

## TMS 12-04

# Standard Test Method for Treestand Adherence and Static Stability

### 1. Scope

- 1.1 This test method covers the determination of the static stability and the adherence of treestands relative to the manufacturers rated capacity. For changes to this specification since the last issue, refer to the Summary of Changes section at the end of the standard.
- 1.2 The values stated are in inch-pound units and 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 determines the applicability of regulatory limitations prior to use.*

### 2. Terminology

- 2.1 The terminology and definitions in the referenced documents are applicable to this test method.
- 2.2 *Definitions:*
  - 2.2.1 *Non-climbing, fixed position or hang-on treestand*---a treestand which is secured to the tree at the elevation where it is used. (The user usually ascends the tree by some means and then lifts the treestand to the desired position and secures it for use.)
  - 2.2.2 *Climbing treestand*---a treestand which provides both the means to ascend the tree, and allow the user to remain at a desired elevation.
  - 2.2.3 *Hand-climber or climbing aid*--- a device to assist climbing with a climbing treestand. A structure that allows the user to support his weight when lifting a climbing treestand with his legs.
  - 2.2.4 *Backbar or V-bar*--- the adjustable component of a climbing treestand or handclimber, which engages the tree to, provides support.
  - 2.2.5 *Ladder treestand*--- a treestand which is secured to the tree at the elevation where the platform is located. (The ladder treestand may be secured to the tree at other locations and has steps that are used to reach the platform or hunting position).
  - 2.2.6 *Tripod or Tower stand*--- a tripod or tower stand (free standing platform) is constructed to be self-supporting and is not required to be secured to a tree.
  - 2.2.7 *A Climbing Stick*--- a device to assist climbing a tree primarily to a fixed position treestand. A structure that is secured to the tree and allows the user to support his weight and climb to the desired height on the tree.
  - 2.2.8 *Platform*---the horizontal structural area of a treestand on which the user stands and/or places his feet.
  - 2.2.9 *Treestand*---a device designed to be affixed to a tree or its branches so as to permit an individual to sit or stand thereon for the purpose of attaining an elevated position from which to observe, photograph or hunt.

### 3. Summary of Test Method

- 3.1 A climbing treestand is mounted so that its platform is perpendicular to a rigid wood or metal pole when the rated load is applied parallel to the mounting pole, at selected points. A fixed position or ladder stand shall be mounted with the platform perpendicular to the mounting pole. A tripod stand shall be positioned so that the platform is perpendicular to the application of the load. The platform is equipped with deflection measurement devices. The load is applied, in order, at the selected points and recordings are made of the deflection at each point unless the test subject moves from its initial position or until permanent deflection from the load occurs. During this test, the test subject can rotate, but shall not slip or have permanent deformation.
- 3.2 In addition, for climbing treestands only the test given in 3.1 is duplicated except that the treestand platform is not perpendicular to the mounting pole, but at an angle

approximately 15 degrees such as that used in ascending or descending a tree.

#### 4. Significance and Use

- 4.1 This test method is intended for quality assurance and production control purposes. This test method is not intended to be an independent material or product-acceptance test.

#### 5. Apparatus

- 5.1 A rigid round wood or metal pole, preferably vertical, is used to mount the subject product such that pole deflection is minimized.
- 5.1.1 The mounting pole diameter shall be ten (10) inches, +/- 1 inch.
- 5.2 The load shall be applied using either calibrated weights or a mechanical device in conjunction with a calibrated load cell.
- 5.2.1 The use of calibrated weights requires that weight placement be accurate to assure that the load application centroid is coincident with the boundaries defined and meets the requirements as given in 5.3.1 and in 5.4.3. Caution should be exercised for operator protection with the use of weights in case of slippage or premature failure.
- 5.2.2 The use of a mechanical device such as a tensile testing machine or hydraulic power, in combination with pulleys, fulcrums or bearings to re-direct forces, requires the use of a calibrated load cell attached adjacent to the test subject to account for friction losses.
- 5.3 Calibrated deflection measuring devices (such as dial indicators or optical laser) shall be used to measure movement of the test subject under load (reference TMS 05 for ladder stands). The accuracy of the measuring devices shall be at within .010 inches and repeatable within .005 inches. The devices shall measure movement parallel to the direction of the applied load and shall be mounted in such a manner to eliminate deflection of the test apparatus and be placed, as a minimum, as follows:
- 5.3.1 There shall be at least four platform deflection measurements taken when the load is applied.
- 5.3.1.1 One measurement on each side of the test subject, symmetrical about the test subject centerline and at points furthest from the mounting pole i.e., the outermost corners of the platform.
- 5.3.1.2 One measurement on each side of the test subject, symmetrical about the test subject centerline and at points closest to the mounting pole but on the outermost sides of the platform, i.e., the outermost edges closest to the mounting pole.
- 5.4 The application of the load shall be at the points as given in 5.3.1 on the platform area.
- 5.4.1 The load shall be applied, one at a time, to the points as given in 5.3.1.1, each side, and then as given in 5.3.1.2, each side.
- 5.4.2 The load shall be applied to the test subject over a fifty (50) square inch area by means of a flat rectangular steel plate five (5) inches wide by ten (10) inches long and a minimum of one-half (1/2) inch thick. The edges of the load plate adjacent to the test subject shall be deburred (.015/.030 inch radius) to reduce damage to the test subject by sharp corners. A single layer of thin masking tape may be applied to the surface of the load plate contacting the test subject to reduce scratching and improve friction.

NOTE 1-- Load attachment structure must be secured to this load plate therefore fabrication by welding must assure that the plate remain flat and free of distortion.

- 5.4.3 The load plate shall be positioned on the test subject with its long axis and its center as close to the point as given in 5.3.1 as possible, yet maintaining the fifty (50) square inch contact area. The centerline of the load plate need not be parallel to the major axis (axis of symmetry) of the test subject.
- 5.5 Climbing stands are to be tested at approximately 15 degrees below level, and above level, as per manufacturer's directions.
- 5.5.1 Apparatus shall be as given in 5.1-5.3.12.
- 5.5.2 The load shall be applied as given in 5.4.2 except that the load plate shall be 100 sq.in. (0.065 sq.M) by using a 10 in. (254mm) square by ½ in. (12.7mm) thick plate.

## 6. Procedure

- 6.1 Read instructions accompanying the test subject to ascertain the proper procedure for use and mounting and secure the test subject to the mounting pole such that the platform (plane of the platform) is approximately perpendicular to the mounting pole when its rated load is applied. If necessary, use minimum auxiliary temporary means to maintain the subject in the correct position during set-up. (Frictional forces, without a load on the subject, may not be sufficient in some cases for the subject to remain in position).
- 6.2 By geometric means determine the location of the load application points as given in 5.3.1 and 5.4.3 and mark accordingly
- 6.3 Determine if the test subject will deflect sufficiently during the test to allow the load plate to slip or shift. If so, provide auxiliary means such as clamps or stops to eliminate sideways movement of the load plate. The load must be applied as given in 5.4 and must be continuously applied parallel to the mounting pole throughout the entire test.
- 6.4 Locate and mount deflection measurement devices, or reference points using optical laser, as given in 5.3.
- 6.5 The initial trial load for beginning the test, at the first test point only, shall be eighty (80) percent of the test subjects' rated capacity. Example: a test subject with a rated capacity of 300 pounds shall begin the test at a trial load of 240 pounds.
- 6.5.1 The trial load shall be applied to one of the two points as given in 5.3.1.1. Place the load plate centerline coincident with the mark as given in 5.4.3. With the initial trial (80 percent) load, verify that the test subject does not move (shift) from its initial static equilibrium position on the mounting pole and that deflection from the load returns to its value with no yielding. If this initial trial load verification fails, record the test as a failure to meet trial load conditions.
- 6.5.2 After verification of the initial trial load, perform a load test at the test subjects' rated capacity. Duplicate this test at the opposite (remaining) point as given in 5.3.1.1 and repeat for the test points given in 5.3.1.2.
- 6.6 At each of the four (4) test points the load and all deflection measurements shall be recorded (reference TMS 05 for ladder stands). The load shall then be removed and the deflection measurements re-recorded. A note shall be made of any measurement that does not return to within .200 inches of the maximum measured deflection from its initial position (before loading) or which the test subject moves (shifts) from its initial static equilibrium position in the mounting pole, as defined in 6.5.1. A note shall be made for any test point in which the test subject moves (shifts) from its initial static equilibrium position on the mounting pole.
- 6.7 Climbing treestands only are to be re-tested at 1) approximately 15 degrees below level, and 2) approximately 15 degrees above level, as per manufacturer's directions.
- 6.7.1 The application of the load for a standing platform shall be at a point that is the geometric centroid of the test subject's placement area for a users feet while ascending or descending a tree. Repeat the test procedures as given in 6.3 to 6.6 at each angle.
- 6.7.2 The application of the load for a sitting platform only (the upper platform of a two piece stand/sit climbing treestand) shall be with a load plate as given in 5.5.2. Repeat the test procedures as given in 6.3 to 6.6 at each angle except that only two points instead of four, specifically those given in 5.3.1.1, shall be used at each angle.

## 7. Report

- 7.1 Deflection readings shall be discarded only when a calibration change is discovered after readings have been made or when improper operator techniques can be cited.
- 7.2 Recording of results shall include the following:
  - 7.2.1 Identification of test subject model, manufacturer and rated capacity.
  - 7.2.2 Photograph of test subject.
  - 7.2.3 Photograph of test set-up (three views; side, top and end).
  - 7.2.4 Load and deflection measurements at all test points.
  - 7.2.5 Verification of calibration.

- 7.2.6 Date of test.
- 7.2.7 If yielding or permanent deformation has been reached, or movement (shifting) has been detected as given in 6.6 or 6.7 (for climbing Treestands), the corresponding load in pounds and test point shall be noted.
- 7.3 *Pass-Fail Criterion*
- 7.3.1 A treestand is considered failed if (after applying loads and measurements per Section 5.3.1) permanent deformation or yielding occurs as noted per Section 6.6 or 6.7 in any section of the treestand.
- 7.3.2 A treestand is considered failed if after applying loads (and measurements per Section 5.3.1) the treestand shifts as defined in Section 6.6 or 6.7.
- 7.3.3 If a treestand fails this test the stand and a copy of the test data shall be returned to the manufacturer.

#### 8. Precision and Bias

- 8.1 No statement is made about either the precision or bias of this test method for measuring load capacity since the result merely states whether there is conformance to the criteria for success specified in the procedure.

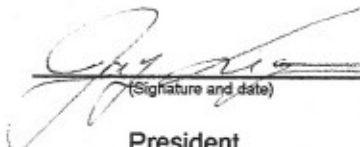
#### 9. Keywords

- 9.1 backbar; climbing aid; climbing stick; platform; treestand; tripod

### SUMMARY OF CHANGES

This section identifies the location of principle changes to this standard that have been incorporated since its last issue. Changes or additions are underlined on the section reference number.

(This '04 original combines TMS-12 & TMS-13)

  
(Signature and date) 11-3-04

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