[INCH-POUND]
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April 1, 2004
Superseding
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 deadbolts (PDD's) for use with changeable combination locks and strikes. Pedestrian door deadbolts include designs that meet the Americans with Disabilities Act (ADA) and Uniform Federal Accessibility Standards (UFAS).

1.2 Classification. Pedestrian door deadbolts 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

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

## 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

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

Military Specification:

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

Military Standards:

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

(Copies of Military Specification 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 invitation for bids or request for proposals shall apply.

American Society For Quality Control:

ASQ 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.)

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 Qualification. The pedestrian door deadbolts furnished under this specification shall be products which have been tested, and have passed the qualification tests specified in section 4, and have been listed on or approved for listing on the applicable qualified products list (QPL).

3.1.1 Qualification suspension.

3.1.1.1 Development of entry techniques. The pedestrian door deadbolts qualified under this specification will be continually tested by the Government during the term of qualification to determine whether the security protection afforded by the deadbolts should or can be improved. If, at any time, entry techniques are developed within the framework of the specification which affect a pedestrian door deadbolt's security integrity, it shall be removed from the QPL and the manufacturer will be required to modify the product to the extent necessary to defeat the techniques, and have the pedestrian door deadbolt requalified.

3.1.1.2 Change in specification requirements. This specification will be continually reviewed by the Government to determine whether specification requirements should or can be changed to improve product quality. If, at any time, requirements are changed, and such changes affect the qualification status of a qualified pedestrian door deadbolt, it shall be removed from the QPL and the manufacturer will be required to modify the product to the extent necessary to comply with specification changes and have the pedestrian door deadbolt requalified.

3.2 Description. A pedestrian door deadbolt shall consist of a mounting plate (as specified by this specification), combination lock that meets Federal Specification FF-L-2740, and a strike (as specified by this specification). The pedestrian door deadbolt may also contain an access control component.

3.3 Materials. Material used shall be free from defects that would adversely affect the performance or maintainability of the 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.

3.3.1 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.

3.4 Design.

3.4.1 Pedestrian door deadbolt interface. Pedestrian door deadbolts shall be designed for use with commercially available combination locks having standard dimensions and footprints as described in federal specification FF-L-2740A.

3.4.2 Type III. Type III pedestrian door deadbolts shall comply with requirements of the Uniform Federal Accessibility Standards and the Americans with Disabilities Act.

3.4.3 Type IV. Type IV pedestrian door deadbolts shall meet the same requirements as the Type III pedestrian door deadbolts 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.

3.4.4 Automatic deadbolt mechanism. The pedestrian door deadbolt shall have a trip device that operates in such a manner that when the combination lock is in the locked position, the deadbolt shall automatically extend into the locked position upon engagement of the strike. 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.

3.4.5 Life safety feature. The pedestrian door deadbolt shall be designed to incorporate a life safety feature to meet the requirements of NFPA 101 (section 101) once the lock is in the open condition. The life safety feature must be able to ensure a quick, safe exit in the case of an emergency. Type I Pedestrian door deadbolt shall use a conventional key cylinder. Each Type I pedestrian door deadbolt shall be furnished with a minimum of two keys.

3.4.6 Access control key bypass. Type IV pedestrian door deadbolts may be fitted with an exterior key bypass that will allow entry without use of the access control when the combination lock bolt is retracted. Removal of the key cylinder shall not permit access to the FF-L-2740 lock mechanism.

3.4.7 Mounting plates.

3.4.7.1 Drill resistant mounting plate. When Class D is specified, the pedestrian door deadbolt shall be supplied with a drill resistant plate. The drill resistant plate shall prevent penetration by drilling for a period of 20 man-minutes. In addition, to drill resistance, the mounting plate shall increase the strength of the lock mount, be resistant to crushing of the door during installation, and aid in maintaining proper alignment between the pedestrian door deadbolt and the mounting plate. The mounting plate shall be designed for door thickness between 1-3/8 and 2 inches (41 mm to 49 mm) thick and shall be adjustable to doors within this range without modification or replacement of parts. The mounting plate shall have a corrosion resistant decorative finish or cover. In no case may the plate interfere with the door stop on the jamb.

3.4.7.2 Mounting plate. When Class N is specified, the pedestrian door deadbolt shall be provided with a mounting plate that shall increase the strength of the lock mount, be resistant to crushing of the door during installation, and aid in maintaining proper alignment between the pedestrian door deadbolt and the mounting plate. The mounting plate shall be designed for door thickness between 1-3/8 and 2 inches (41 mm to 49 mm) thick. All parts required for proper operation over the range of door thickness shall be provided. The mounting plate shall have a corrosion resistant decorative finish or cover. In no case may the plate interfere with the door stop on the jamb.

3.4.8 Strikes. The pedestrian door lock shall be furnished with one or more strikes, as specified. The strikes shall withstand without damage a force of 600 pounds from outside of the door, when tested as specified in 4.7.5.

3.5 Operation and performance.

3.5.1 Lock bolt operation. The torque required to retract the deadbolt, using either the lock dial or exit actuator, shall not exceed 50 inch-ounces (353 N-m), and shall not exceed 15 lbs for exit actuators.

3.5.2 Case and bolt strength. The pedestrian door deadbolt case and bolt shall withstand the test specified in 4.7.4 without any fracture or bending of the bolt or case.

3.5.3 Temperature. The pedestrian door deadbolt shall operate in a temperature range of –10°F to 158°F (-23.4°C to 70°C). Lock extensions shall be tested in accordance with 4.7.8.

3.5.4 Humidity. The pedestrian door deadbolt 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 4.7.2.

3.5.5 Vibration. Pedestrian door deadbolts shall be subjected to environmental vibration tests, as specified in 4.7.6. Operation and security performance and tolerances shall remain within standards.

3.5.6 Lock operation. All features of the pedestrian door deadbolt 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 4.7.1.2.

3.5.7 Electrostatic discharge. The pedestrian door deadbolt with a properly mounted FF-L-2740 lock, shall be subjected to the electrostatic discharge tests, as specified in 4.7.9 The test shall be performed with the pedestrian door deadbolt mounted on a wood stand. Operation and security performance and tolerances shall remain within standards.

3.5.8 Shock Test. The pedestrian door deadbolt case and bolt shall withstand the shock test specified in paragraph 4.7.3. The pedestrian door deadbolt shall be tested in both the locked and unlocked position. Operation and security performance and tolerances shall remain within standards.

3.6 Security.

3.6.1 Government testing. The Government reserves the right of testing the pedestrian door deadbolt in accordance with standards that are privileged to the Government.

3.6.2 Surreptitious entry. The pedestrian door deadbolt shall resist surreptitious entry for a period of 20 man-hours when tested as specified in 4.7.10.

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

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

3.9 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 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 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 application referenced documents.

4.1.3 Examination of preparation for delivery. An examination shall be made to determine that the packaging, packing and marking comply with the requirements in Section 5 of this specification. Defects shall be scored in accordance with table II. The sample unit shall be one shipping pedestrian door deadbolts fully prepared for delivery. Sampling shall be in accordance with ANSI/ASQ Z1.4. The lot size shall be the number of pedestrian door deadbolts in the inspection lot. The inspection level shall be I and the AQL shall be 4.0 defects per hundred units.

**Table I Classification of preparation for delivery defects**

| Examine | Defects |
|---|---|
| Markings (exterior) | Omitted; incorrect; illegible; improper size, location, sequence or method of application. |
| Materials | Any component missing or damaged. |
| Workmanship | Inadequate application of components such as incomplete closure of container flaps or shroud. |

4.2 Testing procedures and tests.

4.2.1 Testing agency. Qualification tests accomplished on pedestrian door deadbolts submitted for approval for inclusion on the applicable Qualified Products List (QPL) and any retesting that may be required shall be performed by a testing agency specifically designated by the General Services Administration.

4.2.2 Test costs. All testing costs entailed in determining the qualification of the supplier's product, including costs of retesting of a qualified product if subsequently disqualified under 0, shall be borne by the supplier, and shall be payable to the General Services Administration.

4.2.3 Test procedures. The following procedures shall govern the testing of all pedestrian door deadbolts submitted for qualification under this specification:

(a) Samples shall be submitted for qualification only after the supplier has obtained written authorization from the General Services Administration.

(b) A qualification test may be discontinued at the Government's testing facility at any time the product fails to meet any one or more of the requirements set forth in this specification. The manufacturer may be permitted to make modifications on the sample during the testing phase where such modifications, in the judgement of the General Services Administration and the testing facility, are clearly in the interest of the Government.

(c) In case of failure of the sample, consideration will be given to the request of the manufacturer for resubmission 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.

(d) The manufacturer or his representative will not be permitted to observe the actual tamper resistance tests conducted on his product at the testing facility. However, when samples tested fail to comply with the requirements of this specification, the sample may be examined by the manufacturer or his representatives and full details of the failure may be made known to them in a manner which, for reasons of security, will be in the best interest of the Government.

4.2.3.1 Test samples. Ten qualification test samples shall be forwarded at a time and to a place designated by the General Services Administration. In the event the samples are destroyed or damaged to such an extent during testing that testing cannot be completed, the Government reserves the right to require the manufacturer to furnish additional samples to complete the testing. Samples delivered to the test facility shall have a tag attached, which shall reference this specification and identify the sample by class, type, and strike.

4.2.3.2 Drawings and material specifications. The manufacturer shall furnish two complete sets of construction and assembly drawings and material specifications with the sample submitted for qualification. When samples have been tested and the product is approved for inclusion on the applicable QPL, the manufacturer shall furnish three additional complete sets of the assembly and construction drawings and material specifications lists to the General Services Administration for the Government's use in inspection and acceptance of the product after award of contract. All material so furnished by the manufacturer will be held in proprietary confidence.

4.2.3.3 Changes in construction or construction drawings. No changes shall be made in the construction or construction drawings of the pedestrian door deadbolts after it has become qualified and is furnished under contract or order unless prior written authorization to make changes is obtained from the GSA contracting officer.

4.3 Qualification testing. Qualification testing shall consist of the following tests described under test methods in 4.7. Failure of the sample to withstand one or more of these tests shall provide reason to consider the product as having failed to meet qualification requirements.

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

a. Quality conformance inspection (see 4.5)
b. Inspection of packaging (see 4.5.4)

4.5 Quality conformance inspection. The pedestrian door deadbolts shall be examined for defects in accordance with Table II. 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 ASQ 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 4.7. 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 II. Examination for defects.

| |
|---|
| 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 holdback device not as specified. |
| Lock torque not as specified. |
| Finish not as specified. |
| Instructions not furnished, or not as specified. |

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

Table III. 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 the contract or order. |
| | Item description marked on unit container. |

4.6 Acceptance after award of contract. The Government reserves the right to inspect and test each pedestrian door deadbolt, including all component parts thereof, delivered for acceptance under this specification after award of contract.

4.7 Test methods.

4.7.1 Operation test.

4.7.1.1 Types I through IV. The pedestrian door deadbolts shall be subjected to 10,000 cycles of operation without replacement of any component. One cycle shall consist of the activation of every aspect of the deadbolt. The pedestrian door deadbolts 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.

4.7.1.2 ADA compliant operation test. Type III and IV lock extensions shall be subjected to 200,000 cycles of operation without replacement of any components. The lock shall be mounted on a door with the appropriate strike. Each cycle shall consist of retracting the bolt using the outside entry handle, opening the door, releasing the outside entry handle, allow door to close, 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.

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

4.7.3 Shock test. Lock extensions shall be tested in accordance with MIL-S-901.

4.7.4 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 2a. 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 Figure 2b. Any fracture or bending of the bolt or case shall be a failure.

4.7.5 Strike test. Mount the strike on a test stand as shown in figure 3. Apply a force of 600 pounds in the direction of the door swing for the strike being tested. The force shall be applied as the strike opening as would be applied by the pedestrian door deadbolts in an attempt to force the lock extension. Any fracture or bending of the strike shall be a failure.

4.7.6 Environmental vibration. The category 21 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.

4.7.8 Temperature test.

4.7.8.1 Low temperature test. The pedestrian door deadbolts 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 pedestrian door deadbolt shall be examined for proper operation and for any defects that would affect operation or life of the product. The pedestrian door deadbolt shall be removed from the chamber and allowed to return to room temperature. The pedestrian door deadbolt 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 pedestrian door deadbolt.

4.7.8.2 High temperature test. The pedestrian door deadbolt 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 pedestrian door deadbolt shall be removed from the chamber and, without allowing time to cool, the pedestrian door deadbolt shall be examined for any damage or defects due to high temperature exposure. There shall be no defects affecting the operation or life of the pedestrian door deadbolts.

4.7.9 Electrostatic discharge. The lock dial shall be subjected to five electrostatic discharges of 250kV. After exposure, the lock system shall operate normally.

4.7.10 Surreptitious entry. Attempts shall be made to unlock the lock through manipulation, radiological analysis and emanations analysis. Manipulation may include the use of automatic dialing devices. Manipulation and analysis may include the use of computer enhancement techniques for signals or emanations. The lock shall resist opening for the times specified in 3.6.2.

## 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 D 3951 and shall ensure carrier acceptance under the National Motor Freight Classification and Uniform Freight Classification.

5.2 Marking. Marking shall be as specified or in accordance with MIL-STD-129, as specified.

## 6. NOTES

6.1 Intended use. Pedestrian door deadbolts 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 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:

FFL2890-4D1

| | |
|---|---|
| 1st Position | 1 – Type I |
| | 2 – Type II |
| | 3 – Type III |
| | 4 – Type IV |
| 2nd Position | D – Class D |
| | N – Class N |
| | B – Class B |
| 3rd Position | 1 – Strike 1 |
| | 2 – Strike 2 |
| | 3 – Strike 3 |
| | 9 – Strike 9 |

MILITARY INTERESTS:

Preparing Activity:
GSA-FSS

Military Coordinating Activity:
DLA-IS

Custodians:
DLA-IS
AF-99
Army-AR

FSC 5340

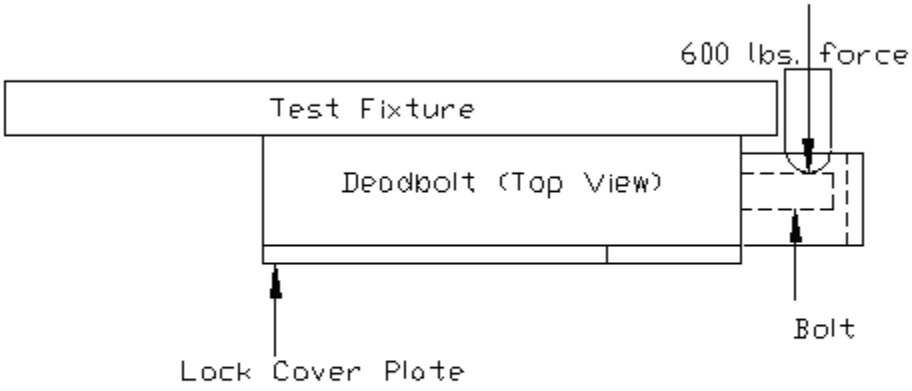


Figure 2a - Case and Bolt Strength Test

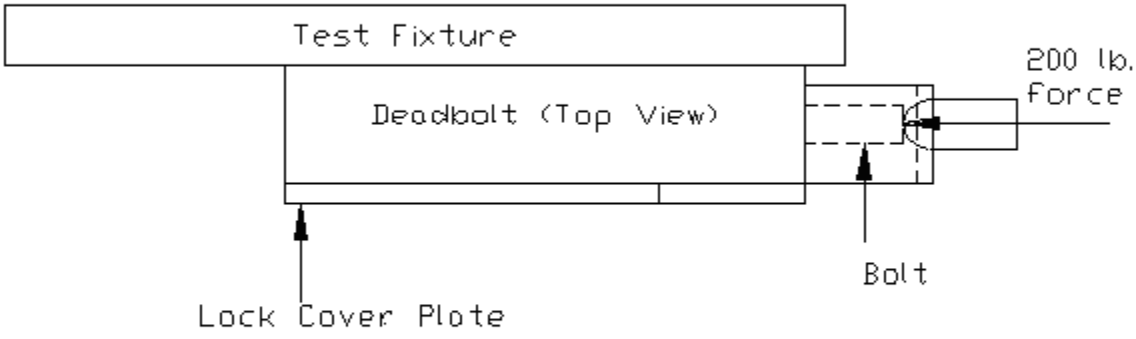


Figure 2b - Bolt End Pressure Test

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.

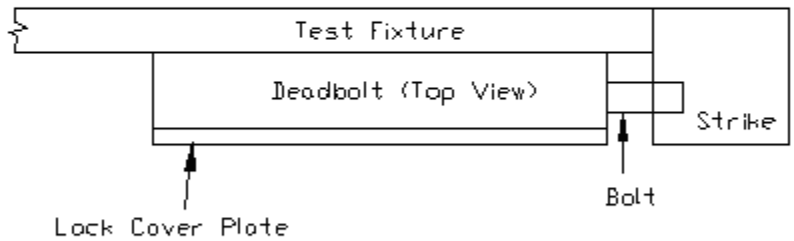


Figure 3 - Test Fixture Configuration