



## Standard Test Methods for Bicycle Forks<sup>1</sup>

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### 1. Scope

1.1 These test methods describe mechanical tests for determining the following performance properties:

- 1.1.1 Compression Load,
- 1.1.2 Bending Load,
- 1.1.3 Impact Resistance, and
- 1.1.4 Fatigue Life.

1.2 The values stated in SI units are to be regarded as standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

### 2. Referenced Documents

2.1 *ASTM Standards:*

- E 4 Practices for Force Verification of Testing Machines<sup>2</sup>
- F 2043 Classification for Bicycle Usage<sup>3</sup>

### 3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *bicycle fork (fork)*—the mechanism between the head tube and the front axle, including the steerer tube, crown, triple clamps, shock absorbers, lower tubes, and upper tubes.

3.1.2 *steerer tube*—the structural fork component typically housed inside the bicycle head tube, connected to the fork crown. The steerer tube transmits steering inputs from the rider to the fork and connects the fork to the bicycle frame by means of headset bearings.

3.1.3 *fork crown (crown)*—the primary structural fork component responsible for connecting the steerer tube to the fork upper tube(s) or fork blades.

3.1.4 *lower triple clamp*—See *fork crown*. The lower crown of a two-crown suspension fork.

3.1.5 *upper triple clamp*—the secondary structural fork component responsible for connecting the steerer tube to the upper tube(s).

3.1.6 *dropout*—the fork component used to support the front wheel(s) at the axle(s).

3.1.7 *dropout centerline*—the front hub mounting axis that passes through both right and left dropouts.

3.1.8 *tire clearance*—the distance between the top surface of the tire and the bottom surface of the fork crown with no compressive force applied to the fork.

3.1.9 *crown-to-axle clearance*—the distance between the fork axle centerline and the bottom surface of the crown with no compressive load applied to the fork.

3.1.10 *head set*—the bearing cup, cones, and other supporting components for allowing rotation of the fork about the steering axis.

3.1.11 *limit trip or stop*—a deflection of the fork, which exceeds the allowable displacement values and causes the machine to stop running.

### 4. Summary of Test Methods

4.1 *Compression Load Test*—This test method compresses the fork. The distance from the bottom surface of the crown to the axle centerline is measured.

4.2 *Bending Load Test*—This test method restrains a fork by the steerer tube and applies a load perpendicular to the steerer tube axis at the point on the dropout centerline centered between the two dropouts. The deflection at the dropout centerline perpendicular to the steerer tube axis is measured.

4.3 *Impact Resistance Test*—This test method restrains a fork by the steerer tube in horizontal orientation; a weight is dropped from a prescribed height onto a fixture attached to the fork dropouts in line with the dropout centerline. Permanent deflection at the dropout centerline perpendicular to the steerer tube axis is measured. The ability of the connection between the steerer tube and crown to support torque applied about the axis of the steerer tube is also checked.

4.4 *Fatigue Test*—This test method restrains a fork by the steerer tube and applies a fully reversed load perpendicular to the steerer tube axis at the point on the dropout centerline centered between the two dropouts. The test is stopped either at failure as defined by the criteria below or at 250 000 cycles, whichever come first. The number of cycles is recorded.

### 5. Significance and Use

5.1 These tests are used to determine the performance of a bicycle fork.

<sup>1</sup> These test methods are under the jurisdiction of ASTM Committee F08 on Sports Equipment and Facilities and is the direct responsibility of Subcommittee F08.10 on Bicycles.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 03.01.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 15.07.