



## Retention of Steering Column Assemblies for Rearward Vehicular Impacts

### 1 Introduction

**Note:** Nothing in this standard supercedes applicable laws and regulations.

**Note:** In the event of conflict between the English and domestic language, the English language shall take precedence.

**1.1 Purpose.** The purpose of this test procedure is to determine if the steering shaft and its connected components of motor vehicles, maintain integrity due to a rearward vehicle impact.

**1.2 Applicability.** This procedure applies to all passenger cars, light/medium duty trucks, and category M<sub>1</sub> motor vehicles (vehicles used for the carriage of passengers and comprising of not more than eight (8) seats in addition to the driver's seat) and is intended as a system level test procedure.

This test is applicable for both manual and power adjustable steering column designs.

**1.3 Remarks.** Determination of the steering column assembly's integrity from a rearward vehicle impact is established by the three methods listed in 1.3.1 thru 1.3.3, but the purpose of this system level test procedure is for only the method in 1.3.3.

**1.3.1 Steering Column Component Tests for Quasi-static Steering Shaft Rearward Retention.** Testing individual steering column vertically on a test stand with production intent fasteners and nominal torque values provides a simulation of the subsystem's performance in a vehicle. Reference the test procedure within CG3735.

**Note:** These tests will typically be conducted by the steering column supplier.

**1.3.2 Steering Column Component Tests for Dynamic Steering Shaft Rearward Retention.** Testing individual steering column on a test stand using a drop-mass and simulating the in-vehicle steering column nominal mounting angle, provides a simulation of the subsystem's performance in a vehicle. Reference the test procedure within CG3735.

**Note:** These tests will typically be conducted by the steering column supplier.

**1.3.3 Steering Column System Tests for Dynamic Steering Shaft Rearward Retention.** The structural performance of any steering column subsystem is evaluated as a complete system. This Steering Column System Test is conducted with a fully dressed steering column assembly, which includes: steering column, highest content/mass steering wheel, inert Driver Air Bag (DAB) module, Column Electrical Assembly (CEA), ignition lock housings, ignition lock cylinders, ignition key, and column wiring harness.

**Note:** These tests are typically conducted at GM, but may be conducted at a supplier with proper test facility. Reference Section 3.

### 2 References

**Note:** Only the latest approved standards are applicable unless otherwise specified.

#### 2.1 External Standards/Specifications.

UN R 17

#### 2.2 GM Standards/Specifications.

None

#### 2.3 Additional References.

- CG3735
- Program-specific Subsystem Technical Specification (SSTS)

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### 3 Resources

#### 3.1 Facilities.

**3.1.1 Calibration.** The test facilities and equipment shall be in good working order and shall have a valid calibration label.

**3.1.2 Alternatives.** Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

**3.1.3 Sled Facility.** The test outlined in 4.3 requires facilities having the test equipment described in 3.2 appropriate for the test(s) being conducted. The Body Test Lab at the GM Technical Center (Warren, Michigan) is an example of such a facility. The Sled Facility must be capable of producing the generic UN R 17 pulse acceleration.

#### 3.2 Equipment.

**3.2.1 Mounting Fixture.** A means to support the steering column subsystem per CG3735, section titled, Dynamic System Level Test. Reference Figure 1 and Figure 2.



Figure 1: Steering Column Mounting Fixture

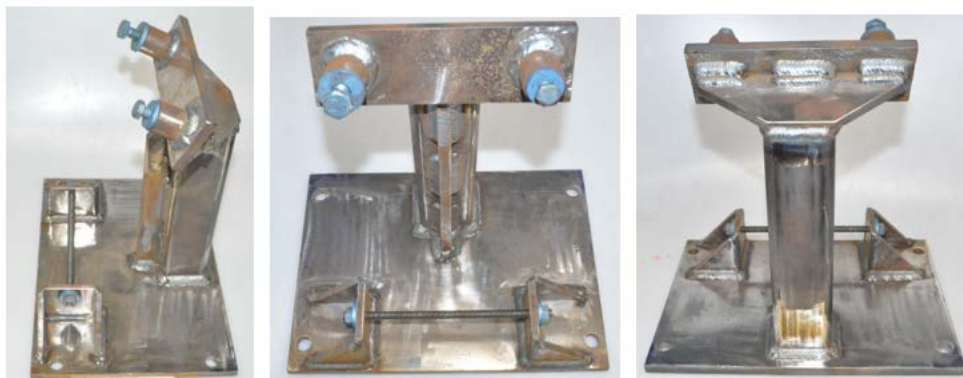


Figure 2 Three Views of Sample Fixture

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