

# Roadway Departure Technical Brief No. 2

## Drive-by Inspection of Safety Hardware



**CATEGORY:** Maintenance

**ISSUE:** Traffic barriers, such as w-beam and cable, and their various end treatments must be installed and maintained properly to function as intended in a crash. Seemingly minor damage to these features can make them partially ineffective. Maintenance personnel must be able to identify at a glance the types of damage that must be repaired to restore a feature to its original performance.

**OBJECTIVE:** To provide guidelines for identifying the types of damage to barriers and terminals that may degrade crash performance and that can be seen on a drive-by type inspection.

**METHODOLOGY:** Show the types of damage to safety hardware that can be readily observed without an in-depth inspection.

**GENERAL:** Traffic barriers, terminals and crash cushions are designed to reduce the severity of a crash by keeping vehicles on the roadway or slowing them safely when struck near the ends. Initial inspections should ensure that these features were installed to meet State specifications and manufacturer's guidelines. However, environmental factors and traffic impacts may lessen the crash performance of those safety features. Most damage that could impair proper functioning can be identified without an in-depth inspection. This Technical Brief identifies the most common deficiencies that should be identified and promptly repaired.

It is critical that the need for repair be communicated to the appropriate staff as soon as practical after damaged barrier is first noted. Temporary delineation (e.g. cones, barrels, or barricades) should be used to warn the public of the damage. In some instances, temporary barrier or a crash cushion may be warranted, depending on site conditions and the time needed to complete repairs.



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**Federal Highway Administration**

## EXPECTED RESULTS:

Maintenance personnel and other local agency employees will be able to identify, without an in-depth inspection the type of barrier and terminal damage that should be reported and repaired.

### TYPES OF DAMAGE:

**W-Beam Guardrail:** The following types of damage can be easily seen and may significantly reduce the capacity of the barrier if not repaired:

- More than 9 inches of deflection over a 25-foot span (**Photograph A**).
- Top of rail two or more inches below original height
- Two or more posts missing or detached from rail.

### W-Beam Terminals:

These terminals must function as an anchor for barrier impacts immediately downstream from the end. Therefore:

- The cable must be in place and tight. The terminal head in **Photograph B** is separated from the end post and the cable is missing.
- The steel bearing plate must be in place and set with the longer dimension facing up.
- The end post must be intact with the extruder head firmly in place. The end post in **Photograph C** has split, causing the head to drop. The terminal may not function properly in a end-on hit.

For end-on hits, extruder type terminals must act as an energy-absorbing device when hit directly and allow a vehicle to pass behind it when struck at an angle on the nose. Therefore:

- The w-beam rail must be fully inserted into the impact head to prevent spearing in a head-on crash (**Photograph D**).
- Any energy absorbing head must be properly aligned with the w-beam.
- The first 50 feet of w-beam must be straight (not a curved section) and undamaged so the rail can extrude without kinking.
- An energy absorbing terminal must have a reasonably clear runout area behind and beyond the terminal nose.
- For non-energy absorbing terminals, a longer runout area is needed because an impacting vehicle will not be significantly slowed on impact.

A



B



C



D

