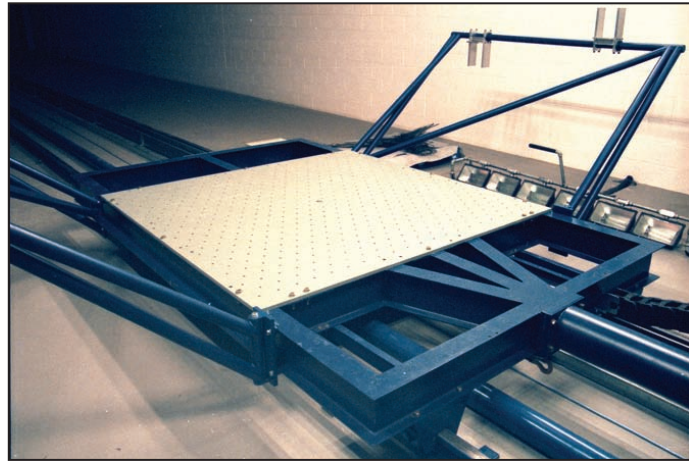


DECELERATOR SLED SYSTEMS





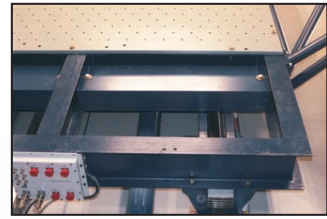
Sled

The sled is designed to accommodate high payload weights and a variety of test fixtures, yet it is easily rolled by hand. An optional rotatable plate can be attached to allow test articles to be mounted at different yaw angles. Data acquisition system and accelerometers are mounted below the sled top surface for protection and convenience.



Camera Outriggers

Outriggers allow attachment of optional camera equipment to the sled. The outriggers also feature a swing-out design to allow better access to payload on the sled.



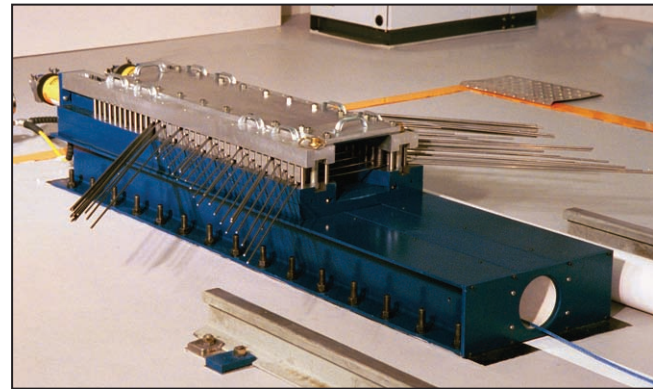
Sled Ballast

Weight can be added or subtracted from the sled to maintain a desired constant sled weight.



Pneumatic Accelerator

The system uses pressurized air to propel the sled to desired velocities. Accuracy within 0.5% and repeatability within 0.25% are typical, and no civil work is required for installation. Firing pressure is remotely monitored and automatically maintained.



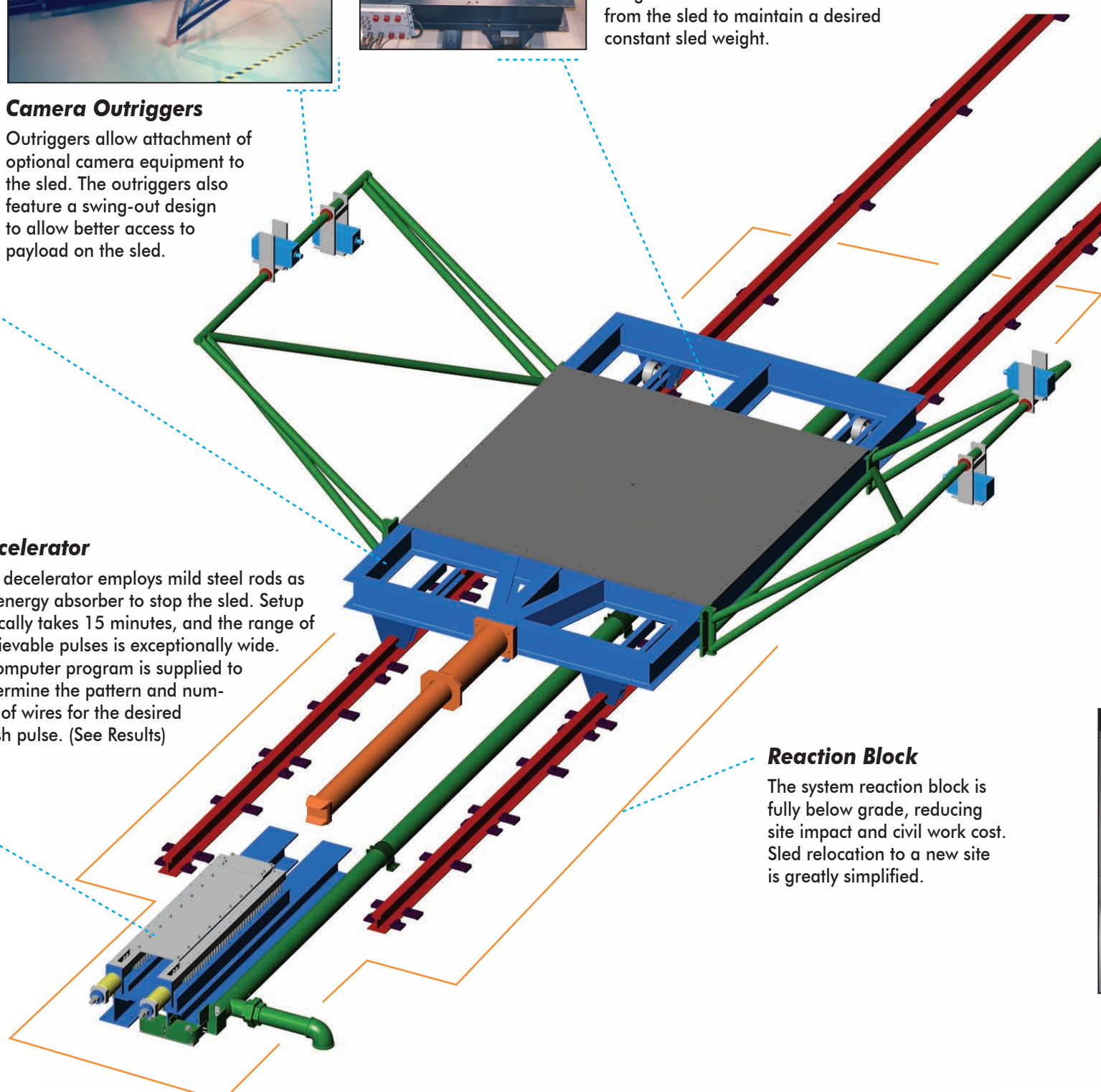
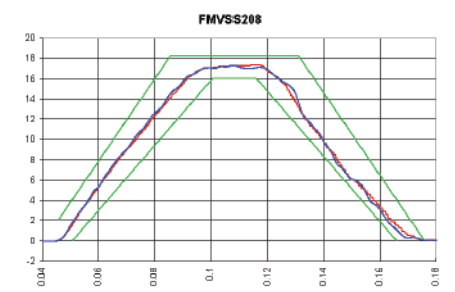
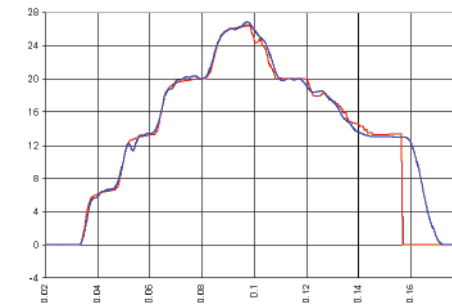
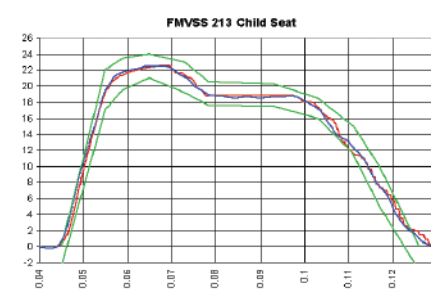
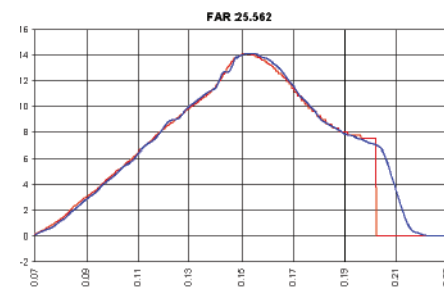
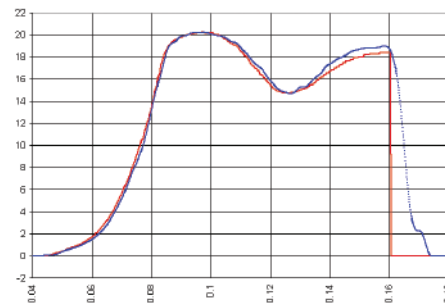
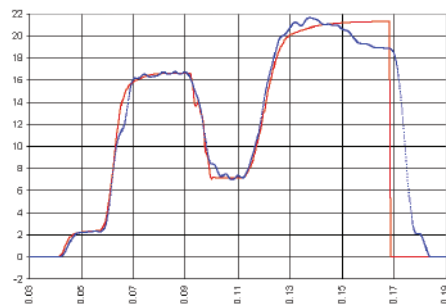
Decelerator

The decelerator employs mild steel rods as an energy absorber to stop the sled. Setup typically takes 15 minutes, and the range of achievable pulses is exceptionally wide. A computer program is supplied to determine the pattern and number of wires for the desired crash pulse. (See Results)

Results

The charts below show the correlation between the pulse predicted by the Seattle Safety wire pattern program and actual pulses acquired in test. The predictability, accuracy, repeatability, and flexibility of our pulses rank the Seattle Safety system among the best at any price, accelerator or decelerator type.

— Prediction — Sled Accelerometer



Reaction Block

The system reaction block is fully below grade, reducing site impact and civil work cost. Sled relocation to a new site is greatly simplified.

Lighting Systems

Seattle Safety manufactures overhead lights, portable floor lights, and portable adjustable-height lights for impact zone illumination. We build both traditional incandescent tungsten-halogen and modern flicker-free metal-halide systems.



Specifications for Seattle Safety Manufactured Equipment

The Seattle Safety decelerator sled system is available in six basic versions. Other sizes and capacities can be produced as a custom order. Seattle Safety provides the equipment described below along with on-site installation and training.

System Model	Peak Force	Stroke	Peak g-Force	Max. Energy	Max. Velocity	Max. Payload	Std. Sled Size
D1000-3.7	1000 kN 225,000 lb	1.9 m 74 in.	115 g	340 kN-m 250,000 ft-lb	100 kph 62 mph	4000 kg 8800 lb	2.2 m x 3.7 m 86 in. x 144 in.
D1000-3.0	1000 kN 225,000 lb	1.9 m 74 in.	187 g	340 kN-m 250,000 ft-lb	127 kph 79 mph	4000 kg 8800 lb	1.5 m x 3.0 m 60 in. x 118 in.
D780-3.7	780 kN 175,000 lb	1.9 m 74 in.	90 g	285 kN-m 210,000 ft-lb	91 kph 57 mph	4000 kg 8800 lb	2.2 m x 3.7 m 86 in. x 144 in.
D780-3.0	780 kN 175,000 lb	1.9 m 74 in.	146 g	285 kN-m 210,000 ft-lb	116 kph 72 mph	4000 kg 8800 lb	1.5 m x 3.0 m 60 in. x 118 in.
D400-3.0	400 kN 90,000 lb	1.6 m 63 in.	82 g	147 kN-m 108,000 ft-lb	87 kph 54 mph	2000 kg 4400 lb	1.5 m x 3.0 m 60 in. x 118 in.
D400-2.5	400 kN 90,000 lb	1.6 m 63 in.	120 g	147 kN-m 108,000 ft-lb	105 kph 65 mph	2000 kg 4400 lb	1.25 m x 2.5 m 47 in. x 98 in.

Decelerator – Mounts to submerged reaction block flush with adjacent floor. Double pulse capable. Highly accurate and flexible wire pattern software included.

Pneumatic Accelerator – Low, near-constant acceleration, typically 0.2–0.4 g with 0-g coast. Variable lengths to suit customers' needs. No civil work typically required.

Sled – Payload attaches directly to sled or to interchangeable, rotatable yaw plate with customer-specified hole pattern.

Track – Variable lengths made to suit customers' needs. 117–189 ft (36–58 m) to date. No civil work required.

Firing – Control valving, gauging, and safety interlock firing switches provided.

Photographic Floodlights – Lighting systems range in capacity from 0.4–200 kW. Types include overhead suspended banks, low-profile portable floor units, adjustable-height portable units, film pit lights, and onboard lights. Also available are computer control and power actuation of overhead suspended banks and integrated time zero strobes.

Camera Outriggers – Hinge-mounted camera outriggers have low profiles and allow easy sled access.

Test Article Fixturing – Established design and manufacturing capability of a wide variety of innovative and convenient customized test article fixturing.

OEM and System Integration

Carefully selected data acquisition, photometric, transducer, and dummy equipment is provided with the systems at competitive prices. OEM equipment includes integration, setup, and training.

Data Acquisition – Onboard cordless data acquisition systems are expandable in 8-channel blocks and are SAE J211 compliant. Includes installation on sled, triggering, and full integration.

High-Speed Video – A range of high-speed video solutions for both high-g and off sled. Digitization software, SAE J211 compliance, triggering, and integration are available.

Transducers – SAE J211 compliant dummy transducers, sled accelerometers, string pots, and test fixture load cells. Connectors and integration into Seattle Safety supplied data acquisition provided. Installation included.

Dummies – Fully compliant test dummies are available. Installation of Seattle Safety OEM transducers included.

Triggering – A highly reliable triggering system with either Seattle Safety supplied data acquisition or high-speed video.

Software Integration – Seattle Safety is experienced in complete control of sleds, lights, data acquisition, cameras, and other equipment, as well as post-test automated test report generation and analysis using Diadem.

ServoSled Catapult Sled Systems

Our ServoSled reverse-acceleration catapult-type sled systems represent the top of the Seattle Safety product line. Revolutionary friction braking pulse control and other design innovations give the ServoSled system superior pulse accuracy, repeatability, and frequency response. The ServoSled system has "inherent" negative-g pulse capability due to the friction servobrake acting directly against the sled, allowing the baseline system to perform negative-g and side-impact pulses. Pulse tuning is typically completed within one to three test runs for even complex high-frequency pulses. With optional side-impact and payload pitching systems, the ServoSled system provides unsurpassed performance and functionality.

Warranty and Support

Seattle Safety provides a one-year limited warranty. Customization to user needs is our policy.