Jefferson Lab LERF

LERF Gun Lockout Procedure

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Estimated Time to Perform: 15 minutes

Procedure Overview

This procedure describes two methods of locking out the LERF gun: 1.) locking VBV0F01, the vacuum valve immediately downstream of the LERF gun, in the beamline, *OR* 2.) locking out the Gun High-Voltage Power Supply. Both methods prevent the gun from producing electrons; however, disabling the vacuum valve has the advantage of allowing gun high-voltage conditioning to proceed as needed. Locking out the Gun High-Voltage Power Supply requires coordination with a Gun System Expert, who safes out the power supply before the Crew Chief lock is applied. This procedure also covers the process required to remove the lock/tag gear and re-enable systems.

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This procedure is divided into the following sections:

Hazard Analysis

There are no special hazards associated with this procedure.

Prerequisites

1. This procedure must be executed by a Crew Chief (Crew Chief lock/tag required).

   NOTE: When not in use, the lock & tag equipment is stored in the LERF vault, locked onto the equipment in the immediate vicinity procedure execution.

Procedure Steps

1.0 Locking Out VBV0F01

1. Using the vacuum control screen (**JMenu⇒Ops Menu (LERF)⇒Vacuum (LERF)⇒Vacuum Overview (LERF)**, select the opposite of the present state of vacuum valve VBV0F01 (**OPEN/CLOSED**) to verify that the valve will cycle. Did the valve cycle?

   YES NO → **A.** Enter the LERF vault and verify that the compressed air valve is not already locked out (see Figures 1-1 and 1-2) and that the valve is in the open position (valve handle should be pointing directly toward you). If the air valve IS NOT locked out and is in the open position, abort this procedure and contact the Vacuum system expert.

2. Leave the valve in the **CLOSED** state.
3. Enter the LERF vault.
4. Locate the compressed air valve that supplies vacuum valve VBV0F01 (see Figure 1-1, below).

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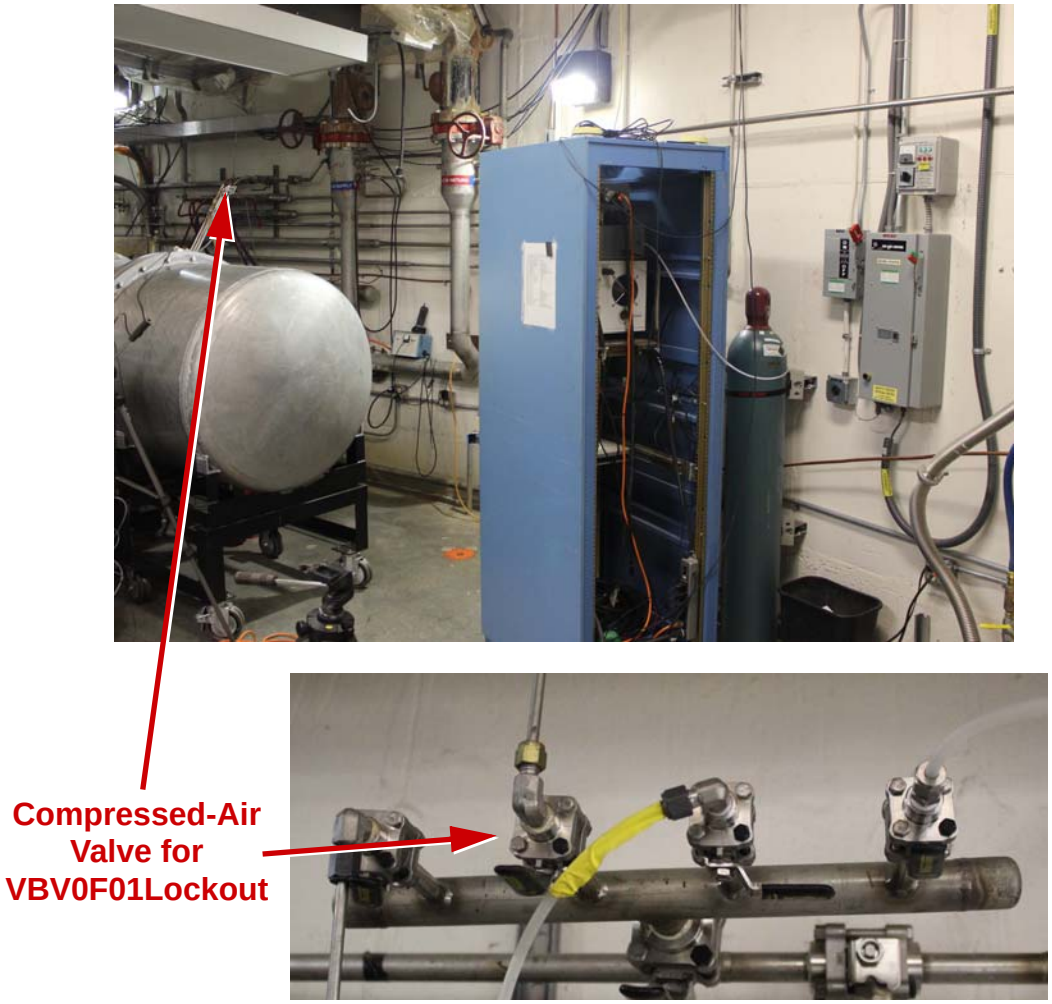
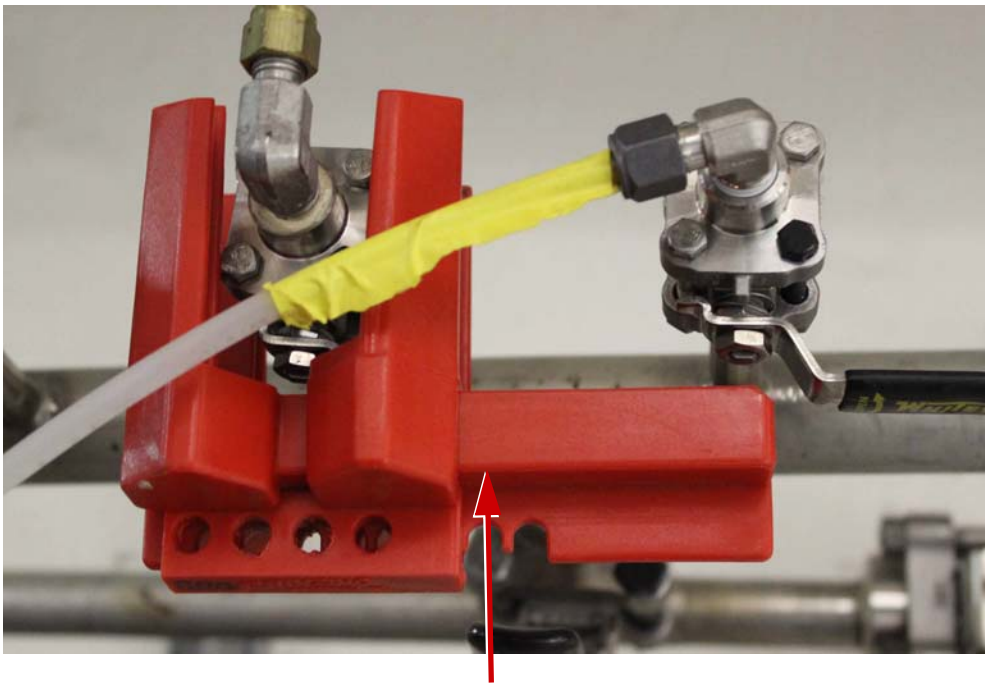


Figure 1-1: Valve Location

5. Unlock the lock/tag equipment from the vacuum line.
6. Turn the compressed-air valve OFF (handle should now point to the right).
7. Apply the compressed-air lockout device to the valve along with a Crew Chief lock/tag as shown in Figure 1-2, below. The locking device must capture the valve handle in the OFF position (pointed to the right). Place the valve handle in the trough of the piece on the left, and slide the right half of the locking device over the valve handle.



Compressed-Air Valve VBV0F01Lockout: Capture the valve handle between the sliding piece on the right and the trough of the piece on the left.

Figure 1-2: Compressed-Air Valve with Locking Device in Place

8. From the vacuum control screen, attempt to open vacuum valve VBV0F01. Did the Status display change to **OPEN**?

   NO YES → **A.** Abort this procedure and contact the Vacuum system expert.

9. The LERF gun is now locked out. Make a *LERFLog* entry.
10. PROCEDURE COMPLETE.

2.0 Unlocking VBV0F01

1. Enter the LERF vault and locate the air supply line valve for VBV0F01 (see Figure 1-1 on page 2).
2. Remove the Crew Chief lock and the lock/tag gear.
3. Open the air supply valve for VBV0F01 (the valve handle should now point directly toward you).

4. Store the lock/tag gear by locking it to the air supply line with the Crew Chief lock as shown in Figure 2-1, below.

   NOTE: The locking device used for this application is relatively unique. Locking the device to the air supply line ensures it will be available for the next use.

Figure 2-1: Lock/Tag Gear Locked to Air Supply Line for Storage

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5. Verify that VBV0F01 is operational as follows:
   a. From the vacuum control screen (**JMenu⇒Ops Menu (LERF)⇒Vacuum (LERF)⇒Vacuum Overview (LERF)**), select the opposite of the present **Open/Closed** state. Watch the Status display. Did the Status display cycle through both states (**Open/Closed**)?

   YES NO → **A.** Abort this procedure and contact the Vacuum system expert.

   b. Leave VBV0F01 in a state consistent with the scheduled program.
6. Make a red "Read-Me" *LERFLog* entry noting that VBV0F01 is no longer locked out.
7. PROCEDURE COMPLETE.

3.0 Locking Out the Gun High-Voltage Power Supply

NOTE: The following steps must be completed in coordination with a LERF Gun System Expert, who applies the initial hasp/lock to the Gun HVPS Disconnect Switch and also safes out the system. A Crew Chief lock is then applied as an additional administrative safety measure.

1. Contact the LERF Gun System Expert (or Electron Gun Group [EGG] On-call) and verify that they have either already applied a hasp/lock to the Gun HVPS Disconnect Switch or will meet you in the LERF vault to lock out the gun high voltage.
2. Enter the LERF vault.

3. Locate the Gun HVPS Disconnect Switch (see Figure 3-1, below).

Figure 3-1: Gun HV Power Supply Disconnect Switch

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4. Unlock the Crew Chief lock and hasp from above the disconnect switch (see Figure 3-2, below).

Figure 3-2: Lock/Tag Gear & VVU

5. Has the LERF Gun System Expert already applied a hasp and lock to the Gun HVPS Disconnect Switch?

YES NO → **A.** **STOP** and wait for the System Expert to first complete the voltage-verification portion of the process and apply their hasp/lock. *DO NOT* apply the Crew Chief lock without the System Expert lock already in place.

6. Apply the Crew Chief lock to the hasp on the Gun HVPS Disconnect Switch (see Figure 3-3, below).

Figure 3-3: Apply Lock/Tag

7. The Gun High-Voltage Power Supply has been locked out.
8. PROCEDURE COMPLETE.

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4.0 Unlocking the Gun High-Voltage Power Supply

1. Enter the LERF vault.
2. Locate the Gun HVPS Disconnect Switch (see Figure 4-1, below).

Figure 4-1: Gun HV Power Supply Disconnect Switch

3. Remove the Crew Chief lock from the Gun HVPS Disconnect Switch and secure it to the conduit immediately above the switch (see Figure 4-2, below).

Figure 4-2: Lock/Tag Gear Storage Location

4. Notify the LERF Gun System Expert (or EGG On-call) that the Crew Chief lock has been removed and it is okay to remove all other lock/tag gear from the Gun HVPS Disconnect Switch.
5. Make a red “Read-Me” *LERFLog* entry noting that the gun is no longer locked out.
6. PROCEDURE COMPLETE.

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