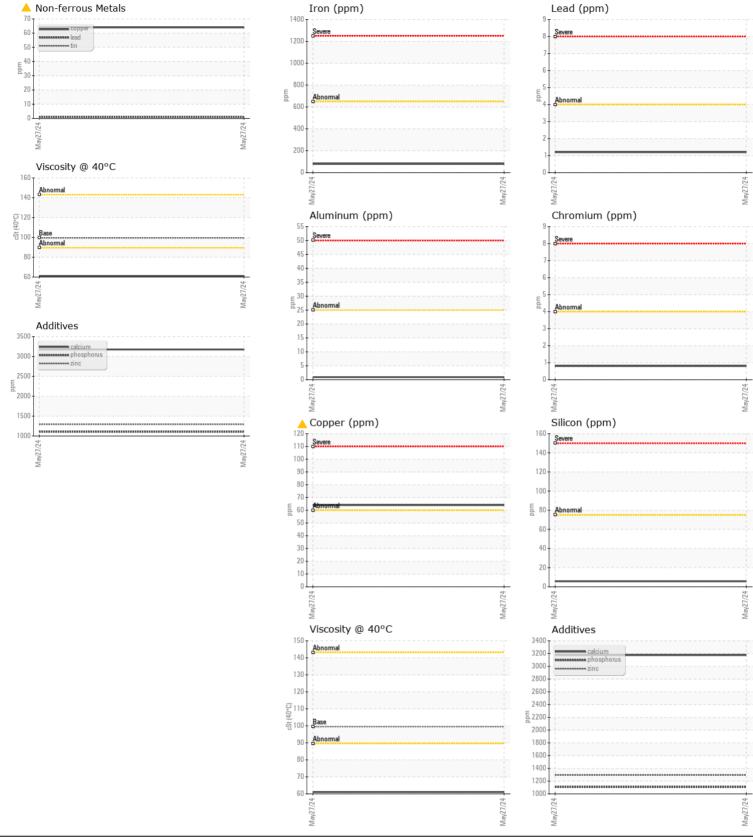
## CONTAMINATION

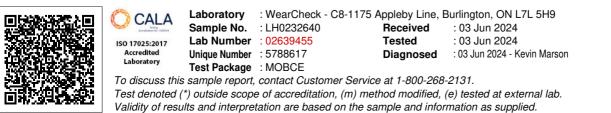
There is no indication of any contamination in the oil.

FLUID CONDITION			_	- · · ·
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Viscosity of sample indicates oil is within SAE 20 range, advise investigate. This plus the additive levels indicates that this is not the same brand, or type of oil as reported. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

TestUOMMethodLimit/MCurrentHistory1History2Sample NumberClient InfoIH0232640Sample DateClient Info3213Machine AgehrsClient Info0Filter AgehrsClient InfoOFilter AgehrsClient InfoChangedFilter ChangedClient InfoNoneSample StatusABNORMALTronppmASTMD5185m>640NickelppmASTMD5185m>440NickelppmASTMD5185m>440SilverppmASTMD5185m>41AluminumppmASTMD5185m>41NoneppmASTMD5185m>41VanadiumppmASTMD5185m>41YandoumppmASTMD5185m>41YandoumppmASTMD5185m>41YandoumppmASTMD5185m>41YandoumppmASTMD5185m>41YandoumppmASTMD5185m>56YandoumppmASTMD5185m>20<1<							
Sample DateClient Info27 May 2024Machine AgehrsClient Info3213Oil AgehrsClient Info0Filter AgehrsClient InfoChangedOil ChangedClient InfoChangedFilter ChangedClient InfoNoneFilter ChangedClient InfoNoneSample StatusABNORMALIronppmASTM05185(m)>65079IronppmASTM05185(m)>440NickelppmASTM05185(m)>440SilverppmASTM05185(m)>440AluminumppmASTM05185(m)>40LeadppmASTM05185(m)>40YanadiumppmASTM05185(m)>40YanadiumppmASTM05185(m)>40Yatio MetalscalarVisual*NONENONESiliconppmASTM05185(m)>756Yatio MetalscalarVisual*NONENONESiliconppmASTM05185(m)>20<1Yatio MetalscalarVisual*NONENONESiliconppmASTM05185(m)>20<1Yatio MetalscalarVisual*NONENONE <th>Test</th> <th>UOM</th> <th>Method</th> <th>Limit/Abn</th> <th>Current</th> <th>History1</th> <th>History2</th>	Test	UOM	Method	Limit/Abn	Current	History1	History2
Machine Age      hrs      Client Info      3213          Oil Age      hrs      Client Info      0          Filter Age      hrs      Client Info      Changed          Oil Changed      Client Info      None          Filter Changed      Client Info      None          Sample Status       ABNORMAL          Iron      ppm      ASTM05185(m)      >650      79          Nickel      ppm      ASTM05185(m)      >4      0          Silver      ppm      ASTM05185(m)      >4      0          Aluminum      ppm      ASTM05185(m)      >4      0          Vanadium      ppm      ASTM05185(m)      >4      0          Yellow Metal      scalar      Visual*      NONE      NONE          Yellow Metal      scalar	Sample Number		Client Info		LH0232640		
Oil Age      hrs      Client Info      0         Filter Age      hrs      Client Info      0          Oil Changed      Client Info      None          Filter Changed      O      Client Info      None          Sample Status      Client Info      None          Iron      ppm      ASTM05185(m)      >640      0          Nickel      ppm      ASTM05185(m)      >44      0          Aluminum      ppm      ASTM05185(m)      >4      0          Aluminum      ppm      ASTM05185(m)      >4      0          Aluminum      ppm      ASTM05185(m)      >4      0          Vanadium      ppm      ASTM05185(m)      >4      0          Yellow Metal      scalar      Visual*      NONE      NONE          Yellow Metal      scalar <th>Sample Date</th> <th></th> <th>Client Info</th> <th></th> <th>27 May 2024</th> <th></th> <th></th>	Sample Date		Client Info		27 May 2024		
Filter Age      hrs      Client Info      0          Filter Changed      Client Info      None          Sample Status      Client Info      None          Iron      ppm      ASTM DS185(m)      >650      79          Iron      ppm      ASTM DS185(m)      >44      0          Nickel      ppm      ASTM DS185(m)      >44      0          Titanium      ppm      ASTM DS185(m)      >42      0          Aluminum      ppm      ASTM DS185(m)      >25      <1          Lead      ppm      ASTM DS185(m)      >4      0          Vanadium      ppm      ASTM DS185(m)      >4      0          Yellow Metal      scalar      Visual*      NONE      NONE          Silicon      ppm      ASTM DS185(m)      >75      6 <th>Machine Age</th> <th>hrs</th> <th>Client Info</th> <th></th> <th>3213</th> <th></th> <th></th>	Machine Age	hrs	Client Info		3213		
Oil ChangedClient InfoChangedFilter ChangedClient InfoNoneSample StatusClient InfoNoneIronppmASTMD5185(m) >65079IronppmASTMD5185(m) >44NickelppmASTMD5185(m) >440NickelppmASTMD5185(m) >440SilverppmASTMD5185(m) >440AluminumppmASTMD5185(m) >440AluminumppmASTMD5185(m) >441LeadppmASTMD5185(m) >441YanadiumppmASTMD5185(m) >440YanadiumppmASTMD5185(m) >440YanadiumppmASTMD5185(m) >440YanadiumppmASTMD5185(m) >440Yellow MetalscalarVisual*NONEYellow MetalscalarVisual*NONESiliconppmASTMD5185(m) >756PotassiumppmASTMD5185(m) >20AteSodiurppmASTMD5185(m) >0SodiumppmASTMD5185(m) >0AteSodiumppmASTMD5185(m) >0SodiumppmASTMD5185(m) >0SodiumppmASTMD5185(m) 54BoronppmASTMD5185(m) 5	Oil Age	hrs	Client Info		0		
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Sample StatusABNORMALIronppmASTM D5185(m)>65079ChromiumppmASTM D5185(m)>40NickelppmASTM D5185(m)>40TitaniumppmASTM D5185(m)>40SilverppmASTM D5185(m)>40AluminumppmASTM D5185(m)>2<1LeadppmASTM D5185(m)>41CopperppmASTM D5185(m)>40VanadiumppmASTM D5185(m)>40White MetalscalarVisual*NONE0Yellow MetalscalarVisual*NONENONESiliconppmASTM D5185(m)>20<1Yellow MetalscalarVisual*NONENONESiliconppmASTM D5185(m)>20<1PotassiumppmASTM D5185(m)>20<1SiliconscalarVisual*NONENONESolurscalarVisual*NONENONESolurscalarVisual*NORENONESolurscalarVisual*NORENOREAstm D5185(m1697SolurppmASTM D5185(m54MagneseppmASTM	Oil Changed		Client Info		Changed		
Iron      ppm      ASTM D5185(m)      >650      79         Chromium      ppm      ASTM D5185(m)      >4      <1         Nickel      ppm      ASTM D5185(m)      >4      00         Titanium      ppm      ASTM D5185(m)      >4      00         Aluminum      ppm      ASTM D5185(m)      >2      <1         Aluminum      ppm      ASTM D5185(m)      >2      <1         Lead      ppm      ASTM D5185(m)      >4      1         Vanadium      ppm      ASTM D5185(m)      >4      0         Vanadium      ppm      ASTM D5185(m)      >4      0         Yellow Metal      scalar      Visual*      NONE      VLTTE         Yellow Metal      scalar      Visual*      NONE      NONE         Silicon      ppm      ASTM D5185(m)      >20      <1         Silicon      ppm      ASTM D5185(m)      >20	Filter Changed		Client Info		None		
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Ipp      ASTM D5185(m)      >4      <1	Iron	nnm	ASTM D5185(m)	<u> ∼650</u>	70		
Nickel      ppm      ASTM D5185(m)      >4      0         Titanium      ppm      ASTM D5185(m)      >0          Silver      ppm      ASTM D5185(m)      0          Aluminum      ppm      ASTM D5185(m)      >2      <1          Lead      ppm      ASTM D5185(m)      >60      ▲ 64          Copper      ppm      ASTM D5185(m)      >60           Vanadium      ppm      ASTM D5185(m)      >0           Vanadium      ppm      ASTM D5185(m)      >0           Vanadium      ppm      ASTM D5185(m)      >75      6          Yellow Metal      scalar      Visual*      NONE      NONE          Silicon      ppm      ASTM D5185(m)      >20      <1          Sudar      Visual*      NONE      NONE <th></th> <th></th> <th>( )</th> <th></th> <th>-</th> <th></th> <th></th>			( )		-		
Titanium      ppm      ASTM D5185(m)      >4      0         Silver      ppm      ASTM D5185(m)      >25      <1         Aluminum      ppm      ASTM D5185(m)      >25      <1         Lead      ppm      ASTM D5185(m)      >4      1         Copper      ppm      ASTM D5185(m)      >4      0         Tin      ppm      ASTM D5185(m)      >4      0         Vanadium      ppm      ASTM D5185(m)      >4      0         White Metal      scalar      Visual*      NONE      VLITE         Yellow Metal      scalar      Visual*      NONE      NONE         Silicon      ppm      ASTM D5185(m)<>20      <1          Water      WC Method      >0.2      NEG          Silit      scalar      Visual*      NONE          Sand/Dirt      scalar      Visual*      NOR      NORE      -			· /				
Silver      ppm      ASTM D5185(m)      0         Aluminum      ppm      ASTM D5185(m)      >25      <1         Lead      ppm      ASTM D5185(m)      >4      1         Copper      ppm      ASTM D5185(m)      >40      64         Tin      ppm      ASTM D5185(m)      >4      0         Vanadium      ppm      ASTM D5185(m)      >4      0         White Metal      scalar      Visual*      NONE      VLITE         Yellow Metal      scalar      Visual*      NONE      NONE         Silicon      ppm      ASTM D5185(m)<>20      <1          Water      WC Method      >0.2      NEG          Silit      scalar      Visual*      NONE      NONE         Sand/Dirt      scalar      Visual*      NORE          Appearance      scalar      Visual*      NORM      NORML			( )				
AluminumppmASTM D5186(m)>25<1			( /	24	-		
Lead      ppm      ASTM D5185(m)      >4      1         Copper      ppm      ASTM D5185(m)      >60      ▲ 64          Tin      ppm      ASTM D5185(m)      >4      0          Vanadium      ppm      ASTM D5185(m)      >4      0          White Metal      scalar      Visual*      NONE      VLITE          Yellow Metal      scalar      Visual*      NONE      NONE          Silicon      ppm      ASTM D5185(m)<>75      6          Water      wC Method      >0.2      NEG          Silit      scalar      Visual*      NONE      NONE          Sand/Dirt      scalar      Visual*      NONE      NORE          Sand/Dirt      scalar      Visual*      NORH      NORH          Sodium      ppm      ASTM D5185(m)      NORH	0			>25	-		
Copper      ppm      ASTM D5185(m)      >60      ▲ 64         Tin      ppm      ASTM D5185(m)      >4      0         Vanadium      ppm      ASTM D5185(m)       0         White Metal      scalar      Visual*      NONE      VLITE         Yellow Metal      scalar      Visual*      NONE      NONE         Silicon      ppm      ASTM D5185(m)      >75      6          Potassium      ppm      ASTM D5185(m)      >20      <1          Water      WC Method      >0.2      NEG          Suft      scalar      Visual*      NONE      NONE         Appearance      scalar      Visual*      NORM      NORML          Godr      scalar      Visual*      NORM      NORML          Appearance      scalar      Visual*      NORML      NORML         Godr      <			( /				
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Emulsified Water      scalar      Visual*      >0.2      NEG         Sodium      ppm      ASTM D5185(m)      16          Boron      ppm      ASTM D5185(m)      150      97          Barium      ppm      ASTM D5185(m)      5      4          Molybdenum      ppm      ASTM D5185(m)      0      0          Manganese      ppm      ASTM D5185(m)      0      99          Magnesium      ppm      ASTM D5185(m)      0      9          Phosphorus      ppm      ASTM D5185(m)      20      3175          Zinc      ppm      ASTM D5185(m)      1200      1107          Sulfur      ppm      ASTM D5185(m)      25      1294	Potassium Water Silt Debris	ppm scalar scalar	ASTM D5185(m) WC Method Visual* Visual*	>20 >0.2 NONE NONE	<1 NEG NONE NONE		  
Sodium      ppm      ASTM D5185(m)      16         Boron      ppm      ASTM D5185(m)      150      97         Barium      ppm      ASTM D5185(m)      5      4         Barium      ppm      ASTM D5185(m)      5      4         Molybdenum      ppm      ASTM D5185(m)      0      0         Manganese      ppm      ASTM D5185(m)      0      99         Magnesium      ppm      ASTM D5185(m)      0      99         Calcium      ppm      ASTM D5185(m)      20      3175         Phosphorus      ppm      ASTM D5185(m)      1200      1107         Zinc      ppm      ASTM D5185(m)      25      1294         Sulfur      ppm      ASTM D5185(m)      22000      2842	Potassium Water Silt Debris Sand/Dirt	ppm scalar scalar scalar	ASTM D5185(m) WC Method Visual* Visual* Visual*	>20 >0.2 NONE NONE NONE	<1 NEG NONE NONE NONE		  
Boron      ppm      ASTM D5185(m)      150      97          Barium      ppm      ASTM D5185(m)      5      4          Molybdenum      ppm      ASTM D5185(m)      0      0          Manganese      ppm      ASTM D5185(m)      0      97          Magnesium      ppm      ASTM D5185(m)      0      9          Calcium      ppm      ASTM D5185(m)      20      3175          Phosphorus      ppm      ASTM D5185(m)      1200      1107          Zinc      ppm      ASTM D5185(m)      25      1294          Sulfur      ppm      ASTM D5185(m)      22000      2842	Potassium Water Silt Debris Sand/Dirt Appearance	ppm scalar scalar scalar scalar	ASTM D5185(m) WC Method Visual* Visual* Visual* Visual*	>20 >0.2 NONE NONE NONE NORML	<1 NEG NONE NONE NONE NORML		  
Boron      ppm      ASTM D5185(m)      150      97          Barium      ppm      ASTM D5185(m)      5      4          Molybdenum      ppm      ASTM D5185(m)      0      0          Manganese      ppm      ASTM D5185(m)      0      97          Magnesium      ppm      ASTM D5185(m)      0      9          Calcium      ppm      ASTM D5185(m)      20      3175          Phosphorus      ppm      ASTM D5185(m)      1200      1107          Zinc      ppm      ASTM D5185(m)      25      1294          Sulfur      ppm      ASTM D5185(m)      22000      2842	Potassium Water Silt Debris Sand/Dirt Appearance Odor	ppm scalar scalar scalar scalar scalar	ASTM D5185(m) WC Method Visual* Visual* Visual* Visual* Visual*	>20 >0.2 NONE NONE NORML NORML	<1 NEG NONE NONE NONE NORML NORML	  	
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Manganese      ppm      ASTM D5185(m)      2         Magnesium      ppm      ASTM D5185(m)      0      9          Calcium      ppm      ASTM D5185(m)      20      3175          Phosphorus      ppm      ASTM D5185(m)      1200      1107          Zinc      ppm      ASTM D5185(m)      25      1294          Sulfur      ppm      ASTM D5185(m)      22000      2842	Potassium Water Silt Debris Sand/Dirt Appearance Odor Emulsified Water Sodium Boron	ppm scalar scalar scalar scalar scalar scalar ppm	ASTM D5185(m) WC Method Visual* Visual* Visual* Visual* Visual* Visual* ASTM D5185(m)	>20 >0.2 NONE NONE NORML >0.2	<1 NEG NONE NONE NORML NORML NEG 16 97		
Magnesium      ppm      ASTM D5185(m)      0      9          Calcium      ppm      ASTM D5185(m)      20      3175          Phosphorus      ppm      ASTM D5185(m)      1200      1107          Zinc      ppm      ASTM D5185(m)      25      1294          Sulfur      ppm      ASTM D5185(m)      22000      2842	Potassium Water Silt Debris Sand/Dirt Appearance Odor Emulsified Water Sodium Boron Barium	ppm scalar scalar scalar scalar scalar scalar ppm ppm	ASTM D5185(m) WC Method Visual* Visual* Visual* Visual* Visual* ASTM D5185(m) ASTM D5185(m)	>20 >0.2 NONE NONE NORML NORML >0.2 150 5	<1 NEG NONE NONE NORML NORML NEG 16 97 4		
Calcium      ppm      ASTM D5185(m)      20      3175         Phosphorus      ppm      ASTM D5185(m)      1200      1107         Zinc      ppm      ASTM D5185(m)      25      1294         Sulfur      ppm      ASTM D5185(m)      22000      2842	Potassium Water Silt Debris Sand/Dirt Appearance Odor Emulsified Water Sodium Boron Barium Molybdenum	ppm scalar scalar scalar scalar scalar ppm ppm ppm	ASTM D5185(m) WC Method Visual* Visual* Visual* Visual* Visual* ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	>20 >0.2 NONE NONE NORML NORML >0.2 150 5	<1 NEG NONE NONE NORML NORML NEG 16 97 4 0		
Phosphorus      ppm      ASTM D5185(m)      1200      1107          Zinc      ppm      ASTM D5185(m)      25      1294          Sulfur      ppm      ASTM D5185(m)      22000      2842	Potassium Water Silt Debris Sand/Dirt Appearance Odor Emulsified Water Sodium Boron Barium Malybdenum Manganese	ppm scalar scalar scalar scalar scalar ppm ppm ppm ppm	ASTM D5185(m) WC Method Visual* Visual* Visual* Visual* Visual* ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	>20 >0.2 NONE NONE NORML >0.2 150 5 0	<1 NEG NONE NONE NORML NORML NEG 16 97 4 0 2		
Zinc      ppm      ASTM D5185(m)      25      1294         Sulfur      ppm      ASTM D5185(m)      22000      2842	Potassium Water Silt Debris Sand/Dirt Appearance Odor Emulsified Water Sodium Boron Barium Malybdenum Manganese Magnesium	ppm scalar scalar scalar scalar scalar ppm ppm ppm ppm	ASTM D5185(m) WC Method Visual* Visual* Visual* Visual* Visual* Visual* ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	>20 >0.2 NONE NONE NORML NORML >0.2 150 5 0	<1 NEG NONE NONE NORML NORML NEG 16 97 4 0 2 2 9		
Sulfur      ppm      ASTM D5185(m)      22000      2842	Potassium Water Silt Debris Sand/Dirt Appearance Odor Emulsified Water Sodium Boron Barium Malybdenum Manganese Magnesium Calcium	ppm scalar scalar scalar scalar scalar ppm ppm ppm ppm ppm ppm	ASTM D5185(m) WC Method Visual* Visual* Visual* Visual* Visual* Visual* ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	>20 >0.2 NONE NONE NORML NORML >0.2 150 5 0 20	<1 NEG NONE NONE NORML NORML NEG 16 97 4 0 2 9 3175		
	Potassium Water Silt Debris Sand/Dirt Appearance Odor Emulsified Water Sodium Boron Barium Barium Malybdenum Manganese Magnesium Calcium	ppm scalar scalar scalar scalar scalar ppm ppm ppm ppm ppm ppm	ASTM D5185(m) WC Method Visual* Visual* Visual* Visual* Visual* ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	>20 >0.2 NONE NONE NORML >0.2 150 5 0 0 0 20 1200	<1 NEG NONE NONE NORML NORML NEG 16 97 4 0 2 9 3175 1107		
	Potassium Water Silt Debris Sand/Dirt Appearance Odor Emulsified Water Sodium Boron Barium Malybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm scalar scalar scalar scalar scalar ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) WC Method Visual* Visual* Visual* Visual* Visual* Visual* ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	>20 >0.2 NONE NONE NORML NORML >0.2 150 5 0 20 20 1200 25	<1 NEG NONE NONE NORML NORML NEG 16 97 4 0 2 9 3175 1107 1294		





**Excavation Dolbeau Inc.** 493 - 2ieme Avenue Dolbeau-Mistassini, QC CA G8L 1V3 Contact: Service Manager

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