Designation: F1061 – 08 (Reapproved 2013)

Standard Specification for Ski Binding Test Devices[1]

This standard is issued under the fixed designation F1061; 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.

INTRODUCTION

The purpose of this specification is to aid in the selection of ski binding test devices appropriate for the needs of ski equipment sales and rental facilities. Devices which meet this specification exceed the requirements of Practices F1063 and F1064. Therefore, a device that does not meet this specification may still satisfy the requirements of Practices F1063 and F1064.

1. Scope

1.1 This specification covers requirements for devices used to determine the release moments of ski equipment in retail sales and rental facilities.

1.2 This specification is applicable to the manufacture, repair, and calibration of such devices.

1.3 This specification is to be used with Test Method F1062.

1.4 The values expressed in newton metres, newtons, and centimetres are to be regarded as the standard.

1.5 The values expressed in units of torque may be converted to the appropriate force values when devices that indicate force are used.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

E456 Terminology Relating to Quality and Statistics

F504 Test Method for Measuring the Quasi-Static Release Moments of Alpine Ski Bindings

F939 Practice for Selection of Release Torque Values for Alpine Ski Bindings

F1062 Test Method for Verification of Ski Binding Test Devices

F1063 Practice for Functional Inspections and Adjustments of Alpine Ski/Binding/Boot Systems

F1064 Practice for Sampling and Inspection of Complete and Incomplete Alpine Ski/Binding/Boot Systems in Rental Applications

2.2 *ISO Standard:*

8061 Method for the Selection of Release Torque Values[3]

3. Terminology

3.1 The terms and abbreviations used in this document are defined in Terminology E456, Test Method F504, and Test Method F1062.

3.2 Terms and abbreviations used in this document are repeated here for convenience. Refer to Test Method F1062 for equations.

3.2.1 *a*—the difference between the calibration of the specific device tested for agreement with an instrument of the type described in Test Method F504, and the calibration of an individual device of the same design.

3.2.2 *d*—the agreement between the test device and the standard apparatus described in Test Method F504.

3.2.3 *r*—the imprecision of the device tested.

3.2.4 *Recommended Operating Range (ROR)*—the portion of the full range of the test device which is in compliance with this specification.

3.2.5 *Operating Range (OR)*—the portion of the full range of the test device which may be employed in compliance with Practices F1063 and F1064. OR shall be defined by the user in accordance with the section on Inspection in Annex A1 of Practice F1063, or in the section on Inspection in Annex 2 of Practice F1064.

3.2.6 *M1*—a moment in a horizontal plane as defined in Fig. 1b of Test Method F504.

3.2.7 *M3*—a moment in a vertical plane with the ski as defined in Fig. 1b of Test Method F504.

3.2.8 *reference binding*—a binding (or group of bindings) used in the verification of a test device.

[1] This specification is under the jurisdiction of ASTM Committee F27 on Snow Skiing and is the direct responsibility of Subcommittee F27.10 on Binding Test Procedures.

Current edition approved July 1, 2013. Published August 2013. Originally approved in 1990. Last previous edition approved in 2008 as F1061 – 08. DOI: 10.1520/F1061-08R13.

[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.

[3] Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

3.2.9 *standard apparatus*—laboratory equipment including a test frame and instrumentation (see Test Method F504) used as the basis of comparison with the test device.

3.2.10 *test device*—a machine for determining the release moments of ski/boot/binding systems.

4. Classification

4.1 *Type I*—a device capable of indicating both positive and negative release moments (M_z).

4.1.1 *Type IA*—a Type I device with specified limits of linear displacement or angular deflection.

4.1.2 *Type IB*—a Type I device limited in use to a specified binding or group of bindings.

4.2 *Type II*—a device capable of indicating both positive and negative release moments (M_y).

4.2.1 *Type IIA*—a Type II device with specified limits of linear displacement or angular deflection.

4.2.2 *Type IIB*—a Type II device limited in use to a specified binding or group of bindings.

4.3 *Type III*—a device other than Type I or Type II with specified capability.

5. Selection of Reference Bindings

5.1 A binding (designation B, 4.1.2, 4.2.2) or group of bindings shall be selected by the test device manufacturer which are appropriate for the type of equipment defined by the test device classification. For designations other than B (4.1.2, 4.2.2), six bindings from at least three binding manufacturers will be used.

NOTE 1—Test Method F504 may be used to select reference bindings which are typical of bindings in common usage.

6. Performance Requirements

6.1 The test device shall be of a design such that when tested by Test Method F1062 (Section 8 and 9.3) will meet the following requirements:

6.1.1 *Type I (d)*—not greater than ±5 %[4] or ±2.5 Nm,[4] whichever is greater, for the reference binding(s) as a group and not more than ±7½ %[4] or 3.8 Nm,[4] whichever is greater, for any one binding in a group of two or more reference bindings.

6.1.2 *Type II (d)*—not greater than ±5 %[4] or ±10 Nm,[4] whichever is greater, for the reference binding(s) as a group and not more than ±7½ %[4] or 15 Nm,[4] whichever is greater, for any one binding in a group of two or more reference bindings.

6.1.3 *Type III (d)*—not greater than ±5 %.[4]

6.2 The test device shall be of a design such that repeatability, when tested by Test Method F1062 (Section 8 and 9.4) with a single operator is as follows:

6.2.1 *Type I (r)*—not greater than 3 %[4] or 1.5 Nm,[4] whichever is greater, for the reference bindings as a group.

6.2.2 *Type II (r)*—not greater than 3 %[4] or 6 Nm,[4] whichever is greater, for the reference bindings as a group.

6.2.3 *Type III (r)*—not greater than 3 %[4] for the reference bindings as a group.

6.3 The device shall be calibrated before end use using Test Method F1062 (Section 8.2.1) and meet the following tolerances:

6.3.1 *Type I (a)*—not greater than ±2.5 % or ±1.3 Nm, whichever is greater, over the ROR.

6.3.2 *Type II (a)*—not greater than ±2.5 % or ±5 Nm, whichever is greater, over the ROR.

6.3.3 *Type III (a)*—not greater than ±2.5 % over the ROR.

6.4 The magnitude of the smallest scale increment, which can normally be estimated, shall not exceed the following:

6.4.1 *Type I*—five percent of the smallest value in the ROR or 1.3 Nm, whichever is greater.

6.4.2 *Type II*—five percent of the smallest value in the ROR or 5 Nm, whichever is greater.

6.4.3 *Type III*—five percent of the smallest value in the ROR.

6.5 If the device is designed to indicate force, and a distance measurement is required to calculate the moment, the magnitude of the smallest increment of the distance measurement shall not be greater than 5 % of the shortest measurement anticipated.

6.6 Correction factors may be supplied with the test devices which do not meet the requirements of 6.1.

7. Other Requirements

7.1 If no letter designation is included in the classification, the device shall be suitable for releasable ski/boot/binding systems commonly in use at the time of manufacture.

7.1.1 Specific products or conditions which may limit the use of the device may be specified without adding a letter designation to the classification.

7.1.2 Devices classified with a letter designation shall be supplied with a description of all product types or conditions for which its use is appropriate.

7.1.3 Type III devices shall be supplied with specific references to the products and conditions for which its use is intended.

7.2 Instructions supplied with the device shall include the following:

7.2.1 All information necessary to determine the proper use and limitations of the device, including an explanation of all terminology and coded information used in the labeling device;

7.2.2 Procedures necessary for the proper operation of the device with the ski equipment commonly in use at the time of manufacture. All procedures shall be compatible with Practices F939, F1063, and F1064, or the equivalent ISO Standard 8061;

7.2.3 Precautions required to minimize operator error;

7.2.4 Procedures necessary to check reproducibility among operators (see Annex A1);

7.2.5 Routine maintenance and inspection procedures; and

7.2.6 Calibration requirements and procedures.

8. Product Labeling

8.1 Each device shall be clearly labeled with the following information:

[4] Average over ROR.

8.1.1 Name and address of the manufacturer or distributor,
8.1.2 Model designation,
8.1.3 Classification (see Section 4),
8.1.4 Recommended Operating Range (ROR),
8.1.5 Limitations and correction factors,
8.1.5.1 Specific limitations and correction factors not covered in 8.1.3 may be coded for concise labeling and explained in the instructions, and
8.1.6 Date of calibration.

8.2 Labels need not be affixed to all components of the device but shall be attached to the dynamometer portion of the test device.

ANNEX

(Mandatory Information)

A1. EXAMPLES FOR MANUFACTURERS OF TEST DEVICES OF A TEST METHOD FOR REPRODUCIBILITY AMONG OPERATORS

A1.1. Scope

A1.1.1 This test method covers procedures which may be supplied by the test device manufacturer to the user for the purpose of evaluating reproducibility among operators.

A1.2. Procedure

A1.2.1 Select a ski/boot/binding system which is typical of equipment in use and adjust the release moments to approximately the middle of the ROR for the test device.

A1.2.2 Randomly order a series of tests such that each operator performs five repetitions of the test.

A1.2.3 Designate one person to make all observations. The observer should not perform any tests.

A1.2.4 Conduct all training recommended by the test device manufacturer.

A1.2.5 Conduct all tests in the order determined in A1.2.2.

A1.2.6 Do not allow the operators to observe each other or the results of any tests.

A1.2.7 Observe and record the test results to the resolutions specified by the test device manufacturer.

A1.2.8 Perform the tests in only one direction of release. Repeat the entire procedure for other directions, as appropriate.

A1.3. Calculation

A1.3.1 Determine the median (middle quantitative value) test result for each operator.

A1.3.2 Determine the range of operator medians and express it as a percentage of the median for all operators.

A1.4 Other Uses for This Test Method

A1.4.1 This test method may be used to evaluate multiple observers of the test device scale using a single operator.

A1.4.2 This test method may also be modified to evaluate multiple observers of other scales such as the release indicator scale of the binding.