

ANSI/BHMA A156.2-2011
Revision of ANSI/BHMA A156.2-2003

**AMERICAN NATIONAL STANDARD
FOR
BORED AND PREASSEMBLED LOCKS AND LATCHES**

SPONSOR



BUILDERS HARDWARE MANUFACTURERS ASSOCIATION, INC.

**American Standards Institute
Approved July 22, 2011**



AMERICAN NATIONAL STANDARD

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FOREWORD (This Foreword is not a part of ANSI/BHMA A156.2)

The general classification of builders hardware includes a wide variety of items which are divided into several categories. To recognize this diversity, a sectional classification system has been established. Locks and Lock Trim is one such section and this Standard is the result of the collective efforts of members of the Builders Hardware Manufacturers Association, Inc. who manufacture these products. The total Product Standards effort is therefore a collection of sections, each covering a specific category of items.

Performance tests and, where it has been necessary, dimensional requirements have been established to insure safety, security and stability to which the public is entitled. Performance criteria for resistance to surreptitious and forceful attack are not fully covered. There are no restrictions on design except for those dimensional requirements imposed for the reasons given above. It is also required that locks fit certain cut-out dimensions.

This Standard is not intended to obstruct but rather to encourage the development of improved products, methods and materials. The BHMA recognizes that errors will be found, items will become obsolete, and new products and methods will be developed. With this in mind, the Association will update, correct and revise these Standards on a regular basis. It shall also be the responsibility of manufacturers to request such appropriate revisions.

Bored locks have been described in three grade levels related to performance and security. Choice of grade and specific products are made on the basis of utility, aesthetics, security objectives and end use required.

The BHMA numbers which indicate functions of locks and latches do not identify grade, finish or design and are not intended to be used without necessary supplementary information. Individual manufacturer's catalogs are to be consulted.

Users of this Standard consult applicable local building codes as to requirements affecting the functions of locks used on fire doors and doors within a means of egress. Only functions compatible with the requirements of the applicable building codes are used.

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1. SCOPE

1.1 This Standard establishes performance requirements for bored and preassembled locks and latches, and includes cycle tests, strength tests, operational tests, security tests, material evaluation tests, finish tests, and dimensional criteria.

1.2 Tests described in this Standard are performed under laboratory conditions. In actual usage, results vary because of installation, door and frame construction, maintenance and environmental conditions.

1.3 **Grade Qualifications** Manufacturers shall indicate the Grade level of their locks. Locks shall meet all tests for their grade listing. A Grade 1 lock shall meet all Grade 1 criteria, a Grade 2 lock shall meet all Grade 2 criteria, and a Grade 3 lock shall meet all Grade 3 criteria.

2. DEFINITIONS

2.1 **Backset** The distance from the edge of the door measured at the centerline of the door thickness to the centerline of the cylinder or spindle.

2.2 Bolts

2.2.1 **Auxiliary Dead Latch** A plunger which, when actuated, automatically locks a projected latch bolt against return by end pressure.

2.2.2 **Latch Bolt** A lock component having a beveled end which projects from the lock front in its extended position, but is forced back into the lock case by end pressure or drawn back by action of the lock mechanism. When the door is closed, the latch bolt projects into a hole provided in the strike, holding the door in a closed position.

2.2.3 **Dead Locking Latch Bolt** A type latch bolt incorporating a plunger which, when depressed, automatically locks the projected latch bolt against return by end pressure. Also called dead latch.

2.3 Cylinders

2.3.1 **Cylinder** The subassembly of a lock containing a plug with a keyway and cylinder body with tumbler mechanism.

2.3.2 **Cylinder Body** The portion of a cylinder that surrounds the plug and contains the tumbler mechanism.

2.3.3 **Cylinder Plug** A component of the cylinder within the body which is actuated when the correct key is inserted.

2.3.4 **Interchangeable Core Cylinder** A cylinder that is removable from the lock with a designated key without disassembly of the lock.

2.4 **Lever Catch** Also called knob catch. The spring activated retainer which engages the lever in order to maintain its attachment to the lever spindle.

2.5 **Lock Front** A plate fastened to the edge of a door through which the bolt(s) pass.

2.6 Lock Series

2.6.1 **Preassembled Lock Series 2000** A lock fitting into a notched cutout in a door.

2.6.2 **Bored Lock Series 4000** A lock installed in a round bored opening in the edge and face of a door.

2.7 **Operating Trim** Lock components including levers, knobs, paddles, or handlesets and equivalent components.

2.8 Push Button and Related Terms

2.8.1 **Push Button Code Mechanism** A mechanism used in place of, or in conjunction with a key and cylinder.

2.8.2 **Push Button** A single inside locking device that when depressed, locks the outside operating trim.

2.8.3 **Turn Button** A single inside locking device that when rotated, locks the outside operating trim.

2.8.4 **Combination Push Button/Turn Button** A single inside locking device that when depressed, locks the outside operating trim, or when depressed and rotated maintains the locked state.

- 2.9 **Indicator Button** The component of a hotel guest room lock which when activated, indicates on the outside that the room is occupied.
- 2.10 **Spindle** A lock component which transfers operating trim rotation to the lock mechanism.
- 2.11 **Strike** A mortised or surface mounted plate fastened to the door frame into which the bolts project.
- 2.12 **Strike Box** A housing used in back of a strike to enclose the bolt or bolt openings.
- 2.13 **Thumb Piece** A lever projecting from a handle pressed by the thumb to retract a latch bolt.

3. GENERAL

3.1 **Cylinders** Cylinders supplied or mated with locks shall meet the performance requirements for the appropriate cylinder types and grade level found in the ANSI/BHMA Standard A156.5-2010 for Cylinders and Input Devices for the lock to retain its grade listing. Assemblies take the grade level of the lowest graded component. Other mechanisms are permitted to be used in lieu of cylinders providing the performance and security criteria are equivalent to that of cylinders. Suffix D shall be indicated in the certified products directory for locks to be used only with drill resistance cylinders as evaluated in A156.5.

3.2 No lock can provide complete security by itself. Locks may be defeated by forcible or technical means, or evaded by entry elsewhere on the property. No lock can substitute for caution, awareness of your environment, and common sense. Builders hardware is available in multiple performance grades to suit the application. In order to enhance security and reduce risk, consult a qualified locksmith or other security professional. For applications where pick resistance and other higher security protections are required users should consider locks meeting UL 437 or ANSI/BHMA A156.30 for High Security Cylinders.

3.3 **Operating Trim** Where levers are referenced, knobs, paddles, or handlesets are permitted to be used.

3.4 **Trim** Roses, escutcheons, knobs, levers, turns, paddles, cylinder guards shall cover all door preparation openings.

3.5 **Reference to Other Standards** The following Standards are referenced within: ASTM F476 R1996, Security Tests for Swinging Door Assemblies; ANSI/BHMA Standard A156.5-2008 for Cylinders and Input Devices, ANSI/BHMA Standard A156.12-2005 for Interconnected Locks, ANSI/BHMA Standard A156.13 2005 for Mortise Locks, ANSI/BHMA Standard A156.18 2006 for Materials and Finishes, ANSI/BHMA A156.25-2002 for Electrified Locking Devices, ANSI/BHMA A156.36 for Auxiliary Locks. ANSI Standards are available from BHMA, www.buildershardware.com. ASTM Standards are available from www.astm.org.

3.6 **Values** Required values in this Standard are given in US units. The SI (metric) equivalents are approximate.

3.7 **Door and Frame Preparation** The lock models described in this standard shall fit the door and frame preparations described in the ANSI/BHMA A156.115 Series. Other configurations are permitted to fit special opening templating requirements. See manufacturers' instructions for details.

3.8 **Building Codes** Certain lock functions described in this standard are not permitted on doors within a means of egress. Consult local authority having jurisdiction. When locks and latches are used in fire door assemblies, they shall have been tested and listed for use in fire doors by a Nationally Recognized Testing Laboratory (NRTL) and shall be under an in-plant follow-up inspection service.

4. DIMENSIONAL CHARACTERISTICS

4.1 **Latch bolt projection:** minus 1/16 in. (1.6 mm) tolerance.

4.1.1 **Series 2000** with dead locking latch bolts. Series 2000 preassembled locks and latches are available only in Grade 1. All Grades: 1/2 in. (12.7mm)

4.1.2 **Series 4000** with dead locking latch bolts. Series 4000 bored locks and latches are available in Grades 1, 2 and 3. All Grades: 1/2 in. (12.7 mm).

4.1.3 **Series 4000** with latch bolts that are not dead locking:

Grades 1 & 2: 1/2 in. (12.7mm)

Grade 3: 3/8 in. (10 mm)

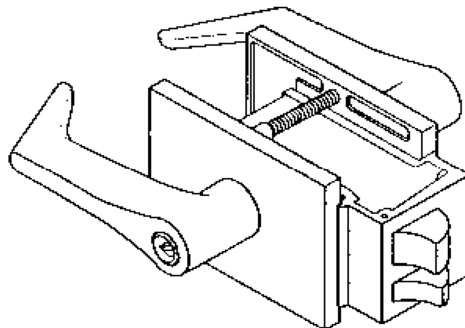
4.1.4 Additional latch bolt projections exceeding those required are available. Consult individual manufacturers' catalogs.

4.2 **Knob major diameter** 1 13/16 in. (46 mm) minimum.

4.3 **Tolerances** All values which do not carry specific tolerances or are not marked maximum or minimum shall have the following tolerances: Linear dimensions shall be $\pm 1/16$ in. (1.6 mm). Weight or force shall be $\pm 2\%$. Angles shall be ± 2 degrees. Where only minus tolerances are given, the dimensions are permitted to be exceeded at the option of the manufacturers.

5. DESCRIPTION AND FUNCTION NUMBERS OF SERIES 2000 PRE-ASSEMBLED LOCKS AND LATCHES

Typical Preassembled Lock



5.1 In the following lock descriptions, the functions are described using lever trim for brevity and clarity. It is acceptable to use models with knobs, paddles, or handlesets wherever levers are referenced. Where keys or cylinders are referenced, pushbutton code mechanisms are permitted. Some functions may be available with electrical operation in place of mechanical operation. The basic function shall remain the same as described.

5.2 **Function Number Tests.** See Chart 1 in appendix for summary of tests by function.

5.3 Function Descriptions

F36 Passage or Closet Latch Set. Latch bolt operated by lever from either side at all times.

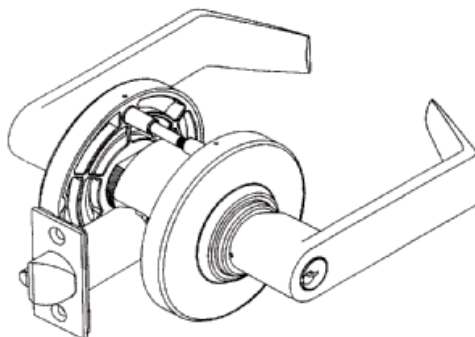
F37 Privacy, Bedroom or Bath Lock. Latch bolt operated by lever from either side. Outside lever is locked by push button inside, and unlocked by emergency release outside, operating inside lever or closing door.

F38 Patio or Privacy Lock. Dead locking latch bolt operated by lever from either side. Outside lever is locked by push button inside and unlocked by operating inside lever or closing door. Do not use on doors in rooms that have no other entrance.

- F39 Communicating Lock.** Dead locking latch bolt operated by lever from either side. Turn button, in either lever, locks or unlocks opposite lever. Do not use on doors in rooms that have no other entrance.
- F40 Entrance or Store Room Lock.** Dead locking latch bolt is operated by lever from either side except when outside lever is locked by turn button in inside lever. When outside lever is locked, latch bolt is retracted by key from outside or by operating inside lever. Turn button shall be manually rotated to unlock outside lever. At the option of the individual manufacturer, operating the key in the outside lever shall permit the latch bolt to be retracted by operating the outside lever, providing the key cannot be removed in the unlocked position.
- F41 Entry Lock.** Dead locking latch bolt operated by lever from either side except when outside lever is locked by push button in inside lever. When outside lever is locked, operating key from outside or operating inside lever retracts latch bolt and releases push button. Closing door does not release push button.
- F42 Classroom Lock.** Dead locking latch bolt operated by lever from either side except when outside lever is locked from outside by key. When outside lever is locked, latch bolt is retracted by key from outside or operating inside lever.
- F43 Holdback Lock.** Dead locking latch bolt operated by lever from either side except when outside lever is locked from outside by key. Latch bolt is locked in a retracted position by key. When outside lever is locked, latch bolt is retracted by key from outside or by operating inside lever, unless latch bolt has been locked in a retracted position.
- F44 Store Room or Closet Lock.** Dead locking latch bolt operated by key from outside or by operating inside lever. Outside lever is always fixed. At the option of the individual manufacturer, operating the key in the outside lever shall permit the latch bolt to be retracted by operating the outside lever, providing the key cannot be removed in the unlocked position.
- F45 Apartment, Exit or Public Toilet Lock.** Dead locking latch bolt operated by lever from either side except when outside lever is locked by key from inside. When outside lever is locked, latch bolt is retracted by key from outside or by operating inside lever.
- F46 Store Door Lock.** Dead locking latch bolt operated by lever from either side except when both levers are locked by key from either side.
- F47 Store Door Lock.** Latch bolt operated by lever from either side. Dead bolt operated by key from either side.
- F48 Hotel Guest Room, Club House, Dormitory or Apartment Entrance Lock.** Dead locking latch bolt operated by lever from inside at all times. Outside lever always fixed. Latch bolt operated by key from outside except when push button inside is depressed, thus shutting out all keys except the emergency key. Depressing push button operates visual indicator in face of cylinder showing the room is occupied. Operating inside lever, or closing door releases indicator and shut out feature except when shut out is activated by a special procedure which shuts out all keys except emergency keys. At the option of the individual manufacturer, operating the key in the outside lever shall permit the latch bolt to be retracted by operating the outside lever, providing the key cannot be removed in the unlocked position.

6. DESCRIPTION AND FUNCTION NUMBERS OF SERIES 4000 BORED LOCKS AND LATCHES

Typical Bored Lock



6.1 In the following bored lock descriptions, the functions are described using lever trim for brevity and clarity. Models with knobs, paddles, thumbpieces, or turnpieces, offered by some manufacturers for certain functions are also permitted. Where keys or cylinders are referenced, other input devices are permitted. See ANSI/BHMA A156.5 for Cylinders and Input Devices. Some functions may be available with electrical operation in place of mechanical operation. See ANSI/BHMA A156.25 for Electrified Locking Devices. The basic function shall remain the same as described.

6.2 The latch bolt and its related working parts shall be contained in a factory assembled unit which shall connect with at least one of the lever or knob assemblies or retractor assembly. The unit passing through the cross bore of the door shall be firmly clamped or fastened to the door by the roses or rose subassemblies. Lock sets shall permit centering of assemblies at installation on doors within the thickness range given.

6.3 Bored lock fronts shall be fixed or adjustable beveled to 1/8 in. (3.2 mm) in 2 in. (51 mm). Flat fronts available if specified.

6.4 **Function Number Tests** See Chart 1 in appendix for summary of tests by function.

6.5 Function Descriptions

F75 Grades 1, 2 and 3. Passage or Closet Latch. Latch bolt operated by lever, from either side at all times.

F76A Grade 1 and 2. Privacy, Bedroom or Bath Lock. Latch bolt operated by lever from either side. Outside lever is locked by push button or other locking device inside and unlocked by emergency release outside, operating inside lever or closing door.

F76B Grades 2 and 3. Privacy, Bedroom or Bath Lock. Latch bolt operated by lever from either side except when outside lever is locked by locking device inside. Locking device shall automatically release when inside lever is operated or be in unlocked position before inside lever is operated. Emergency release on outside shall permit outside lever to operate latch bolt.

F77A Grade 1 and 2. Patio or Privacy Lock. Dead locking latch bolt operated by lever from either side. Outside lever is locked by push button or other locking device inside and unlocked by operating inside lever or closing door. Do not use on doors in rooms that have no other entrance.

F77B Grades 2 and 3. Patio and Privacy Lock. Dead locking latch bolt operated by lever from either side except when outside lever is locked by locking device inside. Locking device shall automatically release when inside lever is operated or be in the unlocked position before the lever is operated. Do not use on doors in rooms that have no other entrance.

F78 Grades 1 and 2. Communicating Lock. Dead locking latch bolt operated by lever from either side. Turn button or locking device on either side locks or unlocks opposite lever. Do not use on doors in rooms that have no other entrance.

F79 Grades 1 and 2. Communicating Lock. Dead locking latch bolt operated from inside by lever and from outside by thumb turn. Turning button or operating locking device in inside lever locks both lever and thumb turn. Turn button or other locking device does not release unless manually restored to unlocked position.

F80 Grades 1 and 2. Communicating Lock. Dead locking latch bolt operated by lever from either side. Turning key in either lever locks or unlocks its own lever independently. Do not use on doors in rooms that have no other entrance.

F81 Grades 1, 2 and 3. Entry Lock. Dead locking latch bolt operated by lever from either side except when outside lever is locked by turn button or other locking device inside. When outside lever is locked, latch bolt is operated by key in outside lever or by operating inside lever. Turn button or other locking device shall be manually operated to unlock outside lever. At the option of the individual manufacturer, operating the key in the outside lever shall permit the latch bolt to be retracted by operating the outside lever, providing the key cannot be removed in the unlocked position.

F82A Grade 1 and 2. Entry Lock. Dead locking latch bolt operated by lever from either side except when outside lever is locked by push button or other locking device on inside. When outside lever is locked, operating key in outside lever or operating inside lever unlocks push button or other locking device and retracts latch bolt. Closing door does not release push button or other locking device.

F82B Grades 2 and 3. Entry Lock. Dead locking latch bolt operated by lever from either side except when outside lever is locked by locking device on inside. When outside lever is locked, operating key in outside lever unlocks locking device. Locking device shall automatically release when inside lever is operated or be in the unlocked position before inside lever is operated.

F83 Grades 1, 2 and 3. Exit Lock. Dead locking latch bolt operated by lever from either side except when outside lever is locked by turn button or other locking device in inside. Turn button or other locking device shall be manually operated to unlock outside lever. Inside lever always operates latch bolt.

F84 Grades 1 and 2. Classroom Lock. Dead locking latch bolt operated by lever from either side except when outside lever is locked from outside by key. At the option of the individual manufacturer, operating the key in the lever shall permit the latch bolt to be retracted. When outside lever is locked, latch bolt is operated by inside lever.

F85 Grade 1. Holdback Lock. Dead locking latch bolt operated by lever from either side except when outside lever is locked from outside by key. Latch bolt is locked in a retracted position by key. When outside lever is locked, latch bolt is retracted by key from outside or by operating inside lever unless latch bolt has been locked in a retracted position.

F86 Grades 1, 2 and 3. Store Room or Closet Lock. Dead locking latch bolt operated by key in outside lever, or by operating inside lever. Outside lever is always inoperable. At the option of the individual manufacturer, operating the key in the outside lever shall permit the latch bolt to be retracted by operating the outside lever, providing the key cannot be removed in the unlocked position.

F87 Grade 1. Utility, Asylum or Institutional Lock. Dead locking latch bolt operated by key in lever, from either side. Both levers always inoperable. At the option of the individual manufacturer, operating the key in the outside lever shall permit the latch bolt to be retracted by operating either the inside or outside lever, providing the key cannot be removed in the unlocked position.

F88 Grade 1. Apartment, Exit or Public Toilet Lock. Dead locking latch bolt operated by lever from either side except when outside lever is locked by key from inside. When outside lever is locked, latch bolt is retracted by key in outside lever or by operating inside lever.

F89 Grades 1, 2 and 3. Exit Latch. Dead locking latch bolt retracted by lever from inside at all times. Outside lever is always inoperable.

F90 Grades 1 and 2. Corridor Lock. Dead locking latch bolt operated by lever from either side except when outside lever is locked by key in outside lever or by push button or other locking device on inside. Key in outside lever locks or unlocks outside lever. Operating inside lever releases push button or other locking device placed in a locked position. Closing door releases push button or other inside locking device. Inside lever always operates latch bolt.

F91 Grade 1. Store Door Lock. Dead locking latch bolt operated by lever from either side except when both levers are locked by key from either side.

F92 Grades 1 and 2. Service Station Lock. Dead locking latch bolt operated by lever from either side except when outside lever is locked by push button or other locking device on inside. Key outside, operating inside lever or closing door releases push button or other locking device unlocking outside lever except when slotted push button or other locking device is in a locked position. Inside lever always operates latch bolt.

F93 Grades 1 and 2. Hotel Guest Room, Club House, Dormitory or Apartment Entrance Lock. Dead locking latch bolt operated by lever from inside at all times. Outside lever always inoperable. Latch bolt operated by key from outside except when push button or other locking device inside is operated thus shutting out all keys except emergency key. Operating push button or other locking device operates outside visual indicator showing room is occupied. Operating inside lever or closing door releases indicator and shut out feature except when shut out is activated by a special procedure which shuts out all keys except emergency or display key. At the option of the individual manufacturer, operating the key in the outside lever shall permit the latch bolt to be retracted by operating the outside lever, providing the key cannot be removed in the unlocked position.

F94 Grades 1, 2, and 3 Entry Handleset. Dead locking latch bolt operated by thumb piece from outside and lever from inside except when outside thumb piece is locked by push button or other locking device on inside. When outside thumb piece is locked, operating key in outside cylinder or operating inside lever retracts latch bolt. Closing door does not release push button or other locking device.

F107 Grade 1. Entry Handleset. Dead locking latch bolt operated by thumb piece from outside and lever from inside except when outside thumb piece is locked by push button or other locking device on inside. When outside thumb piece is locked, operating key in outside cylinder or operating inside lever unlocks push button or other locking device and retracts latch bolt. Closing door does not release push button or other locking device.

F108 Grades 2 and 3. Entry Handleset. Dead locking latch bolt operated by thumb piece from outside and lever from inside except when outside thumb piece is locked by locking device on inside. When outside thumb piece is locked, operating key in outside cylinder unlocks locking device. Locking device shall automatically release when inside lever is operated or be in the unlocked position before inside lever is operated.

F109 Grades 1, 2, and 3. Combined F81 and F82 Entry Lock. Dead locking latch bolt operated by lever from either side except when outside lever is locked by the push or turn button on inside. Key outside or operating inside lever releases push or turn button unlocking outside lever except when push or turn button has been rotated to keep outside lever locked. Inside push or turn button must be manually operated to unlock outside lever. Inside lever always operates latch bolt.

F110 Grade 1. Intruder Classroom Lock. Dead locking latch bolt operated by lever from either side. Key either inside or outside locks or unlocks outside lever. Inside lever always operates latchbolt.

F111 Grade 1 and 2. Communicating Passage Lock. Dead locking latch bolt operated by lever one side only at all times. Non removable blank trim or no trim outside.

F112 Grade 1 and 2. Communicating Storeroom Lock. Dead locking latch bolt operated by key in lever one side only. Lever always inoperable. At the option of the individual manufacturer, operating the key in the lever shall permit the latch bolt to be retracted by operating the lever, providing the key cannot be removed in the unlocked position. Non removable blank trim or no trim outside.

F113 Grade 1 and 2. Communicating Classroom Lock. Dead locking latch bolt operated by lever one side only except when lever is locked by key. At the option of the individual manufacturer, operating the key in the lever shall permit the latch bolt to be retracted. Non removable blank trim or no trim outside.

7. GENERAL TEST PARAMETERS

7.1 Lubrication shall not be applied to the product at any time during the tests.

7.2 **Mounting locks** The test equipment shall permit installation of the complete lockset with trim in accordance with the manufacturer's recommendations as described in the template and instruction sheets regularly furnished. Unless otherwise specified, locksets shall be properly mounted in accordance with the manufacturer's instructions. The lock front-to-strike spacing shall be 1/8 in. +/- 1/32 (0.8 mm) at centerline of bolt for all tests.

7.3 **Test Cylinders** Cylinders used for testing, shall have certification per ANSI/BHMA A156.5-2010 for Cylinders and Input Devices for Locks. For cycle testing, at the manufacturers' discretion, the moveable retainers are allowed to be removed.

7.4 **Standard Test Methods for Security of Swinging Door Assemblies** Some of the test equipment, fixtures and strength tests required in this Standard are taken from ASTM F476. Descriptions of the test equipment, fixtures and strength tests required have been incorporated by reference to the specific paragraph numbers found in ASTM F476.

7.5 Where a lock function or design does not allow a specific test, the test is not required. Failure of the test fixture does not constitute pass or failure of the tests.

7.6 Test Fixtures

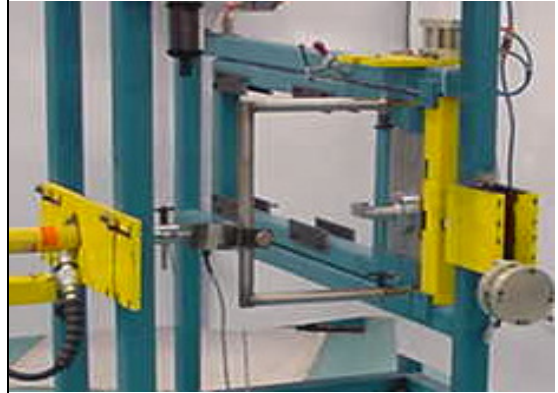
7.6.1 **Mechanically operated test door** Provide a mechanically operated test door or panel a minimum of 30 in. (762mm) and 36 in. maximum (914 mm) wide simulating the normal operation of the lock set through a cycle consisting of (a) operating the lever or the knob to retract the latch bolt from the strike as specified in Cycle Test 11; (b) opening the door to clear the strike without contact; (c) releasing the lever or knob, to fully project the latch bolt; and (d) closing the door to produce full latching by means of a door closer or other suitable device.



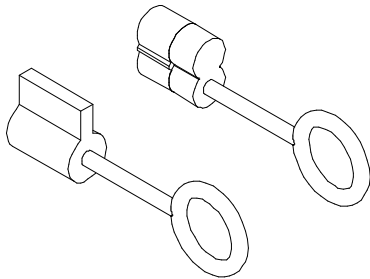
7.6.2 Lockset Impact Test fixture See ASTM F476, paragraphs 6 and 8. The fixture is permitted to be increased in size up to 36 in. (915 mm) square. The door shall be equipped with a simulated stop on the impact side to reduce rebound.



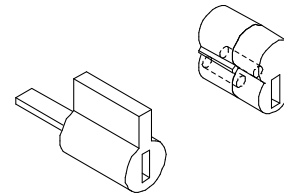
7.6.3 Strength Test Fixture



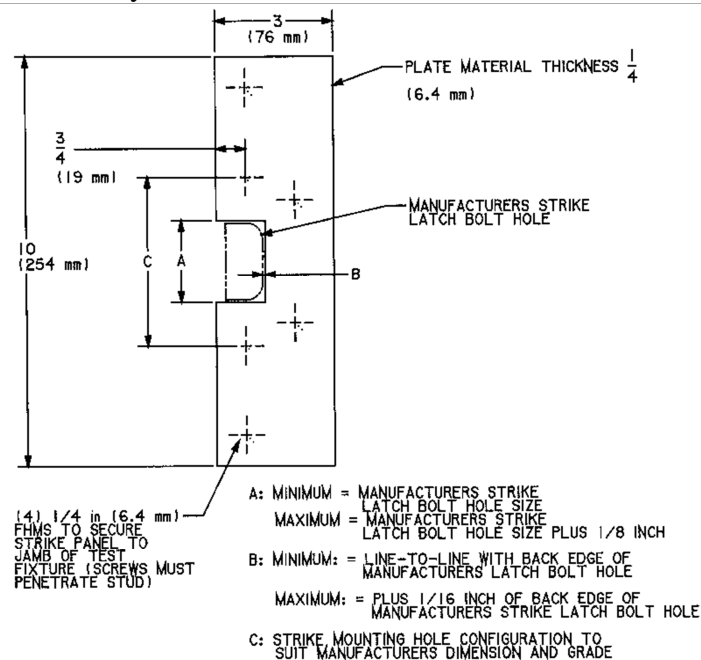
7.6.4 Cylinder Assembly Pulling Test Fixture



7.6.5 Cylinder Assembly Torque Test Fixture



7.6.6 Strike Attachments Where specified within this Standard, use the manufacturer's supplied strike and mounting instructions. Cutaway Strike Attachment shown below.



7.6.7 Strike and Mount Information

Strikes furnished with wood screws shall be applied with a wood backing to accommodate attachment. Combination screws shall be tested in the metal strike attachment. See respective sections for actual strike and mount (wood or metal) to use.

7.8 Measuring Equipment All instruments and equipment used to conduct tests for recording data need to be calibrated and maintained for effectiveness and continued accuracy. Calibration of equipment shall be traceable to the National Institute of Standards and Technology (NIST). The frequency of calibration depends on the recommendation of the particular test equipment manufacturer with a minimum being once per year. Measuring equipment used shall have a known measurement error and be capable of qualifying the value being measured.

7.9 Inside Locked Trim Tests Functions with Keyed *Inside* Locked Trim are subject to the same tests as Locked Outside Trim unless otherwise specified. Use separate samples.

8. SAMPLE TEST LOCKS

Operational and Cycle Tests	Strength Tests	Security Tests	Finish Tests per Finish	Material Evaluation Test
4 lock samples (use same 3 specimens for all operational and cycle tests, and one additional for cylinder cycle)	3 lock samples (use same specimens for all strength tests)	7 total, one specimen each test; 11 for double locking functions	5 trim parts or coupons when required.	1 lock sample may be used for the knob crush, rose dent and rose deformation

Tests shall be made using standard sets. Complete instructions and templates shall be included. Failure of any one lock in any of the tests shall constitute failure of the complete qualification tests.

See Chart 1 in the appendix for information on tests by function.

9. OPERATIONAL TESTS

9.1 Force to Retract Unloaded Bolt (Use no strike and either wood or metal mount)

9.1.1 By Lever A torque meter shall be applied to the **lever** until the bolt is withdrawn to within 1/8 in. of the lock front. The measured torque to retract the bolt shall not exceed the maximum specified. Test both the outside and inside levers both upwards and downwards. When the lever is unidirectional, test only in the direction of operation.

9.1.2 By Knob A torque meter shall be applied to the knob until the bolt is withdrawn to within 1/8 in. of the lock front. The maximum measured torque to retract the bolt shall not exceed the maximum specified. Test both the outside and inside knobs clockwise and counterclockwise. When the knob is unidirectional, test only in the direction of operation.

9.1.3 By Thumb Piece. Center punch the thumb piece to receive a pointed rod connected to a force meter. Apply a perpendicular load at a point 1/4 in. (6.4 mm) from the end of the thumb piece until the bolt is withdrawn to within 1/8 in. of the lock front. The maximum load shall not exceed the value specified.

9.1.4 By Paddle. A force meter shall be applied to the **outside** paddle in the direction of the opening swing of the door 1 in. (25.4mm) from the free end of the paddle on the centerline until the bolt is withdrawn to within 1/8 in. of the lock front. Repeat to the **inside** paddle in the direction of the opening swing of the door 1 in. (25.4mm) from the free end of the paddle retracting the bolt.

9.1.5 **By Key** This test does not apply if the function allows a lock to be unlocked by the key to permit the bolt to be retracted by operating trim. With the dead locking latch bolt plunger depressed and the lockset in locked position, a torque meter shall be applied to the **key** and slowly rotated until the bolt is withdrawn to within 1/8 in. of the lock front. The maximum measured torque to retract the bolt shall not exceed the value specified. Repeat in the opposite direction (when the lock construction permits operation in both clockwise and counterclockwise directions).

9.1.6 **By Turn** A torque meter shall be applied to the inside and outside **turn**. The maximum measured torque to retract the bolt to within 1/8 in. of the lock front shall not exceed the maximum specified.

Requirements Force to Retract Bolt All Grades, maximum

Knobs	9 lbf-in. (1 Nm)
Levers	28 lbf-in. (3.1 Nm)
Thumb Pieces	9 lbf (40N)
Paddles	40 lbf (180N)
Keys	9 lbf-in.(0.7 Nm)
Turns	9 lbf-in. (1 Nm)

9.2 Force to Retract Preloaded Bolt (Warped Door)

Perform per 9.1.1 through 9.1.6 (except use either strike and the wood or metal mount) while a 50 lbf (222 N) is initially applied perpendicular to the door at a point 1 in. (25.4 mm) from the lock edge of the door and on the center line of the latch bolt. The 50 lbf (222 N) shall load the latch bolt against the strike in the direction of opening the door. The maximum measured torque or force to retract the latch bolt to clear the strike without contact shall not exceed the maximum specified.



Requirements All Grades maximum

Knobs	Levers	Thumbpiece	Turn	Paddles	Key *
45 lbf-in. (5Nm)	70 lbf-in. (8Nm)	40 lbf (180N)	50 lbf-in. (5.6 Nm)	80 lbf (360N)	33 lbf-in. (3.7 Nm)

* Does not apply to functions where the lever, knob, or paddle, after it is unlocked by key, can be operated to retract the latch bolt.

9.3 Minimum Projection of Bolt when Depressed to Dead latched Position Use no strike and the wood or metal mount. Depress the auxiliary dead latch and then depress the bolt to the deadlocked position. Measure the projection of the depressed bolt from the centerline of the lock front to the end of the bolt. The measured projection shall not be less than the minimum specified.

Requirements minimum

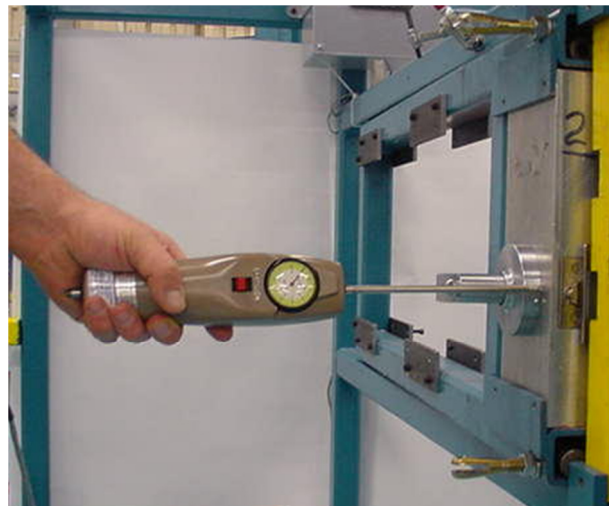
Grade 1	Grade 2	Grade 3
$11/32$ in. (8.7 mm)	$1/4$ in. (6.4 mm)	$1/4$ in. (6.4 mm)

9.4 Minimum Projection of Auxiliary Dead Latch to Deadlock Latch Bolt Use no strike and either mount. Depress the auxiliary dead latch to the specified dimension from the centerline of the lock front to the end of auxiliary dead latch and test the latch bolt for dead locking. Lack of dead locking constitutes failure.

Requirements minimum

Grade 1	Grade 2	Grade 3
$5/16$ in. (7.9 mm)	$7/32$ in. (5.6mm)	$7/32$ in. (5.6mm)

9.5 Force to Latch Door Use either strike and the wood or metal mount. A force meter shall be applied perpendicular to the face of the door to a point 1 in. (25.4 mm) from the lock edge of the door and on the center line of the latch bolt when the door is open just within $1/4$ in. (6.4 mm) of the latch bolt contacting the lip of the strike. Close the door slowly by pushing the force meter against the door until the latch bolt fully enters the strike opening. The test shall be conducted on both locked and unlocked conditions.



Requirements maximum

All Grades	4.5 lbf (20 N)
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10 STRENGTH TESTS

Note: Perform all of the strength tests in order on each of the three samples followed by the qualification tests of 10.8. The lock shall remain in the same mount and not be repositioned or adjusted throughout the strength tests. When the knob is unidirectional, test only in the direction of operation.

10.1 Locked Torque Test Use either strike or the wood or metal mount. This test is to assure lock operation and security is maintained following application of a moderate force. Exception: If torque values listed cannot be reached after one full revolution because of security design features and the lock remains locked after torque has been applied, the requirements of operational tests 9.1, 9.2, and 9.3 shall still be met. Apply the required torque load to the **locked lever or knob**. Repeat in the **opposite** direction for knobs only.

Requirements for Knobs

Grade 1	Grade 2	Grade 3
300 lbf-in. (34 Nm)	150 lbf-in. (17 Nm)	120 lbf-in. (14 Nm)

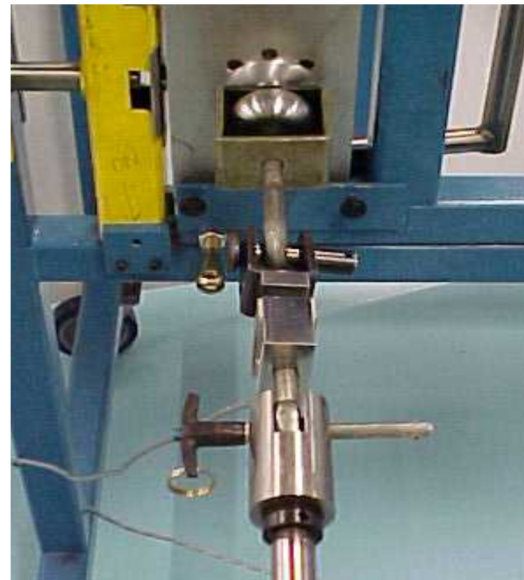
Requirements for Levers

Grade 1	Grade 2	Grade 3
700 lbf-in. (74 Nm)	450 lbf-in. (50 Nm)	225 lbf-in. (25 Nm)

10.2 Axial Load Test Use either strike and the wood or metal mount. Intended to test strength of the trim attachment to the door.

10.2.1 With the door blocked, apply a load dynamometer to the **outside lever, or knob**, along the lock axis perpendicular to the face of the door. For handlesets, apply load to the highest point on curved, and center on straight configurations. Repeat to the **inside lever or knob**.

10.2.2 With the door blocked, apply a load dynamometer to the **outside lever** 2 in. (50.8 mm) from the spindle centerline perpendicular to the face of the door. Repeat to the **inside lever**.



Requirements 10.2.1 minimum

Grade 1	Grade 2	Grade 3
500 lbf (2300 N)	300 lbf (1350 N)	250 lbf (1120 N)

Requirements 10.2.2 minimum

Grade 1	Grade 2	Grade 3
200 lbf (889 N)	150 lbf (667 N)	100 lbf (444 N)

10.2.3 For entry handleset, perform to outside **thumb piece**.

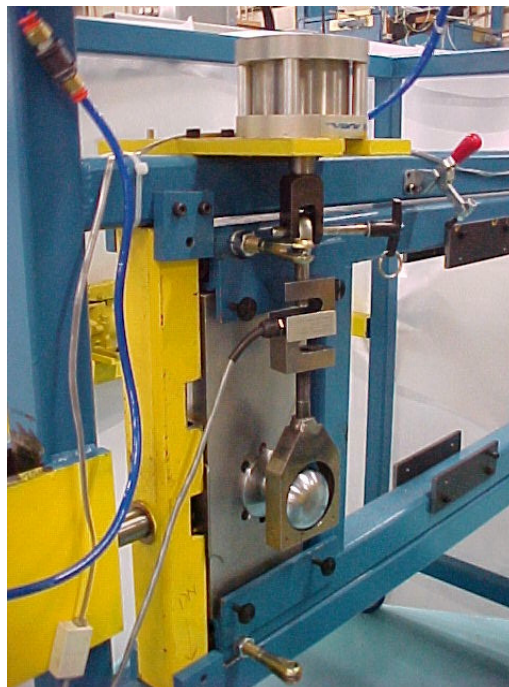
Requirements minimum

All Grades	150 lbf (667N)
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10.3 Vertical load test Use no strike and the wood or metal mount. Apply a load dynamometer vertically to the outside lever, knob or paddle. Block the door and support from below to keep the load off the hinges Paddles shall be tested, one mounted in the horizontal position and a second in the vertical position. Apply the load at 1.5 in. (38mm) from the face of the door or the equivalent bending moment perpendicular to the paddle in the vertical position, lever or knob axis to the load specified. Paddles in the horizontal position shall have the load or the equivalent bending moment applied parallel to the paddle axis.

Repeat to the **inside lever or knob**.

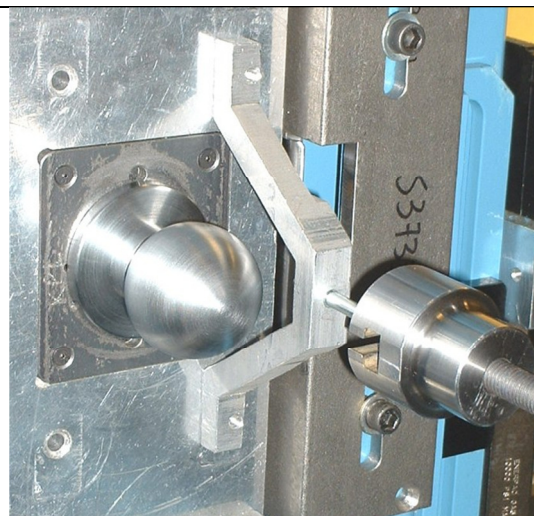
For entry handlesets, apply a load dynamometer to the locked **outside thumb piece** at a point 1/4 in. (6.4 mm) from its outer end along the line of activation to the load specified.



Requirements minimum

Grade 1	Grade 2	Grade 3
360 lbf (1600 N)	250 lbf (1120 N)	150 lbf (667 N)

10.4 Latch Bolt Strength Use the Cutaway Strike attachment and the wood or metal mount. Assures the latchbolt and unsupported strike can withstand a large static load. A load dynamometer shall be applied perpendicular to the face of the test door at a point 1 in. (25.4 mm) from the lock edge of the door and on the center line of the latch bolt in the direction of opening the door while the bolt is engaged in the strike. The loading shall be gradually increased to that specified. See illustration in 9.2.



Requirements minimum

Grade 1	Grade 2	Grade 3
1200 lbf (5300 N)	800 lbf (3600 N)	600 lbf (2650N)

10.5 Latch Bolt End Pressure Use no strike and the wood or metal mount. For a lock with a dead locking latch bolt, test in accordance with ASTM F476, Section 10 Static Bolt Load Test. The latch bolt shall resist the load specified.

Requirements minimum

Grade 1	Grade 2	Grade 3
150 lbf (667 N)	100 lbf (444 N)	75 lbf (335 N)

10.6 Unlocked Outside Lever or Knob Torque Test Use no strike and the wood or metal mount. Apply the specified torque, downward to the unlocked lever, or clockwise to the unlocked knob. Apply the torque slowly.

Requirements maximum

Unlocked lever torque	Grade 1 450 lbf-in. (50 Nm)	Grade 2 225 lbf-in. (25 Nm)	Grade 3 180 lbf-in. (20 Nm)
Unlocked knob torque	Grade 1 250 lbf-in. (28 Nm)	Grade 2 150 lbf-in. (17 Nm)	Grade 3 120 lbf-in. (14 Nm)

10.7 Unlocked Entry Handleset Load Test Use no strike and the wood or metal mount. Apply the load slowly to the thumb piece of entry handleset. This test applies to any unlocked lever, inside or outside, including passage functions.

Requirements maximum

Unlocked entry handleset thumb piece	All Grades 70 lbf (310 N)
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10.8 Qualification Requirements

Upon completion of Strength Tests, the test locks shall be subjected to Operational Tests 9.1 and 9.2, and 9.3. Locks shall operate per the applicable functional descriptions. The lock shall not be repositioned in the mounting prior to the qualification test.

For All Trim

Requirements: Torque or Force to Retract Bolt (9.1) maximum

Knobs	Levers	Thumbpieces	Paddles	Keys
11 lbf-in.(1.2 Nm)	34 lbf-in (3.8 Nm)	11 lbf (49N)	50 lbf (222N)	11 lbf-in (1.2Nm)

Requirements: Force to Retract Preloaded Bolt (9.2) maximum

Knobs	Levers	Thumbpiece	Turn	Paddles	Key *
45 lbf-in. (5Nm)	70 lbf-in. (8Nm)	40 lbf (180N)	50 lbf-in. (5.6 Nm)	80 lbf (360N)	33 lbf-in. (3.7 Nm)

* Does not apply to functions where the lever, knob, or paddle, after it is unlocked by key, can be operated to retract the latch bolt.

Requirements: Deadlatching Projection (9.3) minimum

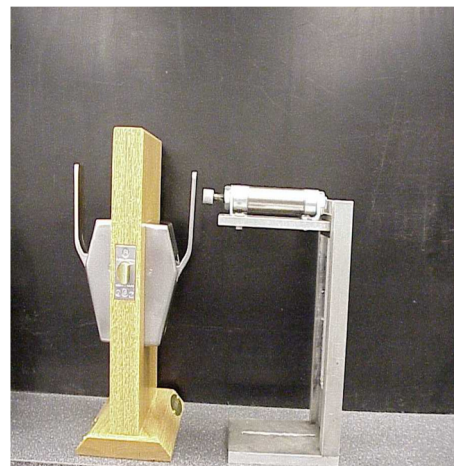
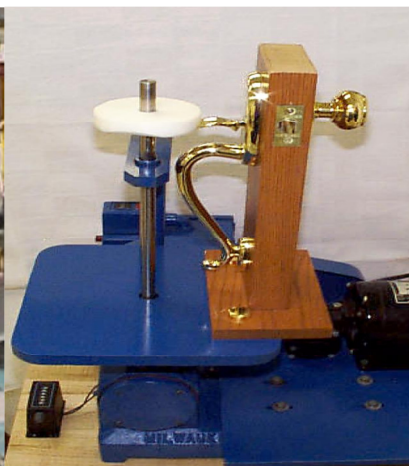
Grade 1	Grade 2	Grade 3
¹¹ / ₃₂ in. (8.7 mm)	¹ / ₄ in. (6.4 mm)	¹ / ₄ in. (6.4 mm)

Additional Requirements For Levers Only

- A. The lever shall not deflect more than 3/8 in. (10 mm) at the end of the lever nor touch the door when a 25 lbf (111 N) load is applied 2 in. (51 mm) from the center-line of the spindle perpendicular toward the door surface.
- B. The rotational lever position shall be within 22.5 degrees of the original position Applicable to Grades 1 only, see Appendix for measurement method).

11. CYCLE TEST

11.1 Install samples as shown. Use the manufacturer's strike and either mount.



11.2 Use samples which successfully passed Operational Tests 9.1 through 9.5 for 11.3 through 11.5, and one separate sample for 11.6.

11.3 Cycle locksets to the values in the following table. This test requirement is to simulate pulling a door open with a lever while being resisted by a door closer. Load shall not be applied during latch retraction.

Cycle and Load Requirements minimum

Grade 1	Grade 2	Grade 3
1,000,000 cycles	400,000 cycles	200,000 cycles
10 lbf (44 N) load	5 lbf (22 N) load	none

Knobs with the load applied to the knob centerline, shall be cycled alternating between clockwise for 100,000 cycles and counterclockwise for 100,000 cycles until the total cycles, clockwise plus counterclockwise, have been met for the grade being evaluated. **Unidirectional knobs** shall be cycled in one direction only until the total cycles have been met for the grade being evaluated. The cycle rate shall be a maximum of 30 cycles per minute (cpm)

Levers shall be cycled with a load applied to the active lever two inches from the spindle centerline perpendicular and away from the door. They shall be cycled in one direction only until the total cycles have been met for the grade being evaluated. The cycle rate shall be a maximum of 30 cycles per minute (cpm)

Handlesets shall be cycled without a load using the fixture pictured. The cycle rate shall be a maximum rate of 30 cpm.

Paddles shall be cycled without a load using the fixture pictured. The cycle rate shall be a maximum rate of 30 cpm.

11.4 At **50% of the Cycle Test**, repositioning and tightening of the test specimen is allowed, then repeat tests 9.1 through 9.5, requirements listed below, then complete the remaining cycling requirements.

Paragraph	Description	Grade	Requirements
9.1	Lever torque maximum	All Grades	34 lbf-in. (3.7 Nm)
	Knob torque maximum	All Grades	11 lbf-in. (1.2 Nm)
	Entry handleset thumb piece	All Grades	11 lbf (49 N)
	Paddle force maximum	All Grades	48 lbf (216 N)
	Key torque maximum	All Grades	11 lbf-in. (1.2 Nm)
9.2	Force to latch maximum	All Grades	5.4 lbf (24 N)
	Knob torque maximum warped door	All Grades	54 lbf-in. (6 Nm)
	Lever torque maximum - warped door	All Grades	85 lbf-in. (9.6 Nm)
	Thumb piece force maximum warped door	All Grades	48 lbf (216 N)
	Paddle force maximum warped door	All Grades	96 lbf (427N)
9.3	Minimum Projection of Bolt when Depressed to Dead latched Position	Grade 1	¹¹ / ₃₂ in. (8.7 mm)
		Grades 2 & 3	13/64 in.(5.1 mm)
9.4	Dead latch plunger projection minimum	Grade 1	¼ in.(6.3 mm)
		Grades 2 & 3	11/64 in. (4.5 mm)
9.5	Force to Latch	All Grades	5.4 lbf (24 N)

11.5 **Performance After Cycle Test** At the completion of the cycle test, locks shall operate per the applicable functional descriptions.

11.6 Operation by Cylinder Cycle Test

The test cylinder or equivalent fixture shall be installed in the lockset. A cycle consists of rotating the driver to lock or unlock, or retracting the latchbolt to within 1/8 in. (3.2 mm) of the front, then releasing the latchbolt, as applicable to the lock function. Perform at a rate of not more than 30 cycles per minute. Complete to the required number of cycles specified for the grade of lock. Failure of the cylinder is not cause for failure or passing of the test.

Requirements minimum

Grades 1	Grade 2	Grade 3
40,000	20,000	10,000

Performance After Cylinder Cycle Test At the completion of the cycle test, locks shall operate per the applicable functional descriptions.

12. SECURITY TESTS

These tests are to assure security is maintained following application of an excessive force. Locksets shall be tested in the locked position. The lock shall not be operated from the inside during the tests. Failure occurs if as a result of the test, the door swings open, or the latch bolt withdrawn to 1/8 in. Also, whenever any part of the internal lock mechanism is exposed as a result of the test, attempt to gain entry by manipulation with a screwdriver for a maximum of five minutes The screwdriver shall be a commercially available type with a blade not exceeding 6 in. (150 mm) in length or 10 in. (250 mm) overall length. It is not intended that the screwdriver be used to attack the lock test fixture or the latchbolt/strike interface. For test paragraphs 12.2, and 12.4, the torque to retract the latch bolt with the opposite lever shall not exceed 34 lbf-in. (3.7 Nm). For test paragraph 12.3, the torque to retract the latch bolt shall not exceed 34 lbf-in. (3.7 Nm) for levers, or 48 lbf (180N) for paddles. Applicable tests in 12.6 and 12.7 are allowed to be waived when shown as limited to Suffix “D” cylinders.

12.1 Dead Latch and Strike Impact Test All Grades. Use the Cutaway Strike attachment and wood mount. Assures the latchbolt and unsupported strike can withstand a large impact. Test in accordance with ASTM F476, Section 21 Bolt Impact Test, using a steel reinforced test panel for the strike attachment as shown in Figure 7.6.1. Apply impacts specified.



Requirements minimum

Grade 1	Grade 2	Grade 3
Grade 2 requirement plus two blows of 120 ft-lbf (160 J)	Grade 3 requirement plus two blows of 90 ft-lbf (120 J)	Two blows of 60 ft-lbf (80J)

12.2 Abusive Locked Lever Test Grade 1 levers only. Use no strike and either mount. Locks shall be subjected to a downward torque of 1200 lbf-in. (135 Nm) torque. Additional Failure Criteria: Deadlatching shall meet 9.3 and 9.4, using 11.4 values.

12.3 Locked Lever or Paddle Vertical Impact Test Grade 1 only. Use wood mount and no strike. Using the vertical impactor described in ASTM F476 paragraph X1.4, subject the lever or paddle of a lock to 5 blows from a 12 in. (305 mm) height. Strike the lever with the front of the hammer 1.5 inches from the door. The paddles shall be tested, one mounted in the horizontal position and a second in the vertical position.

12.4 Locked Cylinder in the Lever Face Impact Test Grade 1 only. Use the Cutaway Strike attachment and wood mount. Using the component ram described in ASTM F476 paragraph X1.3, subject the cylinder face of a lock to 5 blows of 60 ft-lbf (80 J).



12.5 Locked Lever or Knob Catch Attack Test All Grades. Use no strike and the wood or metal mount. Using a punch of the approximately the same or smaller diameter than the catch thickness, apply a

50 lb. force to the catch in the direction of release. Apply a 100 lbf axial force to the lever and remove the punch. The lever shall not be removable.

12.6 Cylinder Assembly Pulling Test This test is intended to evaluate the housing integrity. Perform the test using a fixture (7.6.4) or modified cylinder capable of delivering the required load and of the same interface configuration as an actual cylinder. Attach to a suitable tensile pulling device and apply the tension load specified.

Following the test, attempt to open the door by manipulating any exposed lock mechanism by use of a screwdriver. Manually test the bolt for end pressure resistance to assure that it is deadlocked or dead latched.

Requirements minimum

Grade 1	Grade 2	Grade 3
500 lbf (2200 N)	300 lbf (1350 N)	250 lbf (1100 N)

12.7 Cylinder Assembly Torque Test This test is intended to evaluate the housing integrity and shall be performed using an actual cylinder or equivalent test fixture. Perform the test using a fixture (7.6.5) or modified cylinder capable of delivering the required load and of the same interface configuration as an actual cylinder. Attach to a suitable torque device and apply the force specified. Following the test, attempt to open the door by manipulating any exposed lock mechanism by use of a screwdriver. Manually test the bolt for end pressure resistance to assure that it is deadlocked or dead latched.

Requirements minimum

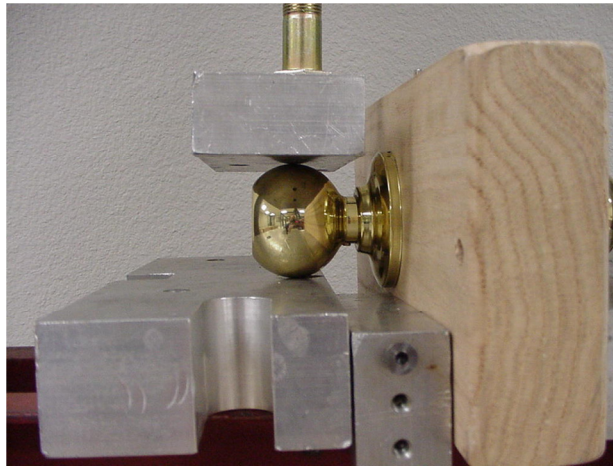
Grades 1 & 1A	Grade 2	Grade 3
300 lbf-in. (34 Nm)	150 lbf-in. (17 Nm)	120 lbf-in. (14 Nm)

13. MATERIAL EVALUATION TESTS

13.1 Knob Crush Test Use no strike and the wood or metal mount. Inside and outside knobs shall be positioned in a tensile loading device having a compression load capability and compressed with 1000 lbf (4448 N). Apply the load to the sides of the knob at their highest points with flat plates. Deformation shall not exceed that specified in Table 1. At the completion of the test, key torque as applicable shall not exceed the values specified.

Requirements maximum

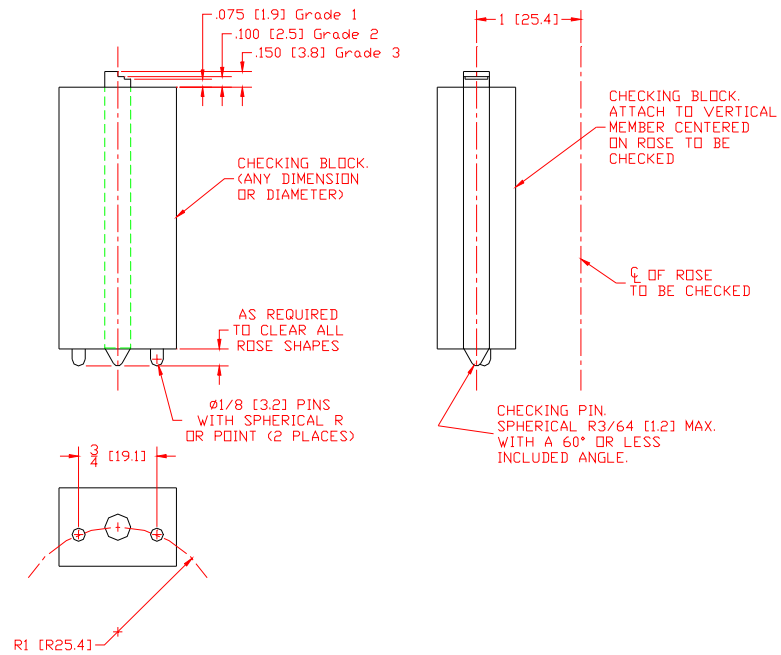
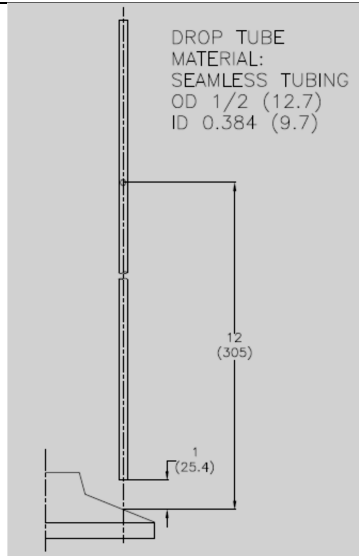
Grade 1	Grade 2	Grade 3
10% deformation	25% deformation	30% deformation
Key torque 11 lbf-in. (1.2 Nm)	Key torque 11 lbf-in. (1.2 Nm)	Key torque 11 lbf-in. (1.2 Nm)



13.2 Rose Assembly Dent Test Use no strike and no mount. Drop a 8 oz. (0.23 Kg) projectile from a height of 12 in. (305 mm) in a drop tube as shown. Rose dent measuring equipment: Two spherical pins contact the rose at a point on the same radius as the drop test projectile. The machined steps of the checking pin indicate pass or fail without giving exact radius. A dial indicator at the top of the checking pin is used where the exact reading is required. Depth of the dent shall not exceed that specified. Both outside and inside roses shall be tested with normal reinforcing material. Rose dent measuring equipment: Two spherical pins contact the rose at a point on the same radius as the drop test projectile. The machined steps of the checking pin indicate pass or fail without giving exact radius. A dial indicator at the top of the checking pin is used where the exact reading is required.

Requirements maximum

Grade 1	Grade 2	Grade 3
0.075 in. (1.9 mm)	0.100 in. (2.5 mm)	0.150 in. (3.8 mm)

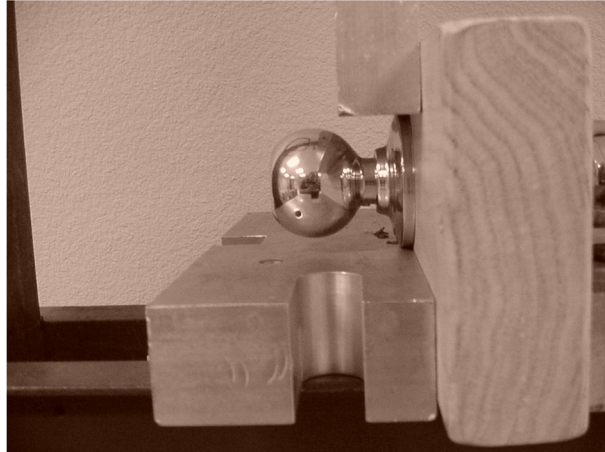


Dent Depth Measuring Device

13.3 Outside Rose Deformation Test Use no strike and either mount. Mount an entry lock to simulate installation on a door. Apply the specified compression load on the horizontal centerline of the rose or rose assembly to be tested. The rose or rose assembly shall not deform beyond 10%.

Requirements minimum

Grade 1	Grade 2	Grade 3
650 lbf (2900 N)	560 lbf (2500 N)	450 lbf (2000 N)



14 FINISH TESTS

These requirements do not predict the performance life of the finishes in actual use but are used as a quality control method to ensure consistent finish quality. Trim parts (levers, knobs, turns, roses, escutcheons, lock fronts, paddles, and strikes) shall meet the requirement as specified. All exposed, architecturally finished parts are subject to the finish requirements as detailed below. The values given are minimum requirements. Category B finishes as defined by A156.18 shall be excluded from any of the following finish test requirements. All tests shall be conducted in accordance with ANSI/BHMA A156.18-2006 Materials and Finishes.

14.1 Neutral Salt Spray Test Requirements

Requirements All Grades

Organic coatings	96 Hours
Organic coatings on lock fronts and strikes	24 Hours
Materials without organic coatings	200 Hours

14.2 Humidity Test

Requirements All Grades

Organic Coatings	240 Hours
Organic Coatings on fronts and strikes	48 Hours

14.3 Finish Hardness Test

Conduct either Pencil Hardness or Taber at the option of the manufacturer

Pencil Hardness Test for all material with organic coatings	4H
Taber Test for all material with organic coatings	500 Cycles

14.4 Perspiration Test

Requirements All Grades

All materials with organic coatings	4 Cycles
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14.5 Ultra Violet Light and Condensation Test

Test cycle 8 hours UV at 60 C and 4 hours condensation at 50 degrees C.

Requirements All Grades

All Coatings	144 Hours
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APPENDIX A USERS GUIDE (NOT A PART OF ANSI/BHMA A156.2)

1.1 Functions described in this Standard are titled (e.g. "Entry Lock" or "Classroom Lock"). These titles are not necessarily indicative of where locks are used. For example, the "Classroom Lock" is used in more locations than in classrooms. This is because of the key control it affords as only someone with a key locks or unlocks the lock in the outside knob.

1.2 Those selecting locks with security objectives in mind also consult American National Standards A156.5 for Cylinders, A156.12 for Interconnected Locks, A156.13 for Mortise Locks, A156.30 for High Security Cylinders, and A156.36 for Auxiliary Locks.

1.3 Because of the Material Evaluation tests imposed, there are no material requirements in this Standard.

1.4 Certification that products offered meet the requirements of this Standard and conform to individual manufacturer's drawings, specifications, standards and quality assurance practices are available and in some circumstances are required. Buyer requirements determine the need for proof of conformance such as first article inspection, test laboratory reports, or listings. BHMA sponsors a third party certification program enabling producers to assert conformance to this Standard on the basis of periodic tests conducted regularly at unannounced times. The program is open to all manufacturers whether or not members of BHMA. Specifiers requiring assertions of conformance use the Directory of Certified Locks and Latches available from BHMA, statements of conformance furnished by individual manufacturers, or test results acceptable to the buyer.

1.5 Consult manufacturers' literature for installation, lubrication, and maintenance requirements. It is important to use the specified fasteners, center and align components as shown, and ensure proper engagement of the latchbolt to the lock body. Install only on doors which have the specified preparation and internal reinforcements. Failure to comply may void warranties, result in premature failures, and prevent operation of the door.

1.6 The various tests are grouped as logically as possible by attributes being confirmed, and economical use of samples. In general, Strength Tests verify resistance to moderate forces where the product is expected to operate afterward. Security Tests are expected to remain locked demonstrating their resistance to unauthorized entry. Material Tests are usually destructive to some degree, and target a component's ability to withstand damage.

1.7 Most hardware supplied to this Standard is designed to fit doors of $1 \frac{3}{8}$ (35mm) or $1 \frac{3}{4}$ in. (45mm) nominal thickness.

1.8 Lever Droop Measurement 10.8 B This test is intended to define a reasonable limit to the rotational displacement on a lever as a result of the strength testing. The following method is described to provide a fair evaluation regardless of the lever style and starting angles:

Locate and mark (A) the center of rotation of the lever. Create a reference line on the test fixture extending from the center of rotation. Mark (B) a point on the lever 2 to 3 inches away from the center of rotation and create a line (AB) connecting marks A and B. Measure the angle between line AB and the reference line. Perform the required tests. Measure the angle between line AB and the reference line. Subtract the first angle from the second angle to arrive at the total lever droop.

1.9 Preloaded Door Tests The previous editions of the Preloaded Door Test based the maximum torque on an equation to allow a mechanical advantage with an increasing keybow width and turn length. In the 2009 edition of A156.5 for Cylinders, revised just prior to this standard, cylinders are now evaluated

independently of their mating products; similarly, the testing of auxiliary locks is expected to be a fair prediction of performance no matter which cylinder or turn is selected. Rather than allowing the use of oversize keys or turns to pass the tests, the new torque values in this standard are constant based on a typical keybow of 1.1 inches, and a turn length of 1 3/16 inches (with a .250 inch wall thickness) as specified by the standard. The preloaded door weights (50 and 30 lbf.) are selected for laboratory evaluation to ensure product performance, but are not considered to be acceptable installation conditions.

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APPENDIX B (NOT A PART OF ANSI/BHMA A156.2)

Chart 1 Applicable Operational And Strength Tests By Function

Series 2000 Preassembled Lock Functions	9.1.1	9.1.2	9.1.3	9.1.4	9.1.5	9.1.6	9.2	9.3	9.4	9.5	10.1	10.2	10.3	10.4	10.5	10.6	10.7	11.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	13.1	13.2	13.3	Series 2000 Preassembled Lock Functions
F36 Passage	Y	Y	N	Y	N	N	Y	N	N	Y	N	Y	Y	Y	N	Y	Y	Y	N	N	N	N	N	N	N	Y	Y	Y	F36 Passage
F37 Privacy	Y	Y	N	Y	N	N	Y	N	N	Y	N	Y	Y	Y	N	Y	Y	Y	N	N	N	N	N	N	N	Y	Y	Y	F37 Privacy
F38 Patio	Y	Y	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N	Y	Y	Y	F38 Patio
F39 Communicating	Y	Y	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N	Y	Y	Y	F39 Communicating
F40 Entrance	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F40 Entrance
F41 Entry	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F41 Entry
F42 Classroom	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F42 Classroom
F43 Holdback	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F43 Holdback
F44 Storeroom	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F44 Storeroom
F45 Apartment	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F45 Apartment
F46 Store Door	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F46 Store Door
F47 Store Door	Y	Y	N	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F47 Store Door
F48 Hotel	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F48 Hotel
	9.1.1	9.1.2	9.1.3	9.1.4	9.1.5	9.1.6	9.2	9.3	9.4	9.5	10.1	10.2	10.3	10.4	10.5	10.6	10.7	11.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	13.1	13.2	13.3	

Series 4000 Bored Lock Functions	9.1.1	9.1.2	9.1.3	9.1.4	9.1.5	9.1.6	9.2	9.3	9.4	9.5	10.1	10.2	10.3	10.4	10.5	10.6	10.7	11.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	13.1	13.2	13.3	Series 4000 Bored Lock Functions
F75 Passage	Y	Y	N	Y	N	N	Y	N	N	Y	N	Y	Y	Y	N	Y	Y	Y	N	N	N	N	N	N	N	Y	Y	Y	F75 Passage
F76 Privacy	Y	Y	N	Y	N	N	Y	N	N	Y	N	Y	Y	Y	N	Y	Y	Y	N	N	N	N	N	N	N	Y	Y	Y	F76 Privacy
F77 Patio	Y	Y	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N	Y	Y	Y	F77 Patio
F78 Communicating	Y	Y	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N	Y	Y	Y	F78 Communicating
F79 Communicating	Y	Y	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N	Y	Y	Y	F79 Communicating
F80 Communicating	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F80 Communicating
F81 Entry	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F81 Entry
F82 Entry	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F82 Entry
F83 Exit Lock	Y	Y	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	F83 Exit Lock
F84 Classroom	Y	Y	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F84 Classroom
F85 Holdback	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F85 Holdback
F86 Storeroom	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F86 Storeroom
F87 Utility	N	N	N	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F87 Utility
F88 Apartment	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F88 Apartment
F89 Exit Latch	Y	Y	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	N	N	N	Y	Y	Y	F89 Exit Latch
F90 Corridor	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F90 Corridor
F91 Store Door	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F91 Store Door
F92 Service Station	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F92 Service Station
F93 Hotel	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F93 Hotel
F94 Entry HS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	Y	Y	N	N	N	N	N	Y	Y	Y	Y	F94 Entry HS
F107 Entry HS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	Y	Y	N	N	N	N	N	Y	Y	Y	Y	F107 Entry HS
F108 Entry HS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	Y	Y	N	N	N	N	N	Y	Y	Y	Y	F108 Entry HS
F109 Comb F81/F82	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F109 Comb F81/F82
F110 Intruder	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F110 Intruder
F111 Comm. Passage	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	Y	Y	Y	F111 Comm. Passage
F112 Comm. Store	N	N	N	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F112 Comm. Store
F113 Comm. Class	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	F113 Comm. Class
	9.1.1	9.1.2	9.1.3	9.1.4	9.1.5	9.1.6	9.2	9.3	9.4	9.5	10.1	10.2	10.3	10.4	10.5	10.6	10.7	11.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	13.1	13.2	13.3	