

IMPACT RECOVERY SYSTEMS  
 PED-IN-A-BAG™ CRASH TEST REPORT  
 MARCH 2012

Product Tested

Product tested was a standard Ped-in-a-Bag™ Pedestrian sign, 12” x 36” with a standard yellow 110 spring assembly. Base used was a 20 pound lightweight portable. Sample is representative of a standard production model, although sheeting applied was obsolete but deemed to have no impact on crash testing mechanical results.



Design

Product is designed as a temporary sign for hourly use in crosswalks in low speed (20mph) areas. It is of a lightweight design for portability. Although the sign system retains Impact Recovery System’s spring rebound system and plastic construction, it is not intended as a replacement to our line of In-Street Pedestrian signs in terms of durability and impactability. Studies have shown signs of this type greatly increase driver awareness and incidence of yielding to pedestrians.

Testing

The product was struck a total of 30 times using a small pickup truck. Speeds ranged from 10 to 25 mph, though vehicle strikes over 20 mph are deemed as extreme to design criteria. Average speed was 19.33 mph. Both bumper hits and wheel strikes were performed, and one off angle (45°) strike was included.

Data

Speed (mph)	Bumper	Wheel	Total
10	1	0	1
15	5	2	7
20	10	7	17
25	5	0	5
Total			30

Below is a representation of a 20 mph bumper strike:



### Results

Initial testing through 14 impacts was at or below design criterion. The sign exhibited the expected results, giving upon impact and returning upright. Several times re-positioning of the base was required to continue.



Figure 1 - Through 14 Impacts



Figure 2 - Through 18 Impacts

Impacts 15-18 were more extreme, including one 25 mph strike and an off-angle strike. Damage to the lower portion of the sign can be seen in Figure 2. The spring mechanism and base are fully functional, however.

Final testing was intended to produce a failure of the product to determine failure modes. Strikes above 20 mph induced base drag beneath the vehicle. Also, previous damage to the lower sheeting was exacerbated.

Final failure was caused by a catching of the base under the bottom of the vehicle. Although the sign would continue to serve its purpose, it would no longer behave as intended upon impact. Spring and post mechanisms were intact.



Figure 3 - Tested to Failure Mode

### Conclusions

Exact ratings of reboundable sign systems is an inexact science at best, as each impact is unique in velocity, angle, vehicle type, and the randomness of each event. However a feel for expected capabilities on the whole (not for an individual sign) can be estimated based on this testing as well as on decades of experience with our product.

This product, though lightweight and intended for temporary use, can be expected to average dozens of vehicle strikes at low speeds, in the 10-15 mph range. Vehicle impacts 20 to 25 mph would decrease the expected average life of the product to the 10-20 range. Extreme impacts beyond that or at off angles (greater than approximately 10°) can induce immediate failure of this sign system. It is important to understand, therefore, the expected use of this product as one belonging in a fairly controlled, low-speed school crossing or event application.