

Port Hueneme, California 93043-4370

Operation and Maintenance Manual for the First Generation Internal Locking Device Installed on Personnel Doors

February 2019



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INTRODUCTION

1-1 OBJECTIVE

This manual provides users information necessary to operate and maintain first generation Internal Locking Device (ILD) systems installed on armory personnel doors.

1-2 BACKGROUND

DoD Directive 3224.3 (Reference 1) assigns the Navy as Executive Agent for DoD locks, safes, vaults, seals, and containers. The Chief of Naval Operations (OP-09N) is the Program Sponsor and the Naval Facilities Engineering Command Engineering, Expeditionary Warfare Center (NAVFAC EXWC) is the DoD Lock Program Manager. The DoD Lock Program are the Subject Matter Experts (SME) providing all DoD activities technical expertise and support for technical issues related to research, development, test, and evaluation for locks, safes, vaults, containers, and seals.

In 1994, to address recognized security and operational deficiencies with the externally mounted high security padlock and hasp systems on Arms, Ammunition and Explosives (AA&E) storage magazines, the DoD Lock Program was tasked to develop an alternative locking system. In response, the DoD Lock Program developed the Internal Locking Device (ILD) with various boltwork configurations to replace high security padlock and hasp systems. An ILD system significantly improves forced entry resistance time compared to the padlock and hasp system. ILD systems can be retrofited to exsisting magazines or used for new construction of AA&E storage magazines. In addition to ILD systems for AA&E storage magazines, an ILD system is available for personnel door applications. The ILD is approved for use on all AA&E storage magazines as defined in References 2 through 5. The approving document (Reference 6) can be viewed on the DoD Lock Program web site at https://www.navfac.navy.mil/go/locks.

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COMPONENT DESCRIPTIONS

2-1 INTRODUCTION

An ILD system is a combination of integrated sub-assemblies, designed specifically for swinging or sliding magazine door applications. The following paragraphs provide information on the sub-assemblies.

2-2 ILD SYSTEM SUB-ASSEMBLIES

2-2.1 ILD System

A basic ILD System include the following sub-assemblies:

- ILD lock with High Security Cylinder(s)/Key(s)
- Key Guide Protector (KGP) assembly/assemblies
- Locking Boltwork with a Lock Enclosure/Weldment or Mounting Plate

2-2.2 ILD Lock Cylinder/Key Configurations

ILD Lock Cylinder/Key Configurations are either single or dual, depending on your Command's requirements. Dual key configurations are designed to meet the two-person integrity (TPI) requirement. The two lock cylinders are keyed differently. Both cylinders must be operated for the unlocking and locking process. Keys shall be stored and issued according to DoD requirements. Figure 2-1 shows a dual key configured ILD.



Figure 2-1. Dual Key ILD

2-2.3 ILD Keys and Cylinders

All ILD locks use a Medeco bi-axial key and cylinder design that provides the largest possible number of key code combinations. The keys and cyclinders use a controlled key profile and keyway to ensure security. Issued serial numbers are located on the face of the cylinder core and on the extended flange of the key bow. Figure 2-2 shows the ILD specific Medeco key and cylinder used with the ILD.



Figure 2-2. ILD Key and Cylinder

2-2.4 Key Guide Protector (KGP) Assembly

An ILD KGP Assembly has a stainless steel slotted key guide shroud, key guide core with detent button, and 5/32" hex head key retention screw. The KGP enables a magazine operator to easily index and insert the key into the internally mounted ILD lock and lock cylinder. By design, the KGP minimizes operator error and reduces the possibility of key breakage.

During transport to and from a magazine and after using the key, the KGP will protect the key blade from damage if fully retracted inside the slotted key guide shroud. When fully retracted the detent button pops up locking the shroud in place. Complete instructions for the KGP may be found on page 6-2. Figure 2-3 shows the KGP with key installed and fully extended. Figure 2-4 shows the key retracted into the KGP.



Figure 2-3. ILD KGP Assembly with Fully Extended Key



Figure 2-4. ILD KGP Assembly with Retracted Key

2-2.5 Sliding Boltwork Assembly for Personnel Swinging Doors

The **Sliding Boltwork Assembly** is used on personnel swinging doors. The ILD and sliding bolt are located on the door and the bolt receiver is located on the door frame/jam. Figure 2-5 shows the Personnel Door Sliding Boltwork Assembly viewed from inside the armory in the locked position. Figure 2-6 shows the boltwork unlocked.



Figure 2-5. Personnel Swinging Door Boltwork Locked



Figure 2-6. Personnel Swinging Door Boltwork Unlocked

2-3 ILD DRAWINGS

ILD production drawings are available through NAVFAC EXWC, Code CI8. Part numbers and descriptions are shown on the drawings.

OPERATION

3-1 INTRODUCTION

This section provides the recommended instructions for operating an ILD Lock.

3-2 SINGLE KEY ILD LOCK

3-2.1 Single Key ILD Operator Instructions

Single key lock operation steps are shown in Figures 3.1 and 3.2

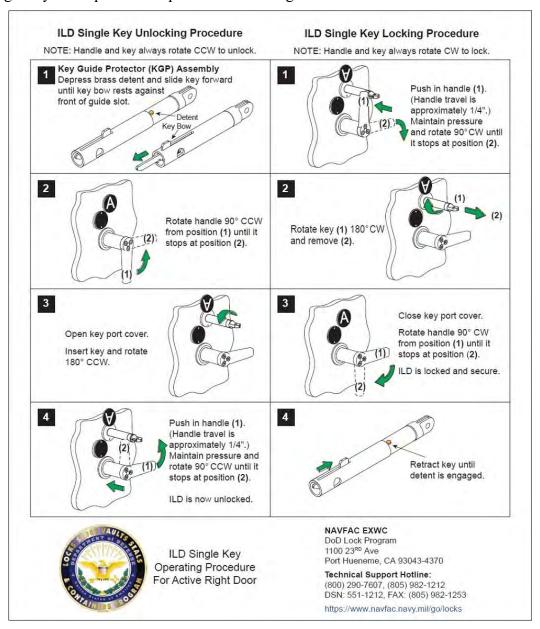


Figure 3-1. Operation of the Single Key ILD for Active Right Door

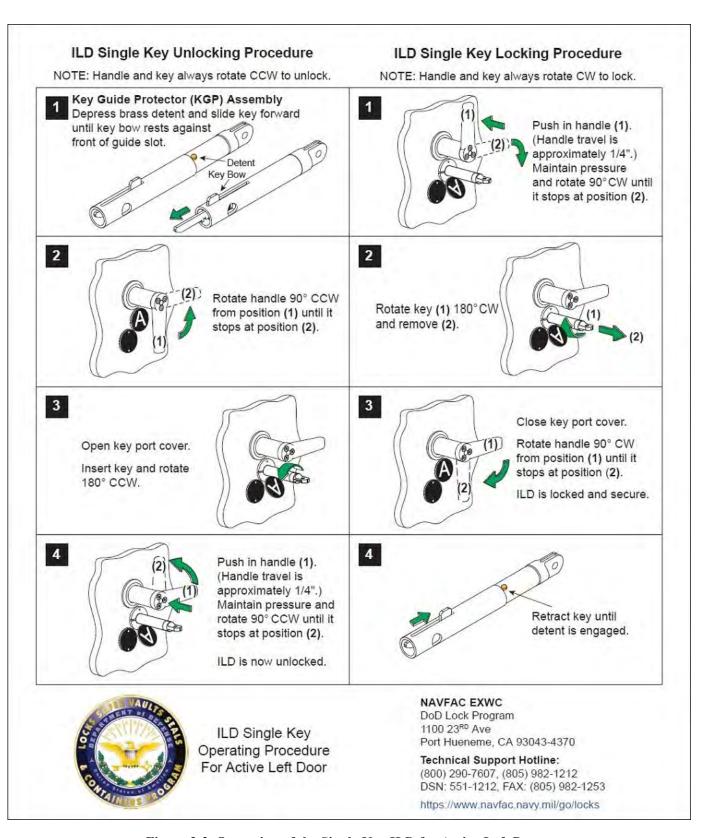


Figure 3-2. Operation of the Single Key ILD for Active Left Door

3-3 DUAL KEY ILD LOCK

3-3.1 **Dual Key ILD Operator Instructions**

Dual key lock operation steps are shown in Figures 3.3 and 3.4

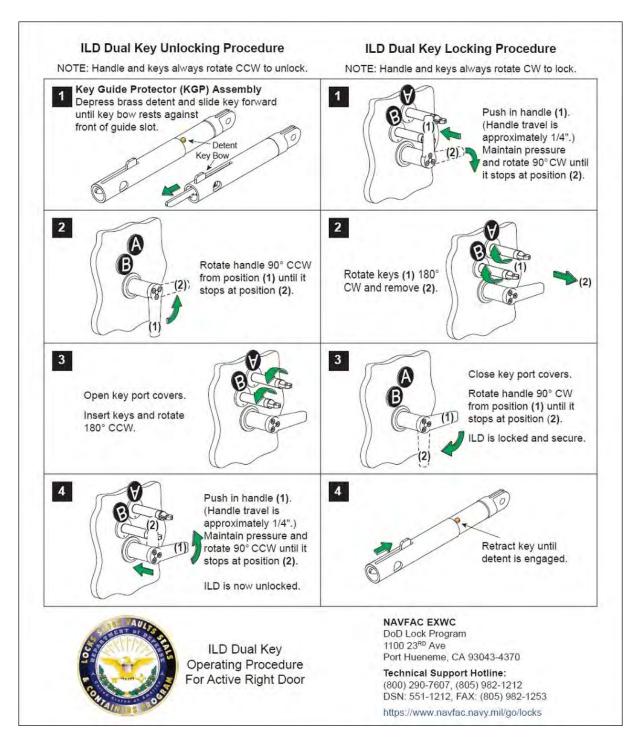


Figure 3-3. Operation of the Dual Key ILD for Active Right Door

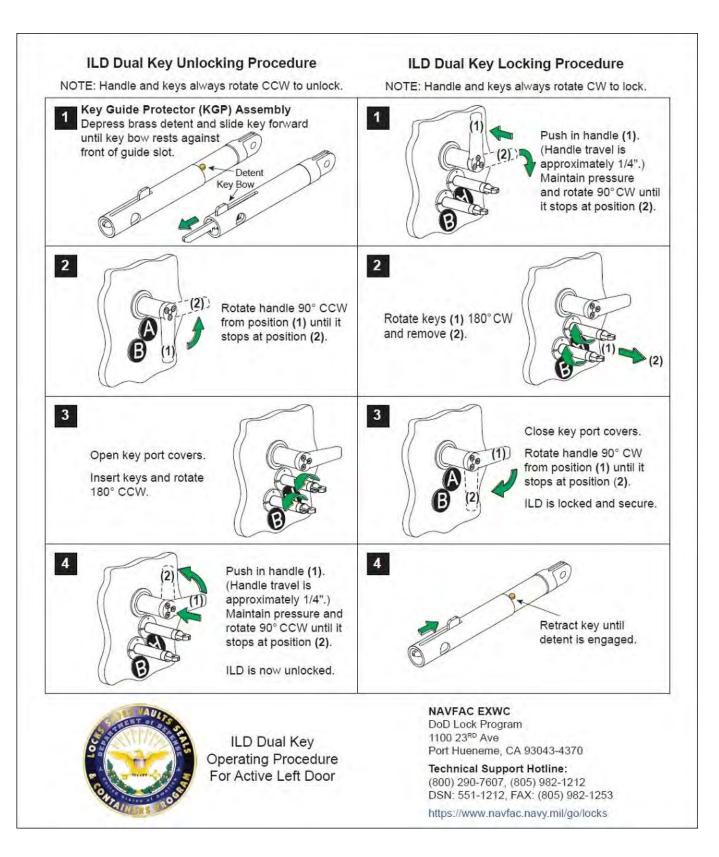


Figure 3-4. Operation of the Dual Key ILD for Active Left Door

MAINTENANCE AND FAILURE ANALYSIS

4-1 INTRODUCTION

This section provides scheduled maintenance and operational failure analysis guidance for the ILD and boltwork assemblies. By design, ILD systems require little maintainance. It is not necessary to inspect the inside of the ILD (DO NOT DISASSEMBLE ILD LOCK). Refer to Failure Analysis Guide shown in Table 4-1 and Internal Locking Device (ILD) Operating Procedure instruction card, supplied with the unit, to determine if a "lockout" is a problem with the door, or with the ILD locking system. If the "lockout" is determined to be associated with the locking system and cannot be resolved using this guide, contact NAVFAC EXWC for information on emergency entry procedures.

DoD Lock Program ILD Sustainment Team, DSN: 551-5625, Comm: 805-982-5625 Email: ILD Field Support@navy.mil, Website: https://www.navfac.navy.mil/go/locks

Table 4-1. Failure Analysis Guide

Problem	Powered Sliding Doors	Un-Powered Sliding Doors	Hinged Doors	Procedure/Solution
Lock appears to operate correctly, but door will not open	X	X		Check door operating system
Lock appears to operate correctly, but door will not open			X	Check for binding or stuck door, and, if used, check secondary latching devices to insure they disengage correctly
Lever Arm will not rotate 90° to allow the shutter plate to expose key cylinder(s)	X	X	X	Make sure lever arm is rotated in the correct direction – CCW. Check for obstructions and remove
Key(s) cannot be inserted into cylinder(s)	X	X	X	Check for obstructions and remove

Table 4-1. Internal Locking Device (ILD) Lockout Failure Analysis Guide (cont.)

Keys(s) will not rotate after inserted into the cylinder(s)	X	X	X	Make sure you have the correct key(s) and they are inserted completely into the cylinder(s) and rotated CCW
Lever Arm will not rotate 90° CCW to open lock after key(s) have been rotated CCW 180°	X	X	X	Make sure that the lever arm can be pushed in approximately 1/4" to disengage the shutter plate, then rotate the lever arm CCW 90°
Lever arm will not push in approximately ¼ inch to disengage shutter plate	X	X	X	Make sure key(s) have been rotated 180° CCW then push in and rotate the lever arm 90° CCW

4-2 PLANNED MAINTENANCE

Planned maintenance involves inspecting operational attributes, cleaning, and lubricating specific points of the ILD locking system. Performing semi-annual inspections and planned maintenance, as specified in this section, an ILD and the boltwork assembly will provide many years of reliable service.

4-2.1 Cleaning and Lubricating Boltwork Assemblies

Inspect the boltwork every 6 months. Check for buildup of dirt, sand, and debris trapped between moving parts. Disassemble, clean, lubricate, and reassemble. To lubricate sliding boltwork assemblies, apply a think coat of lithium grease or anti-seize to bottom edge of the sliding bolt and contact surface of receiver tube and lower support bar.

4-2.2 Removing Debris from Key Access Ports

Inspect the inside of the Key Guide Port using a flash light. If debris is found, insert a small brush, i.e. a toothbrush, taking care not to force any debris farther into the key guide bushing. Drag the brush toward the door front while pressing it down on the lower surface of the port. Repeat this procedure until the port is cleared. If something solid is wedged in the port use a screwdriver or a stiff piece of wire to free the foreign object.

4-2.3 Removing Debris from Shutter Plate Assembly

It is unlikely that debris buildup or anything else will impede rotation of the shutter plate. However, if a shutter plate becomes difficult to turn, there are two possible explanations:

- There is debris trapped between the shutter plate and the ILD housing
- There is debris lodged between the shutter plate and the lock enclosure.

If one of these problems is causing the shutter plate to resist rotation, contact NAVFAC EXWC Code CI-8, Port Hueneme, California, (805) 982-5625 for further directions.

4-2.4 Painting External Hardware

Do not paint any of the moving ILD boltwork parts. Painting the exterior of lock enclosure/weldments may be required as maintainance but, do not allow paint into the Key Guide Ports. Do not paint the sliding bolt contact surfaces of the receiver tube or receiver.

4-2.5 Inspecting ILD Keys

Extend key from the KGP to inspect the key blade. Look for debris trapped in key millings and remove with small wire brush. Look for any damage and/or excessive wear; such as cracks, impact damage on the tip of the key, or bent key. Ensure that the key is properly seated in the KGP and the securing screw is tight. If any of the above mentioned damage and or excessive wear are found, have a qualified person replace the key (with correct serial number), following all applicable key control procedures.

4-2.6 Recommeded Lock Cylinder and Key Maintainance

Maintainance is recommended every 6 months. Use only lubricant approved by Medeco. Conducting the recommended maintainance will provide easy and reliable key and cylinder performance. See Figure 4.1 for Medeco cylinder and key lubrication products and instructions.

Medeco Cylinder and Key Lubrication

Approved Products:

Sandstrom® Poxylube® CP-200 Air Drying Solid Film Lubricant

Poxylube CP-200 (4.5 oz.) Aerosol can with spray tube

Synco® Super Lube® Dri-Film Lubricant

Super Lube Dri-Film (5.25 or 11 oz.) Aerosol can with spray tube

Where to Order:

Poxylube CP-200

http://www.sandstromproducts.com or 1-800-747-1084

Synco Super Lube Dri-Film

http://www.super-lube.com or 1-800-253-LUBE (5823)

How to Lubricate:

No other lubricants should be used with Synco/Medeco Key Lube. Locks that are dirty or oily should be cleaned with an electrical contact cleaner such as the one made by LPS. Extremely dirty or oily locks may have to be completely disassembled as part of the cleaning procedure. It is recommended that only Medeco Factory Certified Locksmiths take apart Medeco cylinders.

- ✓ Shake can well and with opening on white nozzle pointing away from face, insert the red plastic spray tube into the end of the white nozzle.
- ✓ Place the red plastic spray tube against the keyhole and press down on the white nozzle using three, one second bursts of spray.
- ✓ Allow the lubricant to penetrate the cylinder 10 seconds before inserting the key. Wipe the face of the cylinder with a rag if over-spray coats the face of the lock.

How Often to Lubricate:

Frequency of lubrication depends on location of the cylinder, weather conditions and amount of use. A lock installed on an interior door that is only used a couple times a day should be lubricated once a year. A lock installed on the exterior entrance door of an apartment with several hundred tenants and freezing weather conditions should be lubricated at least 4 times a year or anytime the key is difficult to insert or turn.

Warranty:

Medeco is not responsible for damage to the lock caused by foreign matter other than Medeco approved lubricants or by accident, theft, misuse, abuse, or abnormal use or conditions.

Figure 4-1. Medeco Cylinder and Key Lubrication Instructions

4-3 PERFORMING SCHEDULED MAINTENANCE AND INSPECTION

Minimize repair of ILD units and associated boltwork by **Performing Scheduled Maintenance and Inspection** as described in Section 4-2. Each ILD is thoroughly inspected and operated through lock-unlock sequences prior to being shipped to a site. It is unlikely the ILD unit will suffer a catastrophic failure. It is possible that improper maintenance, operation, or installation could lead to an ILD failure. ILD units that are installed, maintained, and operated correctly will work properly over the life of the product.

4-3.1 Reporting Unscheduled Repairs

Always contact NAVFAC EXWC Code CI-8, Port Hueneme, California, (805) 982-5625, prior to making any repairs to the ILD. If personnel at the activity level are directed to perform repairs on the ILD, ensure that they follow directions given by NAVFAC personnel.

4-3.2 Scheduled ILD Lock Rotations

Prior to performing regularly scheduled lock rotations, contact the ILD Sustainment Team at NAVFAC EXWC Code CI-8, Port Hueneme, California, (805) 982-5625 to request a preassembled ILD for this task. Refer to ILD Maintenance Advisory, Figure 4-2.



26 January 2017

SUBJECT: Maintenance Advisory Message (MAM) rotation of lock cylinder(s) used in Internal Locking Device (ILD)

REFERENCES:

- a. Army Regulation 190-11, Physical Security of Arms, Ammunition and Explosives, 5 September 2013.
- b. OPNAVINST 5530.13C, Department of the Navy Physical Security Instruction for Conventional Arms, Ammunition and Explosives (AA&E), 26 September 2003.
- c. Air Force Instruction 21-200, Munitions and Missile Maintenance, 2 January 2014.
- 1. DISTRIBUTION: This is a "Maintenance Advisory Message". Ammunition Supply Point personnel will retransmit this message to all essential personnel.
- 2. BACKGROUND: The ILD was originally designed to facilitate lock cylinder rotations without removing the ILD from its mounting surface. This capability has been used since the ILD first came into service. However, based on recent feedback from users in the field, disassembling and re-assembling the ILD while mounted in a confined space has presented challenges in ensuring proper alignment of internal components. As a result, this has led to expensive and timely magazine lock-outs impacting training exercises and mission support.
- 3. USER ACTIONS: Users are no longer advised to open the ILD for any reason, to include rotation of the key cylinder. When performing cylinder rotations, users will simply rotate the entire ILD from one magazine to another. This will greatly minimize the chances of incorrect reassembly or loss of internal components leading to a potential lock-out. In addition, this reduces the time required to perform key cylinder rotations.

If users experience any issues while operating the units (i.e. key does not rotate smoothly with two finger operation, key gets stuck in the cylinder, etc...) users are instructed to contact the ILD support line immediately for assistance.

4. POC: ILD Technical Support DSN: 551-5625, COM: 805-982-5625, EMAIL: ILD Field Support@navy.mil

Figure 4-2. ILD Maintenance Advisory

ILD REMOVAL AND INSTALLATION ON PERSONNEL DOOR BOLTWORKS

5-1 INTRODUCTION

This section describes the removal and installation of the ILD on the personnel swinging door boltworks for either replacement or maintenance.

5-2 ILD REMOVAL AND INSTALLATION (PERSONNEL SWINGING DOOR BOLTWORK)

5-2.1 Tools and Supplies Required

- a) 3/16" Hex Key Wrench (T-Handle or L) 3" minimum length
- b) 5/16" Hex Key Wrench (T-Handle or L)
- c) 2 ea. 15/16" Open End or Combination Wrench (Alternate; Adjustable Wrenchs)
- d) 1/8" Drift Punch or Pliers
- e) Hammer
- f) Thread Anti-Seize Compound, Molybdenum Disulfide
- g) Transparent Tape (1/4" wide x 1.0" Long Strips, Qty 2)

5-2.2 ILD Removal

Step 1: Place ILD and locking bolt in the **unlocked** position.

<u>Step 2</u>: Drive out roll pin from castle nut using drift punch and hammer, or if equipped with cotter pin, use pliers to remove (see Figure 5-1).

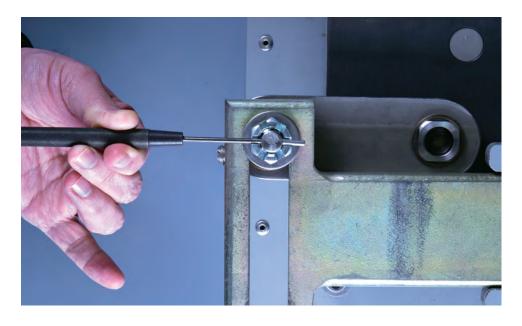


Figure 5-1. Removal of Roll Pin (or Cotter Pin)

Step 3: Remove the 5/8"-11UNC castle nut from the 5/8"-11UNC x 2.5" hex bolt that connects the sliding lock bolt to the aluminum cam driver using a 15/16" open end wrench on the bolt head and another 15/16" open end wrench on the nut (see Figure 5-2). Note: nut may be finger tightened and wrenches will not be needed.



Figure 5-2. Removal of Castle Nut

<u>Step 4</u>: Remove cam driver bolt, sleeve, thrust bearings, and washers. Note orientation of these components for proper reassembly (see Figure 5-3). Remove sliding bolt.



Figure 5-3. Orientation of Bolt, Thrust Bearings, & Washers

<u>Step</u> <u>5</u>: With the ILD in the **locked** position, remove ILD handle by unscrewing the $\frac{1}{4}$ "-20UNC x 1.25" socket head cap screw using a 3/16" hex key wrench (see Figure 5-4).



Figure 5-4. Removal of ILD Handle

Step 6: Remove the four (4) each $\frac{1}{4}$ "-20UNC x 2.00" socket head cap screws using a $\frac{3}{16}$ " hex key wrench (Figure 5-5).

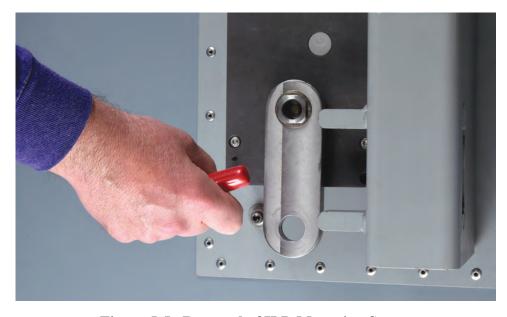


Figure 5-5. Removal of ILD Mounting Screws

<u>Step 7</u>: When removing the ILD from mounting surface as shown in Figure 5-6, the aluminum cam driver may be removed, if necessary, by removing the spiral retaining ring on output shaft. Note the orientation of cam driver, if removed, for reassembly. Take care to not lose the wave spring located between the ILD shutter plate and the ILD mounting surface.



Figure 5-6. Removal of ILD Lock

5-2.3 ILD Installation

Step 8: Clean ILD mounting surface before re-installing ILD. Install the wave spring on the ILD shutter plate with the ears of the spring positioned against the shutter plate and secure it in place with two (2) strips of transparent tape as shown in Figure 5-7. If installing a new ILD the wave spring should already be secured.



Figure 5-7. Installation of ILD Shutter Plate Wave Spring

Step 9: Installing the ILD is the reverse of steps 1 through 8, plus the following steps: 1) ILD must be mounted to the boltwork mounting plate in the **locked** position and cycled from **locked** to **unlocked** positions at least three times to ensure the ILD is operating properly before proceeding with final installation of the boltwork parts. 2) Tighten 5/8"-11UNC castle nut against sleeve so that clearance remains between all moving parts. Align slots in castle nut to through hole in bolt for roll pin or cotter pin insertion. 3) Anti-seize compound should be applied to threads of all screws during reassembly. Do not over tighten screws. The recommended torque for ½" ILD mounting screws is 8-10 ft-lbs, using a torque wrench is not mandatory. 4) Tighten the locking bolt detent (Figure 5-8) so the cam driver bolt barely "hangs up" on the detent when the lock bolt is cycled. The reassembled ILD personnel door sliding boltwork is shown in Figure 5-9.

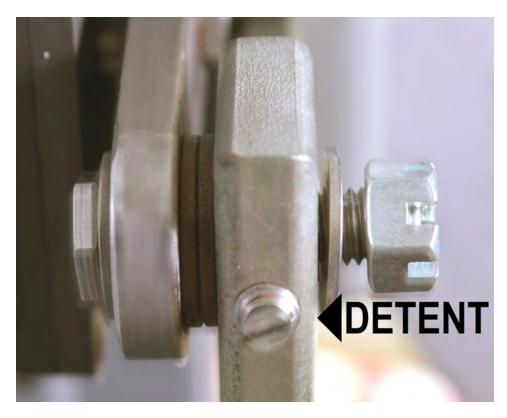


Figure 5-8. Locking Bolt Detent



Figure 5-9. Reassembled Personnel Door Sliding Boltwork

KEYS AND KEY GUIDE PROTECTORS (KGP)

6-1 ILD KEY AND CYLINDER CONTROL PROCESS

Construction keys and cylinders (See Figure 6-1) are not auothorized for use on AA&E storage magazines. Upon completing an ILD installation, contact the ILD Field Support Coordinator to obtain approved high security keys and cylinders at: https://www.navfac.navy.mil/navfac_worldwide/specialty_centers/exwc/
products_and_services/capital_improvements/dod_lock/SecurityHardware/
InternalLockingDevice/CylinderControl.html.

The DoD Lock Program will ship the cylinders, keys, KGPs, and change-out procedure to the government POC at the installation site. The government POC shall acknowledge receipt of the approved high security cylinders and keys with ILD Field Support Coordinator.



Figure 6-1. Construction Key and Cylinder

Once the approved high security cylinders are received and installed, the construction cylinders, keys, and key guides must be returned to the DoD Lock Program using the return mailing label, Figure 6-2, provided on the DoD Lock Program web site at: https://www.navfac.navy.mil/content/dam/navfac/Specialty%20Centers/Engineering%20and%20Expeditionary%20Warfare%20Center/DoD_Lock_Program/Images/LockProgramMailingLabel.jpg.

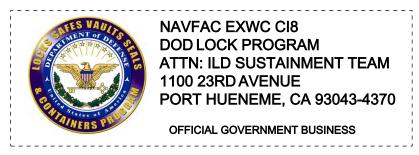


Figure 6-2. Return Mail Label

6-2 INSTRUCTIONS FOR INSTALLING KEYS IN THE KGP

Keys for the ILD are mounted in protective guide assemblies shown in Figures 6-2.1 through 6-2.8.

6-2.1 Tools Required for Key Change-Out

- a. 5/32" Hex Head Wrench
- b. RECOMMENDED: Loctite® Threadlocker Blue 242® (Or Similar Non-Permanent Thread Lock Compound)

6-2.2 KGP Assembly and Key Change-Out Instructions

- Step 1. The new design KGP has 3 main components including:
 - A. Slotted key guide shroud
 - B. Key guide core with detent button
 - C. 5/32" hex head retention screw



Figure 6-2.1. Key Guide Protector Assembly

Step 2. With key in fully extended position remove the key retention screw.



Figure 6-2.2. Remove Hex Head Screw

Step 3. Move the key guide core away from the key guide shroud about 3/4" as shown in figure at right. Remove the key through slot in the key guide shroud.

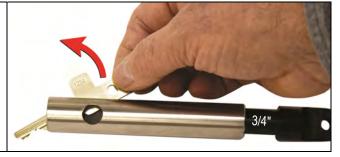


Figure 6-2.3. Slide Key Guide Core Away From Key Guide Shroud and Remove Key

Step 4. Insert the new key through slot in the key guide shroud and seat the key into key guide core.

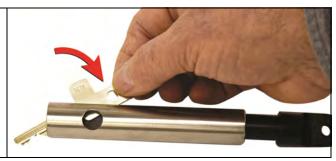


Figure 6-2.4. Insert New Key Into KGP

Step 5. Slide the key guide shroud to fully extend key as shown in Figure 6-2.5, exposing key retention screw hole through the access hole in key guide shroud.



Figure 6-2.5. Move Key Guide Core to Left

Step 6. Apply a SMALL amount of nonpermanent thread lock compound to screw thread before Installing the key retention hex head screw.



Figure 6-2.6. Prepare Hex Head Screw for Reinstallation

Step 7. Insert key retention hex head screw through access hole and firmly tighten screw.



Figure 6-2.7. Tighten Key Retention Screw

Step 8. Ensure key is properly aligned and seated in key guide core recess. Confirm the shroud slides freely over KGP core.

KGP is now ready for service.



Figure 6-2.8. Ensure KGP Operates Correctly

6-3 REPLACING DAMAGED/BROKEN KEYS

It is unlikely that ILD keys will break if they are regularly cleaned, lubricated, and properly installed in the KGP. The key is designed to break at a specific location that will leave a small portion of the key protruding from the cylinder. This allows broken keys to be removed from either the primary or secondary lock cylinders. If a key is damaged, broken, or is difficult to use, contact the ILD Field Support Coordinator: Comm: (805) 982-5625, DSN: 551-5625, E-Mail: ILD_Field_Support@navy.mil.

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REFERENCES

- 1. DoD Directive 3224.3 "Physical Security Equipment (PSE): Assignment of responsibility for Research, Development, Testing, Evaluation, Production, Procurement, Deployment and Support" 17 February 1989.
- 2. DoD Instruction C5210.41-M, "Nuclear Weapons Security Manual" November 22, 2004
- 3. DoD Instruction 5100.76-M, "Physical Security of Sensitive Conventional Arms, Ammunition and Explosives" June 13, 2003.
- 4. DoD Directive 5210.65, "Chemical Agent Security Program" 15 October 1986
- 5. CNO letter of 03 May 2001, Serial No. 9N3/IU533927, "Approval of the Internal Locking Device System for Magazine Doors"
- 6. UFC 4-420-10, "Internal Locking Device for Magazine Doors" 29 September 2006