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An American National Standard

Standard Specification for Condition 3 Bicycle Forks[1]

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1. Scope

1.1 This specification establishes testing requirements for qualifying designs using production forks intended for use in Condition 3 per Classification F2043.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

F2043 Classification for Bicycle Usage

F2273 Test Methods for Bicycle Forks

3. Classification

3.1 Condition 3 per Classification F2043.

4. Sampling and Test Specimens

4.1 *Selection and Preparation of Specimens:*

4.1.1 Three forks shall be randomly selected from the first production lot for the fatigue plus impact test per this specification.

4.1.2 One fork shall be randomly selected for the impact test per this specification.

4.1.3 One fork shall be randomly selected for both the compression and bending tests per this specification.

5. Performance Requirements

5.1 Bicycle forks intended by the manufacturer to be used according to Condition 3 shall be tested per Test Methods F2273.

5.1.1 *Compression Load Test:*

5.1.1.1 The fork shall withstand a compression load of 2800 N without any component failure, fracture or permanent deformation.

5.1.1.2 Under the application of the compression load of 2800 N, the minimum clearance from the maximum tire profile intended for use by the manufacturer to the nearest surface of the crown shall be at least 3 mm.

5.1.2 *Bending Load Test:*

5.1.2.1 The fork shall withstand a maximum bending load of 1500 N (100 N initial load plus an additional 1400 N).

5.1.2.2 The permanent deflection of a rigid fork shall not exceed 5 mm and the permanent deflection of a suspension fork shall not exceed 10 mm.

5.1.3 *Impact Resistance Test:*

5.1.3.1 For each fork, permanent deflection shall be less than 45 mm following impact of a 22.5 kg mass dropped from height number 1, and the sample shall not develop cracks or fractures. The velocity at impact shall be at least 2.66 m/s. Note that in a frictionless system, this velocity would be achieved with a drop height of 360 mm.

5.1.3.2 For each fork, following impact of a 22.5 kg mass dropped from height number 2, the connection between the steerer tube and crown must withstand at least 108.5 Nm of torque without rotation. The velocity at impact from drop height number 2 shall be at least 3.43 m/s. Note that in a frictionless system, this velocity would be achieved with a drop height of 600 mm.

5.1.4 *Fatigue Plus Impact Test:*

5.1.4.1 Each fork shall withstand a fully reversed sinusoidal load of 650 N for at least 100 000 cycles without structural cracks or fractures and without exceeding the displacement limits described in Test Methods F2273.

5.1.4.2 If the fork withstands 100 000 cycles, it shall be subjected to an impact test in which the mass is dropped from height number 1 as described in 5.1.3.1.

5.1.4.3 Following this impact test the permanent deflection shall not exceed 45 mm.

6. Rejection and Rehearing

6.1 If any sample fails to meet all the requirements of this specification, the fork models shall be rejected.

7. Certification

7.1 When specified in the purchase order or contract, a report of the test results shall be furnished pursuant to the report as described in Test Methods F2273.

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[1] This specification is under the jurisdiction of ASTM Committee F08 on Sports Equipment, Playing Surfaces, and Facilitiesand is the direct responsibility of Subcommittee F08.10 on Bicycles.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

8. Keywords

8.1 bicycle forks; condition 3; fatigue; impact; load test; qualifying designs