



Standard Test Method for Crash Testing of Vehicle Security Barriers¹

This standard is issued under the fixed designation F2656/F2656M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

INTRODUCTION

Original perimeter barrier test methods were first published in 1985 by the Bureau of Diplomatic Security to assess the crash performance of perimeter barriers and gates. Since that time, the frequency and scale of attacks using vehicles with or without an explosive payload have increased both internationally and domestically. Therefore, there is a need to address a broad spectrum of possible incident conditions such as credible threat vehicle types for the locale, attack velocities of the different vehicles, and different acceptable penetration limitations. Also, there are different evaluation criteria for different agencies that fulfill their unique access control operations, aesthetics, and other organizational requirements. This test method was originally developed to expand the previous Department of State, Bureau of Diplomatic Security's crash testing standard to meet the broader needs of multiple organizations responsible for the protection of U.S. assets domestically and abroad.

Published test standards for vehicle perimeter security devices have previously been maintained by the U.S. State Department, Bureau of Diplomatic Security. The Specification for Vehicle Crash Test of Perimeter Barriers and Gates was first published in 1985 as SD-STD-02.01. In that standard, the test vehicle was specified as a medium-duty truck weighing 6800 kg [15 000 lb]. The payload was to be securely attached to the frame and nominal impact velocities were 50, 65, and 80 km/h [30, 40, and 50 mph]. Penetration limits were 1, 6, and 15 m [3, 20, and 50 ft] and were measured from the attack face of the perimeter security device to the final resting position of the front of the frame rails of the test vehicle.

In 2003, the U.S. State Department, Bureau of Diplomatic Security issued an updated standard (SD-STD-02.01, Revision A) for the testing of perimeter barriers. This update was done for several reasons. The foremost reason for change was limited setback distances precluded the use of any devices at their facilities or compounds that did not meet the highest test level, that is, those allowing more than 1-m [3-ft] penetration distance. Therefore, the revised standard only uses a 1-m [3-ft] penetration distance. Secondly, the method of rigid attachment of the ballast to the test vehicle was not simulating likely payload configurations and was altering the structural integrity of the test vehicle. Consequently, the updated standard requires a payload consisting of 208-L [55-gal] steel drums strapped together that have been filled with soil. This assembly is then strapped to the vehicle load platform. The third reason for change was based on the observation that the cargo bed of trucks could effectively penetrate certain types of barriers. Accordingly, the penetration distance is now measured from the inside face or non-impact surface of the barrier to the front of the cargo bed when the vehicle has reached its final position. Lastly, it was determined that the trucks used different platforms within a given class affecting result consistency. The revised test standard required the use of very specific diesel-powered medium-duty trucks.

In 2007, ASTM first published Test Method F2656 for Vehicle Crash Testing of Perimeter Barriers. It included the same test vehicle as specified in the 2003 SD-STD-02.01, Revision A, but additional test vehicles were added. They were the small passenger car, a ½-ton regular cab pickup, and a tandem axle dump truck. In addition, penetration ratings were reestablished and included the highest rating established by the 2003 SD-STD-02.01. Occupant risk values as established in NCHRP Report 350 were also added.