

[INCH-POUND]  
FF-L-2890  
November 29, 1997

## FEDERAL SPECIFICATION

### LOCK EXTENSION (PEDESTRIAN DOOR, DEADBOLT)

The General Services Administration has authorized the use of this federal specification by all Federal agencies.

#### 1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers pedestrian door, deadbolt lock extensions for use with changeable, combination locks. Lock extensions include designs that meet the Americans with Disabilities Act (ADA) and Uniform Federal Accessibility Standards (UFAS).

1.2 Classification. Lock extensions and strikes shall be of the following types, classes, and strike configurations.

- Type I - Key lock life safety feature
- Type II - Keyless life safety feature
- Type III - ADA/UFAS compliant
- Type IV - ADA/UFAS compliant with access control interface

- Class D - Drill resistant mounting plate
- Class N - Mounting plate
- Class B - Without mounting plate

- Strike 1 - Single or double door in-swing mortise
- Strike 2 - Single door out-swing
- Strike 3 - Single or double door in-swing surface
- Strike 9 - Double door out-swing surface

1.3 Reference Identification Number (RIN). A specification based Reference Identification Number to identify types, classes, and strikes is addressed in paragraph 6.4.1 of this specification.

#### 2. APPLICABLE DOCUMENTS

2.1 Government publications. The following documents, of the issues in effect on the date of invitation for bids or request for proposals, form a part of this specification to the extent specified herein.

Federal Specifications:

FF-L-2740 - Lock, Combination

Federal Standards:

Fed. Std. No. 123 - Marking for Domestic Shipment (Civilian Agencies)

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(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents., U. S. Government Printing Office, Washington, DC 20402.

(Single copies of this specification and other Federal specifications required by activities outside the Federal Government for bidding purposes are available without charge from Business Service Centers at the General Services Administration Regional Offices in Boston, New York, Washington, DC, Atlanta, Chicago, Kansas City, MO, Fort Worth, Denver, San Francisco, Los Angeles, and Seattle.

(Federal Government activities may obtain Federal Specifications, Standards and Handbooks and the Index of Federal Specifications, Standards and Commercial Item Descriptions from the established distribution points in their agencies.)

Military Specifications:

MIL-S-901 - Shock Tests, HI (High Impact) Shipboard Machinery, Equipment and Systems, Requirements for Navy

Military Standards:

MIL-STD-129 - Marking for Shipment and Storage  
MIL-STD-810 - Environmental Test Methods and Engineering Guidelines  
MIL-STD-889 - Dissimilar Metals

(Copies of Military Specifications and Standards required by contractors in specification procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

Code of Federal Regulations:

Uniform Federal Accessibility Standards

United States Code

Americans with Disabilities Act of 1990

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on the date of for bids or request for proposals, shall apply.

American Society For Quality Control:

ANSI/ASQC Z1.4-1993 - Sampling Procedures and Tables for Inspection by Attributes

(Application for copies should be addressed to the American Society For Quality Control, 611 East Wisconsin Avenue, Milwaukee, WI 53202.)

National Fire Protection Association:

NFPA 101 - Life Safety Code

(Application for copies should be addressed to the National Fire Protection Association, 1 Batterymarch Park, P. O. Box 9101, Quincy, MA 02269-9101.)

National Motor Freight Traffic Association, Inc., Agent:

National Motor Freight Classification.

(Application for copies should be addressed to the American Trucking Association, Inc., Traffic Department, 1616 P Street, NW, Washington, DC 20036.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption is obtained.

### 3. REQUIREMENTS

3.1 Description. A pedestrian door, deadbolt, combination lock shall consist of a lock extension described by this specification, a combination lock and a strike. The lock extension may or may not include exterior mounting plates, as specified.

3.2 Bid samples. When specified, five lock extensions of each type offered for award, five mounting plates of each class offered and five strikes of each configuration shall be furnished for bid sample testing and approval (see 4.3 and 6.2). Bid samples shall be representative of the product to be furnished under any resultant contract. Upon successful completion of the testing, one sample shall be returned for use as a guide in manufacturing. Deviation from the approved sample is not acceptable without written approval from the contracting officer.

3.3 First article. Unless otherwise specified, five lock extensions of each type awarded, five mounting plates of each class awarded and five strikes of each configuration shall be furnished for first article testing and approval (see 4.4 and 6.4). The first article sample shall be selected at random from the first 100 standard production units or from the contractor's current inventory. If approved, one intact unit of the first article submission shall be retained by the Government to serve as a manufacturing standard. No deviation from the manufacturing standard shall be acceptable without formal written approval of the contracting officer.

3.4 Materials. Material used shall be free from defects that would adversely affect the performance or maintainability of individual components or of the overall assembly. Materials not specified herein shall be of the same quality used for the intended purpose in the commercial market.

3.4.1 Material deterioration and control. The lock shall be fabricated from compatible materials inherently corrosion or deterioration resistant or treated to provide protection against corrosion. Dissimilar metals, as defined in MIL-STD-889, shall be plated or compatible to prevent operationally destructive corrosion.

#### 3.5 Design.

3.5.1 Lock and lock extension interface. Pedestrian door deadbolt lock extensions shall be designed for use with commercially available combination locks having standard dimensions and footprints as described in federal specification FF-L-2740. When necessary, the lock extension shall include a replacement lock bolt or a lock bolt extension for use with a combination lock.

3.5.2 Type III. Type III lock extensions shall comply with requirements of the Uniform Federal Accessibility Standards and the Americans with Disabilities Act.

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3.5.3 Type IV. Type IV lock extensions shall meet the same requirements as the Type III extensions and shall include an electronic interface to allow use with existing electronic access control systems. When the combination lock is in the locked condition, the lock shall override the access control mechanism and prevent entry.

3.5.4 Automatic deadbolt mechanism. The lock extension shall have a trip device to automatically extend the deadbolt into the locked position upon engagement of the strike. The trip device shall not extend the deadbolt when the life safety feature is engaged. Once the lock bolt has been extended to the locked position it shall not be possible to reopen the lock without completely redialing the lock combination. For the purposes of this requirement, the locked position means the bolt has been fully extended.

3.5.5 Life safety feature. Lock extensions shall be designed with a bolt hold-back feature, when required, to meet the requirements of NFPA 101. This life safety feature shall be designed to hold the deadbolt in a non-locked position after the deadbolt is retracted. The life safety feature must be able to prevent inadvertent engagement while the area being protected is occupied and ensure a quick, safe exit in the case of an emergency. The bolt hold-back feature on Type I lock extensions shall use a conventional key cylinder. Each Type I extension shall be furnished with two keys.

3.5.6 Access control key bypass. Type IV extensions may be fitted with an exterior key bypass that will allow entry without use of the access control when the when the combination lock bolt is retracted.

3.5.7 Mounting plates.

3.5.7.1 Drill resistant mounting plate. When Class D is specified, the pedestrian door lock shall be supplied with a drill resistant plate. The drill resistant plate shall prevent penetration by drilling for a period of 20 man-minutes. The Class D lock extension shall include an exterior mounting plate that is designed to sandwich the door and increase the strength of the lock mount. The mounting plate shall be designed for doors between 1-5/8 and 1-3/4 inches (41 mm to 45 mm) thick and shall be adjustable to doors within this range without modification or substitution of parts. The mounting plate shall have a decorative stainless steel or corrosion protected cover. The cover shall fit closely to the plate. The plate and cover shall be 5-5/8 inches (143 mm) wide by 5 inches (127 mm) high, minimum overall. In no case may the plate interfere with the door stop on the jamb.

3.5.7.2 Mounting plate. When Class N is specified, the lock shall be provided with a mounting plate (A36 steel or equivalent) that is designed to sandwich the door and increase the strength of the lock mount. The mounting plate shall be designed for doors between 1-5/8 inches and 1-3/4 inches (41 mm to 45 mm) thick and shall be adjustable to doors within this range without modification or substitution of parts. The mounting plate shall have a decorative stainless steel or corrosion protected cover. The cover shall fit closely to the plate. The plate and cover shall be 5-5/8 inches (143 mm) wide by 5 inches (127 mm) high, minimum overall. In no case may the plate interfere with the door stop on the jamb.

3.5.8 Lock cover. When specified, see 6.2, the lock extension shall be provided with a removable lock cover that completely encloses the combination lock case. The cover shall be secured to the lock extension with a high security lock meeting UL standards and shall be removable only when the combination lock bolt is retracted.

3.5.9 Strikes. The pedestrian door lock shall be furnished with one or more strikes, as specified. Strikes shall be as shown in Figure 1. The strikes shall withstand without damage a force of 600 pounds from outside of the door, when tested as specified in 4.6.5.

3.6 Operation and performance.

3.6.1 Lock bolt operation. The torque required to retract the deadbolt, using either the lock dial or exit actuator, shall not exceed 50 inch-ounces (0.225 N-m).

3.6.2 Case and bolt strength. The lock extension case and bolt shall withstand the test specified in 4.6.4 without any fracture or bending of the bolt or case.

3.6.3 Temperature. The lock extension shall operate in a temperature range of -10°F to 158°F (-23.3°C to 70°C). Lock extensions shall be tested in accordance with 4.6.7.

3.6.4 Humidity. The lock extension shall be designed to operate in a humidity range of 10 to 98 percent relative humidity for its operating life. Lock extensions shall be tested in accordance with 4.6.2.

3.6.5 Vibration. Lock extensions shall be subjected to environmental vibration tests, as specified in 4.6.6. Operation and security performance and tolerances shall remain within standards.

3.6.6 Lock operation. All features of the lock extension and all internal parts shall operate smoothly for the operating life of the lock, without the addition of anything but proper lubricants and without showing appreciable wear. Lock extensions shall be tested for compliance as specified in 4.6.1.

3.7 Finish and workmanship. All surfaces shall have a uniform finish of sufficient smoothness to accept markings required. The lock extension shall be free of sharp edges, burrs, slivers and any defects affecting appearance, operations or serviceability.

3.7.1 Marking. Each lock shall be marked with the month and year of manufacturer on the dial, dial ring and lock case. Marking shall be embossed, impressed or engraved. Markings on the dial ring and dial shall be located so that they are not exposed when the lock is mounted. Marking on the lock case shall be visible on removal of the lock back cover.

3.7.2 Instructions. Complete instructions on the installation and operation of the lock shall be provided with each lock.

3.8 Regulatory requirements. The offeror/contractor is encouraged to use recovered materials in accordance with Public Law 94-580, as amended, to the maximum extent practicable.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. The contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. Inspection records of the examination and tests with itemized results shall be kept complete at the manufacturer's facility, available to the Government throughout the duration of the contract, or a minimum of two years, whichever is longer. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this document shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in this document shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not

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authorize submission of known defective material either indicated or actual, nor does it commit the Government to accept defective material.

4.1.2 Component and material inspection. Components and materials shall be inspected in accordance with all the requirements specified herein and in applicable referenced documents.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. Bid sample inspection (see 4.3)
- b. First article inspection (see 4.4)
- c. Quality conformance inspection (see 4.5)
- d. Inspection of packaging (see 4.5.4)

4.3 Bid sample inspection. Bid sample inspections shall be conducted by agencies as specified in the contract. Samples shall be selected at the manufacturer's option from preproduction or standard production units from the manufacturer's current inventory. Upon successful completion of testing, one sample unit will be returned to the manufacturer for use as a production guide. In the event of failure, samples will be returned for manufacturer examination.

4.3.1 Bid sample submission. As specified, bid samples shall be delivered to the inspection facility, transportation prepaid. Samples shall be furnished at no cost to the Government. Samples shall be plainly identified as follows:

Bid Sample for Test  
Pedestrian Door, Deadbolt Lock Extension  
(Type, Class, Strike)  
Fed. Spec. FF-L-2890  
Date of manufacture: (mm/yy)

4.3.2 Bid sample examination. Bid samples shall be examined for defects listed in Table I. The presence of any defects among all the bid sample units shall constitute failure.

4.3.3 Bid sample tests. Samples shall be tested as accordance with the tests in 4.4. Testing may be discontinued by the testing facility at any time the product fails to meet one or more requirements of this specification. The manufacturer may be permitted to make modifications on his product during the testing phase when such modifications, in the judgment of the test facility and contracting officer, are clearly in the best interest of the Government. In case of failure, consideration will be given for retest only after it has been clearly shown that changes have been made in the product which the Government considers sufficient to warrant retest.

4.4 First article inspection.

4.4.1 First article samples. First article samples shall be production units manufactured using the equipment, processes and materials to be used under the contract or standard production from the manufacturer's current inventory manufactured using the same equipment, processes and materials.

4.4.2 First article examination. First article samples shall be examined for compliance with all requirements of this specification. Presence of any defects affecting the intended operation of the product shall be cause for rejection. Presence of more than two minor defects in materials or workmanship among all samples submitted shall be cause for rejection.

4.4.3 First article tests. Samples shall be tested in accordance with 4.4. Failure of any test shall be cause for rejection.

4.5 Quality conformance inspection. The lock extensions shall be examined for defects in accordance with Table I. Presence of any defect listed shall provide reason to reject the product. Rejected lock extensions may be reworked to correct defects and they may be submitted for acceptance. Reworked lock extensions shall be so indicated to the Government inspector.

4.5.1 Component and material inspection. The supplier is responsible for insuring that components and materials are manufactured, tested and inspected in accordance with the requirements of referenced specifications and standards to the extent specified or, if none, in accordance with this specification.

4.5.2 End item inspection. All items must meet all requirements of section 3. Sampling for inspection shall be in accordance with ANSI/ASQC Z1.4. The inspections set forth in this specification shall become a part of the supplier's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the specification. Sampling in quality conformance does not authorize the submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material. The inspection level shall be level II with an Acceptable Quality Level of 2.5 percent defective.

4.5.3 Quality conformance testing. Periodically, during the term of the contract, the Government inspector, at a time convenient to the Government, may select samples of the manufacturer's regular production to subject them to the tests in 4.6. This acceptance testing shall be performed by a Government agency specifically designated by the contracting officer. Failure of the lock to meet any one or more of these tests shall provide reason to suspend acceptance of the manufacturer's product until the Government is satisfied that all defects have been corrected.

Table I. Examination for defects.

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Material is not resistant to corrosion and deterioration or treated to be resistant to corrosion and deterioration for the applicable storage and operating conditions.

Dissimilar metals as defined in MIL-STD-889 are not treated or plated to prevent corrosion.

Supplier does not have documentation available for identification of material, material finishes or treatment.

Used, rebuilt, or remanufactured components incorporated in the locks.

Design not as specified.

Life safety feature does not work as specified.

Automatic deadbolt mechanism does not operate as specified.

Mounting plate not provided as specified. (Class D and N)

Dimensions not as specified.

Bolt lockout device not as specified.

Lock torque not as specified.

Finish not as specified.

Instructions not furnished, or not as specified.

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4.5.4 Inspection of preparation for delivery. An inspection shall be made to determine that packaging, packing and marking comply with Section 5 of this specification. The sample unit shall be one shipping

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container fully prepared for delivery, selected at random just prior to the closing operations. Defects of closure listed shall be examined on shipping containers fully prepared for delivery.

TABLE II. Classification of preparation for delivery defects.

Packaging	Key not in unit container with lock as specified (Type I only). Instruction sheet not in unit container with lock.
Packing	Shipping container weights exceed specified limitations.
Marking	Marking not in accordance with Fed. Std. 123 or MIL-STD-129, as specified. Marking not in accordance with the contract or order. Item description marked on unit container.

#### 4.6 Test methods.

##### 4.6.1 Operation test.

4.6.1.1 Types I through IV. The lock extension shall be subjected to 10,000 cycles of operation without replacement of any component. One cycle shall consist of retracting the bolt, activating the life safety features, activating the bolt throw mechanism, deactivating the life safety feature, and activating the bolt the bolt throw mechanism. The lock extension shall operate smoothly and the torque shall be in the range specified in 3.6.1. Any failure of the lock extension during test shall be cause for rejection.

4.6.1.2 ADA compliant operation test. Type III and IV lock extensions shall be subjected to 200,000 cycles of operation without replacement of any components. Each cycle shall consist of retracting the bolt using the outside entry handle, releasing the outside entry handle activating the bolt throw mechanism, activating the interior exit actuator, and activating the bolt throw mechanism. The lock extension shall operate smoothly. Any failure of the lock extension during test shall be cause for rejection.

4.6.2 Moisture absorption test. Lock extensions shall be tested in accordance with MIL-STD-810, Method 507.3.

4.6.3 Shock test. Lock extensions shall be tested in accordance with MIL-STD-901.

4.6.4 Case and bolt strength. Mount the lock extension on a test stand so that the bolt extends beyond the edge of the stand, as shown in figure 2. Apply a force of 600 pounds to the face of the bolt as shown in the figure. Examine the extension and bolt for damage. Apply a force of 200 pounds to the end of the bolt as shown in the figure 3. Any fracture or bending of the bolt or case shall be a failure.

4.6.5 Strike test. Mount the strike on a test stand. Apply a force of 600 pounds in the direction of the door swing for the strike being tested. The force shall be applied at the strike opening as would be applied by the extension deadbolt in an attempt to force the lock extension. Any fracture or bending of the strike shall be a failure.

4.6.6 Environmental vibration (type I). The type I environmental vibration test of MIL-STD-810 shall be conducted. Lock extensions shall be checked for conformance to the operation and tolerance requirements. There shall be no movement or damage that affects normal operation or security.

4.6.7 Temperature test.



4.6.7.1 Low temperature test. The lock extension shall be placed in a chamber maintained at a temperature of -10°F for a period of three hours or until the lock extension temperature has stabilized. At the end of that period, without removing the lock from the chamber, the lock extension shall be examined for proper operation and for any defects that would affect the operation or life of the product. The lock extension shall be removed from the chamber and allowed to return to room temperature. The lock extension shall be examined for any damage or defects due to the low temperature exposure. There shall be no defects affecting the operation or life of the lock extension.

4.6.7.2 High temperature test. The lock extension shall be placed in a chamber maintained at a temperature of 158°F for a period of three hours. At the end of that period, the lock extension shall be removed from the chamber and, without allowing time to cool, the lock extension shall be examined for any damage or defects due to the high temperature exposure. There shall be no defects affecting the operation or life of the lock extension.

## 5. PREPARATION FOR DELIVERY

5.1 Packaging and packing. Unless otherwise specified in the contract or order, the lock shall be packaged and packed in accordance with the manufacturer's normal commercial practice. Packed units shall be in accordance with ASTM D3951 and shall ensure carrier acceptance under the National Motor Freight Classification and Uniform Freight Classification.

5.2 Marking. Marking shall be in accordance with Federal Standard No. 123 or MIL-STD-129, as specified.

## 6. NOTES

6.1 Intended use. Lock extensions covered by this specification are intended for use on interior pedestrian doors used for normal entrance and egress during day-to-day operations.

6.2 Ordering data. Purchasers shall specify the following:

- a) Title, number and date of this specification
- b) Type, class, and strike required (see 1.2)
- c) Bid sample requirements
- d) First article requirements
- e) Special packaging, packing and marking, if required.

6.3 Definitions.

6.3.1 Entry. For the purpose of this specification, entry means retracting the bolt.

6.3.2 Normal use. For the purpose of this specification, normal use means retracting and extending the bolt using the combination lock or the extension exit actuator.

6.4 First article. Unless first article testing is waived, the contracting officer should include specific instructions regarding the arrangements for examinations, tests and disposition of samples.

6.4.1 First article samples. All samples required for test purposes shall be furnished at no expense to the Government and the manufacturer shall pay all transportation to and from the point where the tests are performed. All tested samples shall become property of the Government but may be released to the manufacturer at the option of the Government. Upon request, the manufacturer shall furnish to the

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Government testing facility, a lock extension equal in respect to that of the qualified sample for use in inspection and test during the term of the contract.

6.5 Reference identification number. The reference identification number (RIN) system may be used for items covered by this specification. An example of the RIN is as follows:

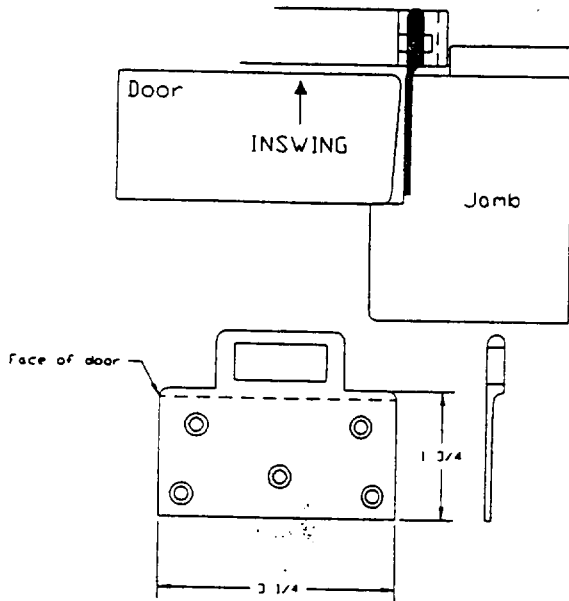
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1<sup>st</sup> position      1 - Type I  
                      2 - Type II  
                      3 - Type III  
                      4 - Type IV

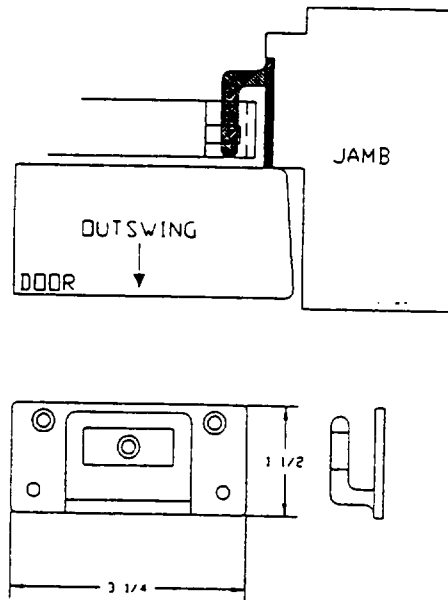
2<sup>nd</sup> position      D - Class D  
                      N - Class N  
                      B - Class B

3<sup>rd</sup> position      1 - Strike 1  
                      2 - Strike 2  
                      3 - Strike 3  
                      9 - Strike 9

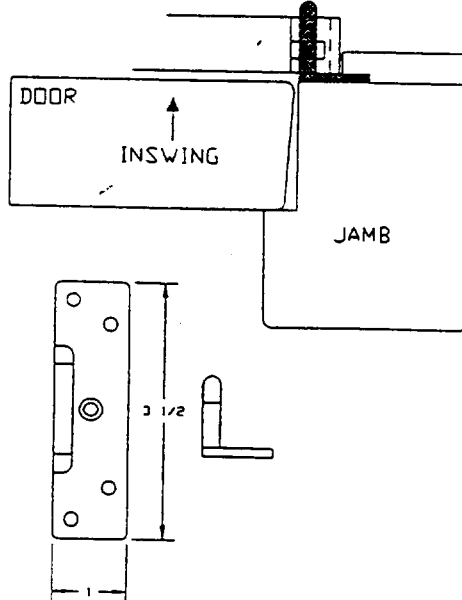
Strike No. 1  
Single Door Regular Bevel or  
Double Door Regular Bevel



Strike No. 2  
Single Door Reverse Bevel



Strike No. 3  
Single Door Regular Bevel or  
Double Door Regular Bevel



Strike No. 9  
Double Door Reverse Bevel

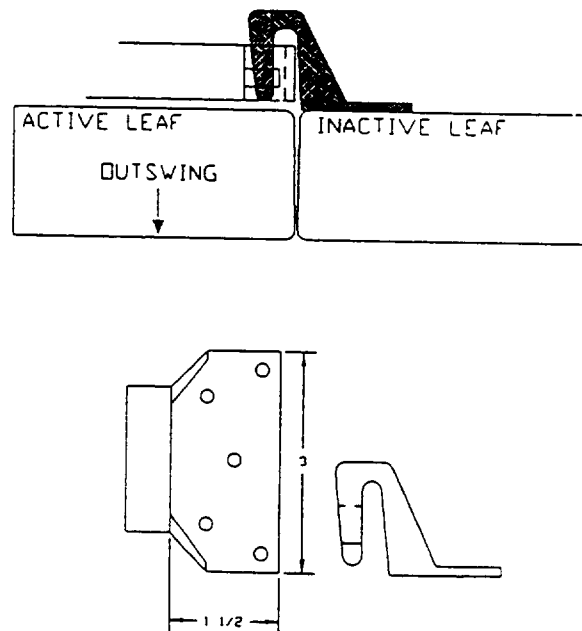


FIGURE 1 Strike Configurations

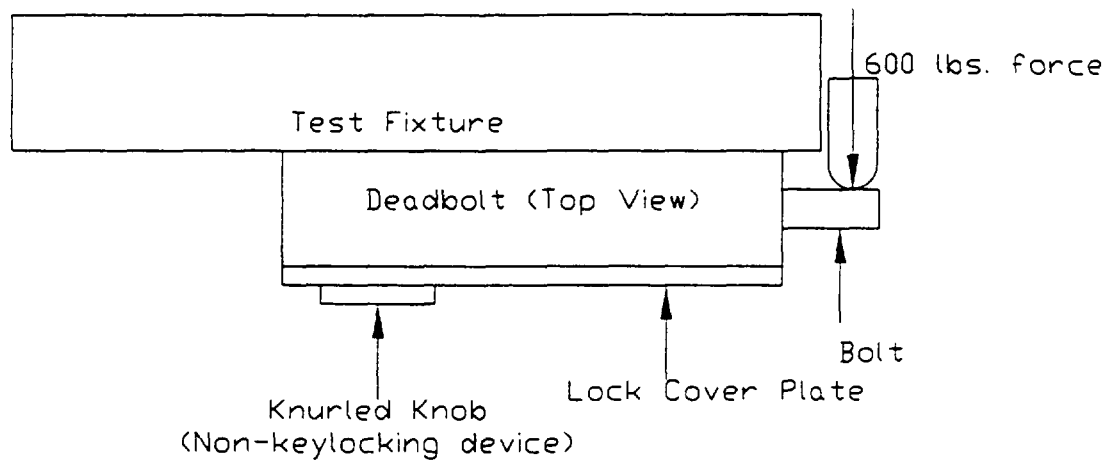


Figure 2a - Case and Bolt Strength Test

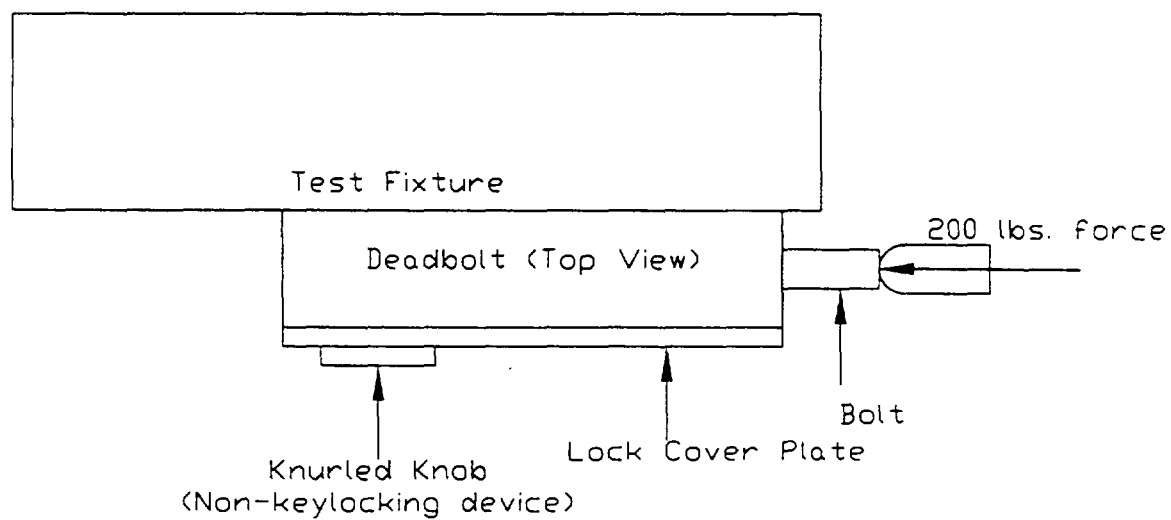


Figure 2b - Bolt End Pressure Test

Pedestrian Door Lock Test Fixture:

- (1) Vertically mounted, 1-5/8 to 1-3/4 inch thick plate approx. 19 inches wide by 11 inches high.
- (2) Drilled and tapped to allow for mounting deadbolt.
- (3) Hinged to allow for cyclic test using strike.

Alternatively, the lock may be mounted to a fixed plate with the strike mounted to a moveable fixture.

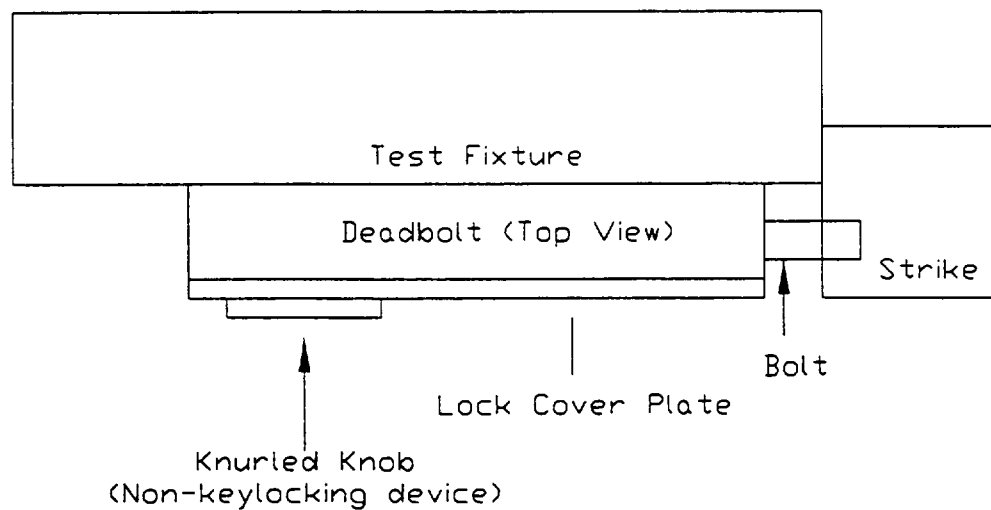


Figure 3 - Test Fixture Configuration