

Standard Test Method for Determining the Force-Draw and Let-Down Curves for Archery Bows¹

This standard is issued under the fixed designation F 1832; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method covers the procedure to be used to determine the force-draw and let-down curves for archery bows.

1.2 The values stated in inch-pound units are to be regarded as the standard. The SI units given in parentheses are for information only.

1.3 *This standard does not purport 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. Terminology

2.1 Definitions of Terms Specific to This Standard:

2.1.1 *AMO (archery manufacturers and merchants organization) draw length*—the perpendicular distance from the point where the shooting string of the bow contacts bottom of the nock slot of the arrow, to a vertical line through the pivot or low point of the hand grip (draw length pivot point), plus a standard dimension of 1 3/4 in. (44.5 mm).

2.1.2 *brace height*—the dimension in inches (millimetres), from the grip pivot point (low point) of the grip to the nearest side of the bowstring, measured perpendicular to the bowstring, with the bow strung and in the undrawn condition.

2.1.3 *compound bow*—a type of bow that imposes a secondary system of control of the force-draw characteristic on the usual limb geometry control system of the conventional bow. This secondary control system can be composed of cam, levers, cables, or other elements, and combinations thereof. The dual control system permits great versatility in the design of the force-draw characteristic, and simplifies the inclusion of let-off. In general, it is normal for compound bows to have greater stored energy than conventional bows for a given level of peak or maximum draw weight.

2.1.4 *draw*—to move the shooting string of a bow from the rest or braced position toward the full drawn position by applying force to said string. Such action causes the limbs of the bow to bend and store energy. Moving the string from brace height to the full draw position corresponds to the draw stroke of a bow.

2.1.5 *draw cycle*—the combination of the draw-stroke and the power-stroke, resulting in a full cycle from brace height to full draw and return to brace height.

2.1.6 *draw-stroke*—the distance in inches (millimeters) from brace height to full draw.

2.1.7 *force-draw curve*—the curve that is plotted using the force readings, taken at incremental values of draw length when drawing the bow, as the ordinate and the corresponding draw length as abscissa.

2.1.8 *full draw*—the position assumed by the bowstring when the bow is drawn to a draw length corresponding to that from which it will be released for the shot. For most standard test purposes full draw is specified as 30 in. (762 mm) AMO draw length for compound bows, and 28 in. (711.2 mm) AMO draw length for non-compound bows, but it can take any assigned value.

2.1.9 *let-down curve*—curve that is plotted using the force readings, taken at incremental values of draw length when relaxing the bow, as the ordinate and the corresponding draw length as abscissa.

2.1.10 *let-off*—the difference between the peak or maximum draw force reached during the draw stroke of a bow, and the lowest level of draw force reached subsequent to that peak. Quantitatively, it is most frequently expressed as a percentage of the peak force and is then referred to as percent of let-off.

2.1.11 *non-compound bow*—a bow constructed in the traditional manner, having two flexing limbs extending outwardly in opposite directions from a handle. A single shooting string of a length shorter than the bow, connects the extreme ends of the limbs causing them to assume a pre-stressed flexed condition. Drawing the bow causes additional bending and stressing of the limbs, storing the energy necessary to propel the arrow. Control of the force-draw characteristic of the bow is exercised entirely by the static and dynamic geometry of the flexing limbs and the bowstring.

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