

4.9 Handlebar and stem assembly — Fatigue test

4.9.1 Test method for city and trekking, young adult, and mountain bicycles

4.9.1.1 Test method for stage 1

Unless the handlebar and stem are permanently connected, e.g. by welding or brazing, align the grips of portion of the handlebar in a plane perpendicular to the stem axis [see [Figure 3 a\)](#)] and secure the handlebar to the stem according to the manufacturer's instructions.

Clamp the handlebar stem securely in a fixture to the minimum insertion depth as specified in ISO 4210-2:2014, 4.7.3, or in the case of a stem extension which is intended to be clamped to an extended fork steerer, secure the extension using the manufacturer's recommended tightening procedure to an extended fork steerer which is secured in fixture to the appropriate length.

For handlebars where the manufacturer states that they are not intended for use with bar ends, apply fully reversed forces of F_6 at a position 50 mm from the free end for each side of the handlebar for 100 000 cycles, with the forces at each end of the handlebar being out of phase with each other and parallel to the axis of the fork steerer as shown in [Figure 10 a\)](#). The forces are given in [Table 7](#). The maximum test frequency shall be maintained as specified in ISO 4210-3:2014, 4.5.

Where a bicycle manufacturer fits bar ends, fit the bar ends to the handlebar according to the manufacturer's tightening instructions but with the bar ends located in a plane perpendicular to the handlebar stem axis and apply the out-of-phase forces to the bar ends, as shown in [Figure 8](#) and [Figure 11 a\)](#).

Where a handlebar manufacturer specifies that his handlebars are suitable for use with bar ends, conduct the test with the out-of-phase forces applied to simulated bar ends, as shown in [Figure 11 b\)](#).

If the handlebar meets the requirement as specified in ISO 4210-2:2014, 4.7.7.2, remove any bar ends and conduct stage 2 of the test with the assembly in the same mountings.

Table 7 — Forces on handlebars and bar ends

		Forces in newtons			
Bicycle type		City and trekking bicycles	Young adult bicycles	Mountain bicycles	Racing bicycles
Stage 1	Force, F_6	200	200	270	280
Stage 2	Force, F_7	250	250	450	400

Dimensions in millimetres

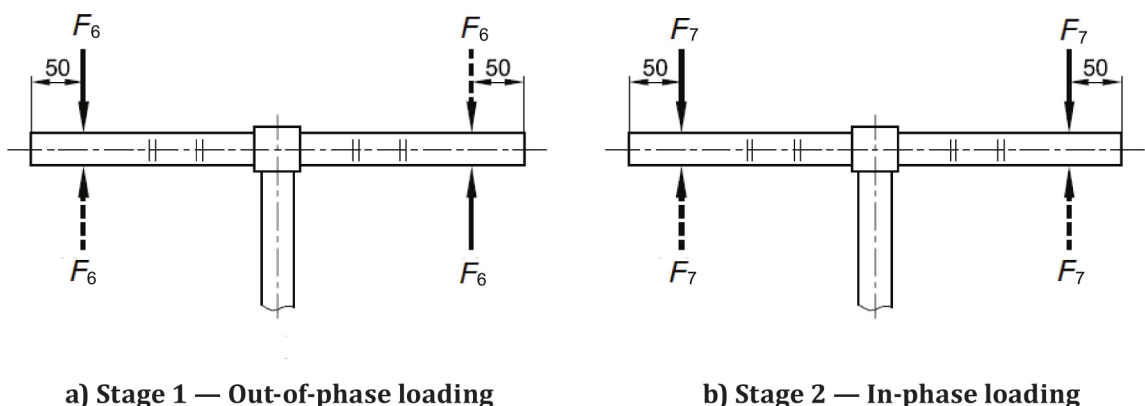
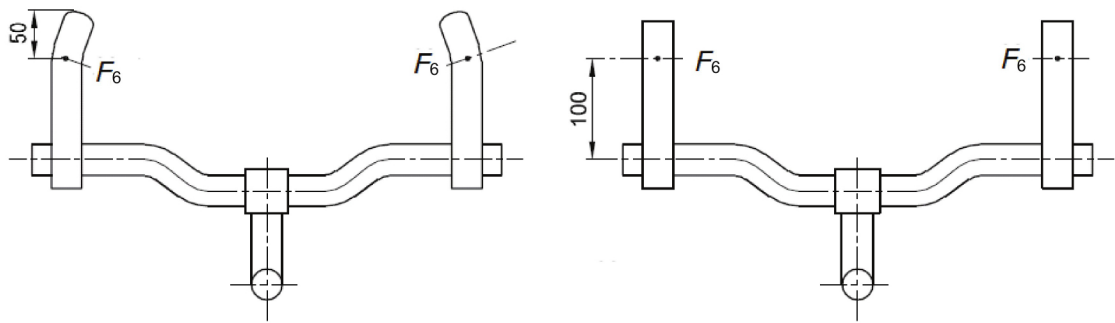


Figure 10 — Handlebar and stem — Fatigue tests for city and trekking, young adult, and mountain bicycles

Dimensions in millimetres



a) Test for handlebar fitted with bar ends
(plan view)

b) Test for handlebar intended for bar ends
(plan view)

Figure 11 — Handlebar incorporating bar ends — Out of phase fatigue tests for city and trekking, young adult, and mountain bicycles

4.9.1.2 Test method for stage 2

Apply fully reversed forces of F_7 at a position 50 mm from the free end for each side of the handlebar for 100 000 cycles, with the forces at each end of the handlebar being in phase with each other and parallel to the axis of the handlebar stem, as shown in [Figure 10 b](#)). The maximum test frequency shall be maintained as specified in ISO 4210-3:2014, 4.5.