This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

Designation: F962 – 04 (Reapproved 2023)

Standard Specification for Oil Spill Response Boom Connection: Z-Connector[1]

This standard is issued under the fixed designation F962; 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 specification covers design criteria requirements, design geometry, material characteristics, and desirable features for oil spill response boom connections. These criteria are intended to define minimum mating characteristics and are not intended to be restrictive to a specific configuration.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

F818 Terminology Relating to Spill Response Booms and Barriers

F1523 Guide for Selection of Booms in Accordance With Water Body Classifications

3. Material Characteristics

3.1 End connector and cross pin materials shall be corrosion resistant in sea water and such other environments as the intended service may require. If dissimilar metals are used, care shall be used in design to avoid galvanic corrosion.

3.2 Any material is acceptable for construction of the boom connector provided consideration is given to such factors as weight, mechanical strength, chemical resistance, flexibility, and conditions of the environment in which it is to be used.

4. Design Requirements

4.1 The minimum tensile strength of a boom-to-boom connection shall equal or exceed the minimum fabric tensile strength specified in Table 1 of Guide F1523.

4.2 When the connector is designed as an integral part of the boom, it shall ensure distribution or transfer of the tension member loads from one boom section to the next through or around the end connector in such a manner that the integrity of the joint is not broken.

4.3 The connector or adapter shall not take more than 0.04 in. permanent set when a 250 lb load, distributed over 3 in., is applied. The load shall be applied at the location that results in maximum deflection and shall be resisted by supports placed ½ in. from each end as shown in Fig. 1.

4.4 In addition to the dimensional requirements shown in Fig. 2, the self-locking cross-pin/lanyard assembly shall have the following characteristics:

4.4.1 Its assembled strength shall resist a tensile load of 180 lbs placed upon the closed toggle by the test fixture to which the cross pin's lanyard is attached without deformation as shown in Fig. 3.

4.4.2 It shall have a ring or lanyard loop of a minimum diameter of 1 ½ in. for the convenience of pulling the pin from the boom connectors.

4.4.3 The toggle shall turn freely and shall latch in either direction.

4.4.4 The cross-pin's spring shall be captured or locked to the assembly and shall exert a force on the toggle of between 16 and 22 lbs when connectors are assembled.

4.4.5 When the cross-pin's spring is compressed fully, there shall be a clearance of ⅛ in. between the short end of the toggle and the mated connector as shown in Fig. 2.

4.4.6 The cross-pin's overall length shall be minimized and its ends rounded or chamfered so as to minimize wear and tear on adjacent stored booms or injury to boom handlers.

4.5 Pinholes, designed to accommodate the ⅜ in. diameter self-locking pin, shall be incorporated at the design water line (DWL) and, if required, a location as determined in 4.5.1 or 4.5.2 and shown in Fig. 4.

4.5.1 For any connector with 7.0 in. to 12.9 in. of connector material below the DWL pinhole, a second pinhole shall be located 6.000 in. ± 0.0015 in. below the DWL pinhole as shown in Fig. 4(a).

[1] This specification is under the jurisdiction of ASTM Committee F20 on Hazardous Substances and Oil Spill Response and is the direct responsibility of Subcommittee F20.11 on Control.

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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.

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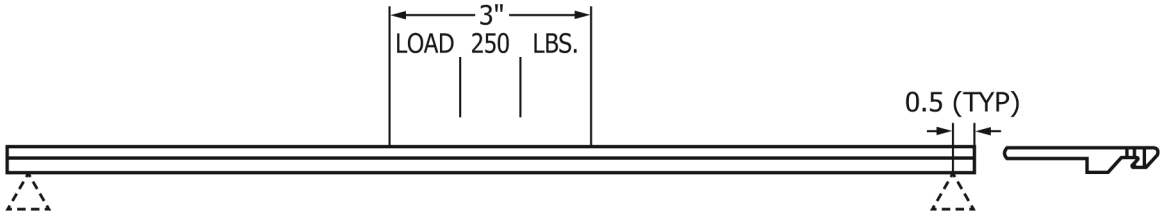

NOTE 1—All items shown are generic and not intended to depict any manufacturer's specific product.

FIG. 1 Connector/Adapter

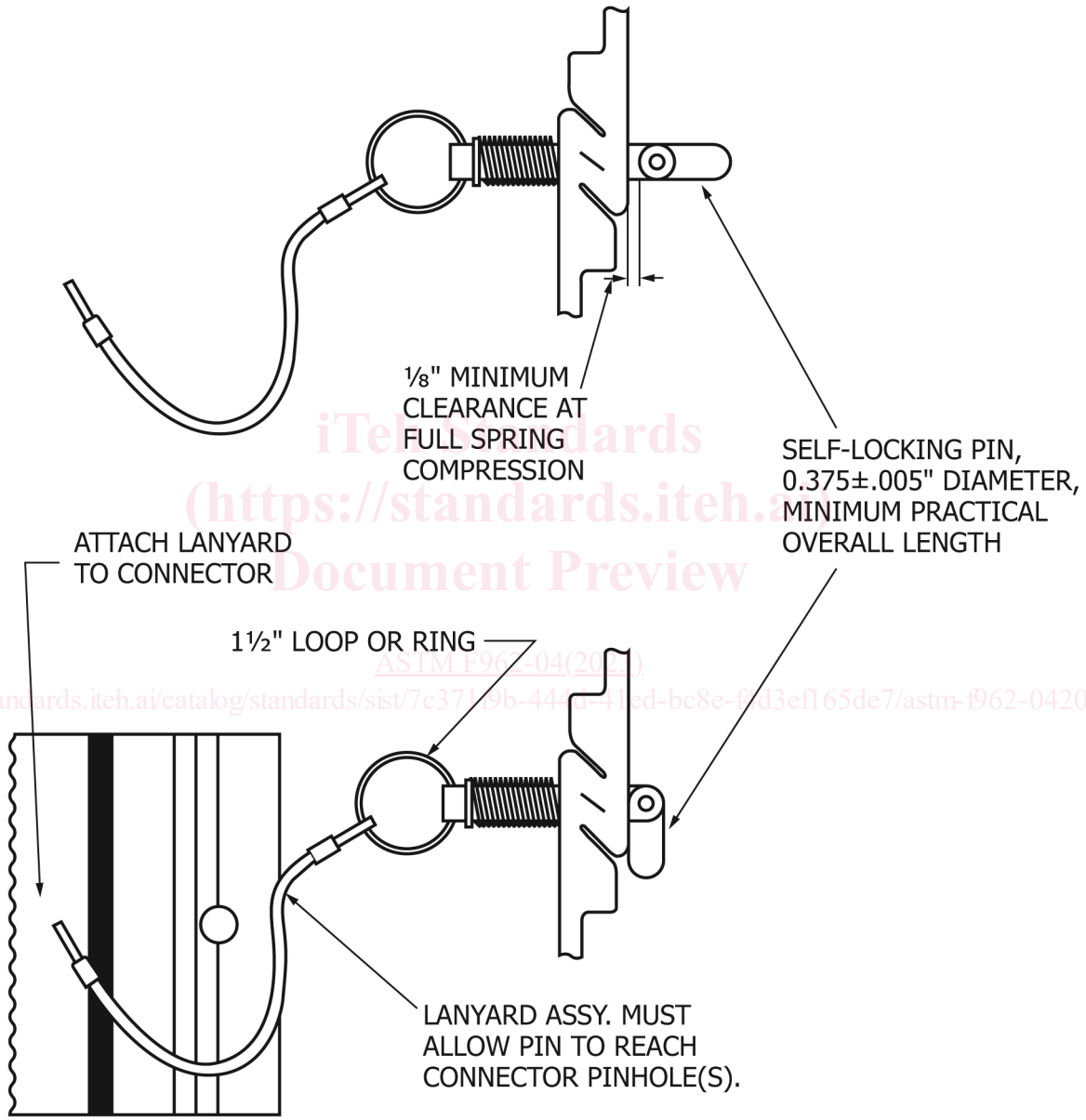

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FIG. 2 Self Locking Cross Pin / Lanyard Assembly

4.5.2 For any connector with 13.0 in. or more of connector material below the DWL pinhole, a second cross-pin hole shall be located 12.000 in. ± 0.0015 in. below the DWL pinhole as shown in Fig. 4(b).

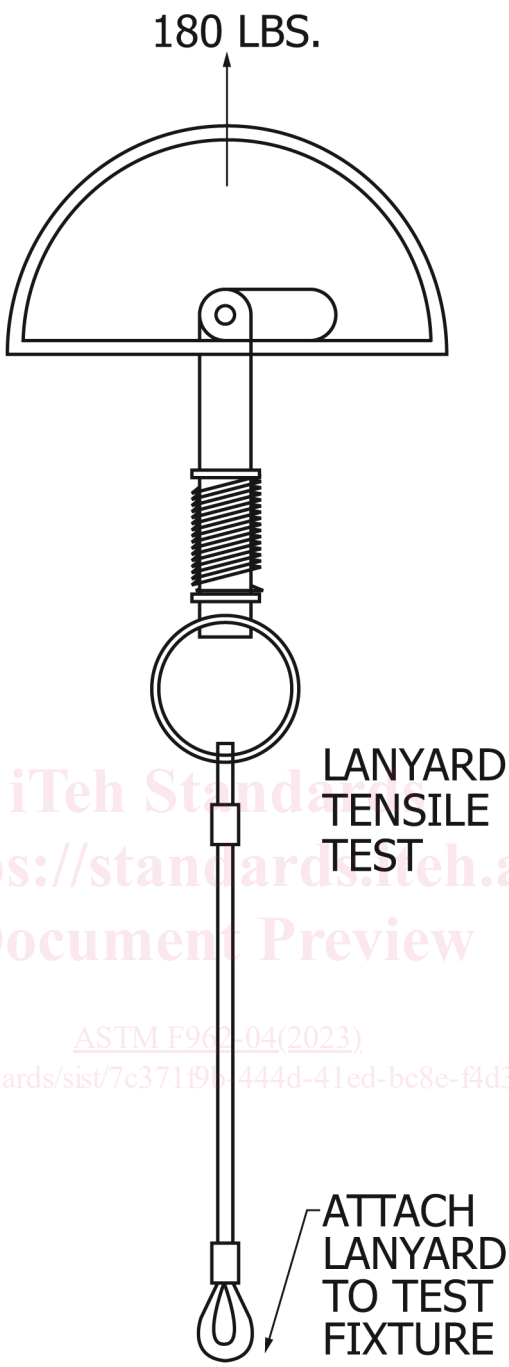

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FIG. 3 Toggle / Test Fixture

4.6 Where one half of a connector set mates with one having the geometry defined herein but is of other dimensions, it shall meet the following design requirements:

4.6.1 Possess adequate mechanical strength.

4.6.2 Minimize oil leakage.

4.6.3 Be sexless (neither male/female).

4.6.4 Be full height of boom of which it is a part.

4.6.5 Not impair stability of the boom.

4.6.6 Require no special tools for assembly.

4.6.7 Not reduce freeboard.

5. Significance and Use

5.1 The general design geometry herein defined applies to both a separate adaptor accessory mating two booms of different geometry as well as boom end connectors (see Terminology F818).

5.2 Interconnectibility is intended to facilitate mating of oil spill response booms of various sizes, strengths, design, and manufacture.