

# LR Motor Shop Repairs

## **Job Number 102294**

Prepared for Reynolds Metals company

1333 highway 270 Malvern AR 72104

## **Table of Contents**

AC Inspection as Found - Shop

AC Inspection - Rev. 2

1.0

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### **AC Inspection as Found**

Reynolds Metals company

1333 highway 270 Malvern, AR 72104

FolderID: 102294 FormID: 18947781

AC Inspection - Rev. 2		
Location:	Shop	
Serial Number:		
Description:75	HP SIEMENS	

Hi-Speed Job Number:	102294
Manufacturer:	Siemens
Spec/ID #:	1CV3252B
Serial Number:	1LE15232CB235AB4-Z
HP/kW:	75 (HP)
RPM:	1786 (RPM)
Frame:	250M
Voltage:	480
Current:	81
Phase:	Three
Hz:	60 (Hz)
Enclosure:	TEFC
J-box Included:	Complete
Repair Stage:	Final

Priorities Found: 5 - High



4 - Good

#### **Overall Condition**

1. Report Date

Nameplate Picture





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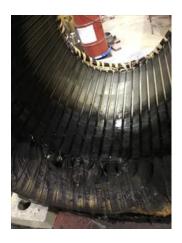




































	3.	Photos of all six sides of the machine				
	4.	Describe the Overall Condition of the	Describe the Overall Condition of the Equipment as Received			
		Rotor feels rough while turning. Very of	lirty			
	5.	Distance from the end of the shaft to	the Coupling/Sheave			
In	itial	Mechanical/Electrical				
	6.	Does Shaft Turn Freely?		(No) No		
	7.	Does Shaft Have Visible Damage?		(No) No		
	8.	Assembled Shaft Runout		0.001 Inches		
	9.	Assembled Shaft End Play				
	10.	Air Gap Variation <10%				
	11.	Lead Condition		(P) Pass		
	12.	Lead Length		10 Inches		
	13.	Lead Numbers		123456		
	14.	Stator Temperature Detector Rating	and Function			
		Quantity	Rating	Quantity Passed		
	-	Thermistor 237 ohms at approximately	68 degrees			
	15.	Bearing Temperature Detector Rating	g and Function			
		Quantity	Rating	Quantity Passed		
	16.	Frame Condition				

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17	Fan Condition		(F) Fail
•	Very dry and brittle		(1)1 411
	Heater Quantity, Ratings		
10.	Quantity	Volts/Watts	Pass/Fail
	Quantity	VOIIS/ VVAIIS	r a55/1 all
19.	Broken or Missing Components		
nitial	Electrical Inspection		
	Insulation Resistance/Megger		0 Megohms
21.	Winding Resistance		-
	1-2	1-3	2-3
	0	0	0
22.	Perform Surge Test		(F) Fail
23.			48
24.	Stator Condition		rewind
25.	Stator Thermistors/Ohms		thermistors good. 237 ohms
26.	Stator Overloads/Ohms		5
	anical Inspection		
	Drive End Bearing Brand		skf
28.			nu215ecp
29.			1
30.			(Roller) Roller Bearing
31.			(Grease) Grease Lubricated
32.		nding Device?	(1.11.7)
33.	Drive End Wavy Washer/Snap-Ring (	•	
34.	Drive End Bearing Condition		worn
35.	Opposite Drive End Bearing Brand		information missing
36.	Opposite Drive End Bearing Number	-	6215zc3
37.			1
38.	Opposite Drive End Bearing Type		(Ball) Ball Bearing
39.	Opposite Drive End Lubrication Type		(Grease) Grease Lubricated
40.	Opposite Drive End Bearing Insulatio	n or Grounding Device?	
41.	Opposite Drive End Wavy Washer/Sr	nap-Ring Other Retention Device?	snap ring
42.			fail
43.	Drive End Seal		VA75
44.	Opposite Drive End Seal		VA75
45.	DE Sleeve Bearing Inside Diameter		
	0 degrees	120 degrees	240 degrees
46.	<b>9</b>		
	0 degrees	120 degrees	240 degrees
47	DE Sleeve Bearing Housing Inside D	iameter	
-7/.	0 degrees	120 degrees	240 degrees
	u degrees	120 degrees	240 degrees
48.	DE Sleeve Bearing to Housing Clears	ance	

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49.	ODE Sleeve Bearing Inside Diameter	•			
	0 degrees	120 degrees	240 degrees		
50.	50. ODE Sleeve Bearing Outside Diameter				
	0 degrees	120 degrees	240 degrees		
51.	ODE Sleeve Bearing Housing Inside	Diameter			
	0 degrees	120 degrees	240 degrees		
52.	ODE Sleeve Bearing to Housing Clea				
	0 degrees	120 degrees	240 degrees		
	Inspection				
53.	Rotor Type/Material		(Squirrel Aluminum) Squirrel Cage Aluminum Die Cast		
54.	Growler Test		(Pass) Pass		
55.	Number of Rotor Bars		40		
56.	Rotor Condition		pass		
57.	List the Parts needed for the Repair B	Below			
	NU215 6215 Rewind				
	Newilla				
58.	Signature of Technician that Disasse	mbled Motor	Trevor Hall		
58.	Signature of Technician that Disasse	mbled Motor	Trevor Hall		
	Signature of Technician that Disasse	mbled Motor	Trevor Hall		
Mech		mbled Motor	Trevor Hall  0.001 inches		
<b>Mech</b> 59.	anical Fits- Rotor	mbled Motor			
<b>Mech</b> 59.	anical Fits- Rotor Shaft Runout Rotor Runout		0.001 inches		
<b>Mech</b> 59.	anical Fits- Rotor Shaft Runout	Rotor Body			
<b>Mech</b> : 59. 60.	anical Fits- Rotor Shaft Runout Rotor Runout	Rotor Body	0.001 inches		
<b>Mech</b> : 59. 60.	anical Fits- Rotor Shaft Runout Rotor Runout Drive End Bearing Fit	Rotor Body	0.001 inches		
<b>Mech</b> : 59. 60.	anical Fits- Rotor Shaft Runout Rotor Runout Drive End Bearing Fit  Coupling Fit Closest to Bearing House	Rotor Body ing	0.001 inches  Opposite Drive End Bearing		
<b>Mech</b> 59. 60.	anical Fits- Rotor Shaft Runout Rotor Runout Drive End Bearing Fit  Coupling Fit Closest to Bearing Hous 0 Degrees	Rotor Body ing 90 Degrees 2.5595	0.001 inches  Opposite Drive End Bearing  120 Degrees		
<b>Mech</b> 59. 60.	anical Fits- Rotor Shaft Runout Rotor Runout Drive End Bearing Fit  Coupling Fit Closest to Bearing Hous 0 Degrees 2.5595 Coupling Fit Closest to the end of the	Rotor Body ing 90 Degrees 2.5595	0.001 inches  Opposite Drive End Bearing  120 Degrees 2.5596		
<b>Mech</b> 59. 60.	anical Fits- Rotor Shaft Runout Rotor Runout Drive End Bearing Fit  Coupling Fit Closest to Bearing Hous 0 Degrees 2.5595	Rotor Body ing 90 Degrees 2.5595 Shaft 60 Degrees	0.001 inches  Opposite Drive End Bearing  120 Degrees 2.5596  120 Degrees		
<b>Mech</b> 59. 60. 61.	anical Fits- Rotor Shaft Runout Rotor Runout Drive End Bearing Fit  Coupling Fit Closest to Bearing Hous 0 Degrees 2.5595 Coupling Fit Closest to the end of the 0 Degrees 2.5596	Rotor Body ing 90 Degrees 2.5595	0.001 inches  Opposite Drive End Bearing  120 Degrees 2.5596		
<b>Mech</b> 59. 60. 61.	anical Fits- Rotor Shaft Runout Rotor Runout Drive End Bearing Fit  Coupling Fit Closest to Bearing Hous 0 Degrees 2.5595 Coupling Fit Closest to the end of the 0 Degrees 2.5596 Drive End Bearing Shaft Fit	Rotor Body ing 90 Degrees 2.5595 Shaft 60 Degrees 2.5595	0.001 inches  Opposite Drive End Bearing  120 Degrees 2.5596  120 Degrees 2.5595		
<b>Mech</b> 59. 60. 61.	anical Fits- Rotor Shaft Runout Rotor Runout Drive End Bearing Fit  Coupling Fit Closest to Bearing Hous 0 Degrees 2.5595 Coupling Fit Closest to the end of the 0 Degrees 2.5596 Drive End Bearing Shaft Fit 0 Degrees	Rotor Body ing 90 Degrees 2.5595 Shaft 60 Degrees 2.5595 60 Degrees	Opposite Drive End Bearing  120 Degrees 2.5596  120 Degrees 2.5595		
<b>Mech</b> 59. 60. 61. 62.	anical Fits- Rotor Shaft Runout Rotor Runout Drive End Bearing Fit  Coupling Fit Closest to Bearing Hous 0 Degrees 2.5595 Coupling Fit Closest to the end of the 0 Degrees 2.5596 Drive End Bearing Shaft Fit 0 Degrees 2.9534	Rotor Body ing 90 Degrees 2.5595 Shaft 60 Degrees 2.5595 60 Degrees 2.9533	Opposite Drive End Bearing  120 Degrees 2.5596  120 Degrees 2.5595  120 Degrees 2.9532		
Mech. 59. 60. 61. 62.	anical Fits- Rotor Shaft Runout Rotor Runout Drive End Bearing Fit  Coupling Fit Closest to Bearing House 0 Degrees 2.5595 Coupling Fit Closest to the end of the 0 Degrees 2.5596 Drive End Bearing Shaft Fit 0 Degrees 2.9534 Drive End Bearing Shaft Fit Condition	Rotor Body ing 90 Degrees 2.5595 Shaft 60 Degrees 2.5595 60 Degrees 2.9533	Opposite Drive End Bearing  120 Degrees 2.5596  120 Degrees 2.5595		
Mech. 59. 60. 61. 62.	anical Fits- Rotor Shaft Runout Rotor Runout Drive End Bearing Fit  Coupling Fit Closest to Bearing House 0 Degrees 2.5595 Coupling Fit Closest to the end of the 0 Degrees 2.5596 Drive End Bearing Shaft Fit 0 Degrees 2.9534 Drive End Bearing Shaft Fit Condition Opposite Drive End Bearing Shaft Fit	Rotor Body ing 90 Degrees 2.5595 Shaft 60 Degrees 2.5595 60 Degrees 2.9533	Opposite Drive End Bearing  120 Degrees 2.5596  120 Degrees 2.5595  120 Degrees 2.9532  (P) Pass		
Mech. 59. 60. 61. 62.	anical Fits- Rotor Shaft Runout Rotor Runout Drive End Bearing Fit  Coupling Fit Closest to Bearing House 0 Degrees 2.5595 Coupling Fit Closest to the end of the 0 Degrees 2.5596 Drive End Bearing Shaft Fit 0 Degrees 2.9534 Drive End Bearing Shaft Fit Condition Opposite Drive End Bearing Shaft Fit 0 Degrees	Rotor Body ing 90 Degrees 2.5595 Shaft 60 Degrees 2.9533 60 Degrees	Opposite Drive End Bearing  120 Degrees 2.5596  120 Degrees 2.5595  120 Degrees 2.9532  (P) Pass		
Mech. 59. 60. 61. 62.	anical Fits- Rotor Shaft Runout Rotor Runout Drive End Bearing Fit  Coupling Fit Closest to Bearing House 0 Degrees 2.5595 Coupling Fit Closest to the end of the 0 Degrees 2.5596 Drive End Bearing Shaft Fit 0 Degrees 2.9534 Drive End Bearing Shaft Fit Condition Opposite Drive End Bearing Shaft Fit 0 Degrees 2.953	Rotor Body ing 90 Degrees 2.5595 Shaft 60 Degrees 2.5595 60 Degrees 2.9533	Opposite Drive End Bearing  120 Degrees 2.5596  120 Degrees 2.5595  120 Degrees 2.9532  (P) Pass		

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07.	Shaft Air Seal Fits			
	Drive End Air Seal	Opposite Drive End Air Seal		
	Drive Life All Seal	Opposite Drive Life All Seal		
Mech	anical Fits- Bearing Housings			
	Drive End - Endbell Bearing Fit			
	0 Degrees	60 Degrees	120 Degrees	
	5.1189	5.1189	5.1189	
<b>6</b> 9.			(P) Pass	
	Opposite Drive End - Endbell Bearing		(1 ) 1 433	
70.	0 Degrees	60 Degrees	120 Degrees	
	5.1192	5.1193	5.1193	
<b>7</b> 1.			(F) Fail	
_	Bearing Cap Condition	Tit Condition	(1)1 all	
12.	Drive End Bearing Cap	Opposite Drive End Bearing Con		
		Opposite Drive End Bearing Cap		
72	pass End Bell Air Seal Fits	pass		
73.	Drive End Air Seal	Opposite Drive End Air Seel		
	Drive End Air Seal	Opposite Drive End Air Seal		
74	List Machine Work Needed Below			
	Sleeve OD endbell			
75.	Technician		Trevor Hall	
	- / L			
	/ -/h			
	Cause of Failure			
	Cause of Failure Failure locations			
	Cause of Failure			
76.	Cause of Failure Failure locations			
76.	Cause of Failure Failure locations Bearings, opposite drive end bell, wind Root cause of failure Drive end bearing is showing signs of the	ings. rosting. Opposite drive bearing failed, spun ins	ide endbell wearing it out and rotor	
76. 77.	Cause of Failure Failure locations Bearings, opposite drive end bell, wind Root cause of failure Drive end bearing is showing signs of the drug the iron causing the windings to be	ings. rosting. Opposite drive bearing failed, spun ins	ide endbell wearing it out and rotor	
76. 77. <b>Dyna</b> i	Cause of Failure Failure locations Bearings, opposite drive end bell, wind Root cause of failure Drive end bearing is showing signs of the drug the iron causing the windings to be mic Balance Report	ings. rosting. Opposite drive bearing failed, spun ins	ide endbell wearing it out and rotor	
76. 77. <b>Dyna</b> i	Cause of Failure Failure locations Bearings, opposite drive end bell, wind Root cause of failure Drive end bearing is showing signs of the drug the iron causing the windings to be mic Balance Report Rotor Weight and Balance Grade	ings. rosting. Opposite drive bearing failed, spun ins low.	ide endbell wearing it out and rotor	
76. 77. <b>Dyna</b> i	Cause of Failure Failure locations Bearings, opposite drive end bell, wind Root cause of failure Drive end bearing is showing signs of the drug the iron causing the windings to be mic Balance Report	ings. rosting. Opposite drive bearing failed, spun ins	ide endbell wearing it out and rotor	
76. 77. <b>Dynai</b> 78.	Cause of Failure Failure locations Bearings, opposite drive end bell, wind Root cause of failure Drive end bearing is showing signs of the drug the iron causing the windings to be mic Balance Report Rotor Weight and Balance Grade Rotor Weight	ings. rosting. Opposite drive bearing failed, spun ins low.	ide endbell wearing it out and rotor	
76. 77. <b>Dyna</b> i	Cause of Failure Failure locations Bearings, opposite drive end bell, wind Root cause of failure Drive end bearing is showing signs of the drug the iron causing the windings to be mic Balance Report Rotor Weight and Balance Grade Rotor Weight Initial Balance Readings	ings. irosting. Opposite drive bearing failed, spun ins low. Balance Grade	ide endbell wearing it out and rotor	
76. 77. <b>Dynai</b> 78.	Cause of Failure Failure locations Bearings, opposite drive end bell, wind Root cause of failure Drive end bearing is showing signs of the drug the iron causing the windings to be mic Balance Report Rotor Weight and Balance Grade Rotor Weight	ings. rosting. Opposite drive bearing failed, spun ins low.	ide endbell wearing it out and rotor	
76. 77. <b>Dynai</b> 78.	Cause of Failure  Failure locations  Bearings, opposite drive end bell, wind  Root cause of failure  Drive end bearing is showing signs of the drug the iron causing the windings to be mic Balance Report  Rotor Weight and Balance Grade  Rotor Weight  Initial Balance Readings  Drive End	ings. irosting. Opposite drive bearing failed, spun ins low. Balance Grade	ide endbell wearing it out and rotor	
76. 77. <b>Dynai</b> 78.	Cause of Failure  Failure locations  Bearings, opposite drive end bell, wind  Root cause of failure  Drive end bearing is showing signs of the drug the iron causing the windings to be mic Balance Report  Rotor Weight and Balance Grade  Rotor Weight  Initial Balance Readings  Drive End  Final Balance Readings	ings.  Frosting. Opposite drive bearing failed, spun insulow.  Balance Grade  Opposite Drive End	ide endbell wearing it out and rotor	
76. 77. <b>Dynai</b> 78.	Cause of Failure  Failure locations  Bearings, opposite drive end bell, wind  Root cause of failure  Drive end bearing is showing signs of the drug the iron causing the windings to be mic Balance Report  Rotor Weight and Balance Grade  Rotor Weight  Initial Balance Readings  Drive End	ings. irosting. Opposite drive bearing failed, spun ins low. Balance Grade	ide endbell wearing it out and rotor	
76. 77. <b>Dynai</b> 78. 79.	Cause of Failure  Failure locations  Bearings, opposite drive end bell, wind  Root cause of failure  Drive end bearing is showing signs of the drug the iron causing the windings to be mic Balance Report  Rotor Weight and Balance Grade  Rotor Weight  Initial Balance Readings  Drive End  Final Balance Readings	ings.  Frosting. Opposite drive bearing failed, spun insulow.  Balance Grade  Opposite Drive End	ide endbell wearing it out and rotor	
76. 77. <b>Dynai</b> 78. 79.	Cause of Failure  Failure locations  Bearings, opposite drive end bell, wind  Root cause of failure  Drive end bearing is showing signs of the drug the iron causing the windings to be mic Balance Report  Rotor Weight and Balance Grade  Rotor Weight  Initial Balance Readings  Drive End  Final Balance Readings  Drive End  Technician	ings.  Frosting. Opposite drive bearing failed, spun insulow.  Balance Grade  Opposite Drive End	ide endbell wearing it out and rotor	
76. 77. <b>Dynai</b> 78. 79. 80. 81. <b>Rewir</b>	Cause of Failure Failure locations Bearings, opposite drive end bell, wind Root cause of failure Drive end bearing is showing signs of the drug the iron causing the windings to be mic Balance Report Rotor Weight and Balance Grade Rotor Weight Initial Balance Readings Drive End Final Balance Readings Drive End Technician	ings.  irosting. Opposite drive bearing failed, spun insolow.  Balance Grade  Opposite Drive End  Opposite Drive End	ide endbell wearing it out and rotor	
76. 77. <b>Dynai</b> 78. 79. 80. 81. <b>Rewir</b>	Cause of Failure  Failure locations  Bearings, opposite drive end bell, wind  Root cause of failure  Drive end bearing is showing signs of the drug the iron causing the windings to be mic Balance Report  Rotor Weight and Balance Grade  Rotor Weight  Initial Balance Readings  Drive End  Final Balance Readings  Drive End  Technician	ings.  irosting. Opposite drive bearing failed, spun insolow.  Balance Grade  Opposite Drive End  Opposite Drive End	ide endbell wearing it out and rotor	

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83.	Core Hot Spot Test		
	Pre-Burnout	Post-Burnout	
	Post Rewind Electrical Test- Insulation	n Resistance	
	Post Rewind Polarization Index		
86.	Post Rewind Winding Resistance		
	1-2	1-3	2-3
87	Post Rewind Surge Test		
	Post Rewind Hi-Pot		
	Technician		
Mecha	anical Fits- Rotor - Post Repair		
	Shaft Runout Post Repair		
	Rotor Runout Post Repair		
	Drive End Bearing Fit	Rotor Body	Opposite Drive End Bearing
	ű	,	.,
92.	Coupling Fit Closest to Bearing Housi	ng Post Repair	
	0 Degrees	90 Degrees	120 Degrees
00	On the Fit Olandates that and of the	Ob -44 D - 44 D - 22 - 22	
93.	Coupling Fit Closest to the end of the	·	400 D
	0 Degrees	60 Degrees	120 Degrees
94.	Drive End Bearing Shaft Fit Post Repa	air	
	0 Degrees	60 Degrees	120 Degrees
			1_0 _ 0 _ 0
95.	Opposite Drive End Bearing Shaft Fit	Post Repair	
	0 Degrees	60 Degrees	120 Degrees
00	01 (1.4) 0 15) 5 15		
96.	Shaft Air Seal Fits Post Repair	Onnesite Drive Ford Air Cool	
	Drive End Air Seal	Opposite Drive End Air Seal	
97.	Shaft Repair Sign-off		
	anical Fits- Bearing Housings - P	ost Repair	
	Drive End - Endbell Bearing Fit Post F	•	
	0 Degrees	60 Degrees	120 Degrees
	ū		ŭ
99.	Opposite Drive End - Endbell Bearing	Fit Post Repair	
	0 Degrees	60 Degrees	120 Degrees
400	Paging Con Condition Page Pagein		
100.	Bearing Cap Condition Post Repair	Opposite Drive Find Decrine Con	
	Drive End Bearing Cap	Opposite Drive End Bearing Cap	
101.	End Bell Air Seal Fits Post Repair		
	Drive End Air Seal	Opposite Drive End Air Seal	
		.,	
102.	DE Sleeve Bearing Inside ID Post Rep	pair	
	Measure 1	Measure 2	Measure 3

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			Measure 3		
104	DE Sleeve Bearing Inside OD Post Repair				
104.	Measure 1	Measure 2	Measure 3		
	Measure 1	iviedsure 2	ivieasure 3		
105.	DE Sleeve Bearing Outside OD Post I	Repair			
	Measure 1	Measure 2	Measure 3		
	modeure !	madara 2	Modeure e		
106.	End Bell Repair Sign-off				
107.	ODE Sleeve Bearing Inside ID Post R	epair			
	Measure 1	Measure 2	Measure 3		
108.	ODE Sleeve Bearing Outside ID Post				
	Measure 1	Measure 2	Measure 3		
100	ODE Sleeve Bearing Inside OD Post I	Donair			
109.	Measure 1	Measure 2	Measure 3		
	Measure 1	ivieasure 2	ivieasure 3		
110.	ODE Sleeve Bearing Outside OD Pos	t Repair			
	Measure 1	Measure 2	Measure 3		
Assen	nbly				
111.	QC Check All Parts for Cleanliness Pr	ior to Assembly			
112.	Photograph All Major Components pri	or to assembly			
	Photograph All Major Components pri Final Insulation Resistance Test	or to assembly			
113.		or to assembly			
113. 114. 115.	Final Insulation Resistance Test Assembled Shaft Endplay Assembled Shaft Runout	or to assembly			
113. 114. 115.	Final Insulation Resistance Test Assembled Shaft Endplay	or to assembly			
113. 114. 115.	Final Insulation Resistance Test Assembled Shaft Endplay Assembled Shaft Runout	or to assembly  Volts	Volts		
113. 114. 115. 116.	Final Insulation Resistance Test Assembled Shaft Endplay Assembled Shaft Runout Test Run Voltage Volts		Volts		
113. 114. 115. 116.	Final Insulation Resistance Test Assembled Shaft Endplay Assembled Shaft Runout Test Run Voltage Volts Test Run Amperage	Volts			
113. 114. 115. 116.	Final Insulation Resistance Test Assembled Shaft Endplay Assembled Shaft Runout Test Run Voltage Volts		Volts		
113. 114. 115. 116.	Final Insulation Resistance Test Assembled Shaft Endplay Assembled Shaft Runout Test Run Voltage Volts Test Run Amperage Amps	Volts			
113. 114. 115. 116.	Final Insulation Resistance Test Assembled Shaft Endplay Assembled Shaft Runout Test Run Voltage Volts Test Run Amperage Amps Drive End Vibration Readings - Inches	Volts Amps Per Second	Amps		
113. 114. 115. 116.	Final Insulation Resistance Test Assembled Shaft Endplay Assembled Shaft Runout Test Run Voltage Volts Test Run Amperage Amps	Volts			
113. 114. 115. 116. 117.	Final Insulation Resistance Test Assembled Shaft Endplay Assembled Shaft Runout Test Run Voltage Volts Test Run Amperage Amps Drive End Vibration Readings - Inches	Volts  Amps  Per Second  Vertical	Amps		
113. 114. 115. 116. 117.	Final Insulation Resistance Test Assembled Shaft Endplay Assembled Shaft Runout Test Run Voltage Volts Test Run Amperage Amps Drive End Vibration Readings - Inchest Horizontal	Volts  Amps  Per Second  Vertical	Amps		
113. 114. 115. 116. 117.	Final Insulation Resistance Test Assembled Shaft Endplay Assembled Shaft Runout Test Run Voltage Volts Test Run Amperage Amps Drive End Vibration Readings - Inchest Horizontal Opposite Drive End Vibration Reading Horizontal	Volts  Amps s Per Second Vertical gs - Inches Per Second	Amps Axial		
113. 114. 115. 116. 117. 118.	Final Insulation Resistance Test Assembled Shaft Endplay Assembled Shaft Runout Test Run Voltage Volts Test Run Amperage Amps Drive End Vibration Readings - Inchest Horizontal Opposite Drive End Vibration Reading Horizontal Ambient Temperature - Fahrenheit	Volts  Amps s Per Second Vertical gs - Inches Per Second Vertical	Amps Axial		
113. 114. 115. 116. 117. 118.	Final Insulation Resistance Test Assembled Shaft Endplay Assembled Shaft Runout Test Run Voltage Volts  Test Run Amperage Amps  Drive End Vibration Readings - Inchest Horizontal  Opposite Drive End Vibration Reading Horizontal  Ambient Temperature - Fahrenheit Drive End Bearing Temps - Fahrenheit	Volts  Amps  S Per Second  Vertical  Js - Inches Per Second  Vertical	Amps Axial Axial		
113. 114. 115. 116. 117. 118.	Final Insulation Resistance Test Assembled Shaft Endplay Assembled Shaft Runout Test Run Voltage Volts Test Run Amperage Amps Drive End Vibration Readings - Inchest Horizontal Opposite Drive End Vibration Reading Horizontal Ambient Temperature - Fahrenheit	Volts  Amps s Per Second Vertical gs - Inches Per Second Vertical	Amps Axial		
113. 114. 115. 116. 117. 118. 119. 120. 121.	Final Insulation Resistance Test Assembled Shaft Endplay Assembled Shaft Runout Test Run Voltage Volts  Test Run Amperage Amps  Drive End Vibration Readings - Inchest Horizontal  Opposite Drive End Vibration Reading Horizontal  Ambient Temperature - Fahrenheit Drive End Bearing Temps - Fahrenheit 5 Minutes	Volts  Amps Separate Per Second Vertical Separate Per Second Vertical Separate Per Second Vertical Separate Per Second Vertical Separate Per Second	Amps  Axial  Axial		
113. 114. 115. 116. 117. 118. 119. 120. 121.	Final Insulation Resistance Test Assembled Shaft Endplay Assembled Shaft Runout Test Run Voltage Volts  Test Run Amperage Amps  Drive End Vibration Readings - Inchest Horizontal  Opposite Drive End Vibration Readingt Horizontal  Ambient Temperature - Fahrenheit Drive End Bearing Temps - Fahrenheit 5 Minutes  Drive End Bearing Temps - Fahrenheit	Volts  Amps  Per Second  Vertical  gs - Inches Per Second  Vertical  it  10 Minutes  it 20-30 Minutes	Amps Axial Axial 15 Minutes		
113. 114. 115. 116. 117. 118. 119. 120. 121.	Final Insulation Resistance Test Assembled Shaft Endplay Assembled Shaft Runout Test Run Voltage Volts  Test Run Amperage Amps  Drive End Vibration Readings - Inchest Horizontal  Opposite Drive End Vibration Reading Horizontal  Ambient Temperature - Fahrenheit Drive End Bearing Temps - Fahrenheit 5 Minutes	Volts  Amps Separate Per Second Vertical Separate Per Second Vertical Separate Per Second Vertical Separate Per Second Vertical Separate Per Second	Amps Axial Axial		

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	35 Minutes	40 Minutes	45 Minutes
124.	Drive End Bearing Temps - Fahrenhei	t 50-60 Minutes	
	50 Minutes	55 Minutes	60 Minutes
40=			
125.	Opposite Drive End Bearing Temps -		
	5 Minutes	10 Minutes	15 Minutes
126	Opposite Drive End Bearing Temps -	Fahrenheit 20-30 Minutes	
120.	20 Minutes	25 Minutes	30 Minutes
	20 Millates	23 Militates	30 Millutes
127.	Opposite Drive End Bearing Temps -	Fahrenheit 35-45 Minutes	
	35 Minutes	40 Minutes	45 Minutes
128.	Opposite Drive End Bearing Temps -	Fahrenheit 50-60 Minutes	
	50 Minutes	55 Minutes	60 Minutes
129.	Stator Temperatures- Fahrenheit		
	5 Minutes	10 Minutes	15 Minutes
130	Stator Temperatures- Fahrenheit 20-3	0 Minutes	
130.	20 Minutes	25 Minutes	30 Minutes
	20 Millutes	23 Militates	30 Millutes
131.	Stator Temperatures- Fahrenheit 35-4	5 Minutes	
	35 Minutes	40 Minutes	45 Minutes
132.	Stator Temperatures- Fahrenheit 50-6	0 Minutes	
	50 Minutes	55 Minutes	60 Minutes
	Document Final Condition with Picture	es after paint	
134	Final Pics and QC Review		

Hi-Speed Industrial Service disclaims all warranties, both express and implied, relating to the information, reports, opinions and analysis disclosed to the Customer by Hi-Speed. Hi-Speed shall not be liable for any errors or omissions, or any losses, injury or damages arising from the use of such information, reports, opinions and analysis by the Customer.



#### STANDARD TERMS AND CONDITIONS FOR PURCHASE OF GOOD AND/OR SERVICES

- 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. <u>WARRANTIES.</u> 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

replace any defective or non-conforming goods in accordance with the applicable manufacturer's warranty. Warranty for any defective or incorrect parts is limited to the repair or replacement of those parts. Hi-Speed warrants that all services will conform in all material respects to the description of services identified in the quotation and will be performed in a good and workmanlike manner in accordance with industry practices and standards. Should the services be reasonably rejected or not conform with the foregoing warranties, Hi-Speed shall, at its sole cost, re-perform the defective or nonconforming services. Notwithstanding the foregoing, these warranties do not extend to goods or services to the extent that such goods have been subject to misuse, neglect or abuse not caused by Hi-Speed or have been used in violation of the approved written instructions furnished to Buyer. THE FOREGOING REPRESENTS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY HI-SPEED WITH RESPECT TO ALL GOODS SOLD AND IS IN LIEU OF ALL OTHER WARRANTIES EITHER EXPRESS OR IMPLIED. HI-SPEED EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICLAR USE OR PURPOSE. BUYER WAIVES ANY CLAIM THAT THESE EXCLUSIONS OR LIMITATIONS DEPRIVE IT OF AN ADEQUATE REMEDY AT EQUITY OR LAW OR CAUSE THIS AGREEMENT TO FAIL IN ITS ESSENTIAL PURPOSE. BUYER SHALL BE ENTITLED TO NO OTHER REMEDY OTHER THAN AS SET FORTH HEREIN, REGARDLESS OF THE CLAIM OR CAUSE OF ACTION, WHETHER BASED IN CONTRACT, TORT, NEGLIGENCE, GOODS LIABILITY, STRICT LIABILITY OR OTHERWISE.

- 9. <u>LIMITATION OF DAMAGES.</u> 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. <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. 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, 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.