

#### Machine Id **142001 - SG4** Component **Gearbox** Fluid **LIEBHERR GEAR HYPOID 90 EP (--- GAL)**

### RECOMMENDATION

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.

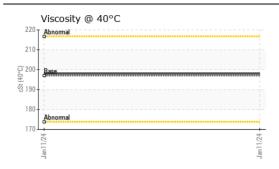
# FLUID CONDITION

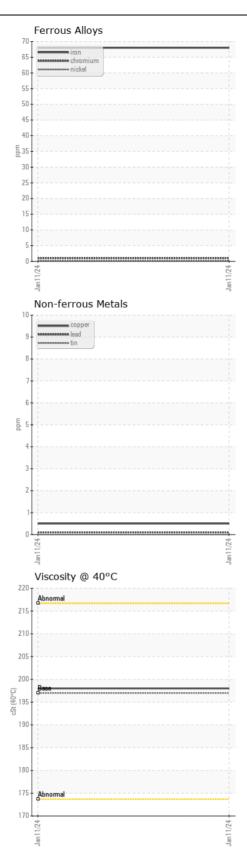
The condition of the oil is acceptable for the time in service.

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TestUOMMethodLimit/AbrCurrentHistory1History2Sample NumberClient InfoLM0000710Sample DateClient Info517Machine AgehrsClient Info517Oil AgehrsClient Info0Filter AgehrsClient InfoChangedOil ChangedClient InfoMASample StatusClient InfoNASample StatusSTM D5185m>20068IronppmASTM D5185m>101NickelppmASTM D5185m>101SilverppmASTM D5185m>50<1AluminumppmASTM D5185m>50<1AlumatinumppmASTM D5185m>50<1VanadiumppmASTM D5185m>50<1Yellow Metalscalar*VisualNORESiliconppmASTM D5185m>501SiliconppmASTM D5185m>201SiliconppmASTM D5185m>201SiliconppmASTM D5185m>201							
Sample DateClient InfoIn Jan 2024Machine AgehrsClient Info517Oil AgehrsClient Info517Filter AgehrsClient Info0Oil ChangedClient InfoN/AFilter ChangedClient InfoN/ASample StatusClient InfoN/AIronppmASTM05185m>200688NickelppmASTM05185m>101NickelppmASTM05185m>101NickelppmASTM05185m>2001AluminumppmASTM05185m>200<1AluminumppmASTM05185m>200<1AgandumppmASTM05185m>200<1VanadiumppmASTM05185m>200<1VanadiumppmASTM05185m>200<1SiliconppmASTM05185m>200<1SiliconppmASTM05185m>2001SiliconppmASTM05185m>201SiliconppmASTM05185m>201SiliconppmASTM05185m>201 <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 Oil Age Nachine Age Dil Age hrsClient Info517Filter Age NicehrsClient Info0Oil ChangedClient InfoN/ASample StatusClient InfoN/ASample StatusVisualNORMALIronppmASTM D5185m>20068NickelppmASTM D5185m>101NickelppmASTM D5185m>10SilverppmASTM D5185m>10SilverppmASTM D5185m>2061AluminumppmASTM D5185m>200LeadppmASTM D5185m>20c1CopperppmASTM D5185m>100VanadiumppmASTM D5185m>100VanadumppmASTM D5185m>201SiliconppmASTM D5185m>502SiliconppmASTM D5185m>201SiliconppmASTM D5185m>201SiliconppmASTM D5185m>201SiliconppmASTM D5185m>201	Sample Number		Client Info		LM0000710		
Oil Age Filter AgehrsClient Info517Filter AgehrsClient Info0Oil ChangedClient InfoN/ASample StatusClient InfoN/ASample StatusVClient InfoN/AIronppmASTM D5185m>20068NickelppmASTM D5185m>101NickelppmASTM D5185m>10<1SilverppmASTM D5185m>10<1AluminumppmASTM D5185m>20c1AluminumppmASTM D5185m>50c1CopperppmASTM D5185m>20c1VanadiumppmASTM D5185m>20c1VanadiumppmASTM D5185m>502VisualNONENONENONESiliconppmASTM D5185m>502SiliconppmASTM D5185m>201SiliconppmASTM D5185m>201SiliconppmASTM D5185m>201SiliconppmASTM D5185m>201<	Sample Date		Client Info		11 Jan 2024		
Filter Age Oil ChangedInsClient InfoOOil ChangedClient InfoKAngedFilter ChangedClient InfoN/ASample StatusVisalNORMALIronppmASTM D5185>20068ChromiumppmASTM D5185>101NickelppmASTM D5185>10<1SilverppmASTM D5185>10<1AluminumppmASTM D5185>0<1LeadppmASTM D5185>200<1CopperppmASTM D5185>100VanadiumppmASTM D5185>100VanadiumppmASTM D5185>100VanadiumppmASTM D5185>100VanadiumppmASTM D5185>100VanadiumppmASTM D5185>201VanadiumppmASTM D5185>01VanadiumppmASTM D5185>201SiliconppmASTM D5185>201Siliconscalar'VisualNONENONE </th <th>Machine Age</th> <th>hrs</th> <th>Client Info</th> <th></th> <th>517</th> <th></th> <th></th>	Machine Age	hrs	Client Info		517		
Oil Changed     Client Info     Khanged     Image of the second secon	Oil Age	hrs	Client Info		517		
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Sample StatusNORMALIronppmASTM D5185m>200688ChromiumppmASTM D5185m>101NickelppmASTM D5185m>10<1TitaniumppmASTM D5185m>10<1SilverppmASTM D5185m>250AluminumppmASTM D5185m>200<1LeadppmASTM D5185m>200<1CopperppmASTM D5185m>200<1VanadiumppmASTM D5185m>100VanadiumppmASTM D5185m>100VanadiumppmASTM D5185m>100VanadiumppmASTM D5185m>20ASTMValdoscalar"VisualNONENONESiliconppmASTM D5185m>201SiliconppmASTM D5185m>201SiliconppmASTM D5185m>201SiliconppmASTM D5185m>201SiliconppmASTM D5185m>201SiliconppmASTM D5185m>20NORE	Oil Changed		Client Info		Changed		
IronppmASTM D5185m>20068ChromiumppmASTM D5185m>101NickelppmASTM D5185m>10<1TitaniumppmASTM D5185m>10<1SilverppmASTM D5185m>250AluminumppmASTM D5185m>250LeadppmASTM D5185m>200<1CopperppmASTM D5185m>200<1TinppmASTM D5185m>100VanadiumppmASTM D5185m>100White Metalscalar*VisualNONESiliconppmASTM D5185m>502Yellow Metalscalar*VisualNONENONESiliconppmASTM D5185m>201SiliconppmASTM D5185m>201SiliconppmASTM D5185m>201Solitonscalar*VisualNONENONESilitscalar*VisualNONENONESolidonscalar*VisualNORMNORMLSodiumppmASTM D5185m<2NEGSodiumppmASTM D5185m<2<	Filter Changed		Client Info		N/A		
ChromiumppmASTM D5185m>101NickelppmASTM D5185m>10<1TitaniumppmASTM D5185m0SilverppmASTM D5185m>200AluminumppmASTM D5185m>20<1LeadppmASTM D5185m>200<1CopperppmASTM D5185m>200<1VanadiumppmASTM D5185m>100VanadiumppmASTM D5185m>100VanadiumppmASTM D5185m>100VanadiumppmASTM D5185m>201VanadiumppmASTM D5185m>201VanadiumppmASTM D5185m>201SiliconppmASTM D5185m>201SiliconppmASTM D5185m>201SiliconppmASTM D5185m>201SiliconppmASTM D5185m>201SiliconppmASTM D5185m>201Siliconscalar*VisualNONENONESiliconscalar*VisualNORMN	Sample Status				NORMAL		
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Nickel         ppm         ASTM D5185m         >10         <1							
Titanium         ppm         ASTM D5185m         0            Silver         ppm         ASTM D5185m         0            Aluminum         ppm         ASTM D5185m         >25         0            Lead         ppm         ASTM D5185m         >20         <1            Lead         ppm         ASTM D5185m         >200         <1            Copper         ppm         ASTM D5185m         >200         <1            Yanadium         ppm         ASTM D5185m         >200         <1            Vanadium         ppm         ASTM D5185m         >10         0            Vanadium         ppm         ASTM D5185m         >10         0            Vanadium         ppm         ASTM D5185m         >50         2            Vellow Metal         scalar         *Visual         NONE         NONE            Silicon         ppm         ASTM D5185m         >20         1            Silit         scalar         *Visual         NONE         NONE            Sand/Dirt					-		
SilverppmASTM D5185m0AluminumppmASTM D5185m>250LeadppmASTM D5185m>50<1CopperppmASTM D5185m>200<1TinppmASTM D5185m>100VanadiumppmASTM D5185m>100Venteduationscalar*VisualNONENONEYellow Metalscalar*VisualNONENONESiliconppmASTM D5185m>502Yellow Metalscalar*VisualNONENONESiliconppmASTM D5185m>201YetarWC Method>0.2NEGSilitscalar*VisualNONENONESand/Dirtscalar*VisualNONENONEAppearancescalar*VisualNORMLNORMLGoorscalar*VisualNORMLNORMLSodiumppmASTM D5185m-0SodiumppmASTM D5185m-0BoronppmASTM D5185m-0BariumppmASTM D5185m-0Manganese <td< th=""><th></th><th></th><th></th><th>&gt;10</th><th></th><th></th><th></th></td<>				>10			
Aluminum         ppm         ASTM D5185m         >25         0             Lead         ppm         ASTM D5185m         >50         <1             Copper         ppm         ASTM D5185m         >200         <1             Tin         ppm         ASTM D5185m         >10         0             Vanadium         ppm         ASTM D5185m         >10         0             White Metal         scalar         *Visual         NONE              Yellow Metal         scalar         *Visual         NONE              Silicon         ppm         ASTM D5185m         >50         2             Water         wC Method         >0.2         NEG             Silit         scalar         *Visual         NONE         NONE             Sand/Dirt         scalar         *Visual         NORM         NORML             Gor         scalar         *Visual							
Lead         ppm         ASTM D5185m         >50         <1					•		
CopperppmASTM D5185m>200<1		ppm			-		
TinppmASTM D5185m>100VanadiumppmASTM D5185m0White Metalscalar*VisualNONENONEYellow Metalscalar*VisualNONENONESiliconppmASTM D5185m>502PotassiumppmASTM D5185m>201WaterWC Method>0.2NEGSilitscalar*VisualNONENONEDebrisscalar*VisualNONENONESand/Dirtscalar*VisualNONENONEAppearancescalar*VisualNORMLNORMLOdorscalar*VisualNORMLNORMLSodiumppmASTM D5185m>0SodiumppmASTM D5185m2BariumppmASTM D5185m0MolybdenumppmASTM D5185m0ManganeseppmASTM D5185m<1ManganeseppmASTM D5185m<1ManganeseppmASTM D5185m<1ManganeseppmASTM D5185m<1ManganeseppmASTM D5185m<1ManganeseppmASTM D5185m<							
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PotassiumppmASTM D5185m>201WaterWC Method>0.2NEGSiltscalar*VisualNONENONEDebrisscalar*VisualNONENONESand/Dirtscalar*VisualNONENONEAppearancescalar*VisualNORMLNORMLOdorscalar*VisualNORMLNORMLSodiumppmASTM D5185m2BoronppmASTM D5185m0MalganeseppmASTM D5185mManganeseppmASTM D5185m<1ManganesumppmASTM D5185m<	Yellow Metal	scalar	*Visual	NONE	NONE		
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WaterWC Method>0.2NEGSiltscalar*VisualNONENONEDebrisscalar*VisualNONENONESand/Dirtscalar*VisualNONENONEAppearancescalar*VisualNORMLNORMLOdorscalar*VisualNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGSodiumppmASTM D5185m2BariumppmASTM D5185m0MolybdenumppmASTM D5185m0ManganeseppmASTM D5185m<1ManganeseppmASTM					_		
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Sand/Dirtscalar*VisualNONENONEAppearancescalar*VisualNORMLNORMLOdorscalar*VisualNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGSodiumppmASTM D5185m2BoronppmASTM D5185m<<1BariumppmASTM D5185m0MolybdenumppmASTM D5185m<0ManganeseppmASTM D5185m<1MagnesiumppmASTM D5185m<1				_			
Appearancescalar*VisualNORMLNORMLOdorscalar*VisualNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGSodiumppmASTM D5185m2BoronppmASTM D5185m<<1BariumppmASTM D5185m0MolybdenumppmASTM D5185m0ManganeseppmASTM D5185m<11				-			
Odorscalar*VisualNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGSodiumppmASTM D5185m2BoronppmASTM D5185m<<1BariumppmASTM D5185m0MolybdenumppmASTM D5185m0ManganeseppmASTM D5185m<1MagnesiumppmASTM D5185m<1				-			
Emulsified Water         scalar         *Visual         >0.2         NEG            Sodium         ppm         ASTM D5185m         2             Boron         ppm         ASTM D5185m         <         <1             Barium         ppm         ASTM D5185m          <1             Molybdenum         ppm         ASTM D5185m          0             Manganese         ppm         ASTM D5185m          <1             Magnesium         ppm         ASTM D5185m          <1				_	-		
Sodium         ppm         ASTM D5185m         2            Boron         ppm         ASTM D5185m         <1				-	-		
Boron         ppm         ASTM D5185m         <1		Scalai	• • • • • • • • • • • • • • • • • • •	>0.2	NEG		
Barium         ppm         ASTM D5185m         0            Molybdenum         ppm         ASTM D5185m         0             Manganese         ppm         ASTM D5185m         <1	Sodium	ppm	ASTM D5185m		2		
Molybdenum         ppm         ASTM D5185m         0             Manganese         ppm         ASTM D5185m         <1	Boron	ppm	ASTM D5185m		<1		
Manganese         ppm         ASTM D5185m         <1	Barium	ppm	ASTM D5185m		0		
Magnesium         ppm         ASTM D5185m         1	Molybdenum	ppm	ASTM D5185m		0		
	Manganese	ppm	ASTM D5185m		<1		
Calcium ppm ASTM D5185m 44	Magnesium	ppm	ASTM D5185m		1		
	Calcium	ppm	ASTM D5185m		44		
Phosphorus         ppm         ASTM D5185m         1269	Phosphorus	ppm	ASTM D5185m		1269		
Zinc ppm ASTM D5185m 3	Zinc	ppm	ASTM D5185m		3		
Sulfur         ppm         ASTM D5185m         27515	Sulfur	ppm	ASTM D5185m		27515		
Visc @ 40°C cSt ASTM D445 197 198	Visc @ 40°C	cSt	ASTM D445	197	198		

Contact/Location: RONNY FUNK - LIEHIA





LIEBHERR USA CO - Maritime Cranes 15101 NW 112TH AVE HIALEAH GARDENS, FL US 33018 Contact: RONNY FUNK ronny.funk@liebherr.com T: (305)817-7566 106:2012) F:



 Certificate 12307
 Test Package
 : CONST

 To discuss this sample report, contact Customer Service at 1-800-237-1369.
 \*

 \* - 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)

: LM0000710

: 06065221

: WearCheck USA - 501 Madison Ave., Cary, NC 27513

Diagnostician : Wes Davis

: 18 Jan 2024

: 19 Jan 2024

Recieved

Diagnosed

Report Id: LIEHIA [WUSCAR] 06065221 (Generated: 01/19/2024 18:52:07) Rev: 1

Laboratory

Sample No.

Lab Number

Unique Number : 10836603

Contact/Location: RONNY FUNK - LIEHIA

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