



US Department  
of Transportation  
**Federal Highway  
Administration**

400 Seventh St., S.W.  
Washington, D.C. 20590

Refer To: HSA-CC65

JUL 14 2000

Mr. Dave Gertz  
Director of Engineering  
TraFFix Devices, Inc.  
220 Calle Pintoresco  
San Clemente, CA 92672

Dear Mr. Gertz:

Mr. Richard Powers of my staff has received your April 20 letter and your June 6 follow-up which included additional test reports and other information on your Scorpion 10,000 truck-mounted attenuator (TMA). In your June 21 letter you sent corrected pages for incorporation into the original test reports. You requested that the basic design (cartridge section) be accepted for use as a National Cooperative Highway Research Program (NCHRP) Report 350 device at test level 2 (TL-2) and that an extended design (strut and cartridge sections) be accepted at Report 350 test level 3 (TL-3). To support your request, you also submitted six test reports prepared by the KARCO Engineering Automotive Research Center in Adelanto, California. Two of these test reports covered NCHRP Report 350 tests 2-50 and 2-51 for TL-2 certification. The other four covered tests 3-50 and 3-51 plus optional tests 3-52 and 3-53 for TL-3 certification. Summary sheets for each of these six tests are shown in Enclosure 1. In each test, the support vehicle was a 9000 kg (19,842 pound) dump truck. Maximum reported roll-ahead of the support truck was 5.56 m (18.2 feet) in test 3-51.

The TL-2 design, called the Scorpion A 10,000 and shown in Enclosure 2, consists of 64-kg (141-pound) mounting hardware, a 310-kg (683-pound) steel back-up structure (Enclosure 2A) and a 255-g (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 2060-mm (81-inches) long and its total weight, including the mounting hardware is 629 kg (1386 pounds).

The TL-3 design, called the Scorpion C 10,000 and shown in Enclosure 3, adds a 1500-mm (59-inches) long crushable aluminum strut section between a back-up structure and the cartridge assembly used by itself in the TL-2 design. The strut weighs 249 kg (549 pounds). The total length of the TL-3 design is 3560-mm (140-inches) and it weighs 632 kg (1393 pounds), including mounting hardware weighing 64 kg (141 pounds) and a back up plate that also weighed 64 kg (141 pounds). The backup plate used in the TL-3 tests was different from the one used in the TL-2 test series and is shown in Enclosure 3A.


Both units are 2440-mm (96-inches) wide, 635-mm (25-inches) deep, and have a ground clearance of approximately 305-mm (12 inches) when lowered to their operating positions. Telephone conversations between you and Mr. Powers of my staff indicated that you were requesting acceptance of either backup design for use with either the TL-2 or the TL-3 TMAs. If the heavier backup is used with the TL-3 model, the total weight of the TMA, including its mounting hardware would be approximately 878 kg (1935 pounds).

Based on a review of the test reports and crash test videotapes, I agree that the cartridge, when used alone (the Scorpion A 10,000), meets NCHRP Report 350 TL-2 evaluation criteria and that when used in combination with the strut, the Scorpion C 10,000 TMA satisfies TL-3 evaluation criteria. Either design may be used with either of the tested backup plates and both are considered acceptable for use on the National Highway System (NHS). This acceptance assumes that production models will be essentially identical to the prototype designs that were tested and that you will be able to certify to users that the product supplied has the same internal and external dimensions and construction as the tested models. Since these are both proprietary designs, their use on the NHS, when specified by the contracting agency, is subject to the conditions listed in Title 23, Code of Federal Regulations, Section 635.411. A copy of this regulation is enclosed (Enclosure 4) for your ready reference.

The tests recommended in NCHRP Report 350 address only the crash performance of a TMA. Consequently, as with all TMA acceptances, this letter is not intended to address other performance factors such as long-term durability, the mobility of the support vehicle, the effects of road-induced vibration, or the influence of temperature and moisture variations. Additionally, this acceptance is based on the Scorpion 10,000 performance when it is used behind a support vehicle weighing approximately 9000 kg (19,842 pounds). The use of significantly lighter or heavier vehicles is not recommended unless tests are conducted using lighter or heavier support trucks.

Since numerous errata sheets were submitted to supplement the original test reports, I would appreciate two complete copies of each of the corrected test reports for our files. Please call Mr. Powers of my staff at (202) 366-1320 if you have any questions regarding this acceptance letter.

Sincerely yours,



Frederick G. Wright, Jr.  
Program Manager, Safety

6 Enclosures