DATASYST
Engineering & Testing Services, Inc.
S14 W33511 Highway 18 • Delafield, WI 53018 • 262 968-4003 • Fax: 262 968-3050 • 800 969-4050

Document Name:	**A86-15921-R2_RPT Revision A**
Document Description:	Formal Report for Testing Under DATASYST Project Number A86-15921-R2

Document Prepared For:	**Document Prepared By:**
Jack Conway Advanced Equine Products 544 Western Rhodes Drive Highland, NC 28741	Keil Trettin DATASYST Engineering & Testing Services, Inc. S14 W3511 Hwy 18 Delafield, WI 53018

Testing Start Date	Testing End Date	Document Date
November 1, 2013	November 4, 2013	January 9, 2014

Description of Unit(s) Under Test (UUT)		
Unit Name	**Unit Model Number**	**Unit Serial or Sample Number(s)**
Horseshoes	Various Models	15 Samples Total

Document Outline		
Report Section	**Section Description**	**Test Result**
1.0	Equipment List	N/A
2.0	Peak Impact Force Testing	See Section 2.3

Report Section	Section Description	Sample(s) Exposed
1.0	Equipment List	All

Section	List of Equipment Used for All Testing Described in Report Document			DATASYST Project	
1.1				A86-15921-R2	
Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Calibration**	
				Last	**Due**
Vibration Controller	Dactron	Laser PCI	5883226	26-Jun-2013	26-Jun-2014
Data Acquisition	Somat	eDaq Low Lev	2046	14-Sep-2011	15-Dec-2013
Accelerometer	PCB	357B03	22441	15-Oct-2012	7-Jan-2014
Accelerometer	PCB	352C22	107521	11-Jan-2013	25-Mar-2014
Signal Conditioner	PCB	482A17	433	28-Dec-2012	23-Jan-2015
Load Cell	Lebow	3144-5k	100550A	21-Jun-2012	26-Aug-2014
Decade Box	General Radio	1432-P	20915	21-Jan-2013	9-Jul-2016

Certificates and reports of all calibrations are retained in the DATASYST Engineering & Testing Services, Inc. files and are available for inspection upon request.

Report Section	Section Description	Sample(s) Exposed
2.0	Peak Impact Force Testing	All 15

2.1 Procedure

Advanced Equine provided 15 different horse shoe samples for the purpose of impact testing. Each sample was a different type and some samples were designed to be tested together. The main objective was to determine the reduction in peak impact force for each shoe type. The impact energy was held constant throughout testing. The impact energy was not based on field data, but rather the full scale of the force transducer.

The test was performed using a weighted pendulum. At the base of the pendulum was a flat block made of solid oak. The pendulum was pulled back to a pre-defined height for each impact. When released, the pendulum would strike a second stationary piece of solid oak in the shape of a horse hoof at the bottom of the swing arc. The oak hoof was attached to a load transducer which was used to measure the peak force and the impact pulse. Data from the load transducer was being collected at 10,000 Hz. Three different size hoofs were made to properly fit each shoe type. The shoes were fitted onto the appropriate oak hoof and the pendulum was pulled back and released three times while the impact force was being recorded.

2.2 Results

Before testing began, the peak force and impact pulse of each bare oak hoof against the flat block was recorded. These values were used as a baseline for comparing the different shoe types. A total of three impacts were performed for each shoe type, the average peak impact force was then compared with the average peak force of the bare oak hoof. The percentage in reduction of peak force was then calculated. The data for all samples can be found in Table 2.3.1 in the following section.

The lowest reduction in force was sample 2 with a 14.25% force reduction. The best reduction in force was sample 8 with a 68.53% reduction in peak impact force.

2.3 Data

Impact Force Results for Horse Shoe Samples						
Sample	Hoof Used	Impact Force (lbs)				% Force Reduction
		Impact 1	Impact 2	Impact 3	Average	
Hoof A (Bare)	A	3077	3049	3070	3065	0.00
Hoof B (Bare)	B	2919	3019	2965	2968	0.00
Hoof C (Bare)	C	2509	2621	2573	2568	0.00
1: Steel Horse Shoe	C	2167	2209	2214	2197	14.45
2: Aluminum Horse Shoe	C	2190	2211	2204	2202	14.25
3a: Test Material	A	1448	1815	1837	1700	44.54
3b: Easy Slipper (Closed Bottom)	A	1485	1749	1745	1660	45.86
4a: Test Material	B	2111	2118	2147	2125	28.38
4b: Easy Slipper (Open Bottom)	B	2205	2175	2205	2195	26.04
5: Easy Slipper (Rocker)	B	2158	2154	2153	2155	27.38
6: Easy Boot	A	2207	2207	2214	2209	27.93
7: Easy Boot Cuff	A	2215	2201	2204	2207	28.01
8: Soft Ride	C	784	821	819	808	68.53
8&1: Soft Ride with Insert	C	689	677	685	684	73.37
9&1: Steel Horse Shoe with Easy Slipper Rim Pad	C	1980	1986	1984	1983	22.76
13: Cavallo Boot	B	2392	2340	2341	2358	20.55
13&10: Cavallo Boot with Insert	B	2211	2228	2216	2218	25.25
15: Renegade Glue On	B	2460	2458	2467	2462	17.05
16: No Anvil Shoe	C	2049	2039	2048	2045	20.34

Table 2.3.1: Test Data for Impacting on All Samples

Conclusion: Easy Slipper Closed Bottom provides more reduction in force (Shock Absorption & Vibration Dissipation) than any samples tested. 222% better than an Aluminum Shoe, 221% better than a Steel Shoe, 169% better than a Renegage Glue On, 121% better than a Cavallo Boot, 81% better than a Cavallo Boot with insert, 64% better than Easy Boot,64% better than Easy Boot Cuff.

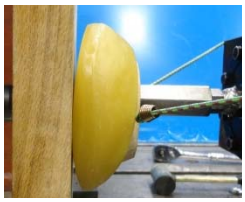
 **Sample 1: Steel Horse Shoe**	 **Sample 2 A: Aluminum Horse Shoe**	 **Sample 3a: Test Material**
 **Sample 3b: Easy Slipper (Closed Bottom)**	 **Sample 4a: Test Material**	 **Sample 4b: Easy Slipper (Open Bottom)**
 **Sample 5: Easy Slipper (Rocker)**	 **Sample 6: Easy Boot**	 **Sample 7: Easy Boot Cuff**
 **Sample 8: Soft Ride**	 **Sample 8&1: Soft Ride with Insert**	 **Sample 9&1: Steel Horse Shoe with Easy Slipper Rim Pad**
 **Sample 13: Cavallo Boot**	 **Sample 13&10: Cavallo Boot with Insert**	 **Sample 15: Renegade Glue On**
	 **Sample 16: No Anvil Shoe**	

Table 2.3.2: Sample Identification

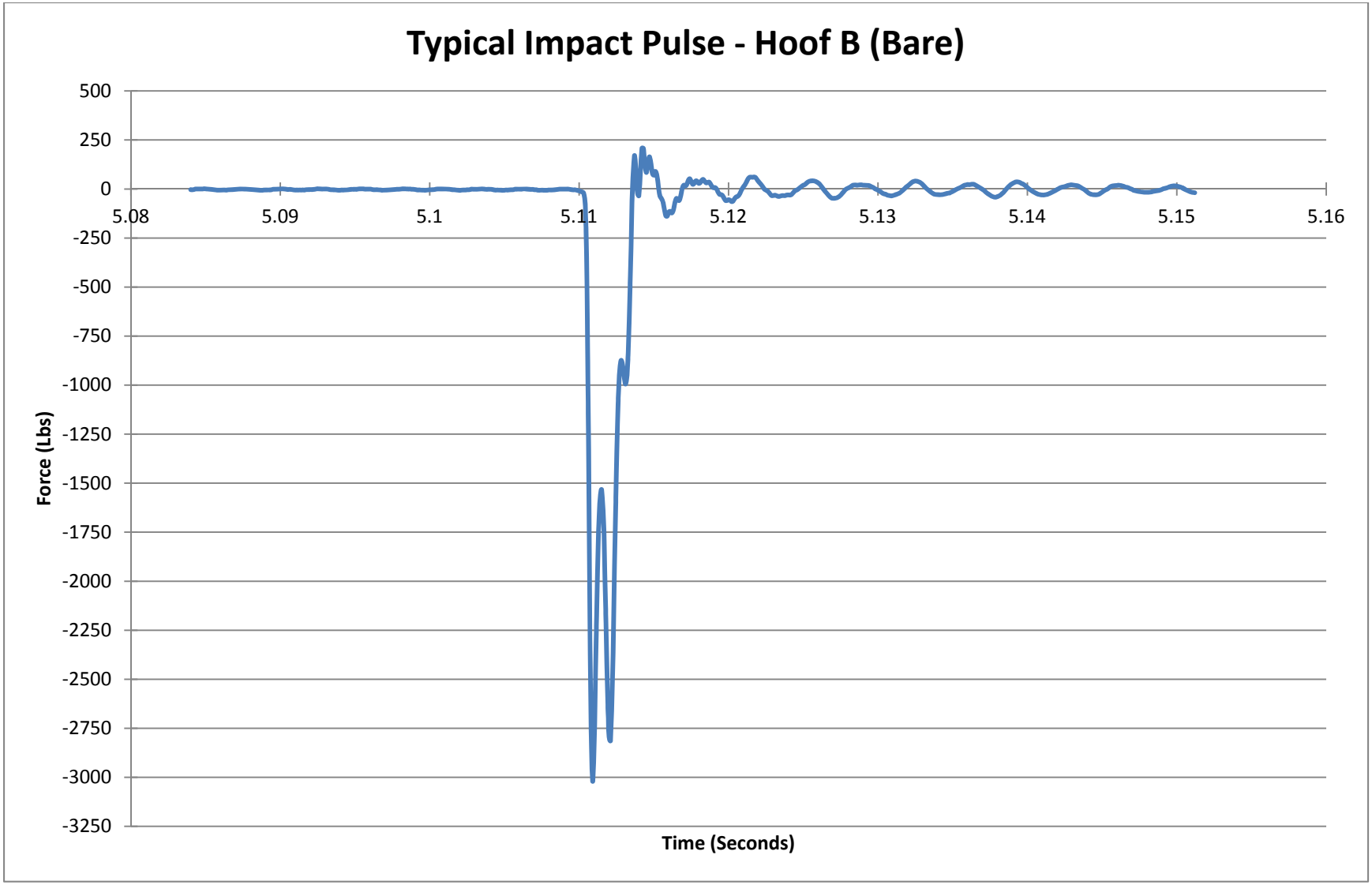


Figure 2.3.4: Typical Bare Hoof Impact Pulse

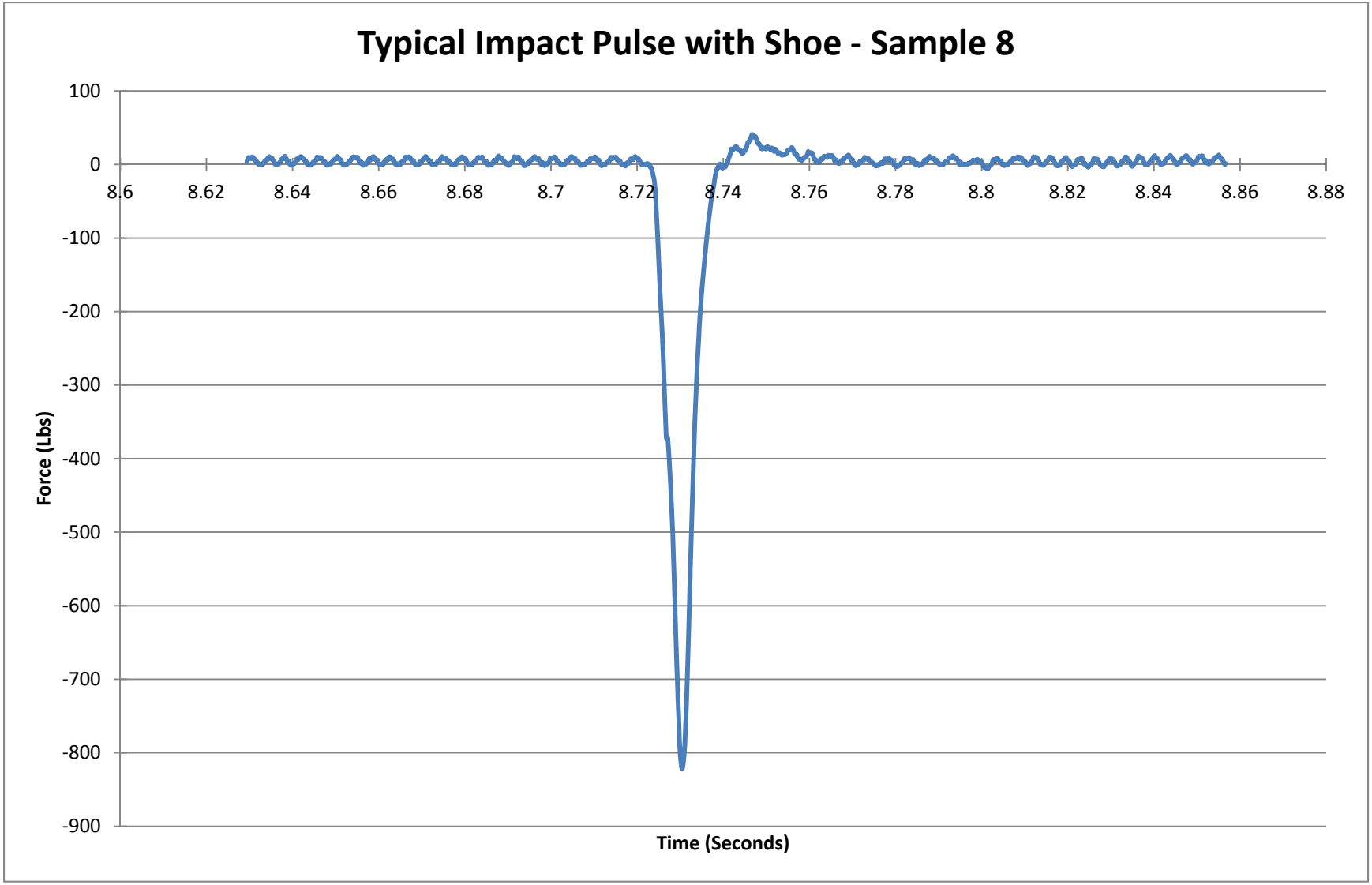
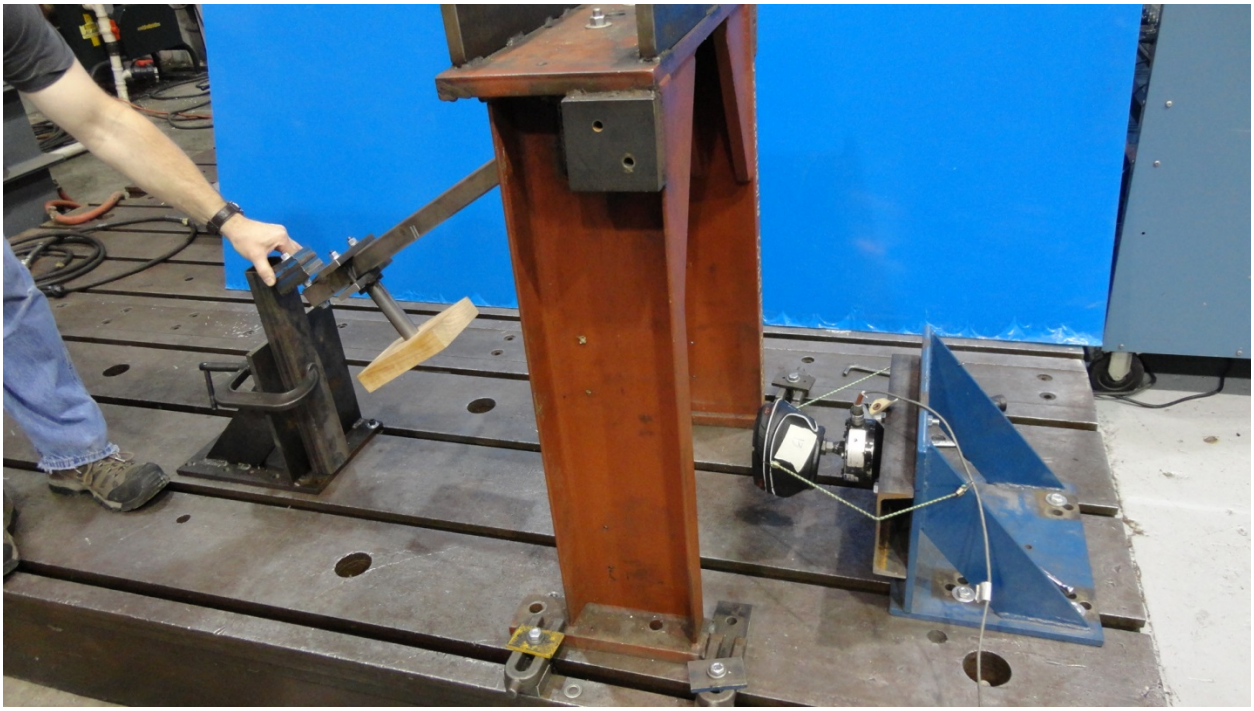
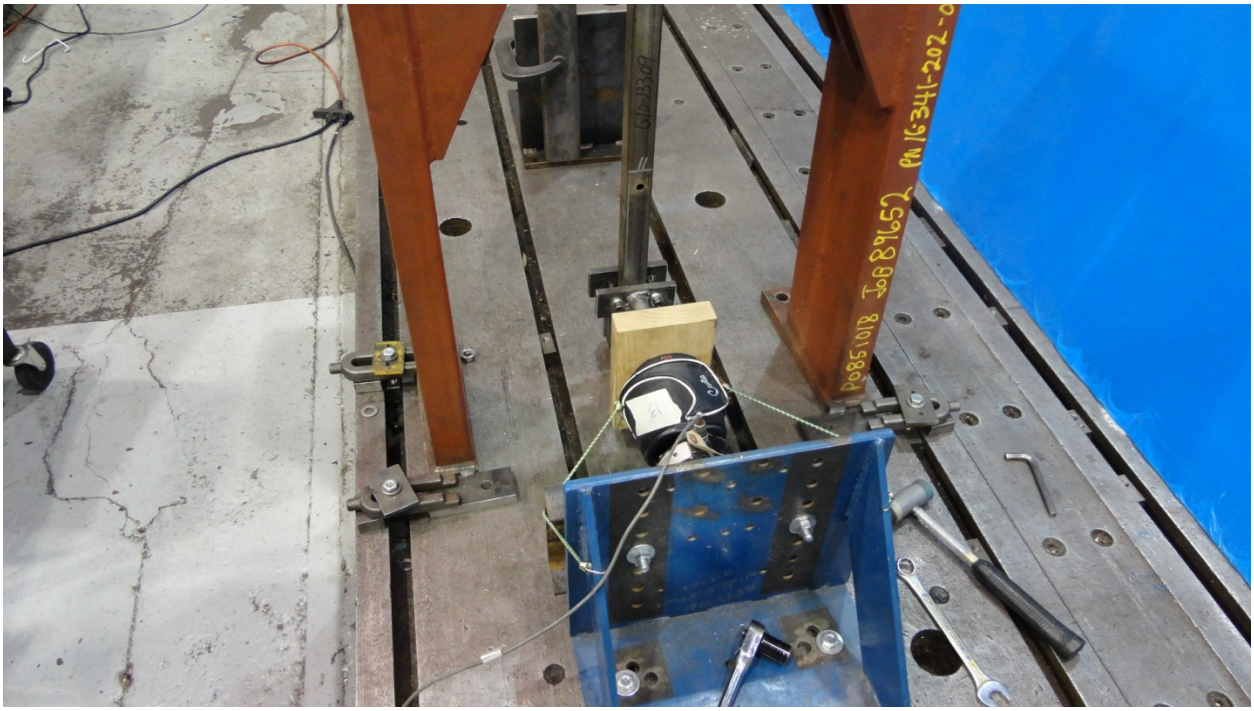


Figure 2.3.3: Typical Horse Shoe Impact Pulse

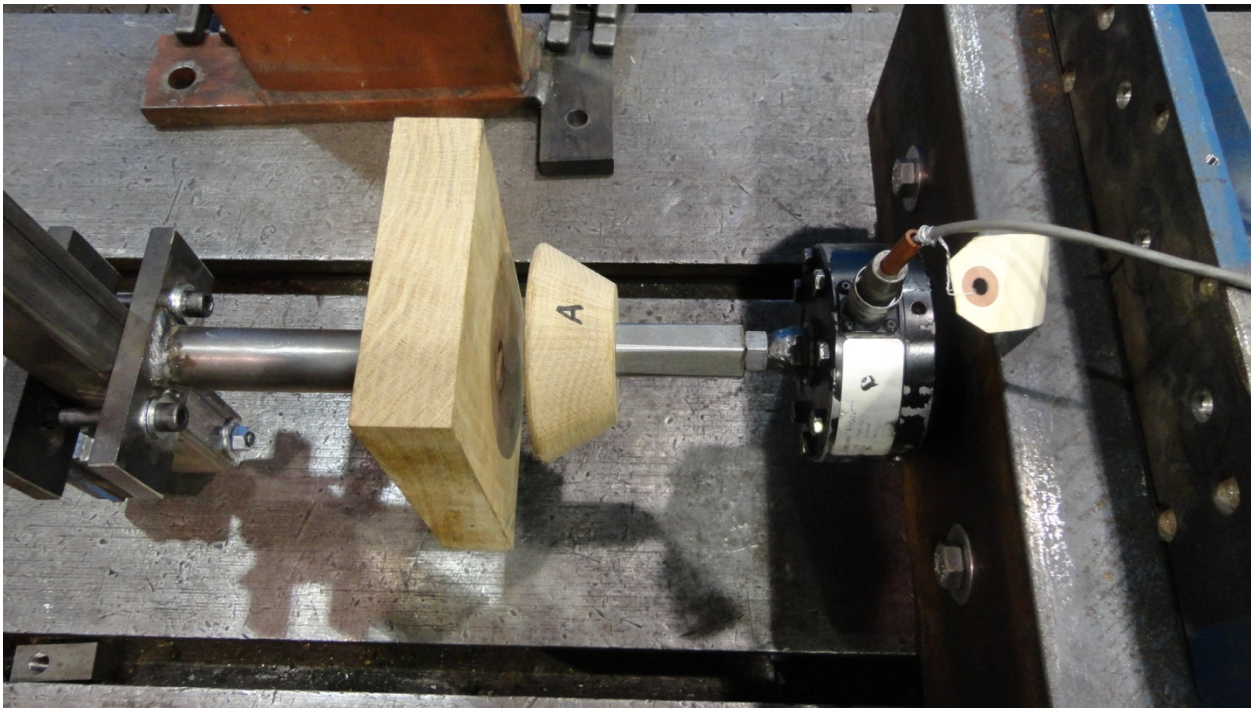
2.4 Photographs



Photograph 2.4.1: Impact Test Setup – Starting Position



Photograph 2.4.2: Impact Test Setup – Impact Position



Photograph 2.4.3: Bare Hoof (A) with Flat Impact Block and Load Transducer