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LR Motor Shop Repairs

**Job Number 103889**

Prepared for Huber Specialty Hydrates, LLC (11913)

4750 Alcoa Road  
Bauxite AR 72011

# Table of Contents



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

**AC Inspection as Found**  
**Huber Specialty Hydrates, LLC (11913)**  
4750 Alcoa Road  
Bauxite, AR 72011

FolderID: 103889  
FormID: 22640395

**AC Inspection - Rev. 2**

**Location:** MOTOR SHOP LR

**Serial Number:**

**Description:**200HP RELIANCE

**Hi-Speed Job Number:** 103889

**Manufacturer:** Reliance

**HP/kW:** 200 (HP)

**RPM:** 1790 (RPM)

**Frame:** 449TC

**Voltage:** 460

**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

**Bearing Housing Machined Fit Repairs Required:** Yes

**Heaters:** No

**Winding Type :** Random Wound

Priorities Found: ● 5 - High ● 8 - Good

**Overall Condition**

- |                      |            |
|----------------------|------------|
| 1. Report Date       | 12/27/2024 |
| 2. Nameplate Picture |            |



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3. Photos of all six sides of the machine.





4. Describe the Overall Condition of the Equipment as Received

*Drive end bearing failed. Damaged shaft and air fit in DE end bell.*

#### 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%	

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11. Lead Condition	(P) Pass
12. Lead Length	21 Inches
13. Does it have Lugs?, If so what is the Stud Size?	(Yes) Yes
1/2 inch lug hole	
14. Lead Numbers	
1-6	
15. Frame Condition	good
16. Fan Condition	(P) Pass
17. Broken or Missing Components	
18. Does motor have internal fan?	
<b>Initial Electrical Inspection</b>	
19. Insulation Resistance/Megger	1870 Megohms

Test ID	Test	Results	Pass/Fail
12/27/2024 2-2	400V w/o...	T...	PASS PASS
12/27/2024 2-0	400V w/o...	T...	PASS PASS
12/27/2024 1-5	400V w/o...	T...	PASS PASS
Test Date	12/27/2024	12/27/2024	12/27/2024
Test Time	2:20:12 PM	2:06:58 PM	1:54:21 PM
Result Status	PASS	PASS	No Test
Bal L1 (Ohms)			
Bal L2 (Ohms)			
Bal L3 (Ohms)			
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 Corr: 0...	
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...	
Coil 3 (Ohms)	0.0153 Corr: 0...	0.0153 Corr: 0...	
Megohm Stat...	PASS	PASS	No Test
Volts (V)	501	494	
I(μA)	0.0781	0.0793	
Resist	6415	6228	
At 40°C	1870	1816	
PI Status	No Test	No Test	No Test
Volts (V)			
DA Ratio			
PI Ratio			
Nameplate	Application	Results Summary	Surge

Test ID	Test	Results	Pass/Fail
12/27/2024 2-2	400V w/o...	T...	PASS PASS
12/27/2024 2-0	400V w/o...	T...	PASS PASS
12/27/2024 1-5	400V w/o...	T...	PASS PASS
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L2-L3 (Ohms)	0.0306 Corr: 0...	0.0303 Corr: 0...	
L3-L1 (Ohms)	0.0303 Corr: 0...	0.0307 Corr: 0...	
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...	
Coil 3 (Ohms)	0.0153 Corr: 0...	0.0153 Corr: 0...	
Megohm Stat...	PASS	PASS	No Test
Volts (V)	501	494	
I(μA)	0.0781	0.0793	
Resist	6415	6228	
At 40°C	1870	1816	
PI Status	No Test	No Test	No Test
Volts (V)			
DA Ratio			
PI Ratio			
Nameplate	Application	Results Summary	Surge

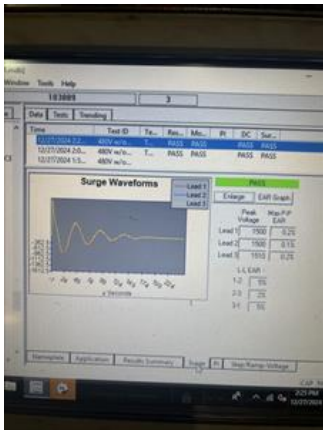
20. Winding Resistance		
1-2	1-3	2-3

Test ID	Test	Results	Pass/Fail
12/27/2024 2-2	400V w/o...	T...	PASS PASS
12/27/2024 2-0	400V w/o...	T...	PASS PASS
12/27/2024 1-5	400V w/o...	T...	PASS PASS
Test Date	12/27/2024	12/27/2024	12/27/2024
Test Time	2:20:12 PM	2:06:58 PM	1:54:21 PM
Result Status	PASS	PASS	No Test
Bal L1 (Ohms)			
Bal L2 (Ohms)			
Bal L3 (Ohms)			
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 Corr: 0...	
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...	
Coil 3 (Ohms)	0.0153 Corr: 0...	0.0153 Corr: 0...	
Megohm Stat...	PASS	PASS	No Test
Volts (V)	501	494	
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Resist	6415	6228	
At 40°C	1870	1816	
PI Status	No Test	No Test	No Test
Volts (V)			
DA Ratio			
PI Ratio			
Nameplate	Application	Results Summary	Surge

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21. Perform Surge Test

(P) Pass



22. Number of Stator Slots

72



23. Stator Condition	good
24. Stator Thermistors/Ohms	
25. Stator Overloads/Ohms	
26. Drive End Bearing Brand	FAG
27. Drive End Bearing Number-	NU222
28. Drive End Bearing Qty.	1
29. Drive End Bearing Type	(Roller) Roller Bearing
30. Drive End Lubrication Type	(Grease) Grease Lubricated
31. Drive End Bearing Insulation or Grounding Device?	N/A
32. Drive End Wavy Washer/Snap-Ring Other Retention Device?	NO



34. Opposite Drive End Bearing Brand

FAG

35. Opposite Drive End Bearing Number-

6318

36. Opposite Drive End Bearing Qty.

1

37. Opposite Drive End Bearing Type

(Ball) Ball Bearing

38. Opposite Drive End Lubrication Type

(Grease) Grease Lubricated

39. Opposite Drive End Bearing Insulation or Grounding Device?

N/A

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

no

41. Opposite Drive End Bearing Condition

Normal wear

42. Drive End Seal

No

43. Opposite Drive End Seal

No

44. DE Sleeve Bearing Inside Diameter

0 degrees

120 degrees

240 degrees

45. DE Sleeve Bearing Outside Diameter

0 degrees

120 degrees

240 degrees

46. DE Sleeve Bearing Housing Inside Diameter

0 degrees

120 degrees

240 degrees

47. DE Sleeve Bearing to Housing Clearance

0 degrees

120 degrees

240 degrees

48. ODE Sleeve Bearing Inside Diameter

0 degrees

120 degrees

240 degrees

49. ODE Sleeve Bearing Outside Diameter

0 degrees

120 degrees

240 degrees

50. ODE Sleeve Bearing Housing Inside Diameter


0 degrees

120 degrees

240 degrees



51. ODE Sleeve Bearing to Housing Clearance			
0 degrees	120 degrees	240 degrees	
<b>Rotor Inspection</b>			
52. Rotor Type/Material	(Squirrel Aluminum) Squirrel Cage Aluminum Die Cast		
53. Growler Test	(Pass) Pass		
54. Number of Rotor Bars	105		
55. Rotor Condition	good		
56. List the Parts needed for the Repair Below <i>NU222, 6318 2Z</i>			
57. Signature of Technician that Disassembled Motor			Shon
<div> <i>Na</i> </div>			
<b>Mechanical Fits- Rotor</b>			
58. Shaft Runout	inches		
59. Rotor Runout			
Drive End Bearing Fit	Rotor Body	Opposite Drive End Bearing	
60. Coupling Fit Closest to Bearing Housing			
0 Degrees	90 Degrees	120 Degrees	
61. Coupling Fit Closest to the end of the Shaft			
0 Degrees	60 Degrees	120 Degrees	
62. Drive End Bearing Shaft Fit			
0 Degrees	60 Degrees	120 Degrees	
0	0	0	
<div> <i>Badly damaged</i> </div>			
63. Drive End Bearing Shaft Fit Condition			(F) Fail
64. Opposite Drive End Bearing Shaft Fit			
0 Degrees	60 Degrees	120 Degrees	
0	0	0	
<div> <i>New shaft needed</i> </div>			
65. Opposite Drive End Bearing Shaft Fit Condition			(F) Fail
66. Shaft Air Seal Fits			
Drive End Air Seal	Opposite Drive End Air Seal		
ok	ok		
<b>Mechanical Fits- Bearing Housings</b>			

67. Drive End - Endbell Bearing Fit		
0 Degrees	60 Degrees	120 Degrees
0	0	0
 Grooved		

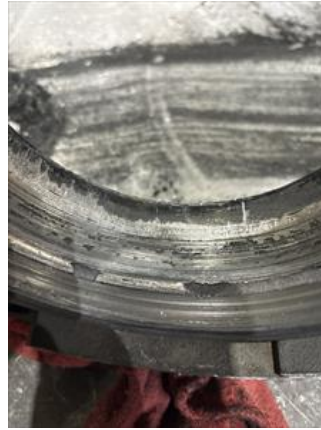


68. Drive End - Endbell Bearing Fit Condition (F) Fail		
69. Opposite Drive End - Endbell Bearing Fit		
0 Degrees	60 Degrees	120 Degrees
7.4803	7.4803	7.4803



70. Opposite Drive End - Endbell Bearing Fit Condition (P) Pass	
71. Bearing Cap Condition	
Drive End Bearing Cap	Opposite Drive End Bearing Cap
sleeve required	ok
need sleeve	good
72. End Bell Air Seal Fits	
Drive End Air Seal	Opposite Drive End Air Seal
sleeve	ok

need sleeve



73. List Machine Work Needed Below

*Replace rotor shaft, sleeve DE endbell, sleeve DE bearing cap, sleeve DE endbell air gap*

74. Technician

David Maclin

A handwritten signature in black ink, appearing to read 'David Maclin', written over a light blue horizontal band.

#### Root Cause of Failure

75. Failure locations

*Drive end bearing*

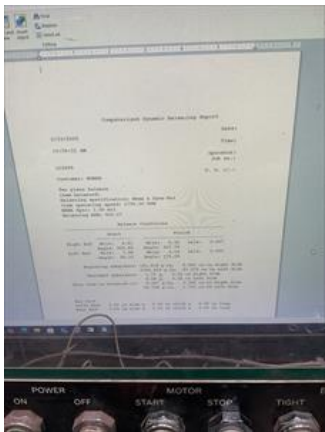
76. Root cause of failure  
*Metal fatigue drive end bearing*



Dynamic Balance Report

77. Rotor Weight and Balance Grade

Rotor Weight	Balance Grade
--------------	---------------



78. Initial Balance Readings

Drive End	Opposite Drive End
4.61	7.90

79. Final Balance Readings

Drive End	Opposite Drive End
.32	.14

80. Technician	RW
----------------	----

Mechanical Fits- Rotor - Post Repair

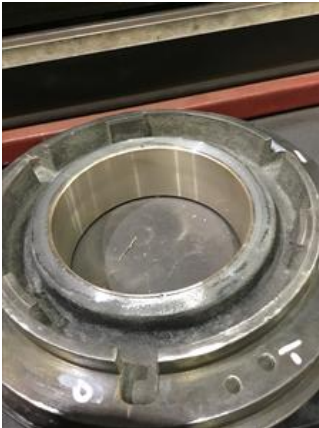

81. Shaft Runout Post Repair	inches
Na	


82. Rotor Runout Post Repair			
Drive End Bearing Fit	Rotor Body	Opposite Drive End Bearing	
Na			
83. Coupling Fit Closest to Bearing Housing Post Repair			
0 Degrees	90 Degrees	120 Degrees	
Na			
84. Coupling Fit Closest to the end of the Shaft Post Repair			
0 Degrees	60 Degrees	120 Degrees	
Na			
85. Drive End Bearing Shaft Fit Post Repair			
0 Degrees	60 Degrees	120 Degrees	
Na			
86. Opposite Drive End Bearing Shaft Fit Post Repair			
0 Degrees	60 Degrees	120 Degrees	
Na			
87. Shaft Air Seal Fits Post Repair			
Drive End Air Seal	Opposite Drive End Air Seal		
Na			
88. Shaft Repair Sign-off			
Na			
<b>Mechanical Fits- Bearing Housings - Post Repair</b>			
89. Drive End - Endbell Bearing Fit Post Repair			
0 Degrees	60 Degrees	120 Degrees	
7.8745	7.8745	7.8744	



90. Opposite Drive End - Endbell Bearing Fit Post Repair			
0 Degrees	60 Degrees	120 Degrees	



91. Bearing Cap Condition Post Repair		
Drive End Bearing Cap	Opposite Drive End Bearing Cap	
<div><div></div><div>Sleeved D.E. bearing cap</div></div>		
		
92. End Bell Air Seal Fits Post Repair		
Drive End Air Seal	Opposite Drive End Air Seal	
4.355	NA	
		
93. DE Sleeve Bearing Inside ID Post Repair		
Measure 1	Measure 2	Measure 3
94. DE Sleeve Bearing Outside ID Post Repair		
Measure 1	Measure 2	Measure 3
95. DE Sleeve Bearing Inside OD Post Repair		
Measure 1	Measure 2	Measure 3
96. DE Sleeve Bearing Outside OD Post Repair		
Measure 1	Measure 2	Measure 3
97. End Bell Repair Sign-off		Gary

98. ODE Sleeve Bearing Inside ID Post Repair		
Measure 1	Measure 2	Measure 3
99. ODE Sleeve Bearing Outside ID Post Repair		
Measure 1	Measure 2	Measure 3
100. ODE Sleeve Bearing Inside OD Post Repair		
Measure 1	Measure 2	Measure 3
101. ODE Sleeve Bearing Outside OD Post Repair		
Measure 1	Measure 2	Measure 3
<b>Assembly</b>		
102. QC Check All Parts for Cleanliness Prior to Assembly		RW
		
103. Photograph All Major Components prior to assembly		(Complete) Complete





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104. Final Insulation Resistance Test

7,820 Megohms



105. Assembled Shaft Endplay

0 inches

106. Assembled Shaft Runout

0 inches

107. Test Run Voltage

Volts

Volts

Volts

457

454

456



Co sign CRW high speed

108. Test Run Amperage

Amps

Amps

Amps

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61.4



60.4

60.2



Hi speed

109. Drive End Vibration Readings - Inches Per Second		
Horizontal	Vertical	Axial
0.03	0.05	0.03
110. Opposite Drive End Vibration Readings - Inches Per Second		
Horizontal	Vertical	Axial
0.03	0.05	0.03
111. Ambient Temperature - Fahrenheit		
Na		
112. Drive End Bearing Temps - Fahrenheit		
5 Minutes	10 Minutes	15 Minutes
Na		
113. Drive End Bearing Temps - Fahrenheit 20-30 Minutes		
20 Minutes	25 Minutes	30 Minutes
Na		



114. Drive End Bearing Temps - Fahrenheit 35-45 Minutes		
35 Minutes	40 Minutes	45 Minutes
Na		
115. Drive End Bearing Temps - Fahrenheit 50-60 Minutes		
50 Minutes	55 Minutes	60 Minutes
Na		
116. Opposite Drive End Bearing Temps - Fahrenheit		
5 Minutes	10 Minutes	15 Minutes
Na		
117. Opposite Drive End Bearing Temps - Fahrenheit 20-30 Minutes		
20 Minutes	25 Minutes	30 Minutes
Na		
118. Opposite Drive End Bearing Temps - Fahrenheit 35-45 Minutes		
35 Minutes	40 Minutes	45 Minutes
Na		
119. Opposite Drive End Bearing Temps - Fahrenheit 50-60 Minutes		
50 Minutes	55 Minutes	60 Minutes
Na		
120. Document Final Condition with Pictures after paint		





121. Final Pics and QC Review

RW



Co sign CRW

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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

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 PARTICULAR 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. **SEVERABILITY.** 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, earthquake, explosion, war, embargo, government requirement, civil or military authority, acts of God, or any other circumstances beyond its reasonable control and not involving any fault or negligence on the party affected ("Condition"). If any such Condition occurs, the party delayed or unable to perform shall promptly give written notice to the other party and, if such Condition remains at the end of thirty (30) days, the party affected by the other party's delay and inability to perform may elect to (i) terminate such order or part thereof, or (ii) suspend the order for the duration of the Condition, if the Buyer is the suspending party, buy elsewhere comparable material to be sold under the order and apply to any commitment the purchase price of such purchase, and resume performance of the order once the Condition ceases, with an option in the affected party to extend the period of this order up to the length of the time the Condition endures.
14. **NONWAIVER.** No course of dealing or failure of either party to strictly enforce any term, right, or condition of these Standard Terms and Conditions will be construed as a waiver of such term, right or condition. Any waiver by Hi-Speed will only be in writing and will waive no succeeding breach of a term, right or condition.
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.