

# EVERY DAY SINCE 1946

LR Motor Shop Repairs

## Job Number 103889

Prepared for Huber Specialty Hydrates, LLC (11913)

4750 Alcoa Road Bauxite AR 72011

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AC Inspection as Found - MOTOR SHOP LR



#### **AC Inspection as Found**

#### Huber Specialty Hydrates, LLC (11913)

4750 Alcoa Road Bauxite, AR 72011

#### AC Inspection - Rev. 2

Location:	MOTOR SHOP LR	
Serial Number:	0739-010514386	

Description:HP 200

Hi-Speed Job Number:	103889
Manufacturer:	ABB
Serial Number:	0739-010514286
HP/kW:	200 (HP)
RPM:	1787 (RPM)
Frame:	315MLA
Phase:	Three
Hz:	60 (Hz)
Enclosure:	TEFC
# of Leads:	6
J-box Included:	None
Coupling/Sheave:	None
Date Received:	12/18/2024
Bearing RTDs:	No
Stator RTDs:	No
Repair Stage:	Final
Rewind:	No
Shaft Machined Fit Repairs Required:	Yes
Heaters:	No
Winding Type :	Random Wound

#### Priorities Found: 🛑 6 - High

#### Overall Condition

- 1. Report Date
- 2. Nameplate Picture



🔵 6 - Good

3. Photos of all six sides of the machine.

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

FolderID: 103889 FormID: 22640395

#### 12/27/2024

























4. Describe the Overall Condition of the Equipment as Received Drive end bearing failed. Damaged shaft and air fit in DE end bell.

In	Initial Mechanical/Electrical		
	5.	Does Shaft Turn Freely?	(N) No
	6.	Does the shaft require T.I.R in Lathe to identify additional repairs?	(Yes) Yes
	7.	Does Shaft Have Visible Damage?	(Yes) Yes
	8.	Assembled Shaft Runout	Inches
	9.	Assembled Shaft End Play	inches
	10.	Air Gap Variation <10%	

11.	Lead Condition	(P) Pass
12.	Lead Length	21 Inches
13.	Does it have Lugs?, If so what is the Stud Size?	(Yes) Yes
Ψ	1/2 inch lug hole	
14.	Lead Numbers	
•	1-6	
15.	Frame Condition	good
16.	Fan Condition	(P) Pass
17.	Broken or Missing Components	

#### **Initial Electrical Inspection**

18. Insulation Resistance/Megger

#### 69 Test ID Te.\_ Rei\_ Mo 480V w/o... 480V w/o... PASS PASS 12/27/2024 2:0\_ 12/27/2024 1:5.. /2024 12/27/2024 12/27/2024 1:5421 PM 2:06:58 PM 12 PM No Test al 12 (Ohms Bal (3 (Ohms) 0.0304 Com 0.... 0.0304 Com 0... L1-L2 (Ohms) L2-L3 (Ohms) 0.0306 Com 0... 0.0303 Com 0... 0.0303 Com 0... 0.0307 Com 0... 3-11 (Ohms Aax Delta R % 1.030 1.175 Gell 1 (Dhms) 0.0150 Cerr 0... 0.0154 Cerr 0... Coll 2 (Dhms) 0.0153 Cerr 0... 0.0150 Cerr 0... 日 中

est Date	12/27/2024	12/21/2024	12/27/28
lest Time	2.2012 PM	2:06:58 PM	1:5421 P
Max Delta R %	1.030	1.175	
Coil 1 (Ohms)	0.0150 Corr. 0.	. 0.0154 Corr. 0	
Coil 2 (Ohms)	0.0153 Corr. 0	0.0150 Corr. 0	No.
Coil 3 (Ohms)	0.0153 Corr. 0	0.0153 Com 0	
Megohim Stat.	PASS	PASS	No Test
Volts (V)	501	494	
IQIA)	0.0781	0.0793	
Resist	6415	6228	
At 40"C	1870	1816	E.
PI Status	No Test	No Test	No Test
Volts (V) DA Ratio	- Chanter		
Nameplate	Application	Results Summary	Surge

1870 Megohms

#### 19. Winding Resistance

1-2

|--|

Test Date	12/27/2024	12/27/2024	12/27/2
Test Time	22012 PM	2:06:58 PM	1:54:21
Recipt Status	PASS	PASS	No Test
Bal L1 (Ohms)	-	21	
Bal L2 (Ohms)	1000		
Bal L3 (Ohms)			13.
L1-L2 (Ohms)	0.0304 Corr: 0	0.0304 Corr 0	
L2-L3 (Ohms)	0.0306 Corr. 0	0.0303 Corr. 0	
L3-L1 (Ohms)	0.0303 Corr. 0	0.0307 Com 0	
Max Delta R %	1.030	1.175	
Coil 1 (Ohms)	0.0150 Corr. 0	0.0154 Com 0	Ł
Coil 2 (Ohms)	0.0153 Com 0	0.0150 Com: 0	
Coil 3 (Ohms)		0.0153 Core 0	
Megohim Stat.	EASS.	PASS	No Test

21.       Number of Stator Slots       72         22.       Stator Condition       good         23.       Stator Thermistors/Ohms       good         24.       Stator Overloads/Ohms       V/A         24.       Stator Overloads/Ohms       Kator Overloads/Ohms         24.       Stator Overloads/Ohms       FAG         25.       Drive End Bearing Rumber-       NU222         26.       Drive End Bearing Number-       NU222         27.       Drive End Bearing Type       (Roller) Roller Bearing         29.       Drive End Bearing Type       (Roller) Roller Bearing         20.       Drive End Bearing Insulation or Grounding Device?       none         30.       Drive End Bearing Condition       pool         31.       Drive End Bearing Number-       bad         32.       Drive End Bearing Number-       bad         33.       Opposite Drive End Bearing Number-       6378         35.       Opposite Drive End Bearing Number-       (Grease) Grease Lubrication         36.       Opposite Drive End Bearing Number-       1         37.       Opposite Drive End Bearing Number-       1         38.       Opposite Drive End Bearing Number-       N/A         39.       Opposite	G Demonstration			
23.       Stator Thermistors/Ohms       N/A         A/A       Stator Overloads/Ohms         N/A       N/A         technologie Colspan="2">FAG         FAG         S Drive End Bearing Brand       FAG         S Drive End Bearing Number-         NU222         Nuve End Bearing Type       (Roller) Roller Bearing         Prive End Bearing Type       (Roller) Roller Bearing         Drive End Bearing Type       (Roller) Roller Bearing         Drive End Bearing Insulation or Grounding Device?       none         Drive End Bearing Condition       bad         Strive End Bearing Condition       bad         Strive End Bearing Rrand       FAG         FAG         Strive End Bearing Rrand       FAG         FAG         Strive End Bearing Number-       6378         Grease Lubricated         Strive End Bearing Type       (Grease) Grease Lubricated         Strive End Bearing Type       (Grease) Grease Lubricated         Strive End Bearing Type       (Grease) Grease Lubricated         Strive End Bearing Type	21.	Number of Stator Slots		72
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25.       Drive End Bearing Brand       FAG         26.       Drive End Bearing Number       NU222         27.       Drive End Bearing Oty.       1         28.       Drive End Bearing Type       (Roller) Roller Bearing         29.       Drive End Lubrication Type       (Grease) Grease Lubricated         30.       Drive End Bearing Insulation or Grounding Device?       none         31.       Drive End Bearing Condition       bad         32.       Drive End Bearing Condition       bad         33.       Opposite Drive End Bearing Number-       bad         34.       Opposite Drive End Bearing Number-       6318         35.       Opposite Drive End Bearing Number-       6(Ball) Ball Bearing         36.       Opposite Drive End Bearing Type       (Grease) Grease Lubricated         37.       Opposite Drive End Bearing Number-       1         38.       Opposite Drive End Bearing Type       (Grease) Grease Lubricated         39.       Opposite Drive End Bearing Type       (Grease) Grease Lubricated         39.       Opposite Drive End Bearing Insulation or Grounding Device?       N/A         39.       Opposite Drive End Bearing Insulation or Grounding Device?       N/A         30.       Opposite Drive End Bearing Insulation or Grounding Device? </th <th></th> <th>N/A</th> <th></th> <th></th>		N/A		
26       Drive End Bearing Number-       NU222         27       Drive End Bearing Qty.       1         28.       Drive End Bearing Type       (Roller) Roller Bearing         29.       Drive End Lubrication Type       (Grease) Grease Lubricated         30.       Drive End Bearing Insulation or Grounding Device?       none         31.       Drive End Bearing Condition       bad         32.       Derive End Bearing Condition       bad         33.       Opposite Drive End Bearing Brand       bad         33.       Opposite Drive End Bearing Number-       bad         33.       Opposite Drive End Bearing Number-       6318         34.       Opposite Drive End Bearing Number-       1         35.       Opposite Drive End Bearing Type       (Grease) Grease Lubricated         36.       Opposite Drive End Bearing Number-       1         35.       Opposite Drive End Bearing Number-       1         36.       Opposite Drive End Bearing Number-       1         37.       Opposite Drive End Bearing Number-       1         38.       Opposite Drive End Bearing Optor Grounding Device?       N/A         39.       Opposite Drive End Bearing Condition or Grounding Device?       N/A         30.       Opposite Drive End				
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28       Drive End Bearing Type       (Roller) Roller Bearing         29       Drive End Lubrication Type       (Grease) Grease Lubricated         30       Drive End Bearing Insulation or Grounding Device?       none         31       Drive End Wavy Washer/Snap-Ring Other Retention Device?       none         32       Drive End Bearing Condition       bad         33       Opposite Drive End Bearing Brand       bad         #       FAG       fAG         34       Opposite Drive End Bearing Number-       f318         35       Opposite Drive End Bearing Type       (Grease) Grease Lubricated         36       Opposite Drive End Bearing Type       (Ball) Ball Bearing         37       Opposite Drive End Bearing Type       (Grease) Grease Lubricated         38       Opposite Drive End Bearing Type       NAA         39       Opposite Drive End Bearing Insulation or Grounding Device?       N/A         39       Opposite Drive End Bearing Insulation or Grounding Device?       N/A         39       Opposite Drive End Bearing Codition       nore         40       Opposite Drive End Bearing Codition       nore         41       Drive End Seal       none         42       Opposite Drive End Seal       none         43	26.			NU222
29       Drive End Lubrication Type       (Grease) Grease Lubricated         30       Drive End Bearing Insulation or Grounding Device?       none         31       Drive End Wavy Washer/Snap-Ring Other Retention Device?       none         32       Drive End Bearing Condition       bad         33       Opposite Drive End Bearing Brand       bad <i>FAG</i> FAG       1         34       Opposite Drive End Bearing Number-       1         6318       Opposite Drive End Bearing Type       (Ball) Ball Bearing         35       Opposite Drive End Bearing Type       (Ball) Ball Bearing         36       Opposite Drive End Bearing Insulation Type       (Ball) Ball Bearing         37       Opposite Drive End Bearing Insulation Type       (Brease) Grease Lubricated         38       Opposite Drive End Bearing Insulation Type       N/A         39       Opposite Drive End Bearing Insulation - Grounding Device?       N/A         39       Opposite Drive End Bearing Condition       none         41       Drive End Seal       none         42       Opposite Drive End Seal       none         43       DE Sleeve Bearing Inside Diameter       anone         44       DE Sleeve Bearing Outside Diameter       240 degrees	27.	÷ .		-
30.       Drive End Bearing Insulation or Grounding Device?       none         31.       Drive End Wavy Washer/Snap-Ring Other Retention Device?       none         32.       Drive End Bearing Condition       bad         33.       Opposite Drive End Bearing Brand       bad <i>FAG FAG</i> faile         34.       Opposite Drive End Bearing Number-       faile         6318       Opposite Drive End Bearing Oty.       1         35.       Opposite Drive End Bearing Type       (Ball) Ball Bearing         37.       Opposite Drive End Bearing Insulation or Grounding Device?       N/A         38.       Opposite Drive End Bearing Insulation or Grounding Device?       N/A         39.       Opposite Drive End Bearing Insulation or Grounding Device?       N/A         39.       Opposite Drive End Bearing Condition       none         40.       Opposite Drive End Bearing Condition       none         41.       Drive End Seal       none         42.       Opposite Drive End Seal       none         43.       DE Sleeve Bearing Inside Diameter       que degrees         44.       De Sleeve Bearing Outside Diameter       que degrees	28.			
31.       Drive End Wavy Washer/Snap-Ring Other Retention Device?       none         32.       Drive End Bearing Condition       bad         33.       Opposite Drive End Bearing Brand	29.	••		(Grease) Grease Lubricated
32.       Drive End Bearing Condition       bad         33.       Opposite Drive End Bearing Brand FAG         34.       Opposite Drive End Bearing Number- 6318         35.       Opposite Drive End Bearing Qty.       1         36.       Opposite Drive End Bearing Type       (Ball) Ball Bearing         37.       Opposite Drive End Bearing Type       (Ball) Ball Bearing         38.       Opposite Drive End Bearing Type       N/A         39.       Opposite Drive End Lubrication Type       N/A         39.       Opposite Drive End Bearing Insulation or Grounding Device?       N/A         39.       Opposite Drive End Bearing Condition       none         40.       Opposite Drive End Bearing Condition       none         41.       Drive End Seal       none         42.       Opposite Drive End Seal       none         43.       DE Sleeve Bearing Inside Diameter       240 degrees         44.       DE Sleeve Bearing Outside Diameter       240 degrees	30.			none
33.       Opposite Drive End Bearing Brand         FAG         34.       Opposite Drive End Bearing Number-         6318         35.       Opposite Drive End Bearing Qty.         1       0pposite Drive End Bearing Type         0pposite Drive End Bearing Insulation Type       (Ball) Ball Bearing         37.       Opposite Drive End Bearing Insulation Type         0pposite Drive End Bearing Insulation or Grounding Device?       N/A         38.       Opposite Drive End Bearing Condition Type         0pposite Drive End Bearing Condition       normal wear         41.       Drive End Seal       none         42.       Opposite Drive End Seal       none         43.       DE Sleeve Bearing Inside Diameter       240 degrees         44.       DE Sleeve Bearing Outside Diameter       240 degrees	31.		Other Retention Device?	none
FAG         34.       Opposite Drive End Bearing Number- 6318         35.       Opposite Drive End Bearing Qty.       1         36.       Opposite Drive End Bearing Type       (Ball) Ball Bearing         37.       Opposite Drive End Lubrication Type       (Grease) Grease Lubricated         38.       Opposite Drive End Bearing Insulation Type       N/A         39.       Opposite Drive End Bearing Condition Type       N/A         39.       Opposite Drive End Bearing Condition Type-Ring Other Retention Device?       N/A         39.       Opposite Drive End Bearing Condition       normal wear         41.       Drive End Seal       none         42.       Opposite Drive End Seal       none         43.       DE Sleeve Bearing Inside Diameter       240 degrees         44.       DE Sleeve Bearing Outside Diameter       240 degrees	-	-		bad
34.       Opposite Drive End Bearing Number- 6318         35.       Opposite Drive End Bearing Qty.       1         36.       Opposite Drive End Bearing Type       (Ball) Ball Bearing         37.       Opposite Drive End Lubrication Type       (Grease) Grease Lubricated         38.       Opposite Drive End Bearing Insulation Type       (Grease) Grease Lubricated         39.       Opposite Drive End Bearing Condition Type-Ring Other Retention Device?       N/A         39.       Opposite Drive End Bearing Condition       no         40.       Opposite Drive End Bearing Condition       none         41.       Drive End Seal       none         42.       Opposite Drive End Seal       none         43.       DE Sleeve Bearing Inside Diameter       120 degrees       240 degrees         44.       DE Sleeve Bearing Outside Diameter       120 degrees       120 degrees				
631835.Opposite Drive End Bearing Qty.136.Opposite Drive End Bearing Type(Ball) Ball Bearing37.Opposite Drive End Lubrication Type(Grease) Grease Lubricated38.Opposite Drive End Bearing Insulation or Grounding Device?N/A39.Opposite Drive End Wavy Washer/Snar-Ring Other Retention Device?N/A40.Opposite Drive End Bearing Conditionnormal wear41.Drive End Sealnone42.Opposite Drive End Sealnone43.DE Sleeve Bearing Inside Diameter240 degrees44.DE Sleeve Bearing Outside Diameter240 degrees	,			
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36.       Opposite Drive End Bearing Type       (Ball) Ball Bearing         37.       Opposite Drive End Lubrication Type       (Grease) Grease Lubricated         38.       Opposite Drive End Bearing Insulation or Grounding Device?       N/A         39.       Opposite Drive End Wavy Washer/Sreated to Device?       N/A         40.       Opposite Drive End Bearing Condition       normal wear         41.       Drive End Seal       none         42.       Opposite Drive End Seal       none         43.       DE Sleeve Bearing Inside Diameter       none         44.       J20 degrees       240 degrees         45.       DE Sleeve Bearing Outside Diameter       searce	· ·			A
37.       Opposite Drive End Lubrication Type       (Grease) Grease Lubricated         38.       Opposite Drive End Bearing Insulation or Grounding Device?       N/A         39.       Opposite Drive End Wavy Washer/Snap-Ring Other Retention Device?       no         40.       Opposite Drive End Bearing Condition       normal wear         41.       Drive End Seal       none         42.       Opposite Drive End Seal       none         43.       DE Sleeve Bearing Inside Diameter       0 degrees         44.       DE Sleeve Bearing Outside Diameter       240 degrees				
38.       Opposite Drive End Bearing Insulation or Grounding Device?       N/A         39.       Opposite Drive End Wavy Washer/Snap-Ring Other Retention Device?       no         40.       Opposite Drive End Bearing Condition       normal wear         41.       Drive End Seal       none         42.       Opposite Drive End Seal       none         43.       DE Sleeve Bearing Inside Diameter       0 degrees         44.       DE Sleeve Bearing Outside Diameter       240 degrees				
39.       Opposite Drive End Wavy Washer/Srig Other Retention Device?       no         40.       Opposite Drive End Bearing Condition       normal wear         41.       Drive End Seal       none         42.       Opposite Drive End Seal       none         43.       DE Sleeve Bearing Inside Diameter       none         44.       De Sleeve Bearing Utside Diameter       240 degrees         44.       DE Sleeve Bearing Outside Diameter       120 degrees			or Grounding Device?	. ,
40.       Opposite Drive End Bearing Condition       normal wear         41.       Drive End Seal       none         42.       Opposite Drive End Seal       none         43.       DE Sleeve Bearing Inside Diameter       0 degrees         44.       DE Sleeve Bearing Outside Diameter       240 degrees				
41.       Drive End Seal       none         42.       Opposite Drive End Seal       none         43.       DE Sleeve Bearing Inside Diameter       120 degrees         44.       DE Sleeve Bearing Outside Diameter       120 degrees				
42.     Opposite Drive End Seal     none       43.     DE Sleeve Bearing Inside Diameter     240 degrees       0 degrees     120 degrees     240 degrees       44.     DE Sleeve Bearing Outside Diameter     5			•	
43. DE Sleeve Bearing Inside Diameter         0 degrees       120 degrees       240 degrees         44. DE Sleeve Bearing Outside Diameter				
0 degrees     120 degrees     240 degrees       44. DE Sleeve Bearing Outside Diameter     540 degrees				
44. DE Sleeve Bearing Outside Diameter		-	120 degrees	240 degrees
0 degrees 120 degrees 240 degrees	44.	DE Sleeve Bearing Outside Diameter		
		0 degrees	120 degrees	240 degrees

45.	DE Sleeve Bearing Housing Inside Di	ameter	
	0 degrees	120 degrees	240 degrees
46.	DE Sleeve Bearing to Housing Cleara	nce	
	0 degrees	120 degrees	240 degrees
47.	ODE Sleeve Bearing Inside Diameter		
	0 degrees	120 degrees	240 degrees
48.	ODE Sleeve Bearing Outside Diamete	er	
	0 degrees	120 degrees	240 degrees
49.	ODE Sleeve Bearing Housing Inside I	Diameter	
	0 degrees	120 degrees	240 degrees
50.	ODE Sleeve Bearing to Housing Clea		
	0 degrees	120 degrees	240 degrees
Deter	Increation		
	Inspection		(Cauting) Aluminum) Cauting
51.	Rotor Type/Material		(Squirrel Aluminum) Squirrel Cage Aluminum Die Cast
52.	Growler Test		(Pass) Pass
53.	Number of Rotor Bars		105
	Rotor Condition		good
	List the Parts needed for the Repair B	elow	<b>3</b> • • • •
	NU222, 6318 2Z		
56.	Signature of Technician that Disasser	nbled Motor	Shon
	anical Fits- Rotor		
	Shaft Runout		inches
	Rotor Runout		indica
50.	Drive End Bearing Fit	Rotor Body	Opposite Drive End Bearing
			Opposite Drive End Dearing
59.	-	-	Opposite Drive Life Dealing
59.	Coupling Fit Closest to Bearing Housi	ng	
59.	-	-	120 Degrees
	Coupling Fit Closest to Bearing Housi	ng 90 Degrees	
	Coupling Fit Closest to Bearing Housi 0 Degrees Coupling Fit Closest to the end of the	ng 90 Degrees Shaft	120 Degrees
	Coupling Fit Closest to Bearing Housi 0 Degrees	ng 90 Degrees	
60.	Coupling Fit Closest to Bearing Housi 0 Degrees Coupling Fit Closest to the end of the	ng 90 Degrees Shaft	120 Degrees
60.	Coupling Fit Closest to Bearing Housi 0 Degrees Coupling Fit Closest to the end of the 0 Degrees	ng 90 Degrees Shaft	120 Degrees
60.	Coupling Fit Closest to Bearing Housi 0 Degrees Coupling Fit Closest to the end of the 0 Degrees Drive End Bearing Shaft Fit	ng 90 Degrees Shaft 60 Degrees	120 Degrees 120 Degrees
60.	Coupling Fit Closest to Bearing Housi 0 Degrees Coupling Fit Closest to the end of the 0 Degrees Drive End Bearing Shaft Fit 0 Degrees	ng 90 Degrees Shaft 60 Degrees 60 Degrees	120 Degrees 120 Degrees 120 Degrees
60.	Coupling Fit Closest to Bearing Housi 0 Degrees Coupling Fit Closest to the end of the 0 Degrees Drive End Bearing Shaft Fit 0 Degrees 0	ng 90 Degrees Shaft 60 Degrees 60 Degrees 0	120 Degrees 120 Degrees 120 Degrees
60. 61.	Coupling Fit Closest to Bearing Housi 0 Degrees Coupling Fit Closest to the end of the 0 Degrees Drive End Bearing Shaft Fit 0 Degrees 0 Badly damaged	ng 90 Degrees Shaft 60 Degrees 60 Degrees 0	120 Degrees 120 Degrees 120 Degrees 0
60. 61.	Coupling Fit Closest to Bearing Housi 0 Degrees Coupling Fit Closest to the end of the 0 Degrees Drive End Bearing Shaft Fit 0 Degrees <b>0</b> Badly damaged Drive End Bearing Shaft Fit Condition Opposite Drive End Bearing Shaft Fit	ng 90 Degrees Shaft 60 Degrees 60 Degrees 0	120 Degrees 120 Degrees 120 Degrees 0 (F) Fail
60. 61.	Coupling Fit Closest to Bearing Housi 0 Degrees Coupling Fit Closest to the end of the 0 Degrees Drive End Bearing Shaft Fit 0 Degrees <b>0</b> Badly damaged Drive End Bearing Shaft Fit Condition	ng 90 Degrees Shaft 60 Degrees 60 Degrees 0	120 Degrees 120 Degrees 120 Degrees 0
60. 61.	Coupling Fit Closest to Bearing Housi 0 Degrees Coupling Fit Closest to the end of the 0 Degrees Drive End Bearing Shaft Fit 0 Degrees <b>0</b> Badly damaged Drive End Bearing Shaft Fit Condition Opposite Drive End Bearing Shaft Fit 0 Degrees	ng 90 Degrees Shaft 60 Degrees 0 60 Degrees 0	120 Degrees 120 Degrees 120 Degrees 0 (F) Fail 120 Degrees

0.5			
65.	Shaft Air Seal Fits		
	Drive End Air Seal	Opposite Drive End Air Seal	
	ok	ok	
Mech	anical Fits- Bearing Housings		
66.	Drive End - Endbell Bearing Fit		
	0 Degrees	60 Degrees	120 Degrees
	0	0	0
-	Bearing spun in housing		
<b>6</b> 7.	Drive End - Endbell Bearing Fit Cond	ition	(F) Fail
68.	Opposite Drive End - Endbell Bearing	) Fit	
	0 Degrees	60 Degrees	120 Degrees
	7.4803	7.4803	7.4803
69.	Opposite Drive End - Endbell Bearing	Fit Condition	(P) Pass
70.	Bearing Cap Condition		
	Drive End Bearing Cap	Opposite Drive End Bearing Cap	
	sleeve required	ok	
71.	End Bell Air Seal Fits		
	Drive End Air Seal	Opposite Drive End Air Seal	
	sleeve	ok	
72.	List Machine Work Needed Below		
	Replace rotor shaft, sleeve DE endbell	sleeve DE bearing cap,sleeve DE endbell air ga	q
73	Technician		David Maclin
Root	Cause of Failure		
74.	Failure locations		
75	DE bearing		
	Root cause of failure		
	Root cause of failure		
Dynai	Root cause of failure Improper lube/contamination/fatigue		
Dynai	Root cause of failure Improper lube/contamination/fatigue mic Balance Report	Balance Grade	
<b>Dynai</b> 76.	Root cause of failure Improper lube/contamination/fatigue mic Balance Report Rotor Weight and Balance Grade	Balance Grade	
<b>Dynai</b> 76.	Root cause of failure Improper lube/contamination/fatigue mic Balance Report Rotor Weight and Balance Grade Rotor Weight	Balance Grade Opposite Drive End	
<b>Dynai</b> 76.	Root cause of failure Improper lube/contamination/fatigue mic Balance Report Rotor Weight and Balance Grade Rotor Weight Initial Balance Readings		
<b>Dynai</b> 76.	Root cause of failure Improper lube/contamination/fatigue mic Balance Report Rotor Weight and Balance Grade Rotor Weight Initial Balance Readings Drive End		
<b>Dynai</b> 76.	Root cause of failure Improper lube/contamination/fatigue mic Balance Report Rotor Weight and Balance Grade Rotor Weight Initial Balance Readings Drive End Final Balance Readings	Opposite Drive End	
<b>Dynai</b> 76.	Root cause of failure Improper lube/contamination/fatigue mic Balance Report Rotor Weight and Balance Grade Rotor Weight Initial Balance Readings Drive End Final Balance Readings Drive End	Opposite Drive End	
<b>Dynai</b> 76. 77. 78. 79.	Root cause of failure Improper lube/contamination/fatigue mic Balance Report Rotor Weight and Balance Grade Rotor Weight Initial Balance Readings Drive End Final Balance Readings Drive End	Opposite Drive End	
<b>Dyna</b> 76. 77. 77. 78. 79.	Root cause of failure Improper lube/contamination/fatigue mic Balance Report Rotor Weight and Balance Grade Rotor Weight Initial Balance Readings Drive End Final Balance Readings Drive End Technician	Opposite Drive End	
<b>Dyna</b> 76. 77. 77. 78. 79. <b>Mech</b> 80.	Root cause of failure Improper lube/contamination/fatigue mic Balance Report Rotor Weight and Balance Grade Rotor Weight Initial Balance Readings Drive End Final Balance Readings Drive End Technician anical Fits- Rotor - Post Repair	Opposite Drive End	
<b>Dyna</b> 76. 77. 77. 78. 79. <b>Mech</b> 80.	Root cause of failure Improper lube/contamination/fatigue mic Balance Report Rotor Weight and Balance Grade Rotor Weight Initial Balance Readings Drive End Final Balance Readings Drive End Technician anical Fits- Rotor - Post Repair	Opposite Drive End	Opposite Drive End Bearing

82.	Coupling Fit Closest to Bearing House	ng Post Repair	
	0 Degrees	90 Degrees	120 Degrees
83.	Coupling Fit Closest to the end of the	Shaft Post Repair	
	0 Degrees	60 Degrees	120 Degrees
	5	5	5
84.	Drive End Bearing Shaft Fit Post Rep	air	
	0 Degrees	60 Degrees	120 Degrees
	5	5	с С
85.	Opposite Drive End Bearing Shaft Fit	Post Repair	
	0 Degrees	60 Degrees	120 Degrees
86.	Shaft Air Seal Fits Post Repair		
	Drive End Air Seal	Opposite Drive End Air Seal	
	Shaft Repair Sign-off		
	anical Fits- Bearing Housings - P	-	
88.	Drive End - Endbell Bearing Fit Post I	Repair	
	0 Degrees	60 Degrees	120 Degrees
89.	Opposite Drive End - Endbell Bearing		
	0 Degrees	60 Degrees	120 Degrees
00	Bearing Cap Condition Post Repair		
90.		Opposite Drive End Pagring Cop	
	Drive End Bearing Cap	Opposite Drive End Bearing Cap	
91.	End Bell Air Seal Fits Post Repair		
	Drive End Air Seal	Opposite Drive End Air Seal	
92.	DE Sleeve Bearing Inside ID Post Re	pair	
	Measure 1	Measure 2	Measure 3
93.	DE Sleeve Bearing Outside ID Post R	lepair	
	Measure 1	Measure 2	Measure 3
94.	DE Sleeve Bearing Inside OD Post R		
	Measure 1	Measure 2	Measure 3
05			
95.	DE Sleeve Bearing Outside OD Post		Maran an O
	Measure 1	Measure 2	Measure 3
96	End Bell Repair Sign-off		
	ODE Sleeve Bearing Inside ID Post R	repair	
51.	Measure 1	Measure 2	Measure 3
			Weddure 0
98.	ODE Sleeve Bearing Outside ID Post	Repair	
	Measure 1	Measure 2	Measure 3

99.	ODE Sleeve Bearing Inside OD Post	Repair	
	Measure 1	Measure 2	Measure 3
100.	ODE Sleeve Bearing Outside OD Pos	at Repair	
	Measure 1	Measure 2	Measure 3
Asser	nbly		
101.	QC Check All Parts for Cleanliness P	rior to Assembly	
102.	Photograph All Major Components pr	or to assembly	
103.	Final Insulation Resistance Test		
104.	Assembled Shaft Endplay		
105.	Assembled Shaft Runout		
106.	Test Run Voltage		
	Volts	Volts	Volts
107.	Test Run Amperage		
	Amps	Amps	Amps
108.	Drive End Vibration Readings - Inches		
	Horizontal	Vertical	Axial
109.	Opposite Drive End Vibration Reading	•	
	Horizontal	Vertical	Axial
110	Ambiant Tomporatura Eabranhait		
	Ambient Temperature - Fahrenheit	14	
111.	Drive End Bearing Temps - Fahrenhe		
	5 Minutes	10 Minutes	15 Minutes
112	Drive End Bearing Temps - Fahrenhe	it 20-30 Minutes	
112.	20 Minutes	25 Minutes	30 Minutes
	20 Minutes	23 Minutes	50 Minutes
113.	Drive End Bearing Temps - Fahrenhe	it 35-45 Minutes	
	35 Minutes	40 Minutes	45 Minutes
114.	Drive End Bearing Temps - Fahrenhe	it 50-60 Minutes	
	50 Minutes	55 Minutes	60 Minutes
115.	Opposite Drive End Bearing Temps -	Fahrenheit	
	5 Minutes	10 Minutes	15 Minutes
116.	Opposite Drive End Bearing Temps -	Fahrenheit 20-30 Minutes	
	20 Minutes	25 Minutes	30 Minutes
117.	Opposite Drive End Bearing Temps -		
	35 Minutes	40 Minutes	45 Minutes
118.	Opposite Drive End Bearing Temps -		
	50 Minutes	55 Minutes	60 Minutes

119. Document Final Condition with Pictures after paint

120. Final Pics and QC Review



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

- 1. <u>APPLICABILITY.</u> 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. <u>SCOPE OF GOODS AND/OR SERVICES.</u> 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 be 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. 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 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 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 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. 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

**TermsAndConditions** 

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. 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. <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. <u>GOVERNING LAW AND JURISDICTION.</u> 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. <u>ABANDONED EQUIPMENT.</u> 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. <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. <u>NO INDIVIDUAL LIABILITY</u>. 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.