



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

LR Motor Shop Repairs

Job Number 100814

Prepared for Union Pacific-Vine St 10945

1020 N. Vine Street
North Little Rock AR

Table of Contents



Hi-Speed Industrial Service
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DC Repair Report
Union Pacific-Vine St 10945
1020 N. Vine Street
North Little Rock, AR

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DC Repair Report Rev. 2

Location: Shop
Job Number: 100814
Serial Number: 4380
Status: In For Repair
Description:HAULOTTE 48V DC HOIST MOTOR

Hi-Speed Job Number: 100814
Manufacturer: Other
Product Number : 2901002650
Serial Number: 4380
Armature Voltage: 48 (Volts)
J-Box Included: Yes
Bearing RTDS: No
Winding RTDS: No
Mounting Orientation : Horizontal

Priorities Found: ● **9 - Good**

Overall Condition

1. Describe the Overall Condition of the Equipment as Received
Armature looks burnt

2. Nameplate Picture



3. Distance From the End of the Shaft to the end of the Face of the Sheave/Coupling

Initial Mechanical/Electrical

● 4. Does the Shaft Turn Freely?

(Y) Yes

5. Does Shaft Have Visible Damage?

(No) No



6. Assembled Shaft Runout	0.001 Inches
7. Assembled Shaft End Play	
8. Air Gap Variation <10%	
9. Lead Condition	(P) Pass



10.	Lead Length	
	11. Frame Condition	(P) Pass
	12. Fan Condition	(NA) Not Applicable
13.	Brush Information	
	Brush Number	Quantity
	B89-012F A-120	4
		Condition
		bad
	Brushes were arcing to the commutator	
14.	Brush Holder Condition - Verify proper gap to Commutator	good



Incoming Electrical Test

15. General Condition of the Armature/Commutator **good**
- Armature windings look good, commutator needs turned/undercut. Brushes got stuck and started arcing to the commutator*



16.	Armature Insulation Resistance to Ground	400 Megohms
17.	Field Circuit Insulation Resistance to Ground	400 Megohms
18.	Interpole Circuit Insulation Resistance to Ground	
19.	Total Field Ohms	0.8
20.	Field Ohms	
	Between F1/F2	Between F3/F4
21.	MegOhms between Fields and Series	
22.	Series Drop Test 1&2	
	Series 1	Series 2
23.	Series Drop Test 3&4	
	Series 3	Series 4
24.	Field Drop Test Fields 1&2	
	Total AC Voltage	Field #1
		Field #2

25. Field Drop Test Fields 3&4		
Field #3	Field #4	Field #2
26. Field Drop Test Fields 5&6		
Field #5	Field #6	Field #2
27. Field Drop Test Fields 7&8		
Field #7	Field #8	Field #2
28. Interpole Drop Test 1&2		
Total AC Voltage	Interpole #1	Interpole #2
29. Interpole Drop Test 3&4		
Interpole #3	Interpole #4	Field #2
30. Interpole Drop Test 5&6		
Interpole #5	Interpole #6	Field #2
31. Interpole Drop Test 7&8		
Interpole #7	Interpole #8	Field #2
32. Armature Number of Bars - Bar to Bar Test		
Number of Bars	Bar to Bar Test	
57	pass	
Armature checks good after commutator being turned		




Mechanical Inspection			
33. Shaft Runout Drive End			0.001 inches
34. Shaft Runout Armature			
Drive End Bearing Journal	Armature Core	ODE Bearing Journal	
35. Drive End Bearing Number			6206 2rsr

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37. Drive End Bearing Type	(Ball) Ball Bearing
38. Drive End Lubrication Type	(Grease) Grease Lubricated
39. Drive End Bearing Insulation or Grounding Device?	
40. Drive End Wavy Washer/Snap-Ring Other Retention Device?	
41. Drive End Bearing Condition	worn
42. Opposite Drive End Bearing Number	6305 2rsr
43. Opposite Drive End Bearing Quantity	1

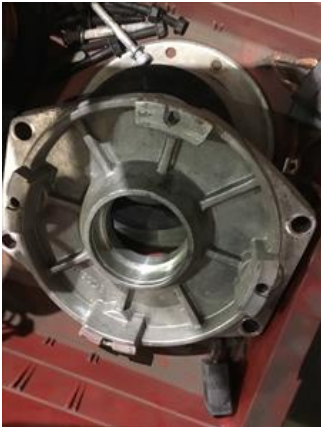


44. Opposite Drive End Bearing Type	(Ball) Ball Bearing
45. Opposite Drive End Lubrication Type	(Grease) Grease Lubricated
46. Opposite Drive End Bearing Insulation or Grounding Device?	
47. Opposite Drive End Wavy Washer/Snap-Ring Other Retention Device?	
48. Opposite Drive End Bearing Condition	worn
49. Signature of Technician who Performed Teardown	Trevor Hall
	

50. List Parts Needed Prior to Reassembly

Mechanical Fits - Armature

51. Coupling Fit Closest to Bearing Housing			
0 Degrees	60 degrees	120 degrees	
52. Coupling Fit Closest to the End of the Shaft			
0 Degrees	60 degrees	120 degrees	
53. Drive End Bearing Shaft Fit			
0 Degrees	60 Degrees	120 Degrees	
1.1813	1.1813	1.1814	
54. Drive End Bearing Shaft Fit Condition			(P) Pass
55. Opposite Drive End Bearing Shaft Fit			
0 Degrees	60 Degrees	120 Degrees	
0.9846	0.9846	0.9846	
56. Opposite Drive End Bearing Shaft Fit Condition			(P) Pass
57. Shaft Air Seal Fits			
Drive End Air Seal	Opposite Drive End Air Seal		
Mechanical Fits- Bearing Housings			
58. Drive End - End Bell Bearing Fit			
0 Degrees	60 Degrees	120 Degrees	
2.4415	2.4415	2.4415	
59. Drive End - Endbell Bearing Fit Condition			(P) Pass



60. Opposite Drive End - End Bell Bearing Fit			
0 Degrees	60 Degrees	120 Degrees	
2.4414	2.4414	2.4414	



62. Bearing Cap Condition

Drive End

Opposite Drive End

63. End Bell Air Seal Fits

Drive End Air Seal

Opposite Drive End Air Seal

64. List any Machine work Needed Below

65. Signature of Technician Performing Measurements

Trevor Hall

Root Cause of Failure

66. Failure Locations

Brushes, commutator, bearings

67. Root Cause of Failure

Brushes got stuck in brush rack and were arcing to the commutator. Bearings normal wear

Commutator Data

68. Total Copper Segment Length

69. Number of Bars

70. Number of Wires Per Copper Bar and Size

Number of Wires per Bar

Wire Size

71. Equalizers per Copper Bar and Equalizer Wire Size

Equalizers per Bar

Wire Size

72. Document Commutator Diameter, Minimum and Max

Current Comm Diameter

Minimum Comm Diameter

Maximum Comm Diameter

73. Commutator Shaft Diameter

Front Shaft Diameter

Back Shaft Diameter

74. Commutator Type

75. Commutator Bore

76. Signature of Technician Recording Data			
Dynamic Balance Report			
77. Rotor Weight and Balance Grade			
Rotor Weight		Balance Grade	
78. Initial Balance Readings			
Drive End Readings		Opposite Drive End Readings	
79. Final Balance Readings			
Drive End Readings		Opposite Drive End Readings	
80. Signature of the Balance Technician			
Post Armature Rewind Testing			
81. Post Rewind Armature Insulation Resistance to Ground			
82. Post Rewind Field Circuit Measure the Insulation Resistance to Ground			
83. Post Rewind Armature Number of Bars - Bar to Bar Test			
Number of Bars		Bar to Bar Test	
84. Post Rewind Field Circuit Insulation Resistance to Ground			
85. Post Rewind Interpole Circuit Insulation Resistance to Ground			
86. Post Rewind Field Drop Test Fields 1&2			
Total AC Voltage		Field #1	Field #2
87. Post Rewind Field Drop Test Fields 3&4			
Field #3	Field #4	Field #2	
88. Post Rewind Field Drop Test Fields 5&6			
Field #5	Field #6	Field #2	
89. Post Rewind Field Drop Test Fields 7&8			
Field #7	Field #8	Field #2	
90. Post Rewind Interpole Drop Test 1&2			
Total AC Voltage		Interpole #1	Interpole #2
91. Post Rewind Interpole Drop Test 3&4			
Interpole #3	Interpole #4	Field #2	
92. Post Rewind Interpole Drop Test 5&6			
Interpole #5	Interpole #6	Field #2	
93. Post Rewind Interpole Drop Test 7&8			
Interpole #7	Interpole #8	Field #2	
Post Mechanical Repair			
94. Post Repair Coupling Fit Closest to Bearing Housing			
0 Degrees	60 degrees	120 degrees	

95. Post Repair Coupling Fit Closest to the End of the Shaft		
0 Degrees	60 degrees	120 degrees
96. Post Repair Drive End Bearing Shaft Fit		
0 Degrees	60 Degrees	120 Degrees
97. Post Repair Drive End Bearing Shaft Fit Condition		
98. Post Repair Drive End Opposite Drive End Bearing Shaft Fit		
0 Degrees	60 Degrees	120 Degrees
99. Post Repair Drive End Opposite Drive End Bearing Shaft Fit Condition		
100. Post Repair Drive End - End Bell Bearing Fit		
0 Degrees	60 Degrees	120 Degrees
101. Post Repair Drive End - Endbell Bearing Fit Condition		
102. Post Repair Opposite Drive End - End Bell Bearing Fit		
0 Degrees	60 Degrees	120 Degrees
103. Post Repair Opposite Drive End - Endbell Bearing Fit Condition		
104. Post Repair Bearing Cap Condition		
Drive End	Opposite Drive End	
105. Post Repair End Bell Air Seal Fits		
Drive End Air Seal	Opposite Drive End Air Seal	
106. Signature of Tech Performing Mechanical Repairs		
Assembly		
107. Take Pictures of all Major Components Prior to Reassembly		
108. Verify Brush Box Holders Have the Proper Clearance, and Brushes have been Seated Properly		
109. Assembled Shaft End Play and Runout		
Shaft Endplay	Shaft Runout	
110. Perform No-Load Test Run, Record Armature Voltage and Current		
Voltage	Current	
111. Perform No-Load Test Run, Record Field Voltage and Current		
Voltage	Current	
112. Document Vibration Readings Drive End		
Horizontal	Vertical	Axial
113. Document Vibration Readings Opposite Drive End		
Horizontal	Vertical	Axial
114. Perform Full-Load Test Run, Record Armature Voltage and Current		
Voltage	Current	

115. Perform Full-Load Test Run, Record Field Voltage and Current			
Voltage		Current	
116. Document Vibration Readings Under Full Load Drive End			
Horizontal		Vertical	Axial
117. Document Vibration Readings Under Full Load Opposite Drive End			
Horizontal		Vertical	Axial
118. Ambient Temperature			
119. Drive End Bearing Temps Under Full Load			
5 Minutes		10 Minutes	15 Minutes
120. Opposite Drive End Bearing Temps Under Full Load			
5 Minutes		10 Minutes	15 Minutes
121. Final Test Run Sign-Off			
122. Document Final Condition With Pictures			
123. Final QC Sign-Off			



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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.
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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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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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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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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.
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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.