

How fast do you ride your motorcycle?

19.7 ft./sec = 13.4 mph Max Speed for Test

S7.1.1 Impact attenuation is measured by determining acceleration imparted to an instrumented test headform on which a complete helmet is mounted as specified in S6.3, when it is dropped in guided free fall upon a fixed hemispherical anvil and a fixed flat steel anvil.

S7.1.2 Each helmet is impacted at four sites with two successive identical impacts at each site. Two of these sites are impacted upon a flat steel anvil and two upon a hemispherical steel anvil as specified in S7.1.10 and S7.1.11. The impact sites are at any point on the area above the test line described in paragraph S6.2.3, and separated by a distance not less than one-sixth of the maximum circumference of the helmet in the test area.

S7.1.3 Impact testing at each of the four sites, as specified in S7.1.2, shall start at two minutes, and be completed by four minutes, after removal of the helmet from the conditioning environment.

S7.1.4 (a) The guided free fall drop height for the helmet and test headform combination onto the hemispherical anvil shall be such that the minimum impact speed is 17.1 feet/second (5.2 m/sec). The minimum drop height is 54.5 inches (138.4 cm). The drop height is adjusted upward from the minimum to the extent necessary to compensate for friction losses.

(b) The guided free fall drop height for the helmet and test headform combination onto the flat anvil shall be such that the minimum impact speed is 19.7 ft./sec (6.0 m/sec). The minimum drop height is 72 inches (182.9 cm). The drop height is adjusted upward from the minimum to the extent necessary to compensate for friction losses.

S7.1.5 Test headforms for impact attenuation testing are constructed of magnesium alloy (K-1A), and exhibit no resonant frequencies below 2,000 Hz.

S7.1.6 The monorail drop test system is used for impact attenuation testing.

S7.1.7 The weight of the drop assembly, as specified in Table 1, is the combined weight of the test headform and the supporting assembly for the drop test. The weight of the supporting assembly is not less than 2.0 lbs. and not more than 2.4 lbs. (0.9 to 1.1 kg). The supporting assembly weight for the monorail system is the drop assembly weight minus the combined weight of the test headform, the headform's clamp down ring, and its tie down screws.

S7.1.8 The center of gravity of the test headform is located at the center of the mounting ball on the supporting assembly and lies within a cone with its axis vertical and forming a 10° included angle with the vertex at the point of impact. The center of gravity of the drop assembly lies within the rectangular volume bounded by $x = -0.25$ inch (-0.64 cm), $x = 0.85$ inch (2.16 cm), $y = 0.25$ inch (0.64 cm), and $y = -0.25$ inch (-0.64 cm) with the origin located at the center of gravity of the test headform. The rectangular volume has no boundary along the z-axis. The x-y-z axes are mutually perpendicular and have positive or negative designations in accordance with the right-hand rule (See Figure 5). The origin of the coordinate axes also is located at the center of the mounting ball on the supporting assembly (See Figures 6, 7, and 8). The x-y-z axes of the test headform assembly on a monorail drop test equipment are oriented as follows: From the origin, the x-axis is horizontal with its positive direction going toward and passing through the vertical centerline of the monorail. The positive z-axis is downward. The y-axis also is horizontal and its direction can be decided by the z- and x-axes, using the right-hand rule.

S7.1.9 The acceleration transducer is mounted at the center of gravity of the test headform with the sensitive axis aligned to within 5° of vertical when the test headform assembly is in the impact position. The acceleration data channel complies with SAE Recommended Practice J211 JUN 80, Instrumentation for Impact Tests, requirements for channel class 1,000.

S7.1.10 The flat anvil is constructed of steel with a 5-inch (12.7 cm) minimum diameter impact face, and the hemispherical anvil is constructed of steel with a 1.9 inch (4.8 cm) radius impact face.

S7.1.11 The rigid mount for both of the anvils consists of a solid mass of at least 300 pounds (136.1 kg), the outer surface of which consists of a steel plate with minimum thickness of 1 inch (2.5 cm) and minimum surface area of 1 ft² (929 cm²).

S7.1.12 The drop system restricts side movement during the impact attenuation test so that the sum of the areas bounded by the acceleration-time response curves for both the x- and y-axes (horizontal axes) is less than five percent of the area bounded by the acceleration-time response curve for the vertical axis.

S7.2 *Penetration test.*