



March 3, 2008

In Reply Refer To: HSSD/CC-65D

Mr. Felipe Almanza  
Technical Engineering Director  
Mr. Jan D. Miller  
Business Development Manager  
TraFFix Devices, Inc.  
220 Calle Pinteroesco  
San Clemente, CA 92672

Dear Messrs. Almanza and Miller:

Thank you for your letter of August 2, 2007, requesting Federal Highway Administration (FHWA) acceptance of your company's Test Level 2 (TL-2) Scorpion Trailer Attenuator (TA) for use on the National Highway System (NHS) based on prior testing of other Scorpion Attenuators. Accompanying your letter were reports of crash testing conducted by KARCO Engineering and DVD video of those earlier tests of the TL-2 Scorpion Truck Mounted Attenuator (TMA) and the TL-3 Scorpion TA. You requested that we find the Scorpion TL-2 TA acceptable for use on the NHS under the provisions of National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features." In a January 21, 2008, e-mail message to Mr. Nicholas Artimovich of my staff you agreed to the conditional acceptance conditions noted below.

### **Introduction**

The FHWA guidance on crash testing of roadside safety hardware is contained in a memorandum dated July 25, 1997, titled "INFORMATION: Identifying Acceptable Highway Safety Features."

A brief description of the device follows:

The TL-2 TA design is shown in the enclosure and consists of a 255-kg (562-pound) cartridge section consisting of aluminum honeycomb inside three separate aluminum boxes. These three energy-absorbing units are supported by and within a 114-mm (4.5-inch) diameter tubular aluminum frame. This design is 3800 mm (149 5/8 inches) long and its total weight, including the mounting hardware is 629 kg (1386 pounds).

Two modifications were made to the Scorpion TL-2 TMA to produce the TL-2 TA design: (1) a rear mounted axle with tire assembly attached to a steel diaphragm at the rear cartridge, and (2) the steel tongue section that provides the trailer attachment point which incorporates an

anti-rotation feature that is activated in the event of an impact. These modifications are displayed in the enclosed drawings and are identical to the modifications made to the TL-3 TMA when a trailer version was made of that TMA. When impacted, the steel tongue is specifically designed to prevent the Attenuator Trailer from rotating about the pintle hook and the rear of the host vehicle by engaging the Telescoping Anti-Rotation System (TARS). The TARS must be aligned with the frame plate of the host vehicle to engage the anti-rotational arms and its bumper must be able to resist the anticipated TL-3 design impact loads to ensure optimal attenuator crash performance.

### **Testing**

No separate testing was done on the Scorpion TL-2 TA. Rather, you rely on prior testing of the TL-2 TMA and TL-3 TA.

The NCHRP Report 350 Tests 2-50 and 2-51 (head-on 820C and 2000P, respectively) were conducted on the Scorpion TL-2 TMA and documented in FHWA acceptance letter CC-65 dated July 14, 2000. The TL-3 TMA was also documented in this letter.

The NCHRP Report 350 Tests 3-50, 3-51, 3-52, and 3-53 (head on, angle, and offset impacts) were conducted on the TL-3 TA and documented in FHWA acceptance letter CC-65B dated March 16, 2007.

You contend that the TL-2 TMA tests prove the concept that the short Scorpion can decelerate the impacting vehicle while meeting NCHRP Report 350 evaluation criteria, and that the TL-3 tests prove that the addition of the wheel assembly and the anti-rotation connection do not compromise the performance of the device.

While we are usually open to accepting variations to tested safety hardware based on “worst-case scenario” analysis, we find that TMA trailers may not be as “predictable” as some other devices. We concur that prior testing of the Scorpion attenuators noted above tend to indicate that the TL-2 trailer will perform in an acceptable manner, and grant conditional acceptance for use on the NHS. You shall monitor the in-service performance of TL-2 TA units sold, and report on their performance in two years time (including impacts during 2008 and 2009). At that time FHWA will reassess our conditional acceptance.

### **Findings**

The results of prior testing met the FHWA requirements and we concur that they indicate likely acceptable performance of the TL-2 TA. Therefore, the Scorpion TL-2 TA described above and illustrated in the enclosed drawing is acceptable for use on the NHS under the range of conditions that other Scorpion attenuators were tested, when permitted by the highway agency, subject to our condition regarding a two-year in-service performance evaluation.

Please note the following standard provisions that apply to the FHWA letters of acceptance:

- Our acceptance is limited to the crashworthiness characteristics of the devices and does not cover their structural features, nor conformity with the Manual on Uniform Traffic

## Control Devices.

- Any changes that may adversely influence the crashworthiness of the device will require a new acceptance letter.
- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals unacceptable safety problems, or that the device being marketed is significantly different from the version that was crash tested, it reserves the right to modify or revoke its acceptance.
- You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.
- You will be expected to certify to potential users that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for acceptance, and that they will meet the crashworthiness requirements of the FHWA and the NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance, designated as number CC-65D, shall not be reproduced except in full. This letter and the test documentation upon which this letter is based are public information. All such letters and documentation may be reviewed at our office upon request.
- Scorpion attenuators are patented products and are considered "proprietary". The use of proprietary devices *specified by a highway agency* for use on a Federal-aid project must meet one of the following criteria: (a) it must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that it is essential for synchronization with existing highway facilities or that no equally suitable alternative exists; or (c) it must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411.
- This acceptance letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented device for which the applicant is not the patent holder. The acceptance letter is limited to the crashworthiness characteristics of the candidate device, and the FHWA is neither prepared nor required to become involved in issues concerning patent law. Patent issues, if any, are to be resolved by the applicant.

Sincerely yours,

David A. Nicol, P.E.  
Director, Office of Safety Design  
Office of Safety

Enclosures

FHWA:HSSD:NArtimovich:tb:x61331:2/13/08

File: s://directory folder/nartimovich/CC65D-TrafFixTL2ScorpionCONDITIONALFin.doc

cc: HSSD (Reader, HSA; Chron File, HSSD; N.Artimovich, HSSD;  
MBloschock, HSSD; M.McDonough, HSSD)



U.S. Department  
of Transportation  
**Federal Highway  
Administration**

1200 New Jersey Avenue, SE.  
Washington, DC 20590

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Sincerely yours,

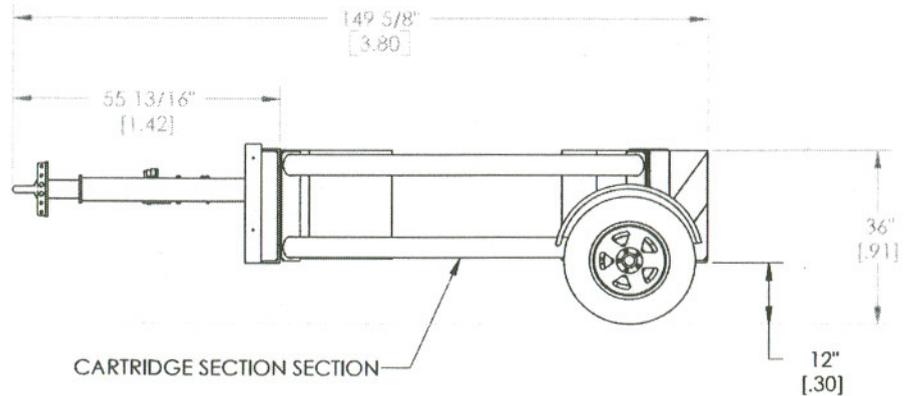
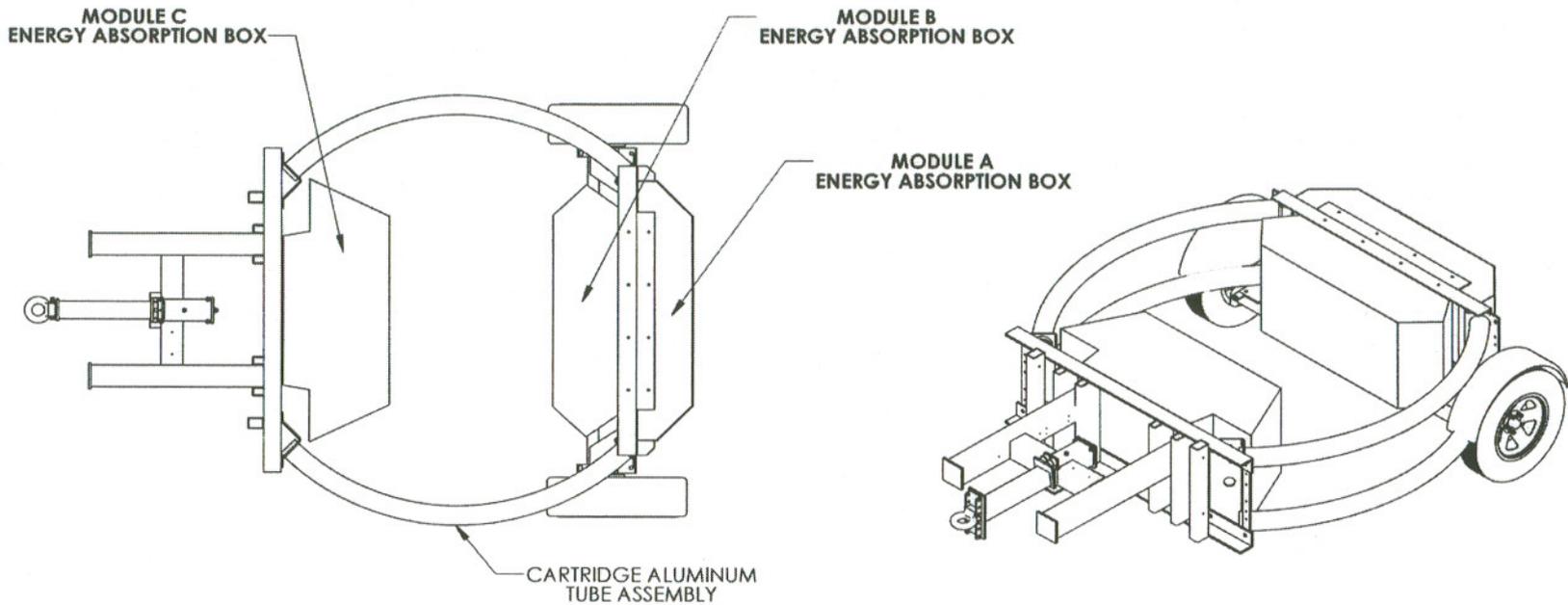


for

David A. Nicol, P.E.  
Director, Office of Safety Design  
Office of Safety

Enclosures

8 7 6 5 4 3 2 1



1. DIMENSIONS: INCHES [METERS]  
UNLESS OTHERWISE SPECIFIED:

8 7 6 5 4 3 2 1

**Traffix Devices Inc.** 

220 Calle Pintoresco  
San Clemente, CA 92672  
(949) 361-5053  
FAX (949) 361-8205  
www.traffixdevices.com

TITLE:  
**TRAFFIX DEVICES SCORPION  
TRAILER ATTENUATOR TL-2**

DRAWN BY:	DATE:	SIZE	DWG. NO.	REV
CHECKED BY:	7-23-07	<b>B</b>	<b>915</b>	-
APPROVED BY:	DATE:			

SHEET 1 OF 1