7.1.6.3
Folding and multipurpose ladders shall be service tested as specified in Section 7.4.

Submitter Information Verification

Committee: FDG-AAA
Submittal Date: Fri Mar 08 08:54:36 EST 2019

Committee Statement

Committee Statement: updated to match section header.
7.2.1.1 Ladder Test Setup.

The ladder shall be placed in a flat horizontal position and supported 150 mm (6 in.) from each end of the ladder, as shown in Figure 7.2.1.1.

Figure 7.2.1.1 Extension Ladder Positioned for Horizontal Bending Test.

7.2.1.1.1 The supports shall be high enough that the ladder does not touch the floor or other surface during the test.

7.2.1.1.2 The ladder shall not be tied, strapped, or otherwise fastened to the supports.

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Committee Statement

Committee Statement: Sub header title added
Response Message: SR-3-NFPA 1932-2019
7.2.1.3 Extension and Combination Ladders.

7.2.1.3.1 Extension and combination ladders shall be extended to their maximum extended length, with pawls engaged.

7.2.1.3.2 Straps or other ties that do not increase the strength of the ladder shall be permitted to be used to ensure that the ladder pawls remain engaged during the test.

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Committee Statement

Committee Statement: Section move to after Load Test section
7.2.1.2 Load Tests.

All test loads shall be applied equally across the beams of the ladder and 406 mm (16 in.) each side of the lengthwise center inclusive, and as follows:

1. If free weights are used, the test load shall be applied in increments consistent with safety and ease of handling to a flat test surface resting on the beams.

2. If a test fixture is used with a dynamometer, the test fixture shall be designed to apply the test load over the required area in a manner that allows a load shift to a weak beam and does not restrain the load directionally.

3. All test loads shall include the weight of the test surface.
**7.2.1.4 Metal and Fiberglass Ground Ladders.**

Metal and fiberglass ground ladders shall be tested in accordance with 7.2.1.4.1 through 7.2.1.4.8, as follows:

1. The ladder shall be loaded with a preload of 159 kg (350 lb) that shall remain in place for at least 1 minute to "set" the ladder prior to the completion of the rest of the test.

2. The preload shall be removed, and the distance between the bottom edge of each beam and the surface upon which the ladder supports are placed shall be measured at the lengthwise center of the ladder.

3. The ladder shall be loaded with a test load of 227 kg (500 lb) that shall remain in place for 3 minutes.

4. The test load shall be removed after 3 minutes and the ladder allowed to rest for up to 5 minutes, unless it recovers sooner.

5. The distance between the bottom edge of each beam and the surface upon which the ladder supports are placed shall be measured at the same spot that the measurements were taken in 7.2.1.4(2).

6. Differences in measurements taken in 7.2.1.4(2) and 7.2.1.4(5) shall not exceed those values shown in Table 7.2.1.4.

7. There shall be no visible permanent change or failure of any hardware.

8. Any ladder that exceeds the allowable difference in horizontal bending test recovery, has visible permanent change, or has failure of any hardware shall be removed from service.

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If the ladder recovers before the 5 minute resting period, within the parameters of Table 7.2.1.4, the ladder has passed the horizontal bend test.

7.2.1.4.1

The ladder shall be loaded with a preload of 159 kg (350 lb) that shall remain in place for at least 1 minute to "set" the ladder prior to the completion of the rest of the test.

7.2.1.4.2

The preload shall be removed, and the distance between the bottom edge of each beam and the surface upon which the ladder supports are placed shall be measured at the lengthwise center of the ladder.

7.2.1.4.3

The ladder shall be loaded with a test load of 227 kg (500 lb) that shall remain in place for 3 minutes.

7.2.1.4.4

The test load shall be removed after 3 minutes and the ladder allowed to rest for 5 minutes.

Table 7.2.1.4 Allowable Differences in Horizontal Bending Test Recovery

A.7.2.1.4(4)
A.7.2.1.4(4)

If the ladder recovers before the 5 minute resting period, within the parameters of Table 7.2.1.4, the ladder has passed the horizontal bend test.

7.2.1.4.5
The distance between the bottom of each beam and the surface upon which the ladder supports are placed shall be measured at the same spot that the measurements were taken in 7.2.1.4.2.

7.2.1.4.6
Differences in measurements taken in 7.2.1.4.2 and 7.2.1.4.5 shall not exceed those values shown in Table 7.2.1.4.6.

Table 7.2.1.4.6 Allowable Differences in Horizontal Bending Test Recovery

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7.2.1.4.7
There shall be no visible permanent change or failure of any hardware.

7.2.1.4.8
Any ladder that exceeds the allowable difference in horizontal bending test recovery, has visible permanent change, or has failure of any hardware shall be removed from service.

Supplemental Information

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Description: For staff use

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Committee Statement

Committee Statement: Test time adjusted to 5 minutes. Test criteria reformatted per MOS.
Response Message: SR-4-NFPA 1932-2019
7.2.1.5 Wood Ground Ladders.

Wood ground ladders shall be tested in accordance with 7.2.1.5.1 through 7.2.1.5.3, as follows:

1. The ladder shall be loaded with a test load of 227 kg (500 lb) that shall remain in place for 5 minutes and then be removed.

2. To pass the test, the ladder and its components shall not show ultimate failure.

3. Any ladder that does not meet the criterion of 7.2.1.5(2) shall be removed from service.

4. Extension ladders shall be extended and retracted their entire length with no interference to operation.

7.2.1.5.1

The ladder shall be loaded with a test load of 227 kg (500 lb) that shall remain in place for 5 minutes and then be removed.

7.2.1.5.2

To pass the test, the ladder and its components shall not show ultimate failure.

7.2.1.5.3

Any ladder that does not meet the criterion of 7.2.1.5.2 shall be removed from service.

7.2.1.5.4

Extension ladders shall be extended and retracted their entire length with no interference to operation.

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Committee Statement

Committee Statement: Section reformatted to conform to the MOS
Second Revision No. 6-NFPA 1932-2019 [ Section No. 7.2.2 ]

7.2.2 Test Procedure for Roof Hooks.
If the ladder is equipped with roof hooks, the roof hooks shall be tested in accordance with 7.2.2.1 through 7.2.2.6, as follows:

1. While the test method depicted in 7.2.2.2 through 7.2.2.5 represents a method of testing the roof hooks, variations of the specific roof hook testing method depicted herein in 7.2.2(2) through 7.2.2(6) shall be permitted provided the variations are consistent with the intent of this test method, are acceptable to the authority having jurisdiction, and provide equivalent results.

2. The ladder shall be positioned for testing as follows, and shall be tested as shown in Figure 7.2.2.
   
   a. The ladder shall be hung solely by the roof hooks, with the hooks supported only by the points of the hooks, in a vertical position from a fixture that is capable of supporting the entire test load and weight of the ladder.
   
   b. The ladder shall be secured in such a manner as to retain the ladder in the test position to prevent injury to test personnel if the hooks fail during the test.

3. A test load of 454 kg (1000 lb) in weight increments that are consistent with safety and ease of handling shall be placed over as many rungs as needed.

4. The test load shall be applied for a minimum of 1 minute.

5* After removal of the test load, there shall be no permanent deformation.

A.7.2.2(5)

Many roof ladders manufactured prior to 1984 were equipped with mild steel roof hooks 16 mm (5/8 in.) in diameter that do not meet the requirements of the roof hook test. Alloy steel (chrome-moly) roof hooks 16 mm (5/8 in.) in diameter or mild steel roof hooks 19 mm (3/4 in.) in diameter normally do meet the roof hook test requirement.

6. If there is any indication of permanent deformation, the ladder shall be removed from service.

Figure 7.2.2 Roof Ladder Positioned for Roof Hook Test.
7.2.2.1

While the test method depicted in 7.2.2.2 through 7.2.2.5 represents a method of testing the roof hooks, variations of the specific method depicted herein shall be permitted provided the variations are consistent with the intent of this test method, are acceptable to the authority having jurisdiction, and provide equivalent results.

7.2.2.2
The ladder shall be positioned for testing and shall be tested as shown in Figure 7.2.2.2.

**Figure 7.2.2.2 Roof Ladder Positioned for Roof Hook Test.**

7.2.2.2.1 The ladder shall be hung solely by the roof hooks, with the hooks supported only by the points of the hooks, in a vertical position from a fixture that is capable of supporting the entire test load and weight of the ladder.

7.2.2.2.2 The ladder shall be secured in such a manner as to retain the ladder in the test position to prevent injury to test personnel if the hooks fail during the test.

7.2.2.3 A test load of 454 kg (1000 lb) in weight increments that are consistent with safety and ease of handling shall be placed over as many rungs as needed.

7.2.2.4 The test load shall be applied for a minimum of 1 minute.

7.2.2.5 After removal of the test load, there shall be no permanent deformation.
A.7.2.2(5)

Many roof ladders manufactured prior to 1984 were equipped with mild steel roof hooks 16 mm (5/8 in.) in diameter that do not meet the requirements of the roof hook test. Alloy steel (chrome-moly) roof hooks 16 mm (5/8 in.) in diameter or mild steel roof hooks 19 mm (3/4 in.) in diameter normally do meet the roof hook test requirement.

7.2.2.6

If there is any indication of permanent deformation, the ladder shall be removed from service.

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Committee Statement

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7.2.3 Test Procedure for Extension Ladder Hardware.

If the ladder is an extension ladder, the hardware shall be tested as follows: in accordance with 7.2.3(1) through 7.2.3(6).

(1) While the test method depicted in 7.2.3(2) through 7.2.3(5) represents a method of testing the extension ladder hardware, variations of the specific extension ladder hardware testing method depicted herein in 7.2.3(2) through 7.2.3(6) shall be permitted provided the variations they are consistent with the intent of this test method, are acceptable to the authority having jurisdiction, and provide equivalent results.

(2) The ladder shall be positioned for testing and shall be tested as shown in Figure 7.2.3 with the ladder extended a minimum of one rung beyond the bedded position.

(3) A test load of 454 kg (1000 lb) in weight increments that are consistent with safety and ease of handling shall be placed on the rungs of the fly section.

(4) The test load shall be applied for a minimum of 1 minute.

(5) Ladders shall sustain this test load with no failure of the hardware and no permanent deformation or other visible damage of the structure.

(6) If there is any failure of the hardware, indication of permanent deformation, or other visible damage, the ladder shall be removed from service.

Figure 7.2.3 Extension Ladder Positioned for Hardware Test.
7.2.3.1

While the test method depicted in 7.2.3.2 through 7.2.3.5 represents a method of testing the extension ladder hardware, variations of the specific method depicted herein shall be permitted provided the variations are consistent with the intent of this test method, are acceptable to the authority having jurisdiction, and provide equivalent results.

7.2.3.2

The ladder shall be positioned for testing and shall be tested as shown in Figure 7.2.3.2 with the ladder extended a minimum of one rung beyond the bedded position.

**Figure 7.2.3.2 Extension Ladder Positioned for Hardware Test.**

7.2.3.3

A test load of 454 kg (1000 lb) in weight increments that are consistent with safety and ease of handling shall be placed on the rungs of the fly section.

7.2.3.4

The test load shall be applied for a minimum of 1 minute.

7.2.3.5

Ladders shall sustain this test load with no failure of the hardware and no permanent deformation or other visible damage of the structure.

7.2.3.6

If there is any failure of the hardware, indication of permanent deformation, or other visible damage, the ladder shall be removed from service.

**Supplemental Information**

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Committee:  FDG-AAA  
Submittal Date:  Thu Mar 07 20:16:40 EST 2019  

Committee Statement

Committee Statement:  Section reformatted per MOS  
Response Message:  SR-7-NFPA 1932-2019
7.3 Service Testing Requirements for Pompier Ladders.

All pompier ladders shall be service tested in accordance with 7.3(1) through 7.3.5 as follows:

1. While the test method depicted in 7.3(2) through 7.3.4 represents a method of testing the strength of pompier ladders, variations of the specific pompier ladder strength test method depicted herein in 7.3(2) through 7.3(5) shall be permitted, provided the variations are consistent with the intent of this test method, are acceptable to the authority having jurisdiction, and provide equivalent results.

2. The ladder shall be positioned for testing as follows and as shown in Figure 7.3.
   a) The ladder shall be tested in the vertical hanging position, supported only by its hook, from a fixture that is capable of supporting the entire test load and weight of the ladder.
   b) The ladder shall be secured in such a manner as to retain the ladder in the test position in order to prevent injury to test personnel if the hook fails during the test.

3. A test load of 454 kg (1000 lb) in weight increments that are consistent with safety and ease of handling shall be applied over multiple rungs.

4. The ladder shall withstand this test without ultimate failure.

5. If the pompier ladder does not meet the criterion of 7.3(4), it shall be removed from service.

Figure 7.3 Pompier Ladder Positioned for Test.

7.3.1

While the test method depicted in 7.3.2 through 7.3.4 represents a method of testing the strength of pompier ladders, variations of the specific method depicted herein shall be permitted, provided the variations are consistent with the intent of this test method, are acceptable to the authority having jurisdiction, and provide equivalent results.

7.3.2
The ladder shall be positioned for testing as shown in Figure 7.3.2.

**Figure 7.3.2 Pompier Ladder Positioned for Test.**

7.3.2.1 The ladder shall be tested in the vertical hanging position, supported only by its hook, from a fixture that is capable of supporting the entire test load and weight of the ladder.

7.3.2.2 The ladder shall be secured in such a manner as to retain the ladder in the test position in order to prevent injury to test personnel if the hook fails during the test.

7.3.3 A test load of 454 kg (1000 lb) in weight increments that are consistent with safety and ease of handling shall be applied over multiple rungs.

7.3.4 The ladder shall withstand this test without ultimate failure.

7.3.5 If the pompier ladder does not meet the criterion of 7.3.4, it shall be removed from service.

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**Submitter Information Verification**

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**Committee Statement**

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Response Message: SR-8-NFPA 1932-2019
7.4 Service Testing Requirements for Folding and Multipurpose Ladders.

All folding and multipurpose ladders shall be service tested in accordance with 7.4.1 through 7.4.4, as follows:

1. The ladder shall be unfolded and extended to its maximum straight length, placed in a flat horizontal position, and supported 150 mm (6 in.) from each end of the ladder, as shown in Figure 7.4(a) for a folding ladder or Figure 7.4(b) for a multipurpose ladder.

2. The supports shall be high enough that the ladder does not touch the floor or other surface during the test.

3. The ladder shall not be tied, strapped, or otherwise fastened to the supports.

4. All test loads shall be applied equally across the beams of the ladder and 203 mm (8 in.) each side of the lengthwise center inclusive.

5. If free weights are used, they shall be applied in increments consistent with safety and ease of handling to a flat test surface resting on the beams.

6. If a test fixture is used with a dynamometer, the test fixture shall be designed to apply the load over the required area in a manner that allows a load shift to a weak beam and does not restrain the load directionally.

7. All test loads shall include the weight of the test surface.

**Figure 7.4(a) Folding or Multipurpose Ladder Positioned for Horizontal Bending Test.**

[Diagram of Figure 7.4(a)]

**Figure 7.4(b) Multipurpose Ladder Positioned for Horizontal Bending Test.**

[Diagram of Figure 7.4(b)]
The ladder shall be unfolded and extended to its maximum straight length, placed in a flat horizontal position, and supported 150 mm (6 in.) from each end of the ladder, as shown in Figure 7.4.1.

**Figure 7.4.1 Folding or Multipurpose Ladder Positioned for Horizontal Bending Test.**

7.4.1.1 The supports shall be high enough that the ladder does not touch the floor or other surface during the test.

7.4.1.2 The ladder shall not be tied, strapped, or otherwise fastened to the supports.

7.4.2 All test loads shall be applied equally across the beams of the ladder and 203 mm (8 in.) each side of the lengthwise center inclusive.

7.4.2.1 If free weights are used, they shall be applied in increments consistent with safety and ease of handling to a flat test surface resting on the beams.

7.4.2.2 If a test fixture is used with a dynamometer, the test fixture shall be designed to apply the load over the required area in a manner that allows a load shift to a weak beam and does not restrain the load directionally.

7.4.2.3 All test loads shall include the weight of the test surface.

7.4.1 Metal and fiberglass folding ladders shall be tested in accordance with 7.4.5.

7.4.2 Wood folding ladders shall be tested in accordance with 7.4.6.

7.4.1 Metal and Fiberglass Folding and Multipurpose Ladders.
Metal and fiberglass folding and multipurpose ladders shall be service tested as follows:

1. The ladder shall be loaded with a preload of 73 kg (160 lb).
2. The preload shall be allowed to remain for at least 1 minute to “set” the ladder prior to completing the rest of the test.
3. After the preload is removed, the distance between the bottom edge of each beam and the surface upon which the ladder supports are placed shall be measured at the lengthwise center of the ladder.
4. The ladder shall be loaded with a test load of 102 kg (225 lb).
5. The test load shall remain in place for 3 5 minutes.
6. The test load shall be removed after 3 minutes and the ladder shall be allowed to rest for up to 5 minutes, unless it recovers sooner.

If the ladder recovers before the 5 minute resting period, within the parameters of Table 7.2.1.4, the ladder has passed the horizontal bend test.

7. The distance between the bottom of each beam and the surface upon which the ladder supports are placed shall be measured at the same location the measurements in 7.4.1(3) were taken.
8. There shall be no more than a 13 mm (0.5 in.) difference between measurements taken in 7.4.1(3) and 7.4.1(7).
9. There shall be no visible permanent change or failure of any hardware.
10. The ladder shall be capable of being folded or retracted back to its stowing configuration.
11. Any ladder that does not meet the test criteria of 7.4.1(8), 7.4.1(9), and 7.4.1(10) shall be removed from service.
12. If the ladder does not operate properly after a load test, it shall be removed from service.

A.7.4.1(6)

If the ladder recovers before the 5 minute resting period, within the parameters of Table 7.2.1.4, the ladder has passed the horizontal bend test.

7.4.1.1
The ladder shall be loaded with a preload of 73 kg (160 lb).

7.4.1.2
The preload shall be allowed to remain for at least 1 minute to “set” the ladder prior to completing the rest of the test.

7.4.1.3
After the preload is removed, the distance between the bottom edge of each beam and the surface upon which the ladder supports are placed shall be measured at the lengthwise center of the ladder.

7.4.1.4
The ladder shall be loaded with a test load of 102 kg (225 lb).

7.4.1.5
The test load shall remain in place for 3 minutes.

7.4.1.6
The test load shall be removed after 3 minutes and the ladder allowed to rest for 5 minutes.

A.7.4.1(6)

If the ladder recovers before the 5 minute resting period, within the parameters of Table 7.2.1.4, the ladder has passed the horizontal bend test.

7.4.1.7
The distance between the bottom of each beam and the surface upon which the ladder supports are placed shall be measured at the same location the measurements in 7.4.1.3 were taken.
7.4.1.8
There shall be no more than 13 mm (0.5 in.) difference between measurements taken in 7.4.1.3 and 7.4.1.7.

7.4.1.9
There shall be no visible permanent change or failure of any hardware.

7.4.1.10
The ladder shall be capable of being folded or retracted back to its stowing configuration.

7.4.1.11
Any ladder that does not meet the test criteria of 7.4.1.8, 7.4.1.9, and 7.4.1.10 shall be removed from service.

7.4.1.12
If the ladder does not operate and fold properly after a load test, it shall be removed from service.

7.4.2 Wood Folding and Multipurpose Ladders.

Wood folding and multipurpose ladders shall be service tested as follows:

(1) The ladder shall be loaded with a test load of 102 kg (225 lb).
(2) The test load shall remain in place for 5 minutes and then be removed.
(3) The ladder and its components shall not show any permanent damage.
(4) If the ladder does not meet the test criterion of 7.4.2.3, it shall be removed from service.
(5) If the ladder does not operate properly after a load test, it shall be removed from service.

7.4.2.1
The ladder shall be loaded with a test load of 102 kg (225 lb).

7.4.2.2
The test load shall remain in place for 5 minutes and then be removed.

7.4.2.3
The ladder and its components shall not show any permanent damage.

7.4.2.4
If the ladder does not meet the test criterion of 7.4.2.3, it shall be removed from service.

7.4.2.5
If the ladder does not operate properly after a load test, it shall be removed from service.

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Committee Statement

Sections reformatted in accordance with MOS. Test time duration and resting period adjusted.