

LR Motor Shop Repairs

Job Number 102807

Prepared for Almatis Inc/RCP Bauxite (10014)

4701 Alcoa Road Bauxite AR 72011

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AC Inspection as Found - LR Motor Shop

AC Inspection - Rev. 2: E17577-01

1.0



Hi-Speed Industrial Service 7030 Ryburn Dr Millington, Tn 38053 901-873-5300

> FolderID: 102807 FormID: 20122158

AC Inspection as Found Almatis Inc/RCP Bauxite (10014)

4701 Alcoa Road Bauxite, AR 72011

AC Inspection - Rev. 2

Location: LR Motor Shop
Serial Number: E17577-01

Description:800 HP SIEMENS 3567 RPM

Hi-Speed Job Number:	102807
Manufacturer:	Siemens
Serial Number:	E17577-01
HP/kW:	800 (HP)
RPM:	3567 (RPM)
Frame:	5010Y
Voltage:	4160
Phase:	Three
Hz:	60 (Hz)
Service Factor:	1.15
Enclosure:	TEFC
Repair Stage:	Final
Rewind:	Yes
Shaft Machined Fit Repairs Required:	No
Bearing Housing Machined Fit Repairs Required:	Yes
Heaters:	No
Winding Type :	Form Coil
Bearing Type:	Rolling Element

Priorities Found: 4 - High

7 - Good

Overall Condition

1. Report Date 04/22/2024

2. Nameplate Picture



3. Photos of all six sides of the machine.













	4.	Describe the Overall Condition of the Equipment as Received Both internal fans had a catastrophic failure. Both endbells are worn. Opposite side bearing came apart.	
	5.	Distance from the end of the shaft to the Coupling/Sheave Coupling flush with shaft	0 inches
In	Initial Mechanical/Electrical		
	6.	Does Shaft Turn Freely?	(Y) Yes
	7.	Does the shaft require T.I.R in Lathe to identify additional repairs?	(No) No
	8.	Does Shaft Have Visible Damage?	(No) No
	9.	Assembled Shaft Runout	0.001 Inches

10.	Assembled Shaft End Play		inche	S
-	Na			
11.	Air Gap Variation <10%			
-	Na			
1 2.	Lead Condition		(P) Pas	s
13.	Lead Length		30 Inches	s
14.	Does it have Lugs?, If so what is the S	Stud Size?	(Yes) Yes	s
-	Wrong size lugs. Needs 4 AWG			
15.	Lead Numbers		123	3
16.	Stator Temperature Detector Rating and Function			
	Quantity	Rating	Quantity Passed	
	8	110	8	







17.	Bearing Temperature Detector Rating	g and Function		
	Quantity	Rating	Quantity Passed	
	2	110	2	
18.	Frame Condition			good
19.	Fan Condition			(F) Fail





20.	Broken or Missing Components		fa	n is broken			
Initial	Initial Electrical Inspection						
21.	Insulation Resistance/Megger			Megohms			
-	Na						
22.	Winding Resistance						
	1-2	1-3	2-3				
-	Na						
23.	Perform Surge Test						
-	Na						
24.	Number of Stator Slots			48			

25. Stator Condition rewind



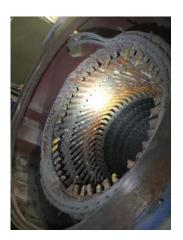












26. Stator Thermistors/Ohms

27. Stator Overloads/Ohms

Na

Mechanical Inspection

28. Drive End Bearing Brand **FAG**

29. Drive End Bearing Number-6315 2Z c3

1 30. Drive End Bearing Qty.

32. Drive End Lubrication Type

(Grease) Grease Lubricated







33. Drive End Bearing Insulation or Grounding Device?	no
34. Drive End Wavy Washer/Snap-Ring Other Retention Device?	no
35. Drive End Bearing Condition	fail
36. Opposite Drive End Bearing Brand	FAG



37. Opposite Drive End Bearing Number-	6315 2Z c3
38. Opposite Drive End Bearing Qty.	1
39. Opposite Drive End Bearing Type	(Ball) Ball Bearing
40. Opposite Drive End Lubrication Type	(Grease) Grease Lubricated

41.	Opposite Drive End Bearing Insulation or Grounding Device?	no
42.	Opposite Drive End Wavy Washer/Snap-Ring Other Retention Device?	no
43.	Opposite Drive End Bearing Condition	fail
-	Cage came apart	





44.	Drive End Seal				
-	Na				
45.	Opposite Drive End Seal				
-	Na				
Rotor	Inspection				
46.	Rotor Type/Material		(Aluminum Bar) Aluminum Barred Rotor		
47.	Growler Test		(Pass) Pass		
48.	Number of Rotor Bars		40		
49.	Rotor Condition		good		
50.	List the Parts needed for the Repair B	elow			
	6315, 6315, 2 internal shaft fans, rewind				
51.	Signature of Technician that Disassen	nbled Motor	Trevor Hall		
Mech	anical Fits- Rotor				
52.	Shaft Runout		0 inches		
53.	Rotor Runout				
	Drive End Bearing Fit	Rotor Body	Opposite Drive End Bearing		
	0	0	0		
54.	Coupling Fit Closest to Bearing Housi	ng			
	0 Degrees	90 Degrees	120 Degrees		
	2.7569	2.7568	2.7567		
55.	Coupling Fit Closest to the end of the	Shaft			
	0 Degrees	60 Degrees	120 Degrees		
	2.7563	2.756	2.7565		
56.	Drive End Bearing Shaft Fit				
	0 Degrees	60 Degrees	120 Degrees		
	2.9533	2.9533	2.9533		
5 7.	Drive End Bearing Shaft Fit Condition		(P) Pass		
58.	Opposite Drive End Bearing Shaft Fit				
	0 Degrees	60 Degrees	120 Degrees		
	2.953	2.9533	2.9533		

59.	Opposite Drive End Bearing Shaft Fit Condition			(P) Pass
60.	60. Shaft Air Seal Fits			
	Drive End Air Seal	Opposite Drive End Air Seal		
	ok ok			
Mechanical Fits- Bearing Housings				
61.	Drive End - Endbell Bearing Fit			
	0 Degrees	60 Degrees	120 Degrees	
	6.304	6.304	6.304	



62. Drive End - Endbell Bearing Fit Condition				(F) Fail
63. Opposite Drive End - Endbell Bearing Fit				
	0 Degrees	60 Degrees	120 Degrees	
	6.3002	6.3003	6.3003	



64. Opposite Drive End - Endbell Bearing Fit Condition			(P) Pass
65.	Bearing Cap Condition		
	Drive End Bearing Cap	Opposite Drive End Bearing Cap	
	ok	ok	
66.	End Bell Air Seal Fits		
	Drive End Air Seal	Opposite Drive End Air Seal	
	ok	ok	
67.	List Machine Work Needed Below		
	Sleeve DE endbell		

68. Technician David Maclin



Root Cause of Failure

69. Failure locations *Ode bearing*

70. Root cause of failure *Fatigue*

Dynamic Balance Report

71. Rotor Weight and Balance Grade

Rotor Weight Balance Grade



72.	Initial Balance Readings		
	Drive End	Opposite Drive End	
	.074	1.11	
73.	Final Balance Readings		
	Drive End	Opposite Drive End	
	0.04	.10	
7/	Technician		DW.

74. Technician

Rewind

75. Core Test Results - Watts loss per Pound

Pre-Burnout Post Burnout

76. Core Hot Spot Test

Pre-Burnout Post-Burnout

77. Post Rewind Electrical Test- Insulation Resistance 24500 Megohms

78. Post Rewind Polarization Index Polarization Index

79. Post Rewind Winding	. Post Rewind Winding Resistance			
1-2	1-3	2-3		
0.492	0.492	0.49		
80. Post Rewind Surge Te	est	(Pa	ass) Pass	



81. Post Rewind Hi-Pot
micro-amps



82. Technician

Mechanical Fits- Bearing Housings - Post Repair

83.	3. Drive End - Endbell Bearing Fit Post Repair			
	0 Degrees	60 Degrees	120 Degrees	
	6.2998	6.2998	6.2998	



0.4	Opposite Drive End - Endhall Bearing	Fit Boot Bonois		
84.	Opposite Drive End - Endbell Bearing Fit Post Repair			
	0 Degrees	60 Degrees	120 Degrees	
	·	·	•	
85.	Bearing Cap Condition Post Repair			
	Drive End Bearing Cap	Opposite Drive End Bearing Cap		
86.	End Bell Air Seal Fits Post Repair			
	Drive End Air Seal	Opposite Drive End Air Seal		
87.	End Bell Repair Sign-off			Gary

Assembly

88. QC Check All Parts for Cleanliness Prior to Assembly

RW







90. Final Insulation Resistance Test

13590 Megohms



- 91. Assembled Shaft Endplay
- 92. Assembled Shaft Runout

93. Test Run Voltage			
Volts	Volts	Volts	
4117	4135	4162	



Co witness Trevor Hall

94. Test Run Amperage		
Amps	Amps	Amps
23.5	22.2	22.7



95.	95. Drive End Vibration Readings - Inches Per Second			
	Horizontal	Vertical	Axial	
	0.0089999999999999	0.02	0.00899999999999999	
96.	. Opposite Drive End Vibration Readings - Inches Per Second			
	Horizontal	Vertical	Axial	
	0.02	0.01	0.02	
97.	Ambient Temperature - Fahrenheit			79
98.	Drive End Bearing Temps - Fahrenheit			
	5 Minutes	10 Minutes	15 Minutes	
	81	83	86	
99.	Opposite Drive End Bearing Temps - Fahrenheit			
	5 Minutes	10 Minutes	15 Minutes	
	105	108	112	

5 Minutes 10 Minutes 15 Minutes

101. Document Final Condition with Pictures after paint













102. Final Pics and QC Review

RW





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- 1. APPLICABILITY. The sale of any and all goods and/or services by Mock, Inc. d/b/a Hi-Speed Industrial Service ("Hi-Speed") shall be specifically conditioned upon and subject to the following terms and conditions which are incorporated by reference into any contracts and purchase orders with Hi-Speed, and which shall form and become a part of any agreement related thereto. Buyer's acceptance of any offer or quotation made by Hi-Speed for sale of any goods or services is expressly made subject to the terms and conditions set forth herein and to be so effective, Buyer need not sign or approve these Terms and Conditions to be bound hereunder provided a copy of same is provided to Buyer through any means. None of the terms and conditions contained herein may be added to, expanded, changed, modified, superseded or otherwise altered except as revised in writing and duly executed by Hi-Speed, and all orders received by Hi-Speed shall be governed only by the terms and conditions contained herein, notwithstanding any terms, conditions or provisions of any purchase order, release order, authorization or any other form issued by the Buyer. Hi-Speed hereby objects to any additional, modified, changed, deleted, altered or other terms and conditions not contained herein and notifies Buyer that any such terms or provisions are expressly rejected by Hi-Speed.
- 2. PRICE. All quoted prices shall remain firm and binding for a period of thirty (30) days from the date of quotation or for the period specifically stated in the quotation. The price for any and all goods and/or services ordered or approved by Buyer after thirty (30) days from the date of any quotation are subject to any increase in price that may occur after the expiration of thirty (30) days from the issuance of the quotation and the date the Buyer releases any shipment.
- 3. SCOPE OF GOODS AND/OR SERVICES. The goods and/or services provided by Hi-Speed pursuant to any quotation shall be limited exclusively to those goods and/or services expressly identified therein. Hi-Speed does not assume any responsibility and/or liability for the failure to provide any other goods and/or services not identified in any quotation. Modifications, additions or deletions to or from the scope referenced in any quotation shall only bee effective if evidenced in writing and signed by Hi-Speed. The sale of any of all goods and/or services affected by such modification, addition or deletion shall be subject to these same Standard Terms and Conditions whether or not referenced therein.
- 4. <u>BILLING AND PAYMENT TERMS.</u> Hi-Speed shall invoice Buyer for all goods and/or services as same are rendered at the address listed on the quotation. Payments for all goods and/or services shall be due thirty (30) days from the date of the current invoice or as otherwise set forth in the quotation. Late payments are subject to a late fee of 5% of the total invoice amount. Recurring late payments may lead to a deposit requirement on future services or sale of goods. Buyer shall be liable to Hi-Speed for any and all fees and expenses incurred by Hi-Speed to collect any invoices or to enforce these Standard Terms and Conditions, including but not limited to, attorney's fees.
- 5. <u>DELIVERY OF GOODS AND/OR SERVICES.</u> Unless otherwise identified in the quotation, all shipments are F.O.B. Hi-Speed's warehouse and the title to and all risk of loss with respect to any goods shipped shall pass to Buyer when such goods are delivered to the carrier at Hi-Speed's warehouse. Hi-Speed will use its best efforts to affect delivery by the date or dates specified in the quotation. However, Hi-Speed shall not be liable for delay in or failure to make shipment, or to perform services, by any identified date for any reason whatsoever, including but not limited to, causes beyond its reasonable control, such as strikes, fires, floods, epidemics, quarantines, restrictions, severe weather, embargos, acts of God, or public enemy, war, riot, delays in transportation or the inability to obtain necessary labor, materials or manufacturing facilities.
- **DELIVERY SITE AND TIME FOR PERFORMANCE.** Hi-Speed and Buver agree that time is of the essence for the purchase order and that Buyer shall fully cooperate with Hi-Speed in order to allow Hi-Speed full access to prosecute its work diligently and in an orderly manner. Buyer shall assist Hi-Speed in every way possible to avoid delaying, disrupting or interfering with the progress of Hi-Speed's work at the project site. In the event Hi-Speed's work is delayed, hindered, suspended, disrupted, re-sequenced or interfered with or rendered less efficient or more costly or adversely affected in any way as a result of acts or omissions of Buyer or other contractors or employees of Buyer or by any other reason beyond Hi-Speed's control and without the fault of Hi-Speed, then, in such event, Buyer shall be liable to Hi-Speed for any damages, additional costs, expenses, labor, materials, man hours, acceleration costs, overtime, additional jobsite overhead, extended home office overhead, and any and all other direct and indirect expenses of whatsoever nature or kind, caused in whole or in part, as a result of any of the above-referenced occurrences. Hi-Speed's project records will be the basis for computing the additional costs and damages of Hi-Speed's labor, materials, expenses and overhead related to such changes. BUYER WARRANTS THAT THE SITE FOR DELIVERY OR INSTALLATION OF ANY GOODS AND/OR FOR THE PERFORMANCE OF ANY SERVICES SHALL BE READY AND ADEQUATE FOR HI-SPEED'S DELIVERY OF GOODS AND/OR PERFORMANCE OF SERVICES AND THAT HI-SPEED SHALL HAVE FULL ACCESS THERETO, FREE OF ALL OBSTRUCTIONS. BUYER SHALL ASSUME ALL EXTRA COSTS ASSOCIATED WITH HI-SPEED'S INABILITY TO INSTALL ANY GOODS OR PERFORM ANY SERVICES AS A RESULT OF BUYER'S FAILURE TO COMPLY WITH THIS PROVISION. HI-SPEED MAY NOT INSPECT THE SITE PRIOR TO DELIVERY AND/OR INSTALLATION OF GOODS AND/OR PERFORMANCE OF SERVICES AND MAKES NO WARRANTY AS TO THE SUFFICIENCY OF THE SITE FOR THE DELIVERY AND/OR INSTALLATION OF GOODS AND/OR THE PERFORMANCE OF SERVICES AT SUCH SITE.
- 7. INSPECTION/ACCEPTANCE. All goods and services ordered pursuant to any quotation shall be subject to inspection by Buyer after delivery or performance to determine conformity with the quotation and/or purchase order and Hi-Speed's advertised or published specifications. Buyer shall have a period of thirty (30) days from shipment of goods at the delivery destination specified in the quotation within which to inspect the goods for conformity with the quotation, order and/or Hi-Speed's advertised and published specifications and to provide Hi-Speed with written notice of any discrepancy or rejection. Buyer shall have a period of thirty (30) days following completion of any services within which to inspect the services for conformity with the quotation, purchase order and/or Hi-Speed's advertised and published specifications and to provide Hi-Speed with written notice of any discrepancy or rejection. If the goods delivered or services performed do not so conform, upon delivery of notice to Hi-Speed of any discrepancy, nonconformance or rejection, Hi-Speed shall have sixty (60) days to cure the alleged discrepancy and/or nonconformance. If Hi-Speed fails to cure in this time period, Buyer shall have the right to reject such goods or services. After the cure period, goods that have been delivered and rejected, in whole or in part, shall be returned to Hi-Speed. Buyer shall notify Hi-Speed and arrange for the return of the goods as required. Should such non-conforming services be rejected Hi-Speed shall, at its sole cost, re-perform the non-conforming services. Inspection or failure to inspect on any occasion shall not affect Buyer's rights under the warranty provisions herein.
- 8. WARRANTIES. Hi-Speed warrants that all goods shall conform in all material aspects to the goods identified in the quotation to Buyer and/or purchase order, and Hi-Speed makes to Buyer the manufacturer's express warranty for any goods sold to Buyer, which is offered by the manufacturer at the time of acceptance of any quotation by Buyer. This warranty is conditioned upon the installation, operation, and maintenance of the goods in accordance with the manufacturer's recommendations and/or standard industry practice and the goods at all times being operated or used under normal operating conditions for which they were designed. Hi-Speed, at its sole option, will repair or

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- 10. <u>SEVERABILITY.</u> The partial or complete invalidity of any provision of these Standard Terms and Conditions shall not affect the enforceability of the remainder of these Standard Terms and Conditions. If any provision is found to be invalid or unenforceable, that portion shall be modified to make it enforceable or shall be stricken and the remainder of these Standard Terms and Conditions shall enforced.
- 11. **GOVERNING LAW AND JURISDICTION.** Any controversy arising out of any quotation, the purchase order, the goods sold or delivered, repair or replacement thereof, or any services provided pursuant to any quotation or any purchase order, or these Standard Terms and Conditions shall be governed by the laws of the state of Tennessee without regard to any choice of law provisions and any cause of action related in any manner thereto shall be brought only in the state or federal courts of Shelby County, Tennessee.
- 12. <u>ABANDONED EQUIPMENT.</u> Hi-Speed requires that Buyer promptly pick up or provide shipment instructions for Buyer equipment or other Buyer property in Hi-Speed's possession. If equipment or other Buyer property is left with Hi-Speed and not picked up within six (6) months after Hi-Speed's final action related to the applicable property (e.g. evaluation, teardown, estimate, completion of services), Hi-Speed will consider such property abandoned and may dispose of it in accordance with applicable law. Buyer agrees to hold Hi-Speed harmless for any damage or claim for such abandoned property and acknowledges that Hi-Speed may discard or recycle it at Hi-Speed's sole and absolute discretion. Specifically, Hi-Speed may sell Buyer's abandoned property at a private or public sale and retain the proceeds to offset Hi-Speed's storage, inspection and servicing costs. For the avoidance of doubt, Hi-Speed reserves its statutory and other lawful liens for unpaid charges related to abandoned property.
- 13. FORCE MAJEURE. Neither party shall be responsible for any delay or failure in performance of any party of the quotation, purchase order or these Standard Terms and Conditions to the extent that such delays or failures are caused by fire, flood, earth quake, explosion, war, embargo, government requirement, civil or military authority, acts of God, or any other circumstances beyond its reasonable control and not involving any fault or negligence on the party affected ("Condition"). If any such Condition occurs, the party delayed or unable to perform shall promptly give written notice to the other party and, if such Condition remains at the end of thirty (30) days, the party affected by the other party's delay and inability to perform may elect to (i) terminate such order or part thereof, or (ii) suspend the order for the duration of the Condition, if the Buyer is the suspending party, buy elsewhere comparable material to be sold under the order and apply to any commitment the purchase price of such purchase, and resume performance of the order once the Condition ceases, with an option in the affected party to extend the period of this order up to the length of the time the Condition endures.
- 14. <u>NONWAIVER.</u> No course of dealing or failure of either party to strictly enforce any term, right, or condition of these Standard Terms and Conditions will be construed as a waiver of such term, right or condition. Any waiver by Hi-Speed will only be in writing and will waive no succeeding breach of a term, right or condition.
- 15. **ASSIGNMENT.** The rights and obligations of the parties shall neither be assigned nor delegated without the prior written consent of the other party. However, any party may assign or delegate its respective rights and obligations, in whole or in part, (i) to any subsidiary, (ii) pursuant to other financing, merger or reorganization or (iii) pursuant to any sale or transfer of substantially all of the assets of the assigning party. These Standard Terms and Conditions shall bind the heirs, successors and assigns of the parties hereto.
- 16. NO INDIVIDUAL LIABILITY. Notwithstanding any other agreement to the contrary, the Buyer agrees that in no event will the Buyer hold and HI-Speed owner, director, officer or employee personally liable for unintentional tortious conduct or conduct that constitutes the breach of any contract between HI-Speed and the Buyer, even if the HI-Speed owner, director, officer or employee is or could be construed to be a party to such contract.