



Memorandum

Subject: **ACTION:** Guardrail Terminal
Installations and Repairs

Date: November 30, 2016

From: Michael S. Griffith *Michael S. Griffith*
Director, Office of Safety Technologies

In Reply Refer To:
HSST

To: Division Administrators
Directors of Field Services
Federal Lands Highway Division Engineers

Purpose

The purpose of this memorandum is to bring to your attention guardrail terminal installation and repair issues.

Background

There have been recent reports of highway crashes involving guardrails that have noted cases of incompatible components being used in the maintenance or repair of terminals. This use of incompatible parts will likely affect the performance of the crashworthy guardrail terminal, and may lead to serious injury or death.

The Office of Safety first addressed this issue in a Frequently Asked Question attached to the [memorandum on Steel Strong Post W-beam Guardrail dated May 17, 2010](#).

Q. WHEN REPAIRING CRASH-DAMAGED GUARDRAIL TERMINALS OR CRASH CUSHIONS, MAY WE USE "BREAKAWAY POSTS" OR OTHER COMPONENTS THAT FIT IF THEY ARE SUPPLIED BY ANOTHER MANUFACTURER?

A. Barrier terminals and crash cushions are precisely engineered devices subjected to up to 8 different crash tests meant to show proper performance when impacted by errant vehicles. If the substitute parts do not crush, break, bend, or slide the same way as the crash-tested parts, the device's performance will be affected, with the potential of negative performance (even if the device's performance in one test may improve with the substitute part in place, it may lead to failure under another test impact condition). If the component in question is covered by patent and unique to the system, then the overall effect can only be determined by the original manufacturer and/or a crash test laboratory.

Substitutions of components are allowable if any one of these conditions is met:

1. The substitute components are generic items (e.g. guardrail line posts, w-beam rail elements, some fastener hardware, etc.) that meet the same specification as the crash tested parts
2. The manufacturer of a patented device has determined that the part will not adversely affect the device's performance and has agreed that the part may be substituted
3. The substitute component has been successfully crash tested as part of the same system
4. A critical or "smart" part that was formerly covered by a patent is manufactured to the same specification as the original part

This guidance applies to the safety performance of barrier terminals, crash cushions, and the barriers themselves when considering the use of substitute components.

The Office of Safety reiterated the importance of proper installation and maintenance practices in [the memorandum of May 26, 2015](#) when it was requested of the Division Administrators to ask their states to "...review and, if necessary, update policies, procedures, standards, and guidelines relative to the selection, installation, maintenance, and in-service evaluations of crashworthy roadside safety hardware on their roadways", specifically:

1. Relative to installation and maintenance of crashworthy roadside safety hardware, it is strongly recommended that they put in place the necessary protocols to ensure that any entity installing or maintaining roadside safety hardware, including contractors or State or local personnel, are capable (e.g., trained, credentialed or authorized by the roadside hardware manufacturer for the installation and maintenance of their hardware) of doing this work.
2. Review standard plans and specifications to ensure that only crashworthy devices are used on the National Highway System (NHS).

In order to encourage the states to provide in-depth training on the installation of barrier and terminal hardware, the Office of Safety led Guardrail Installation and Maintenance training as part of our Focused Approach to Safety effort. This three-day course involving classroom instruction as well as hands-on demonstrations of safety hardware offered directly by the hardware manufacturers themselves has been presented to 15 Focus States to date:

- Pennsylvania
- Delaware
- Ohio
- Kentucky
- Tennessee
- North Carolina
- South Carolina
- Georgia
- Florida
- Alabama
- Mississippi
- Louisiana
- Missouri
- Texas
- California (LTAP)

While the existing contract is ending this year, the effort will be succeeded by the Guardrail Installation and Inspection Training grant program that was included in the Fixing America's Surface Transportation (FAST) Act. Announcements for the opportunity for your State to host this training are expected in 2017.

Action

Please share this memorandum with your State DOT and any city, county, or municipality in your State with responsibility for the operation and maintenance of their roadways.

Please ask them to review and, if necessary, update their policies, procedures, standards, and guidelines relative to the selection, installation, repair, and maintenance of roadside safety hardware, giving strong consideration to:

- A system wide inventory of in-situ roadside safety hardware, especially guardrail terminals
- Accurate identification of safety hardware components in maintenance inventories
- Training of contractors and maintenance forces responsible for guardrail terminal installation and repair
- Training of inspectors who approve new and repaired guardrail terminals

Please emphasize the importance of following the manufacturers' installation manuals for both new construction and repairs and to take advantage of manufacturers' training on proprietary products.

A Transportation Research Board Circular, "Roadside Safety Design and Devices: International Workshop," was just published in November 2016. The first article in the circular "Roadside Barrier Installation and Maintenance Issues: The Need for Improved Quality Control," is quite timely. A PDF of the Circular is available free of charge online at:

<http://www.trb.org/main/blurbs/175369.aspx>

For additional information please contact Mr. William Longstreet at (202) 366-0087 or Will.Longstreet@dot.gov