

# LR Motor Shop Repairs

## Job Number 100866

Prepared for LAYNE (10766)

2015 S Main Street STUTTGART AR 72160

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AC Recondition As Found - Motor Shop

AC Recondition - Rev. 2: R12-30721052-6T-01

1.0





## **AC Recondition As Found LAYNE (10766)**

2015 S Main Street STUTTGART, AR 72160

FolderID: 100866 FormID: 15896884

#### AC Recondition - Rev. 2

Location: Motor Shop

Serial Number: R12-30721052-6T-01

Description:250HP US MOTORS VERTICAL 1800RPM H445TPA

Hi-Speed Job Number:	100866
Manufacturer:	US Motors/Nidec
Product Number:	HO250V2SLH-C
Serial Number:	R12-30721052-6T-01
HP/kW:	250 (HP)
RPM:	1780 (RPM)
Frame:	H445TPA
Voltage:	460
Current:	283
Phase:	Three
Hz:	60 (Hz)
Service Factor:	1.15
Enclosure:	WPI
J-box Included:	Complete
Coupling/Sheave:	None
Bearing RTDs:	No
Stator RTDs:	No
Repair Stage:	Final
Heaters:	No
Winding Type :	Random Wound
Bearing Type:	Rolling Element

Priorities Found: 7 - Good



### **Overall Condition**

- 1. Report Date
- 2. Nameplate Picture



Photos of all six sides of the machine.

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	4.	4. Describe the Overall Condition of the Equipment as Received		
In	Initial Mechanical/Electrical			
	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%		
	10.	Lead Condition	(P) Pass	



11.	Lead Length			15 Inches
12.	Frame Condition			
13.	Fan Condition			(N) NA
14.	Broken or Missing Components			
Initial	Electrical Inspection			
15.	Insulation Resistance/Megger			2000 Megohms
16.	Winding Resistance			
	1-2	1-3	2-3	
17.	Perform Surge Test			(P) Pass
18.	Number of Stator Slots			72 Megohms
19.	Stator Condition			
Mecha	anical Inspection			
20.	Drive End Bearing Brand			FAG

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21. Drive End Bearing Number-	7322B
22. Drive End Bearing Qty.	1
23. Drive End Bearing Type	(Thrust) Thrust
24. Drive End Lubrication Type	(Oil) Oil Lubricated
25. Drive End Bearing Insulation or Grounding Device?	
26. Drive End Wavy Washer/Snap-Ring Other Retention Device?	
27. Drive End Bearing Condition	worn
Balls have been dragging, outer race is worn and has a dent in it.	









28. Opposite Drive End Bearing Brand	Peer
29. Opposite Drive End Bearing Number-	6215





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30.	Opposite Drive End Bearing Qty.		1
31.	Opposite Drive End Bearing Type		(Ball) Ball Bearing
32.	Opposite Drive End Lubrication Ty	ре	(Grease) Grease Lubricated
33.	Opposite Drive End Bearing Insula	ition or Grounding Device?	
34.	Opposite Drive End Wavy Washer	/Snap-Ring Other Retention Device?	snap ring and spacer
35.	Opposite Drive End Bearing Cond	tion	worn
36.	Drive End Seal		
37.	Opposite Drive End Seal		
Rotor	Inspection		
38.	Rotor Type/Material		(Squirrel Aluminum) Squirrel Cage Aluminum Die Cast
39.	Growler Test		(Pass) Pass
40.	Number of Rotor Bars		
41.	Rotor Condition		
42.	List the Parts needed for the Repa	ir Below	
	6215 7322B		
		m	
Mech	anical Fits- Rotor	_	
44.	Shaft Runout		
45.	Rotor Runout		
	Drive End Bearing Fit	Rotor Body	Opposite Drive End Bearing
46.	Coupling Fit Closest to Bearing Ho	ousing	
	0 Degrees	90 Degrees	120 Degrees
47.	Coupling Fit Closest to the end of	the Shaft	
	0 Degrees	60 Degrees	120 Degrees

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48.	Drive End Bearing Shaft Fit		
	0 Degrees	60 Degrees	120 Degrees
	4.3318	4.3318	4.3317



	49.	9. Drive End Bearing Shaft Fit Condition			(P) Pass
	50.	Opposite Drive End Bearing Shaft Fit			
		0 Degrees	60 Degrees	120 Degrees	
		2.9533	2.9531	2.9532	
	51.	Opposite Drive End Bearing Shaft Fit	Condition		(P) Pass
	52.	Shaft Air Seal Fits			
		Drive End Air Seal	Opposite Drive End Air Seal		
M	echa	anical Fits- Bearing Housings			
	53.	Drive End - Endbell Bearing Fit			
		0 Degrees	60 Degrees	120 Degrees	
		9.4498	9.4498	9.4498	
	54.	Drive End - Endbell Bearing Fit Condi	tion		(P) Pass
	55.	Opposite Drive End - Endbell Bearing	Fit		
		0 Degrees	60 Degrees	120 Degrees	
		5.1187	5.1187	5.1186	
	56.	Opposite Drive End - Endbell Bearing	Fit Condition		(P) Pass

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58. End Bell Air Seal	Fits	
Drive End Air S	eal Opposite Drive End Air Seal	
59. List Machine Wor	k Needed Below	
60. Technician		Trevor Hall

**Dynamic Balance Report** 

61. Rotor Weight and Balance Grade

Rotor Weight Balance Grade

62. Initial Balance Readings

Drive End Opposite Drive End

63. Final Balance Readings

Drive End Opposite Drive End

64. Technician

#### Rewind

65. Core Test Results - Watts loss per Pound

Pre-Burnout Post Burnout

66. Core Hot Spot Test

Pre-Burnout Post-Burnout

67. Post Rewind Electrical Test- Insulation Resistance

68. Post Rewind Polarization Index

69. Post Rewind Winding Resistance

1-2 1-3 2-3

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70	Dont Dougland Commo Toot		
	Post Rewind Surge Test		
	Post Rewind Hi-Pot		
	Technician		
	Cause of Failure		
	Failure locations		
	Root cause of failure		
	anical Fits- Rotor - Post Repair		
	Shaft Runout Post Repair		
76.	Rotor Runout Post Repair	D . D .	0 " D: 5 ID :
	Drive End Bearing Fit	Rotor Body	Opposite Drive End Bearing
77.	Coupling Fit Closest to Bearing Housi	ing Post Repair	
	0 Degrees	90 Degrees	120 Degrees
	0 D0g1000	00 D0g.000	120 Dog1000
78.	Coupling Fit Closest to the end of the	Shaft Post Repair	
	0 Degrees	60 Degrees	120 Degrees
79.	Drive End Bearing Shaft Fit Post Rep	air	
	0 Degrees	60 Degrees	120 Degrees
90	Opposite Drive End Bearing Shaft Fit	Poet Popoir	
00.			120 Dograda
	0 Degrees	60 Degrees	120 Degrees
81.	Shaft Air Seal Fits Post Repair		
	Drive End Air Seal	Opposite Drive End Air Seal	
82.	Shaft Repair Sign-off		
	Shaft Repair Sign-off anical Fits- Bearing Housings - P	ost Repair	
Mech	· •	-	
Mech	anical Fits- Bearing Housings - P	-	120 Degrees
Mech	anical Fits- Bearing Housings - P Drive End - Endbell Bearing Fit Post F 0 Degrees	Repair 60 Degrees	120 Degrees
Mech	anical Fits- Bearing Housings - P Drive End - Endbell Bearing Fit Post F 0 Degrees Opposite Drive End - Endbell Bearing	Repair 60 Degrees Fit Post Repair	
Mech	anical Fits- Bearing Housings - P Drive End - Endbell Bearing Fit Post F 0 Degrees	Repair 60 Degrees	120 Degrees 120 Degrees
<b>Mech</b> 83.	anical Fits- Bearing Housings - P Drive End - Endbell Bearing Fit Post F 0 Degrees  Opposite Drive End - Endbell Bearing 0 Degrees	Repair 60 Degrees Fit Post Repair	
<b>Mech</b> 83.	anical Fits- Bearing Housings - P Drive End - Endbell Bearing Fit Post F 0 Degrees  Opposite Drive End - Endbell Bearing 0 Degrees  Bearing Cap Condition Post Repair	Repair 60 Degrees Fit Post Repair 60 Degrees	
<b>Mech</b> 83.	anical Fits- Bearing Housings - P Drive End - Endbell Bearing Fit Post F 0 Degrees  Opposite Drive End - Endbell Bearing 0 Degrees	Repair 60 Degrees Fit Post Repair	
83. 84. 85.	anical Fits- Bearing Housings - P Drive End - Endbell Bearing Fit Post F 0 Degrees  Opposite Drive End - Endbell Bearing 0 Degrees  Bearing Cap Condition Post Repair	Repair 60 Degrees Fit Post Repair 60 Degrees	
83. 84. 85.	anical Fits- Bearing Housings - P Drive End - Endbell Bearing Fit Post F 0 Degrees  Opposite Drive End - Endbell Bearing 0 Degrees  Bearing Cap Condition Post Repair Drive End Bearing Cap	Repair 60 Degrees Fit Post Repair 60 Degrees	•
83. 84. 85.	anical Fits- Bearing Housings - P Drive End - Endbell Bearing Fit Post F 0 Degrees  Opposite Drive End - Endbell Bearing 0 Degrees  Bearing Cap Condition Post Repair Drive End Bearing Cap  End Bell Air Seal Fits Post Repair Drive End Air Seal	Repair 60 Degrees Fit Post Repair 60 Degrees Opposite Drive End Bearing Cap	•
83. 84. 85. 86.	anical Fits- Bearing Housings - P Drive End - Endbell Bearing Fit Post F 0 Degrees  Opposite Drive End - Endbell Bearing 0 Degrees  Bearing Cap Condition Post Repair Drive End Bearing Cap  End Bell Air Seal Fits Post Repair Drive End Air Seal End Bell Repair Sign-off	Repair 60 Degrees Fit Post Repair 60 Degrees Opposite Drive End Bearing Cap	
83. 84. 85. 86.	anical Fits- Bearing Housings - P Drive End - Endbell Bearing Fit Post F 0 Degrees  Opposite Drive End - Endbell Bearing 0 Degrees  Bearing Cap Condition Post Repair Drive End Bearing Cap  End Bell Air Seal Fits Post Repair Drive End Air Seal  End Bell Repair Sign-off  mbly	Repair 60 Degrees Fit Post Repair 60 Degrees  Opposite Drive End Bearing Cap  Opposite Drive End Air Seal	
83. 84. 85. 86. 87. Asser	anical Fits- Bearing Housings - P Drive End - Endbell Bearing Fit Post F 0 Degrees  Opposite Drive End - Endbell Bearing 0 Degrees  Bearing Cap Condition Post Repair Drive End Bearing Cap  End Bell Air Seal Fits Post Repair Drive End Air Seal  End Bell Repair Sign-off  mbly Photograph All Major Components pri	Repair 60 Degrees Fit Post Repair 60 Degrees  Opposite Drive End Bearing Cap  Opposite Drive End Air Seal	•
83. 84. 85. 86. 87. <b>Asser</b> 88. 89.	anical Fits- Bearing Housings - P Drive End - Endbell Bearing Fit Post F 0 Degrees  Opposite Drive End - Endbell Bearing 0 Degrees  Bearing Cap Condition Post Repair Drive End Bearing Cap  End Bell Air Seal Fits Post Repair Drive End Air Seal  End Bell Repair Sign-off  mbly Photograph All Major Components pri Final Insulation Resistance Test	Repair 60 Degrees Fit Post Repair 60 Degrees  Opposite Drive End Bearing Cap  Opposite Drive End Air Seal	•
83. 84. 85. 86. 87. <b>Asser</b> 88. 89.	anical Fits- Bearing Housings - P Drive End - Endbell Bearing Fit Post F 0 Degrees  Opposite Drive End - Endbell Bearing 0 Degrees  Bearing Cap Condition Post Repair Drive End Bearing Cap  End Bell Air Seal Fits Post Repair Drive End Air Seal  End Bell Repair Sign-off  mbly Photograph All Major Components pri Final Insulation Resistance Test Assembled Shaft Endplay	Repair 60 Degrees Fit Post Repair 60 Degrees  Opposite Drive End Bearing Cap  Opposite Drive End Air Seal	•
83. 84. 85. 86. 87. <b>Asser</b> 88. 89. 90.	anical Fits- Bearing Housings - P Drive End - Endbell Bearing Fit Post R 0 Degrees  Opposite Drive End - Endbell Bearing 0 Degrees  Bearing Cap Condition Post Repair Drive End Bearing Cap  End Bell Air Seal Fits Post Repair Drive End Air Seal  End Bell Repair Sign-off  mbly  Photograph All Major Components pri Final Insulation Resistance Test Assembled Shaft Endplay Assembled Shaft Runout	Repair 60 Degrees Fit Post Repair 60 Degrees  Opposite Drive End Bearing Cap  Opposite Drive End Air Seal	
83. 84. 85. 86. 87. <b>Asser</b> 88. 89. 90.	anical Fits- Bearing Housings - P Drive End - Endbell Bearing Fit Post F 0 Degrees  Opposite Drive End - Endbell Bearing 0 Degrees  Bearing Cap Condition Post Repair Drive End Bearing Cap  End Bell Air Seal Fits Post Repair Drive End Air Seal  End Bell Repair Sign-off  mbly  Photograph All Major Components pri Final Insulation Resistance Test Assembled Shaft Endplay Assembled Shaft Runout Test Run Voltage	Repair 60 Degrees Fit Post Repair 60 Degrees  Opposite Drive End Bearing Cap  Opposite Drive End Air Seal	120 Degrees
83. 84. 85. 86. 87. <b>Asser</b> 88. 89. 90.	anical Fits- Bearing Housings - P Drive End - Endbell Bearing Fit Post R 0 Degrees  Opposite Drive End - Endbell Bearing 0 Degrees  Bearing Cap Condition Post Repair Drive End Bearing Cap  End Bell Air Seal Fits Post Repair Drive End Air Seal  End Bell Repair Sign-off  mbly  Photograph All Major Components pri Final Insulation Resistance Test Assembled Shaft Endplay Assembled Shaft Runout	Repair 60 Degrees Fit Post Repair 60 Degrees  Opposite Drive End Bearing Cap  Opposite Drive End Air Seal	·

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93.	93. Test Run Amperage		
	Amps	Amps	Amps
94.	94. Drive End Vibration Readings - Inches Per Second		
	Horizontal	Vertical	Axial
95.	Opposite Drive End Vibration Reading	s - Inches Per Second	
	Horizontal	Vertical	Axial
96.	96. Ambient Temperature - Fahrenheit		
97.	Drive End Bearing Temps - Fahrenhei	t	
	5 Minutes	10 Minutes	15 Minutes
98.	Opposite Drive End Bearing Temps -	Fahrenheit	
	5 Minutes	10 Minutes	15 Minutes
99.	QC Check All Parts for Cleanliness Pr	ior to Assembly	
100.	Document Final Condition with Picture	es after paint	
101.	Final Pics and QC Review		
100.	Document Final Condition with Picture	•	

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- 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.
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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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- 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. <u>ASSIGNMENT.</u> 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.