

# LR Motor Shop Repairs

## **Job Number 102322**

Prepared for Union Pacific-Vine St 10945

1020 N. Vine Street North Liittle Rock AR

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AC Inspection as Found - Shop

AC Inspection - Rev. 2

1.0

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

> FolderID: 102322 FormID: 18975097

### **AC Inspection as Found** Union Pacific-Vine St 10945

1020 N. Vine Street North Liittle Rock, AR

AC Inspection - Rev. 2

Serial Number:

Location:

Hi-Speed Job Number:	102322
HP/kW:	5.6 (kW)
RPM:	3370 (RPM)
Voltage:	460
Current:	11.05
Phase:	Three
Hz:	60 (Hz)
Enclosure:	TEFC
J-box Included:	Complete
Date Received:	01/09/2024
Repair Stage:	Final

Priorities Found: **4 - High** 

Shop



7 - Good

#### **Overall Condition**

- 1. Report Date
- Nameplate Picture



Photos of all six sides of the machine.

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	4.	Describe the Overall Condition of the	Equipment as Received	
		Windings failed. It looks like the high s	peed windings overloaded and shorted out.	
	5.	Distance from the end of the shaft to	the Coupling/Sheave	
Ir	nitial	Mechanical/Electrical		
	6.	Does Shaft Turn Freely?		(Yes) Yes
	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		8 Inches
	13.	Lead Numbers		u1v1w1, u2v2w2. 2 more leads coming off winding
	-	2 leads are coming off of windings. No	t sure if overload or thermistor. Reads open	
	14.	Stator Temperature Detector Rating	and Function	
		Quantity	Rating	Quantity Passed
		1		0
	-	Thermistor		
	15.	Bearing Temperature Detector Rating	g and Function	
		Quantity	Rating	Quantity Passed
	16.	Frame Condition		

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17.	Fan Condition		(P) Pass
18.	Heater Quantity, Ratings		( )
	Quantity	Volts/Watts	Pass/Fail
	•		
19.	Broken or Missing Components		yes
-	Missing brake		
Initial	Electrical Inspection		
20.	Insulation Resistance/Megger		0 Megohms
21.	Winding Resistance		
	1-2	1-3	2-3
<b>a</b> 22	Perform Surge Test		(F) Fail
23.			36
24.			Rewind
25.			they read open
-	David looked up old job and it shown to	be a thermistor	
26.	Stator Overloads/Ohms		
Mech	anical Inspection		
	Drive End Bearing Brand		nsk
28.	Drive End Bearing Number-		6009du
29.	Drive End Bearing Qty.		1
30.	Drive End Bearing Type		(Ball) Ball Bearing
31.	Drive End Lubrication Type		(Grease) Grease Lubricated
32.	Drive End Bearing Insulation or Groun	ding Device?	
33.	Drive End Wavy Washer/Snap-Ring C	ther Retention Device?	wavy washer
34.	Drive End Bearing Condition		good
35.	Opposite Drive End Bearing Brand		nsk
36.	Opposite Drive End Bearing Number-		6306du
	Opposite Drive End Bearing Qty.		1
38.	11 0 71		(Ball) Ball Bearing
	Opposite Drive End Lubrication Type	on One we die a Device O	(Grease) Grease Lubricated
	Opposite Drive End Bearing Insulation Opposite Drive End Wavy Washer/Sn	•	snap ring
41.		· -	good
43.			good
44.			
	DE Sleeve Bearing Inside Diameter		
	0 degrees	120 degrees	240 degrees
	3	3	3
46.	DE Sleeve Bearing Outside Diameter		
	0 degrees	120 degrees	240 degrees
47	DE Clasus Bearing Hausing Inside St	ometer	
47.	DE Sleeve Bearing Housing Inside Dia		240 doggo
	0 degrees	120 degrees	240 degrees
48	DE Sleeve Bearing to Housing Cleara	nce	
.0.			040 de sue se
	0 degrees	120 degrees	240 degrees

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40	ODE Sleeve Bearing Inside Diameter				
49.	-	400 da masa	040 da		
	0 degrees	120 degrees	240 degrees		
50	50. ODE Sleeve Bearing Outside Diameter				
50.	-		240 dograpa		
	0 degrees	120 degrees	240 degrees		
51.	ODE Sleeve Bearing Housing Inside I	Diameter			
	0 degrees	120 degrees	240 degrees		
52.	ODE Sleeve Bearing to Housing Clea	rance			
	0 degrees	120 degrees	240 degrees		
Rotor	Inspection				
53.	Rotor Type/Material		(Squirrel Aluminum) Squirrel Cage Aluminum Die Cast		
54.	Growler Test		(Pass) Pass		
55.	Number of Rotor Bars		28		
56.	Rotor Condition				
57.	List the Parts needed for the Repair B	elow			
	6009du				
	6306du Rewind stator				
58	Signature of Technician that Disasser	nbled Motor	Trevor Hall		
00.	Cignature of Toolinician that Disassor	- A	novo: nan		
_	1-7ell				
-	/- Jell				
-	1-7ell				
	anical Fits- Rotor				
59.	Shaft Runout		0.001 inches		
59.			0.001 inches		
59.	Shaft Runout	Rotor Body	0.001 inches  Opposite Drive End Bearing		
59. 60.	Shaft Runout Rotor Runout Drive End Bearing Fit	· ·			
59. 60.	Shaft Runout Rotor Runout Drive End Bearing Fit Coupling Fit Closest to Bearing Housi	ng	Opposite Drive End Bearing		
59. 60.	Shaft Runout Rotor Runout Drive End Bearing Fit	· ·			
59. 60. 61.	Shaft Runout Rotor Runout Drive End Bearing Fit  Coupling Fit Closest to Bearing Housi 0 Degrees	ng 90 Degrees	Opposite Drive End Bearing		
59. 60. 61.	Shaft Runout Rotor Runout Drive End Bearing Fit Coupling Fit Closest to Bearing Housi 0 Degrees Coupling Fit Closest to the end of the	ng 90 Degrees Shaft	Opposite Drive End Bearing  120 Degrees		
59. 60. 61.	Shaft Runout Rotor Runout Drive End Bearing Fit  Coupling Fit Closest to Bearing Housi 0 Degrees	ng 90 Degrees	Opposite Drive End Bearing		
59. 60. 61.	Shaft Runout Rotor Runout Drive End Bearing Fit  Coupling Fit Closest to Bearing Housi 0 Degrees  Coupling Fit Closest to the end of the 0 Degrees	ng 90 Degrees Shaft	Opposite Drive End Bearing  120 Degrees		
59. 60. 61.	Shaft Runout Rotor Runout Drive End Bearing Fit  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	Opposite Drive End Bearing  120 Degrees  120 Degrees		
59. 60. 61.	Shaft Runout Rotor Runout Drive End Bearing Fit  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	Opposite Drive End Bearing  120 Degrees  120 Degrees  120 Degrees		
<ul><li>59.</li><li>60.</li><li>61.</li><li>62.</li><li>63.</li></ul>	Shaft Runout Rotor Runout Drive End Bearing Fit  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  1.7721	ng 90 Degrees Shaft 60 Degrees 60 Degrees 1.7721	Opposite Drive End Bearing  120 Degrees  120 Degrees  120 Degrees  1.7721		
<ul><li>59.</li><li>60.</li><li>61.</li><li>62.</li><li>63.</li><li>64.</li></ul>	Shaft Runout Rotor Runout Drive End Bearing Fit  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  1.7721  Drive End Bearing Shaft Fit Condition	ng 90 Degrees Shaft 60 Degrees 60 Degrees 1.7721	Opposite Drive End Bearing  120 Degrees  120 Degrees  120 Degrees		
<ul><li>59.</li><li>60.</li><li>61.</li><li>62.</li><li>63.</li></ul>	Shaft Runout Rotor Runout Drive End Bearing Fit  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  1.7721  Drive End Bearing Shaft Fit Condition Opposite Drive End Bearing Shaft Fit	ng 90 Degrees Shaft 60 Degrees 60 Degrees 1.7721	Opposite Drive End Bearing  120 Degrees  120 Degrees  120 Degrees  120 Pegrees  (P) Pass		
<ul><li>59.</li><li>60.</li><li>61.</li><li>62.</li><li>63.</li><li>64.</li></ul>	Shaft Runout Rotor Runout Drive End Bearing Fit  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  1.7721  Drive End Bearing Shaft Fit Condition Opposite Drive End Bearing Shaft Fit 0 Degrees	ng 90 Degrees Shaft 60 Degrees 60 Degrees 1.7721 60 Degrees	Opposite Drive End Bearing  120 Degrees  120 Degrees  120 Degrees  120 Degrees  1.7721  (P) Pass		
59. 60. 61. 62. 63.	Shaft Runout Rotor Runout Drive End Bearing Fit  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  1.7721  Drive End Bearing Shaft Fit Condition Opposite Drive End Bearing Shaft Fit 0 Degrees  1.1814	90 Degrees Shaft 60 Degrees 1.7721 60 Degrees 1.1814	Opposite Drive End Bearing  120 Degrees  120 Degrees  120 Degrees  120 Degrees  1.7721  (P) Pass  120 Degrees 1.1814		
59. 60. 61. 62. 63. • 64. 65.	Shaft Runout Rotor Runout Drive End Bearing Fit  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  1.7721  Drive End Bearing Shaft Fit Condition Opposite Drive End Bearing Shaft Fit 0 Degrees  1.1814  Opposite Drive End Bearing Shaft Fit	90 Degrees Shaft 60 Degrees 1.7721 60 Degrees 1.1814	Opposite Drive End Bearing  120 Degrees  120 Degrees  120 Degrees  120 Degrees  1.7721  (P) Pass		
59. 60. 61. 62. 63. • 64. 65.	Shaft Runout Rotor Runout Drive End Bearing Fit  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  1.7721  Drive End Bearing Shaft Fit Condition Opposite Drive End Bearing Shaft Fit 0 Degrees  1.1814	90 Degrees Shaft 60 Degrees 1.7721 60 Degrees 1.1814	Opposite Drive End Bearing  120 Degrees  120 Degrees  120 Degrees  120 Degrees  1.7721  (P) Pass  120 Degrees 1.1814		

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Mecha	anical Fits- Bearing Housings			
	Drive End - Endbell Bearing Fit			
	0 Degrees	60 Degrees	120 Degrees	
	2.9529	2.9529	2.9529	
69.	Drive End - Endbell Bearing Fit Cond	dition		(P) Pass
70.	Opposite Drive End - Endbell Bearin	g Fit		
	0 Degrees	60 Degrees	120 Degrees	
	2.8352	2.9352	2.8353	
71.	Opposite Drive End - Endbell Bearin	g Fit Condition		(P) Pass
72.	Bearing Cap Condition			
	Drive End Bearing Cap	Opposite Drive End Bearing Cap		
73.	End Bell Air Seal Fits			
	Drive End Air Seal	Opposite Drive End Air Seal		
7.4				
74.	List Machine Work Needed Below			
75	None Technician			Tuescan Hell
75.	recnnician			Trevor Hall
		7		
	//-7///			
	/ ////			
-				
	Cause of Failure			
	Failure locations			
76.	Failure locations Windings, thermistor			
76.	Failure locations Windings, thermistor Root cause of failure			
76. 77.	Failure locations  Windings, thermistor  Root cause of failure  Overloading of the windings caused to	hem to burn and short.		
76. 77. <b>Dyna</b> r	Failure locations  Windings, thermistor  Root cause of failure  Overloading of the windings caused to	hem to burn and short.		
76. 77. <b>Dyna</b> r	Failure locations  Windings, thermistor  Root cause of failure  Overloading of the windings caused to			
76. 77. <b>Dyna</b> r	Failure locations  Windings, thermistor  Root cause of failure  Overloading of the windings caused to	hem to burn and short.  Balance Grade		
76. 77. <b>Dynar</b> 78.	Failure locations  Windings, thermistor  Root cause of failure  Overloading of the windings caused to mic Balance Report  Rotor Weight and Balance Grade			
76. 77. <b>Dynar</b> 78.	Failure locations  Windings, thermistor  Root cause of failure  Overloading of the windings caused to mic Balance Report  Rotor Weight and Balance Grade  Rotor Weight			
76. 77. <b>Dynar</b> 78. 79.	Failure locations Windings, thermistor  Root cause of failure Overloading of the windings caused to mic Balance Report Rotor Weight and Balance Grade Rotor Weight Initial Balance Readings	Balance Grade		
76. 77. <b>Dynar</b> 78. 79.	Failure locations Windings, thermistor  Root cause of failure Overloading of the windings caused to mic Balance Report  Rotor Weight and Balance Grade  Rotor Weight  Initial Balance Readings  Drive End	Balance Grade		
76. 77. <b>Dynar</b> 78. 79.	Failure locations Windings, thermistor  Root cause of failure Overloading of the windings caused to mic Balance Report Rotor Weight and Balance Grade Rotor Weight  Initial Balance Readings Drive End  Final Balance Readings Drive End	Balance Grade  Opposite Drive End		
76. 77.  Dynar 78. 79. 80.	Failure locations Windings, thermistor  Root cause of failure Overloading of the windings caused to mic Balance Report Rotor Weight and Balance Grade Rotor Weight  Initial Balance Readings Drive End  Final Balance Readings Drive End  Technician	Balance Grade  Opposite Drive End		
76. 77.  Dynar 78. 79. 80. 81. Rewir	Failure locations Windings, thermistor  Root cause of failure Overloading of the windings caused to mic Balance Report Rotor Weight and Balance Grade Rotor Weight  Initial Balance Readings Drive End  Final Balance Readings Drive End  Technician	Balance Grade  Opposite Drive End  Opposite Drive End		
76. 77.  Dynar 78. 79. 80. 81. Rewir	Failure locations Windings, thermistor  Root cause of failure Overloading of the windings caused to mic Balance Report Rotor Weight and Balance Grade Rotor Weight  Initial Balance Readings Drive End  Final Balance Readings Drive End  Technician	Balance Grade  Opposite Drive End  Opposite Drive End		
76. 77.  Dynar 78. 79. 80. 81.  Rewir 82.	Failure locations Windings, thermistor  Root cause of failure Overloading of the windings caused to mic Balance Report Rotor Weight and Balance Grade Rotor Weight  Initial Balance Readings Drive End  Final Balance Readings Drive End  Technician Ind Core Test Results - Watts loss per Fore-Burnout	Balance Grade  Opposite Drive End  Opposite Drive End		
76. 77.  Dynar 78. 79. 80. 81.  Rewir 82.	Failure locations Windings, thermistor  Root cause of failure Overloading of the windings caused to mic Balance Report Rotor Weight and Balance Grade Rotor Weight  Initial Balance Readings Drive End  Final Balance Readings Drive End  Technician nd  Core Test Results - Watts loss per F Pre-Burnout  Core Hot Spot Test	Balance Grade  Opposite Drive End  Opposite Drive End  Pound Post Burnout		
76. 77.  Dynar 78. 79. 80. 81.  Rewir 82.	Failure locations Windings, thermistor  Root cause of failure Overloading of the windings caused to mic Balance Report Rotor Weight and Balance Grade Rotor Weight  Initial Balance Readings Drive End  Final Balance Readings Drive End  Technician Ind Core Test Results - Watts loss per Fore-Burnout	Balance Grade  Opposite Drive End  Opposite Drive End		
76. 77.  Dynar 78. 79. 80. 81.  Rewir 82.	Failure locations Windings, thermistor  Root cause of failure Overloading of the windings caused to mic Balance Report Rotor Weight and Balance Grade Rotor Weight  Initial Balance Readings Drive End  Final Balance Readings Drive End  Technician Technician Core Test Results - Watts loss per F Pre-Burnout  Core Hot Spot Test Pre-Burnout	Balance Grade  Opposite Drive End  Opposite Drive End  Pound Post Burnout  Post-Burnout		

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86	Post Rewind Winding Resistance		
00.	1-2	1-3	2-3
	1 2	1.0	2.0
87.	Post Rewind Surge Test		
88.	Post Rewind Hi-Pot		
89.	Technician		
Mecha	anical Fits- Rotor - Post Repair		
90.	Shaft Runout Post Repair		
91.	Rotor Runout Post Repair		
	Drive End Bearing Fit	Rotor Body	Opposite Drive End Bearing
00	Ossalia a Fit Olssatta Basaisa Hassi	and Depth Depth in	
92.	Coupling Fit Closest to Bearing Housi	•	400 Danies
	0 Degrees	90 Degrees	120 Degrees
93.	Coupling Fit Closest to the end of the	Shaft Post Repair	
	0 Degrees	60 Degrees	120 Degrees
		Ü	ŭ
94.	Drive End Bearing Shaft Fit Post Rep	air	
	0 Degrees	60 Degrees	120 Degrees
05	One saits Daise Ford Desaits of Obert Fit	Deat Dear-in	
95.	Opposite Drive End Bearing Shaft Fit		120 Dagger
	0 Degrees	60 Degrees	120 Degrees
96.	Shaft Air Seal Fits Post Repair		
	Drive End Air Seal	Opposite Drive End Air Seal	
	Shaft Repair Sign-off		
	anical Fits- Bearing Housings - P	•	
98.	Drive End - Endbell Bearing Fit Post F		
	0 Degrees	60 Degrees	120 Degrees
99	Opposite Drive End - Endbell Bearing	Fit Post Renair	
00.	0 Degrees	60 Degrees	120 Degrees
	0 2 0g. 000	00 20g.000	120 2 0g.000
100.	Bearing Cap Condition Post Repair		
	Drive End Bearing Cap	Opposite Drive End Bearing Cap	
101.	End Bell Air Seal Fits Post Repair	0 " 0	
	Drive End Air Seal	Opposite Drive End Air Seal	
102	DE Sleeve Bearing Inside ID Post Re	pair	
.02.	Measure 1	Measure 2	Measure 3
103.	DE Sleeve Bearing Outside ID Post R	epair	
	Measure 1	Measure 2	Measure 3
104.	DE Sleeve Bearing Inside OD Post R		
	Measure 1	Measure 2	Measure 3

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105.	105. DE Sleeve Bearing Outside OD Post Repair			
100.	Measure 1	Measure 2	Measure 3	
	Wicasure 1	Wicasure 2	Wedsure 5	
106. End Bell Repair Sign-off				
	ODE Sleeve Bearing Inside ID Post R	epair		
	Measure 1	Measure 2	Measure 3	
108.	ODE Sleeve Bearing Outside ID Post	Repair		
	Measure 1	Measure 2	Measure 3	
109.	ODE Sleeve Bearing Inside OD Post I	•		
	Measure 1	Measure 2	Measure 3	
110	ODE Sleeve Bearing Outside OD Pos	t Panair		
110.	Measure 1	Measure 2	Measure 3	
	ivieasure i	ivieasure 2	ivieasure 3	
Assen	nbly			
	QC Check All Parts for Cleanliness Pr	ior to Assembly		
	Photograph All Major Components pri	•		
	Final Insulation Resistance Test	,		
114.	Assembled Shaft Endplay			
	Assembled Shaft Runout			
116.	Test Run Voltage			
	Volts	Volts	Volts	
117.	Test Run Amperage			
	Amps	Amps	Amps	
118.	Drive End Vibration Readings - Inches			
	Horizontal	Vertical	Axial	
110	Opposite Drive End Vibration Reading	s - Inches Per Second		
110.	Horizontal	Vertical	Axial	
	Tonzontal	vortioal	, with	
120.	Ambient Temperature - Fahrenheit			
121.	Drive End Bearing Temps - Fahrenhei	it		
	5 Minutes	10 Minutes	15 Minutes	
122.	Drive End Bearing Temps - Fahrenhei			
	20 Minutes	25 Minutes	30 Minutes	
400	Drive Ford Decrine T	A OF AF Minutes		
123.	Drive End Bearing Temps - Fahrenhei		4-10	
	35 Minutes	40 Minutes	45 Minutes	
12/	Drive End Bearing Temps - Fahrenhei	t 50-60 Minutes		
124.	50 Minutes	55 Minutes	60 Minutes	
	JO MINIMO	O Milliatoo	OU MINIMO	

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125. Opposite Drive End Bearing Temps - Fahrenheit			
	5 Minutes	10 Minutes	15 Minutes
126.	Opposite Drive End Bearing Temps - I	Fahrenheit 20-30 Minutes	
	20 Minutes	25 Minutes	30 Minutes
127.	Opposite Drive End Bearing Temps - I	Fahrenheit 35-45 Minutes	
	35 Minutes	40 Minutes	45 Minutes
128.	Opposite Drive End Bearing Temps - I		
	50 Minutes	55 Minutes	60 Minutes
400	Otatan Tanan anatumaa Falanan hait		
129.	Stator Temperatures- Fahrenheit		
	5 Minutes	10 Minutes	15 Minutes
130.	Stator Temperatures- Fahrenheit 20-3	0 Minutes	
	20 Minutes	25 Minutes	30 Minutes
131.	Stator Temperatures- Fahrenheit 35-4	5 Minutes	
	35 Minutes	40 Minutes	45 Minutes
132.	Stator Temperatures- Fahrenheit 50-6		
	50 Minutes	55 Minutes	60 Minutes
	Document Final Condition with Picture	es after paint	
134.	Final Pics and QC Review		



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- 1. APPLICABILITY. The sale of any and all goods and/or services by Mock, Inc. d/b/a Hi-Speed Industrial Service ("Hi-Speed") shall be specifically conditioned upon and subject to the following terms and conditions which are incorporated by reference into any contracts and purchase orders with Hi-Speed, and which shall form and become a part of any agreement related thereto. Buyer's acceptance of any offer or quotation made by Hi-Speed for sale of any goods or services is expressly made subject to the terms and conditions set forth herein and to be so effective, Buyer need not sign or approve these Terms and Conditions to be bound hereunder provided a copy of same is provided to Buyer through any means. None of the terms and conditions contained herein may be added to, expanded, changed, modified, superseded or otherwise altered except as revised in writing and duly executed by Hi-Speed, and all orders received by Hi-Speed shall be governed only by the terms and conditions contained herein, notwithstanding any terms, conditions or provisions of any purchase order, release order, authorization or any other form issued by the Buyer. Hi-Speed hereby objects to any additional, modified, changed, deleted, altered or other terms and conditions not contained herein and notifies Buyer that any such terms or provisions are expressly rejected by Hi-Speed.
- 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.