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— EVERY DAY SINCE 1946 —

LR Motor Shop Repairs

Job Number 100358

Prepared for ARKANSAS INDUSTRIAL MACHINERY

3804 N. NONA ST
NORTH LITTLE ROCK AR 72118

Table of Contents



Hi-Speed Industrial Service
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AC Recondition As Found
ARKANSAS INDUSTRIAL MACHINERY
3804 N. NONA ST
NORTH LITTLE ROCK, AR 72118

FolderID: 100358
FormID: 14671966

AC Recondition - Rev. 2

Location: Shop
Serial Number: B0510081EE 1
Description: 20HP SIEMENS 3600RPM 256T

| | |
|-----------------------------|---------------------|
| Hi-Speed Job Number: | 100358 |
| Manufacturer: | Siemens |
| Product Number: | 1LA02562SP21 |
| Serial Number: | B0510081EE 1 |
| HP/kW: | 20 (HP) |
| RPM: | 3525 (RPM) |
| Frame: | 256T |
| Voltage: | 230 / 460 |
| Current: | 46/23 |
| Phase: | Three |
| Hz: | 60 (Hz) |
| Service Factor: | 1.15 |
| Enclosure: | TEFC |
| J-box Included: | Complete |
| Coupling/Sheave: | None |
| Bearing RTDs: | No |
| Stator RTDs: | No |
| Repair Stage: | Teardown Inspection |
| Heaters: | No |
| Winding Type : | Random Wound |
| Bearing Type: | Rolling Element |

Priorities Found:  **8 - Good**

Overall Condition

1. Report Date
2. Nameplate Picture



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| | | |
|--|-----------|--|
| 3. Photos of all six sides of the machine. | | |
| 4. Describe the Overall Condition of the Equipment as Received | | |
| Initial Mechanical/Electrical | | |
| <input checked="" type="radio"/> 5. Does Shaft Turn Freely? | (Yes) Yes | |
| 6. Does Shaft Have Visible Damage? | (No) No | |
| 7. Assembled Shaft Runout | | |
| 8. Assembled Shaft End Play | | |
| 9. Air Gap Variation <10% | | |

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10. Lead Condition

(P) Pass



11. Lead Length

8 Inches

12. Frame Condition

wash and bake

13. Fan Condition

(P) Pass



14. Broken or Missing Components

na

Initial Electrical Inspection

15. Insulation Resistance/Megger

18985 Megohms

| Test ID | T _{in} | Res. | Mo. | PI | DC | Sur. |
|-------------------|-------------------|-------------------|-------------------|------------------|------|------|
| 10/6/2022 12:4... | 480V w/o... | PASS | PASS | PASS | PASS | PASS |
| 10/6/2022 10:5... | 480V w/o... | PASS | PASS | PASS | PASS | PASS |
| 10/6/2022 9:51... | 480V w/o... | PASS | PASS | PASS | PASS | PASS |
| Test Date | 10/6/2022 | 10/6/2022 | 10/6/2022 | 10/6/2022 | | |
| Test Time | 12:43:10 PM | 10:57:38 AM | 9:51:31 AM | 12:41:21 PM | | |
| Cond 3 (Ohms) | 0.818 Conn 0.8... | 1.944 Conn 1.8... | 8.405 Conn 8.5... | 0.0318 Conn 0... | | |
| Megger Test | PASS | PASS | PASS | PASS | | |
| Volts (V) | 301 | 301 | 301 | 308 | | |
| Hz (Hz) | 0.0264 | 0.0005 | 0.0048 | 0.0027 | | |
| Resist | 18985 | 999999 | 101822 | 5481 | | |
| At 40°C | 1538 | 270014 | 27493 | 1479 | | |
| DC Voltage | No Test | No Test | No Test | No Test | | |
| Volts (V) | | | | | | |
| Hz (Hz) | | | | | | |
| PI Ratio | | | | | | |
| DC Voltage | PASS | PASS | PASS | PASS | | |
| Test Type | Step Voltage | Step Voltage | Step Voltage | Step Voltage | | |
| Test ID | Test | Test | Test | Test | | |
| Thermistor | Thermistor | Thermistor | Thermistor | Thermistor | | |

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16. Winding Resistance

1-2

0.546

1-3

0.547

2-3

0.546

| Test ID | Test | Results | Status |
|---------|--------------------|---------|--------|
| 1-2 | Winding Resistance | 0.546 | PASS |
| 1-3 | Winding Resistance | 0.547 | PASS |
| 2-3 | Winding Resistance | 0.546 | PASS |

17. Perform Surge Test

(P) Pass



18. Stator Condition

wash and bake



Mechanical Inspection

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19. Drive End Bearing Number-

6309ZZ



20. Drive End Bearing Qty.

1

21. Drive End Bearing Type

(Ball) Ball Bearing

22. Drive End Lubrication Type

(Grease) Grease Lubricated

23. Drive End Bearing Insulation or Grounding Device?

na

24. Drive End Wavy Washer/Snap-Ring Other Retention Device?

wavy washer



25. Drive End Bearing Condition

found frosting



26. Opposite Drive End Bearing Number-

6309ZZ

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| | |
|--|----------------------------|
| 27. Opposite Drive End Bearing Qty. | 1 |
| 28. Opposite Drive End Bearing Type | (Ball) Ball Bearing |
| 29. Opposite Drive End Lubrication Type | (Grease) Grease Lubricated |
| 30. Opposite Drive End Bearing Insulation or Grounding Device? | na |
| 31. Opposite Drive End Wavy Washer/Snap-Ring Other Retention Device? | na |
| 32. Opposite Drive End Bearing Condition | found frosting |



| | |
|-----------------------------|--|
| 33. Drive End Seal | |
| 34. Opposite Drive End Seal | |
| Rotor Inspection | |
| 35. Rotor Type/Material | (Squirrel Aluminum) Squirrel Cage Aluminum Die Cast |
| 36. Growler Test | (Pass) Pass |
| 37. Number of Rotor Bars | 36 |



39. List the Parts needed for the Repair Below

1-6309 2-6309 Bearing aegis ring shaft size 2.0456

40. Signature of Technician that Disassembled Motor

RW

Mechanical Fits- Rotor

41. Shaft Runout

0.0003 inches

42. Rotor Runout

Drive End Bearing Fit

Rotor Body

Opposite Drive End Bearing

43. Coupling Fit Closest to Bearing Housing

0 Degrees

90 Degrees

120 Degrees

44. Coupling Fit Closest to the end of the Shaft

0 Degrees

60 Degrees

120 Degrees

45. Drive End Bearing Shaft Fit

0 Degrees

60 Degrees

120 Degrees

1.7718

1.7718

1.7718



| | | | |
|---|------------|-------------|--|
| 46. Drive End Bearing Shaft Fit Condition | (P) Pass | | |
| 47. Opposite Drive End Bearing Shaft Fit | | | |
| 0 Degrees | 60 Degrees | 120 Degrees | |
| 1.7719 | 1.7719 | 1.7719 | |



| | | | |
|--|-----------------------------|--|--|
| 48. Opposite Drive End Bearing Shaft Fit Condition | (P) Pass | | |
| 49. Shaft Air Seal Fits | | | |
| Drive End Air Seal | Opposite Drive End Air Seal | | |

Mechanical Fits- Bearing Housings

| | | | |
|-------------------------------------|------------|-------------|--|
| 50. Drive End - Endbell Bearing Fit | | | |
| 0 Degrees | 60 Degrees | 120 Degrees | |
| 3.9379 | 3.9379 | 3.9379 | |

| | | | |
|---|----------|--|--|
| 51. Drive End - Endbell Bearing Fit Condition | (P) Pass | | |
|---|----------|--|--|



| | | | |
|--|------------|-------------|--|
| 52. Opposite Drive End - Endbell Bearing Fit | | | |
| 0 Degrees | 60 Degrees | 120 Degrees | |
| 3.9379 | 3.9379 | 3.9379 | |



54. Bearing Cap Condition

Drive End Bearing Cap

Opposite Drive End Bearing Cap

na

na

55. End Bell Air Seal Fits

Drive End Air Seal

Opposite Drive End Air Seal

56. List Machine Work Needed Below

0

57. Technician

RW

Root Cause of Failure

58. Failure locations

59. Root cause of failure

Bearings



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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.
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4. **BILLING AND PAYMENT TERMS.** 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. **DELIVERY OF GOODS AND/OR SERVICES.** 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.
6. **DELIVERY SITE AND TIME FOR PERFORMANCE.** Hi-Speed and Buyer 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.
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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.
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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.
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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.