



**KEEPING YOUR FACILITY UP TO SPEED**  
— EVERY DAY SINCE 1946 —

LR Motor Shop Repairs

**Job Number 101981**

Prepared for ARKANSAS INDUSTRIAL MACHINERY

3804 N. NONA ST  
NORTH LITTLE ROCK AR 72118

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AC Inspection as Found - *Shop*

AC Inspection - Rev. 2

**1.0**

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*Printed on 10/26/2023*

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

**AC Inspection as Found**  
**ARKANSAS INDUSTRIAL MACHINERY**  
3804 N. NONA ST  
NORTH LITTLE ROCK, AR 72118

FolderID: 101981  
FormID: 18134398

**AC Inspection - Rev. 2**

**Completed by: Motor Shop LR 1 on 10/26/2023**

**Location:** Shop

**Serial Number:**

**Description:** 90KW ABB

**Hi-Speed Job Number:** 101981

**Manufacturer:** ABB

**Product Number:** 3G1P183702606

**Serial Number:** M3AA250SMC2IMB35IM2001

**HP/kW:** 90 (kW)

**RPM:** 3579 (RPM)

**Frame:** 250SMC

**Voltage:** 460

**Current:** 133

**Phase:** Three

**Hz:** 60 (Hz)

**Service Factor:** 1.06

**Enclosure:** TEFC

**J-box Included:** Complete

**Date Received:** 10/11/2023

**Repair Stage:** Final

Priorities Found: ● 3 - High ● 8 - Good

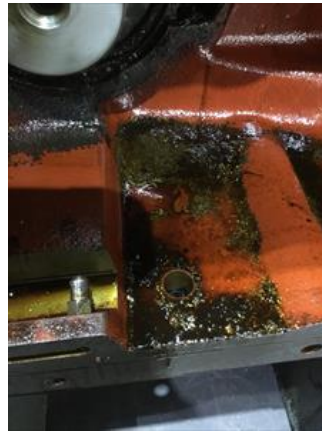
**Overall Condition**

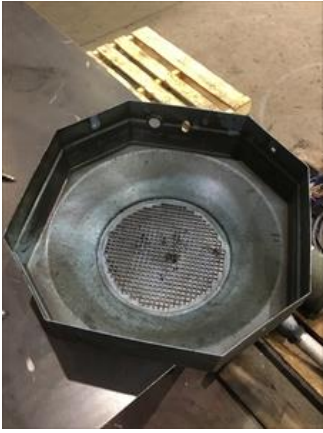
- |                      |            |
|----------------------|------------|
| 1. Report Date       | 10/26/2023 |
| 2. Nameplate Picture |            |



3. Photos of all six sides of the machine.

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Coil 1 (Ohms)	0.0411 Corr: 0.0000	
Coil 2 (Ohms)	0.0411 Corr: 0.0000	
Coil 3 (Ohms)	0.0412 Corr: 0.0000	
Megohm Stat...	PASS	No Test
Volts (V)	501	
I(μA)	0.0293	
Resist	17075	
At 40°C	4610	
Oil Contam.	No Test	No Test
Nameplate	Application	Results Summary



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1.4



4.	Describe the Overall Condition of the Equipment as Received	
	<i>Dirty</i>	
5.	Distance from the end of the shaft to the Coupling/Sheave	inches
	<i>Na</i>	
<b>Initial Mechanical/Electrical</b>		
6.	Does Shaft Turn Freely?	(Yes) Yes
7.	Does Shaft Have Visible Damage?	(No) No
8.	Assembled Shaft Runout	Inches
	<i>Na</i>	
9.	Assembled Shaft End Play	inches
	<i>Na</i>	
10.	Air Gap Variation <10%	
	<i>Na</i>	
11.	Lead Condition	(P) Pass
12.	Lead Length	94 Inches
13.	Lead Numbers	t1-t6
14.	Stator Temperature Detector Rating and Function	
	Quantity	Rating
		Quantity Passed
	<i>Na</i>	

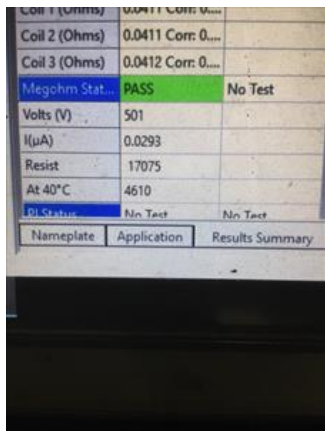
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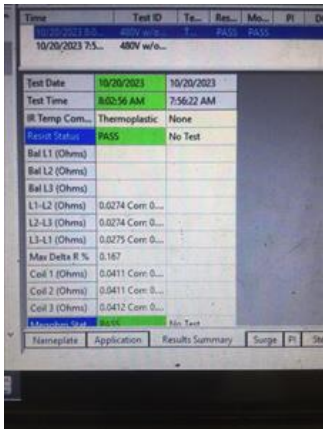
15. Bearing Temperature Detector Rating and Function		
Quantity	Rating	Quantity Passed
Na		
16. Frame Condition		pass
17. Fan Condition		(P) Pass



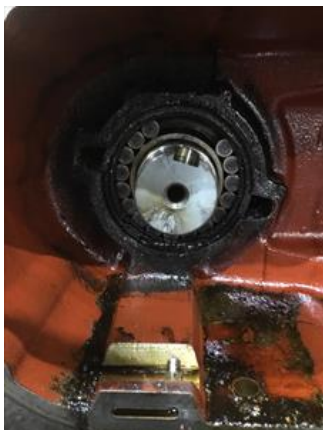
18. Heater Quantity, Ratings		
Quantity	Volts/Watts	Pass/Fail
Na		
19. Broken or Missing Components		na
<b>Initial Electrical Inspection</b>		
20. Insulation Resistance/Megger		17075 Megohms



21. Winding Resistance		
1-2	1-3	2-3
0.0411	0.0411	0.0412



22. Perform Surge Test	(P) Pass
23. Number of Stator Slots	62
24. Stator Condition	pass but dirty and has oil in windings
25. Stator Thermistors/Ohms	Na
26. Stator Overloads/Ohms	Na
<b>Mechanical Inspection</b>	
27. Drive End Bearing Brand	na
28. Drive End Bearing Number-	NU213
29. Drive End Bearing Qty.	1
30. Drive End Bearing Type	(Roller) Roller Bearing
31. Drive End Lubrication Type	(Oil) Oil Lubricated
32. Drive End Bearing Insulation or Grounding Device?	na
33. Drive End Wavy Washer/Snap-Ring Other Retention Device?	snap ring
34. Drive End Bearing Condition	race cage had a catastrophic failure



35. Opposite Drive End Bearing Brand	na
36. Opposite Drive End Bearing Number-	6215


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37. Opposite Drive End Bearing Qty.	1
38. Opposite Drive End Bearing Type	(Ball) Ball Bearing
39. Opposite Drive End Lubrication Type	(Grease) Grease Lubricated
40. Opposite Drive End Bearing Insulation or Grounding Device?	
Na	
41. Opposite Drive End Wavy Washer/Snap-Ring Other Retention Device?	snap ring
42. Opposite Drive End Bearing Condition	signs of frosting




43. Drive End Seal	lip seal	
44. Opposite Drive End Seal		
Na		
45. DE Sleeve Bearing Inside Diameter		
0 degrees	120 degrees	240 degrees
Na		
46. DE Sleeve Bearing Outside Diameter		
0 degrees	120 degrees	240 degrees
Na		
47. DE Sleeve Bearing Housing Inside Diameter		
0 degrees	120 degrees	240 degrees
Na		
48. DE Sleeve Bearing to Housing Clearance		
0 degrees	120 degrees	240 degrees
Na		
49. ODE Sleeve Bearing Inside Diameter		
0 degrees	120 degrees	240 degrees
Na		
50. ODE Sleeve Bearing Outside Diameter		
0 degrees	120 degrees	240 degrees
Na		

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51. ODE Sleeve Bearing Housing Inside Diameter	0 degrees	120 degrees	240 degrees
Na			
52. ODE Sleeve Bearing to Housing Clearance	0 degrees	120 degrees	240 degrees
Na			
<b>Rotor Inspection</b>			
53. Rotor Type/Material	(Squirrel Aluminum) Squirrel Cage Aluminum Die Cast		
54. Growler Test	(Pass) Pass		
55. Number of Rotor Bars	43		
56. Rotor Condition	pass		
57. List the Parts needed for the Repair Below	NU213 6215 Seal seal sleeve		
58. Signature of Technician that Disassembled Motor	Cw 		
<b>Mechanical Fits- Rotor</b>			
59. Shaft Runout	0.001 inches		
60. Rotor Runout			
Drive End Bearing Fit	Rotor Body	Opposite Drive End Bearing	
Na			
61. Coupling Fit Closest to Bearing Housing	0 Degrees	90 Degrees	120 Degrees
Na			
62. Coupling Fit Closest to the end of the Shaft	0 Degrees	60 Degrees	120 Degrees
Na			
63. Drive End Bearing Shaft Fit	0 Degrees	60 Degrees	120 Degrees
	2.5596	2.5595	2.5596
64. Drive End Bearing Shaft Fit Condition	(P) Pass		
65. Opposite Drive End Bearing Shaft Fit	0 Degrees	60 Degrees	120 Degrees
	2.9529	2.9529	2.953
66. Opposite Drive End Bearing Shaft Fit Condition	(P) Pass		
67. Shaft Air Seal Fits			
Drive End Air Seal	Opposite Drive End Air Seal		
Na			

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### Mechanical Fits- Bearing Housings

68.	Drive End - Endbell Bearing Fit		
	0 Degrees	60 Degrees	120 Degrees
	4.7259	4.7262	4.7254
 69.	Drive End - Endbell Bearing Fit Condition		(F) Fail
70.	Opposite Drive End - Endbell Bearing Fit		
	0 Degrees	60 Degrees	120 Degrees
	5.1181	5.1183	5.1181
 71.	Opposite Drive End - Endbell Bearing Fit Condition		(P) Pass
72.	Bearing Cap Condition		
	Drive End Bearing Cap	Opposite Drive End Bearing Cap	
	Pass		



73.	End Bell Air Seal Fits	
	Drive End Air Seal	Opposite Drive End Air Seal
	Na	
74.	List Machine Work Needed Below <i>DE end bell bearing fit, DE seal fit, and DE shaft shoulder fit on end bell</i>	
75.	Technician	Cw
		

### Dynamic Balance Report

76.	Rotor Weight and Balance Grade	
	Rotor Weight	Balance Grade
	0	0
77.	Initial Balance Readings	
	Drive End	Opposite Drive End
	2.21	0.19
78.	Final Balance Readings	
	Drive End	Opposite Drive End
	0.23	0.29

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**Rewind**

80. Core Test Results - Watts loss per Pound

Pre-Burnout

Post Burnout

0

0

81. Core Hot Spot Test

Pre-Burnout

Post-Burnout

ok

ok

82. Post Rewind Electrical Test- Insulation Resistance

2000 Megohms

83. Post Rewind Polarization Index

0 Polarization Index

84. Post Rewind Winding Resistance

1-2

1-3

2-3

0

0

0

85. Post Rewind Surge Test

(Pass) Pass

86. Post Rewind Hi-Pot

0 micro-amps

87. Technician

David Maclin


**Root Cause of Failure**

88. Failure locations

*Bearings, and DE seal fit in end bell, and DE end bell where the shaft shoulder rides*

89. Root cause of failure

*DE race cage had a catastrophic failure causing the rotor shaft to drag in the end bell and wear the bearing fit and the seal fit***Mechanical Fits- Rotor - Post Repair**

90. Shaft Runout Post Repair

0 inches

91. Rotor Runout Post Repair

Drive End Bearing Fit

Rotor Body

Opposite Drive End Bearing

0

0

0

92. Coupling Fit Closest to Bearing Housing Post Repair

0 Degrees

90 Degrees

120 Degrees

0

0

0

93. Coupling Fit Closest to the end of the Shaft Post Repair

0 Degrees

60 Degrees

120 Degrees

0

0

0

94. Drive End Bearing Shaft Fit Post Repair

0 Degrees

60 Degrees

120 Degrees


0

0

0

95. Opposite Drive End Bearing Shaft Fit Post Repair		
0 Degrees	60 Degrees	120 Degrees
0	0	0
96. Shaft Air Seal Fits Post Repair		
Drive End Air Seal	Opposite Drive End Air Seal	
3.083	3.083	



97. Shaft Repair Sign-off		David Maclin
		
<b>Mechanical Fits- Bearing Housings - Post Repair</b>		
98. Drive End - Endbell Bearing Fit Post Repair		
0 Degrees	60 Degrees	120 Degrees
0	0	0
99. Opposite Drive End - Endbell Bearing Fit Post Repair		
0 Degrees	60 Degrees	120 Degrees
0	0	0
100. Bearing Cap Condition Post Repair		
Drive End Bearing Cap	Opposite Drive End Bearing Cap	
ok	ok	

## 101. End Bell Air Seal Fits Post Repair

Drive End Air Seal

Opposite Drive End Air Seal

3.112

3.112



## 102. DE Sleeve Bearing Inside ID Post Repair

Measure 1

Measure 2

Measure 3

0

0

0

## 103. DE Sleeve Bearing Outside ID Post Repair

Measure 1

Measure 2

Measure 3

0

0

0

## 104. DE Sleeve Bearing Inside OD Post Repair

Measure 1

Measure 2

Measure 3

0

0

0

## 105. DE Sleeve Bearing Outside OD Post Repair

Measure 1

Measure 2

Measure 3

0

0

0

## 106. End Bell Repair Sign-off

David Mackin

## 107. ODE Sleeve Bearing Inside ID Post Repair

Measure 1

Measure 2

Measure 3

0

0

0

## 108. ODE Sleeve Bearing Outside ID Post Repair

Measure 1

Measure 2

Measure 3

0

0

0

## 109. ODE Sleeve Bearing Inside OD Post Repair

Measure 1

Measure 2

Measure 3

0

0

0

## 110. ODE Sleeve Bearing Outside OD Post Repair

Measure 1

Measure 2

Measure 3

0

0

0

**Assembly**

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112. Photograph All Major Components prior to assembly





113. Final Insulation Resistance Test			2000 Megohms
114. Assembled Shaft Endplay			0 inches
	115. Assembled Shaft Runout		0 inches
116. Test Run Voltage			
Volts		Volts	Volts
97		99	99
	Robert Wiley witnessed		

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117. Test Run Amperage		
Amps	Amps	Amps
<b>13.8</b>	<b>14.2</b>	<b>14.1</b>
118. Drive End Vibration Readings - Inches Per Second		
Horizontal	Vertical	Axial
<b>0.008</b>	<b>0</b>	<b>0</b>
119. Opposite Drive End Vibration Readings - Inches Per Second		
Horizontal	Vertical	Axial
<b>0.011</b>	<b>0</b>	<b>0</b>
120. Ambient Temperature - Fahrenheit		<b>75</b>
121. Drive End Bearing Temps - Fahrenheit		
5 Minutes	10 Minutes	15 Minutes
<b>0</b>	<b>0</b>	<b>0</b>
122. Drive End Bearing Temps - Fahrenheit 20-30 Minutes		
20 Minutes	25 Minutes	30 Minutes
<b>0</b>	<b>0</b>	<b>0</b>
123. Drive End Bearing Temps - Fahrenheit 35-45 Minutes		
35 Minutes	40 Minutes	45 Minutes
<b>0</b>	<b>0</b>	<b>0</b>
124. Drive End Bearing Temps - Fahrenheit 50-60 Minutes		
50 Minutes	55 Minutes	60 Minutes
<b>0</b>	<b>0</b>	<b>0</b>
125. Opposite Drive End Bearing Temps - Fahrenheit		
5 Minutes	10 Minutes	15 Minutes
<b>0</b>	<b>0</b>	<b>0</b>
126. Opposite Drive End Bearing Temps - Fahrenheit 20-30 Minutes		
20 Minutes	25 Minutes	30 Minutes
<b>0</b>	<b>0</b>	<b>0</b>
127. Opposite Drive End Bearing Temps - Fahrenheit 35-45 Minutes		
35 Minutes	40 Minutes	45 Minutes
<b>0</b>	<b>0</b>	<b>0</b>
128. Opposite Drive End Bearing Temps - Fahrenheit 50-60 Minutes		
50 Minutes	55 Minutes	60 Minutes
<b>0</b>	<b>0</b>	<b>0</b>

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129. Stator Temperatures- Fahrenheit		
5 Minutes	10 Minutes	15 Minutes
0	0	0
130. Stator Temperatures- Fahrenheit 20-30 Minutes		
20 Minutes	25 Minutes	30 Minutes
0	0	0
131. Stator Temperatures- Fahrenheit 35-45 Minutes		
35 Minutes	40 Minutes	45 Minutes
0	0	0
132. Stator Temperatures- Fahrenheit 50-60 Minutes		
50 Minutes	55 Minutes	60 Minutes
0	0	0
133. Document Final Condition with Pictures after paint		<b>new</b>
134. Final Pics and QC Review		





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9. **LIMITATION OF DAMAGES.** HI-SPEED SHALL HAVE NO LIABILITY TO BUYER WITH RESPECT TO THE SALE OR DELIVERY OF ANY GOODS OR THE REPAIR THEREOF OR WITH RESPECT TO THE SALE OR PERFORMANCE OF ANY SERVICES, FOR LOST PROFITS, SPECIAL, CONSEQUENTIAL, EXEMPLARY, PUNITIVE OR INCIDENTAL DAMAGES OF ANY KIND OR NATURE WHETHER ARISING IN CONTRACT, TORT, GOODS LIABILITY OR OTHERWISE, EVEN IF HI-SPEED WAS ADVISED OF THE POSSIBILITY OF SUCH LOSS OR DAMAGES. HI-SPEED SHALL NOT BE LIABLE FOR ANY DAMAGES OR DELAYS CAUSED BY ANY FAILURE TO MAKE ANY DELIVERY OF GOODS BY ANY EXPECTED TIME OR DATE OR THE FAILURE TO PROVIDE OR COMPLETE ANY SERVICES BY ANY EXPECTED DATE OR TIME. IN NO EVENT SHALL HI-SPEED BE LIABLE TO BUYER FOR ANY DAMAGES WHATSOEVER IN EXCESS OF THE TOTAL PRICE PAID FOR ALL GOODS AND/OR SERVICES HEREUNDER OR REFERENCED IN ANY QUOTATION OR THE PURCHASE ORDER.
10. **SEVERABILITY.** 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. **ABANDONED EQUIPMENT.** 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, earthquake, 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. **NONWAIVER.** 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.