

Person: Tucker, Robert ([retucker@jlab.org](mailto:retucker@jlab.org))  
 Org: PHALLA

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Operational Safety Procedure Review and Approval Form # 103282  
 (See [ES&H Manual Chapter 3310 Appendix T1 Operational Safety Procedure \(OSP\) and Temporary OSP Procedure](#) for Instructions)

Type:	<b>OSP</b>	
	<a href="#">Click for OSP/TOSP Procedure Form</a> <a href="#">Click for LOSP Procedure Form</a> <a href="#">Click for LTT-Individual Information</a> <a href="#">Click for LTT-Group Information</a>	
Serial Number:	<b>ENP-20-103282-OSP</b>	
Issue Date:	<b>7/23/2020</b>	
Expiration Date:	<b>6/23/2023</b>	
Title:	<b>Hall A vacuum pump-out seal inspection and/or replacement</b>	
Location: (where work is being performed)	<b>101 - Experimental Hall A - A100</b>	<b>Various locations in Hall</b> Location Detail: (specifies about where in the selected location(s) the work is being performed)
	<a href="#">Building Floor Plans</a>	
Risk Classification:	Without mitigation measures (3 or 4):	<b>3</b>
(See <a href="#">ES&amp;H Manual Chapter 3210 Appendix T3 Risk Code Assignment</a> )	With mitigation measures in place (N, 1, or 2):	<b>1</b>
Reason:	This document is written to mitigate hazard issues that are : <b>Determined to have an unmitigated Risk code of 3 or 4</b>	
Owning Organization:	<b>PHALLA</b>	
Document Owner(s):	<b>Tucker, Robert (<a href="mailto:retucker@jlab.org">retucker@jlab.org</a>) Primary</b>	

Supplemental Technical Validations

**Ergonomics - Lifting, Carrying, Repetitive Motion (Bob May, Smitty Chandler)**  
**Aerial Work Platforms (Scissor/Aerial Lifts, Boom Trucks) (Joe Thomas, Mark Loewus)**  
**Cranes & Hoists - Ordinary or Pre-Engineered (Bob Sperlazza, Mark Loewus)**  
**ODH 0 and 1 (Imani Burton, Jennifer Williams)**  
**Pressurized Tanks, Containers, and Vacuum Vessels (Dave Meekins, Kelly Dixon, Timothy Whitlatch, Will Oren)**  
**Pressurized Vacuum Lines and Piping Systems (Dave Meekins, Kelly Dixon, Timothy Whitlatch, Will Oren)**  
**Radiological Controlled Area (Adam Hartberger, David Hamlette, Keith Welch)**  
**Four Feet or More Above the Ground (other than ladder or scaffold). (Bert Manzlak, George Perry)**  
**Ladders (Bert Manzlak, George Perry)**

Document History

Revision <input checked="" type="checkbox"/>	Reason for revision or update <input checked="" type="checkbox"/>	Serial number of superseded document <input checked="" type="checkbox"/>
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## Lessons Learned

[Lessons Learned](#) relating to the hazard issues noted above have been reviewed.

Comments for reviewers/approvers:

Attachments 

Procedure: *Valve OSP.pdf*  
 THA: *Valve THA.pdf*  
 Additional Files: *Valve procedure.pdf*  
*COVID Pre-Job Checklist for OSP Attachments.pdf*

## Review Signatures

Subject Matter Expert : Ergonomics - Lifting-> Carrying-> Repetitive Motion	<b>Signed</b> on 6/24/2020 4:32:19 PM by Bob May ( <a href="mailto:may@jlab.org">may@jlab.org</a> )
Subject Matter Expert : Material Handling Equipment->Aerial Work Platforms (Scissor/Aerial Lifts-> Boom Trucks)	<b>Signed</b> on 6/22/2020 12:02:57 PM by Joe Thomas ( <a href="mailto:thomasb@jlab.org">thomasb@jlab.org</a> )
Subject Matter Expert : Material Handling Equipment->Cranes & Hoists - Ordinary or Pre-Engineered	<b>Signed</b> on 6/26/2020 1:50:42 PM by Mark Loewus ( <a href="mailto:loewus@jlab.org">loewus@jlab.org</a> )
Subject Matter Expert : Oxygen Deficiency Hazards (ODH)->ODH 0 and 1	<b>Signed</b> on 7/22/2020 11:35:21 AM by Jennifer Williams ( <a href="mailto:jennifer@jlab.org">jennifer@jlab.org</a> )
Subject Matter Expert : Pressure Systems->Pressurized Tanks-> Containers-> and Vacuum Vessels	<b>Signed</b> on 6/16/2020 4:00:56 PM by Dave Meekins ( <a href="mailto:meekins@jlab.org">meekins@jlab.org</a> )
Subject Matter Expert : Pressure Systems->Pressurized Vacuum Lines and Piping Systems	<b>Signed</b> on 6/16/2020 4:00:56 PM by Dave Meekins ( <a href="mailto:meekins@jlab.org">meekins@jlab.org</a> )
Subject Matter Expert : Radiation - Ionizing->Radiological Controlled Area	<b>Signed</b> on 6/26/2020 1:33:01 PM by Keith Welch ( <a href="mailto:welch@jlab.org">welch@jlab.org</a> )
Subject Matter Expert : Working at Elevations->Four Feet or More Above the Ground (other than ladder or scaffold).	<b>Signed</b> on 6/17/2020 6:01:39 PM by Bert Manzlak ( <a href="mailto:manzlak@jlab.org">manzlak@jlab.org</a> )
Subject Matter Expert : Working at Elevations->Ladders	<b>Signed</b> on 6/16/2020 3:50:05 PM by Bert Manzlak ( <a href="mailto:manzlak@jlab.org">manzlak@jlab.org</a> )

## Approval Signatures

Division Safety Officer : PHALLA	<b>Signed</b> on 7/22/2020 3:20:51 PM by Ed Folts ( <a href="mailto:folts@jlab.org">folts@jlab.org</a> )
Person : Folts, Ed (folts)	
<b>Reasoning:</b> On behalf of Org Manager : PHALLA	<b>Signed</b> on 7/23/2020 7:44:43 AM by Ed Folts ( <a href="mailto:folts@jlab.org">folts@jlab.org</a> )
Safety Warden : Experimental Hall A - A100	<b>Signed</b> on 7/22/2020 12:48:49 PM by Jessie Butler ( <a href="mailto:jbutler@jlab.org">jbutler@jlab.org</a> )

**Operational Safety Procedure Form**  
(See [ES&H Manual Chapter 3310 Appendix T1 Operational Safety Procedure \(OSP\) and Temporary OSP Procedure](#) for instructions.)

Click  
For Word Doc

<b>Title:</b>	Hall A vacuum pump-out seal inspection and/or replacement		
<b>Location:</b>	101- Experimental Hall A- A100 *Various locations in hall	<b>Type:</b>	<input checked="" type="checkbox"/> OSP <input type="checkbox"/> TOSP
<b>Risk Classification</b> (per <a href="#">Task Hazard Analysis</a> attached) (See <a href="#">ESH&amp;Q Manual Chapter 3210 Appendix T3 Risk Code Assignment.</a> )	<b>Highest Risk Code Before Mitigation</b>		3
	<b>Highest Risk Code after Mitigation (N, 1, or 2):</b>		1
<b>Owning Organization:</b>	PHALLA	<b>Date:</b>	04/10/2017
<b>Document Owner(s):</b>	Robert Tucker		

**DEFINE THE SCOPE OF WORK**

- Purpose of the Procedure** – Describe in detail the reason for the procedure (what is being done and why).  
To inspect and/or replace seals in small Ability, large Ability, and CVI pump-outs using the valve fixture labeled “Hall A-Noisy Cricket” to keep system under vacuum while performing the maintenance. Inspections and replacement of seals will be done if vacuum is suspected to be marginal or bad as determined by cryo engineer, Hall A coordinator, or qualified Hall A tech.
- Scope** – include all operations, people, and/or areas that the procedure will affect.  
Hall must be in restricted or controlled access  
Requires 2 qualified and trained technicians  
Requires 1 cryo engineer or designee in hall or monitoring system
- Description of the Facility** – include building, floor plans and layout of the experiment or operation.  
Mirror cans and coaxial transfer line  
Cryo distribution and service cans  
Cryo u-tubes  
Other vacuum systems using Ability or CVI pump-outs

**ANALYZE THE HAZARDS and IMPLEMENT CONTROLS**

- Hazards identified on written Task Hazard Analysis**  
Falls  
Crane operations  
Eye injury  
Foot injury
- Authority and Responsibility:**
  - Who has authority to implement/terminate**  
Hall coordinator or designee
  - Who is responsible for key tasks**  
Hall coordinator or designee, Cryo group engineer
  - Who analyzes the special or unusual hazards including elevated work, chemicals, gases, fire or sparks** (See [ES&H Manual Chapter 3210 Appendix T1 Work Planning, Control, and Authorization Procedure](#))

Hall coordinator or designee

**5.4 What are the Training Requirements** (See [http://www.jlab.org/div\\_dept/train/poc.pdf](http://www.jlab.org/div_dept/train/poc.pdf))

JLAB training: GEN034, MED05, SAF100, SAF103, SAF110, SAF130A, \*SAF202, \*SAF202A, \*SAF202B, \*SAF302, \*SAF307, SAF801, as well as equipment specific training

\*if required to access pump-out

**6. Personal and Environmental Hazard Controls Including:**

**6.1 Shielding**

N/A

**6.2 Barriers** (magnetic, hearing, elevated or crane work, etc.)

Crane work or Overhead work safety cones if required

**6.3 Interlocks**

N/A

**6.4 Monitoring systems**

Cryo control page and local gauges

**6.5 Ventilation**

Standard Hall A ventilation

**6.6 Other (Electrical, ODH, Trip, Ladder)** (Attach related Temporary Work Permits or Safety Reviews as appropriate.)

Abide by RADCON guidelines and/or standing Radiation Work Permit (RWP)

**7. List of Safety Equipment:**

**7.1 List of Safety Equipment:**

Safety Glasses w/side shields (as needed)  
 Safety Shoes  
 Ear protection (as needed)  
 Gloves (as needed)  
 Knee Pads (as needed)  
 Proper Work Clothes  
 Engineered Safeguards already in place and reviewed  
 Fall protection if working from lift or platform >4 feet off of ground

**7.2 Special Tools:**

Crane- if required to lift pump or pump cart  
 Aerial platform/Manlift if required to access pump-out  
 Hall A "Noisy Cricket" valve fixture  
 Vacuum pump(s) and associated hardware (hoses, valves, tees, seals, clamps, etc.)  
 Vacuum gauge with appropriate range

**8. Associated Administrative Controls**

Environment, Safety, Health & Quality (ESH&Q) Manual,  
 This OSP and associated THA, Hall A Pump-out port repair procedure

**DEVELOP THE PROCEDURE**

## 9. Operating Guidelines

This OSP and the Hall A Pump-out valve change procedure, Environment, Safety, Health & Quality (ESH&Q) Manual

## 10. Notification of Affected Personnel (who, how, and when include building manager, safety warden, and area coordinator)

Hall A technical staff, Hall A work coordinator

## 11. List the Steps Required to Execute the Procedure: from start to finish.

1. Have all equipment ready before starting and ensure the work area meets JLAB standards as defined by ESH&Q Manual
  - a. New O-Rings or rebuilt plug
  - b. Hall A "Noisy Cricket" valve fixture
  - c. New pump-out plug if required
  - d. Vacuum pump, fittings, and gauges
2. Verbally walk through each step and insure all the equipment is available, in working order and in the correct configuration
3. Attach appropriate mount to "Valve A" using KF40 seal and clamp
  - a. Small Ability mount
  - b. Large Ability mount
  - c. CVI mount
4. Attach and adjust/remove plunger end (*fig. 1.1*)
  - a. ¼-20 rod adjusted approx. 1" for sm. Ability (*fig. 1.2*)
  - b. ¼-20 rod adjusted approx. 1.25" for lg. Ability (*fig. 1.3*)
  - c. Remove ¼-20 rod and nut for CVI (*fig. 1.4*)
5. Connect plunger guide bell (*fig. 1.1*) to "Valve B" side of fixture using KF40 seal and quick clamp (*fig. 1.1 & fig. 2.1*)
6. Open both valves "A" and "B" **fully** \*CRITICAL to ensure port pass through
7. Connect appropriate vacuum hose to fixture at location marked "PUMP" using KF40 seal and clamp. Connect other end to vacuum pump or cart.
  - a. Vacuum pump or cart requirements
    - i. Pump isolation valve
    - ii. Vacuum gauge with appropriate range
    - iii. Rotary vane oil pump or oil pump/turbo combination
    - iv. Additional ports as required (*optional*)
  - b. Vacuum hose requirements
    - i. Enough length to safely access pump-out port
    - ii. KF40 on one end to match Noisy Cricket
    - iii. Appropriate end to connect to pump system
8. Determine if vacuum system to be worked on is an active cryogenic system
  - a. **CONSULT WITH CRYO IF WORKING ON ACTIVE CRYOGENIC SYSTEM**
    - i. Use the guidance of the Cryogenic Department as required
    - ii. Only continue work when Cryogenic designee gives OK
  - b. If working on warm system continue to next step
9. Attach Noisy Cricket to pump-out port
  - a. Support as necessary to ensure proper seal, no damage to device, or dislocation during operation
  - b. Route hose in safe manner to allow access to plunger guide bell

- c. Verify that plunger can be retracted fully without interference
- 10. Pump down Noisy Cricket fixture to <1 mTorr
  - a. **DO NOT PROCEED** if the pressure does not get below 1 mTorr as this could indicate a leak present in the system or a fault in the pump
  - b. Verify pressure using gauge near pump
- 11. Engage plunger into pump-out port **\*MUST have hands on training of port prior to using this procedure**
- 12. Remove pump-out port plug and fully retract fixture plunger
  - a. Plunger **MUST** be fully retracted before continuing
- 13. Close valve "B" on fixture
- 14. Remove plunger guide bell using quick connect KF40
- 15. Perform work on plug as required
- 16. Re-install plunger guide bell using quick connect KF40
- 17. Close valve "A" on fixture **\* CRITICAL**
- 18. Open valve "B" on fixture
- 19. Verify critical vacuum of <0 mTorr on fixture before continuing **\*CRITICAL**
- 20. Open valve "A"
- 21. Continue pumping on system to reach desired ultimate vacuum
  - a. Use rotary vane oil pump or turbo
  - b. Document final pressure achieved
- 22. Re-install pump-out port plug into system
- 23. Disengage plunger from pump-out port **\*MUST have hands on training of port prior to using this procedure**
- 24. Shut pump isolation valve and bleed up fixture
- 25. Safely remove Noisy Cricket from vacuum system as well as any supports used
- 26. Cap pump-out port on system with appropriate cap
- 27. Remove vacuum pumps and all associated equipment and return area to previous state
- 28. Procedure is complete!

**12. Back Out Procedure(s)** i.e. steps necessary to restore the equipment/area to a safe level.

Plug pump-out port and reassess

**13. Special environmental control requirements:**

**13.1 List materials, chemicals, gasses that could impact the environment** (ensure these are considered when choosing Subject Mater Experts) and explore [EMP-04 Project/Activity/Experiment Environmental Review](#) below

N/A

**13.2 Environmental impacts** (See [EMP-04 Project/Activity/Experiment Environmental Review](#))

N/A

**13.3 Abatement steps** (secondary containment or special packaging requirements)

N/A

**14. Unusual/Emergency Procedures** (e.g., loss of power, spills, fire, etc.)

Standard JLAB response

**15. Instrument Calibration Requirements** (e.g., safety system/device recertification, RF probe calibration)

N/A

**16. Inspection Schedules**

N/A

**17. References/Associated/Relevant Documentation**

Associated THA and Chapter 6151 of ES&H Manual, Hall A Pump-out valve change procedure

**18. List of Records Generated (Include Location / Review and Approved procedure)**

N/A

[Click](#)  
 To Submit OSP  
 for Electronic Signatures

**Distribution:** Copies to Affected Area, Authors, Division Safety Officer

**Expiration:** Forward to ESH&Q Document Control

**Form Revision Summary**

**Revision 1.4 – 06/20/16** – Repositioned “Scope of Work” to clarify processes

**Qualifying Periodic Review – 02/19/14** – No substantive changes required

**Revision 1.3 – 11/27/13** – Added “Owning Organization” to more accurately reflect laboratory operations.

**Revision 1.2 – 09/15/12** – Update form to conform to electronic review.

**Revision 1.1 – 04/03/12** – Risk Code 0 switched to N to be consistent with [3210 T3 Risk Code Assignment](#).

**Revision 1.0 – 12/01/11** – Added reasoning for OSP to aid in appropriate review determination.

**Revision 0.0 – 10/05/09** – Updated to reflect current laboratory operations

ISSUING AUTHORITY	FORM TECHNICAL POINT-OF-CONTACT	APPROVAL DATE	REVIEW DATE	REV.
ESH&Q Division	<a href="#">Harry Fanning</a>	06/20/16	06/20/19	1.4

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## Task Hazard Analysis (THA) Worksheet

(See [ES&H Manual Chapter 3210 Appendix T1](#)  
[Work Planning, Control, and Authorization Procedure](#))

Click  
For Word

<b>Author:</b>	Robert Tucker	<b>Date:</b>	04/10/2017	<b>Task #:</b> If applicable	
<b>Complete all information. Use as many sheets as necessary</b>					
<b>Task Title:</b>	Hall A vacuum pump-out seal inspection and/or replacement	<b>Task Location:</b>	Hall A		
<b>Division:</b>	Physics	<b>Department:</b>	Hall A	<b>Frequency of use:</b>	Sporadically
<b>Lead Worker:</b>	Hall coordinator or designee				
<b>Mitigation already in place:</b> <a href="#">Standard Protecting Measures</a> <a href="#">Work Control Documents</a>	Accompanying OSP, Hall A Pump-out valve change procedure				

Sequence of Task Steps	Task Steps/Potential Hazards	Consequence Level	Probability Level	Risk Code (before mitigation)	Proposed Mitigation (Required for Risk Code >2)	Safety Procedures/ Practices/Controls/Training	Risk Code (after mitigation)
	Fall	M	M	3	Harness, ladder, Manlift training	SAF 307,SAF 202B,SAF302	1
	Crane operations, Overhead Lifts	M	L	2	Crane training, warning cones	SAF403,Warning Cones	1
	Eye injury	M	L	2	Safety glasses		1
	Pressure/Vacuum system	M	M	3	Training	SAF130A	1
	Foot injury	M	L	2	Safety shoes		1
	Lifting vacuum pumps	M	L	2	Training	MED05	1

<b>Highest Risk Code before Mitigation:</b>	3	<b>Highest Risk Code after Mitigation:</b>	1
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When completed, if the analysis indicates that the [Risk Code](#) before mitigation for any steps is “medium” or higher (RC≥3), then a formal [Work Control Document](#) (WCD) is developed for the task. Attach this completed Task Hazard Analysis Worksheet. Have the package reviewed and approved prior to beginning work. (See [ES&H Manual Chapter 3310 Operational Safety Procedure Program](#).)

For questions or comments regarding this form contact the Technical Point-of-Contact [Harry Fanning](#)

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# Task Hazard Analysis (THA) Worksheet

(See [ES&H Manual Chapter 3210 Appendix T1](#)  
[Work Planning, Control, and Authorization Procedure](#))

## Form Revision Summary

**Periodic Review – 08/13/15** – No changes per TPOC

**Revision 0.1 – 06/19/12** - Triennial Review. Update to format.

**Revision 0.0 – 10/05/09** – Written to document current laboratory operational procedure.

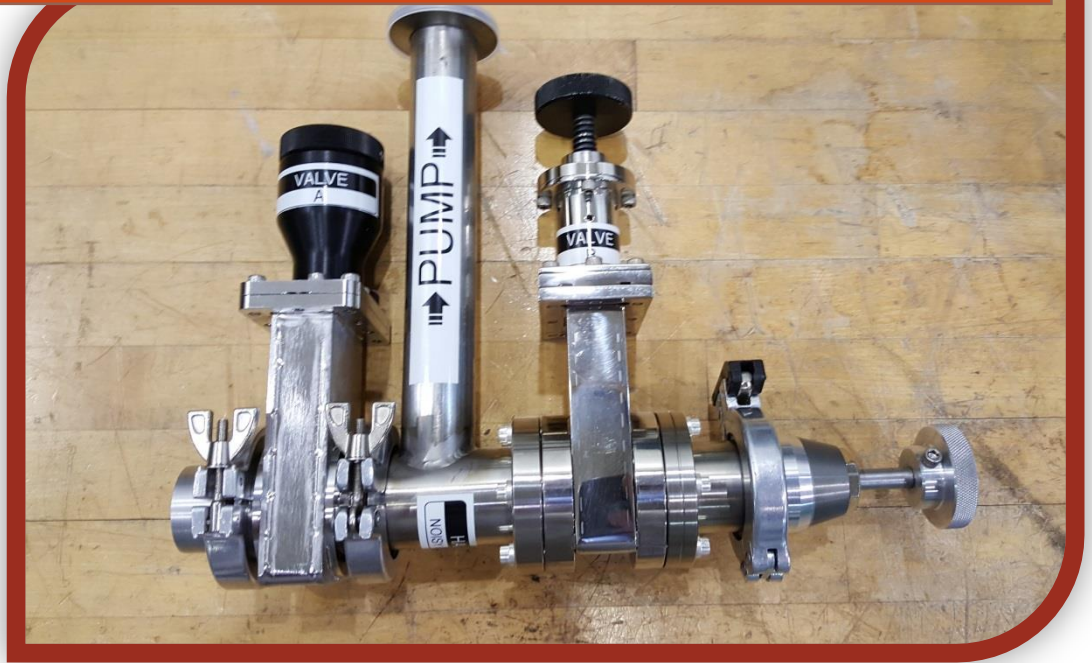
ISSUING AUTHORITY	TECHNICAL POINT-OF-CONTACT	APPROVAL DATE	REVIEW DATE	REV.
ESH&Q Division	<a href="#">Harry Fanning</a>	08/13/15	08/13/18	0.1

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# VACUUM PUMP-OUT PORT REPAIR PROCEDURE



Robert Tucker  
Jefferson Lab

Physics/Hall A  
03/28/2017

## Purpose of procedure

To inspect and/or replace seals in small Ability, large Ability, and CVI pump-outs using the valve fixture labeled “Hall A-Noisy Cricket” to keep system under vacuum while performing the maintenance. Inspections and replacement of seals will be done if vacuum is suspected to be marginal or bad as determined by Cryo, Hall A coordinator, or qualified Hall A tech.

To determine if Cryo support is needed while working on system if in cold operations. In order to repair pump-out on a vacuum that is insulating an active cryogenic system you must consult with a member of the Cryo group.



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## Scope of work

This procedure is intended to be used in **Physics/ Hall A only** and with fixture labeled Hall A/“Noisy Cricket”

Hall A must be in restricted or controlled access

Requires 2 qualified and trained technicians

Requires Cryo group support if system is on an active cryogenic system

This procedure covers mirror cans and coaxial transfer line, Cryo distribution and service cans, Cryo u-tubes, and other vacuum systems using Ability or CVI pump-out ports.



## List of Safety Equipment

Safety Glasses w/side shields

Safety Shoes

Ear protection (as needed)

Gloves (as needed)

Knee Pads (as needed)

Proper Work Clothes

Engineered Safeguards already in place and reviewed

Fall protection if working from lift or platform >4 feet off of ground



## List of Special Tools

Crane- if required to lift pump or pump cart

Aerial platform/Manlift if required to access pump-out

Hall A “**Noisy Cricket**” valve fixture

Vacuum pump(s) or Vacuum Cart

Associated vacuum hardware *i.e. hoses, valves, tees, seals, clamps, etc.*

Vacuum gauge with appropriate range

## Associated Administrative Controls

Environment, Safety, Health & Quality (ESH&Q) Manual

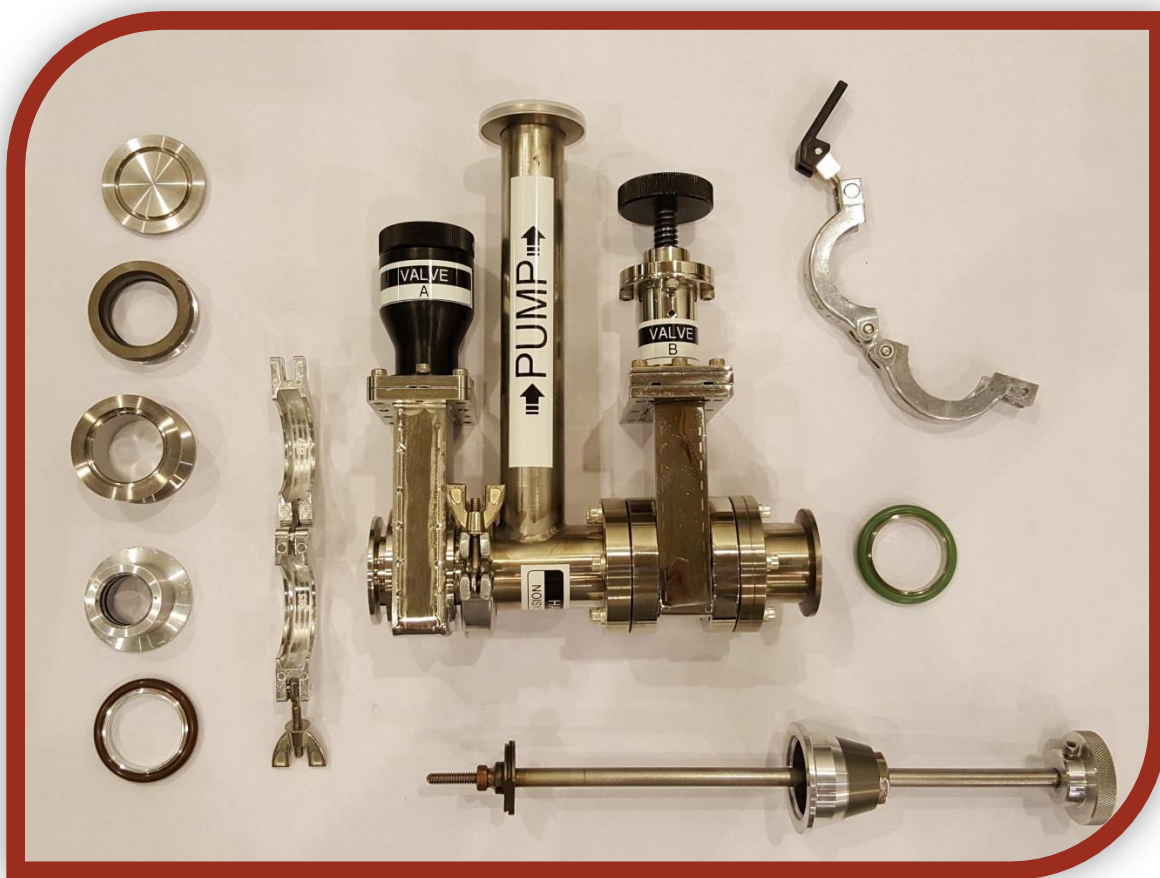
Abide by **RADCON** guidelines and/or standing Radiation Work Permit (RWP)

JLAB Training requirements as defined by Hall A work coordinator using **Job Task Analysis (JTA)** and listed in employees **Skill Requirement List (SRL)**

## Procedure

1. Have all equipment ready before starting and ensure the work area meets JLAB standards as defined by ESH&Q Manual
  - a. New O-Rings or rebuilt plug
  - b. Hall A “Noisy Cricket” valve fixture
  - c. New pump-out plug if required
  - d. Vacuum pump, fittings, and gauges
2. Verbally walk through each step and insure all the equipment is available, in working order and in the correct configuration
3. Attach appropriate mount to “Valve A” using KF40 seal and clamp
  - a. Small Ability mount
  - b. Large Ability mount
  - c. CVI mount
4. Attach and adjust/remove plunger end (**fig. 1.1**)
  - a. ¼-20 rod adjusted approx. 1” for sm. Ability (**fig. 1.2**)
  - b. ¼-20 rod adjusted approx. 1.25” for lg. Ability (**fig. 1.3**)
  - c. Remove ¼-20 rod and nut for CVI (**fig. 1.4**)
5. Connect plunger guide bell (**fig. 1.1**) to “Valve B” side of fixture using KF40 seal and quick clamp (**fig. 1.1 & fig. 2.1**)
6. Open both valves “A” and “B” **fully** **\*CRITICAL** to ensure port pass through
7. Connect appropriate vacuum hose to fixture at location marked “PUMP” using KF40 seal and clamp. Connect other end to vacuum pump or cart.
  - a. Vacuum pump or cart requirements
    - i. Pump isolation valve
    - ii. Vacuum gauge with appropriate range
    - iii. Rotary vane oil pump or oil pump/turbo combination
    - iv. Additional ports as required (**optional**)
  - b. Vacuum hose requirements
    - i. Enough length to safely access pump-out port
    - ii. KF40 on one end to match Noisy Cricket
    - iii. Appropriate end to connect to pump system
8. Determine if vacuum system to be worked on is an active cryogenic system
  - a. **CONSULT WITH CRYO IF WORKING ON ACTIVE CRYOGENIC SYSTEM**
    - i. Use the guidance of the Cryogenic Department as required
    - ii. Only continue work when Cryogenic designee gives OK
  - b. If working on warm system continue to next step
9. Attach Noisy Cricket to pump-out port
  - a. Support as necessary to ensure proper seal, no damage to device, or dislocation during operation
  - b. Route hose in safe manner to allow access to plunger guide bell
  - c. Verify that plunger can be retracted fully without interference
10. Pump down Noisy Cricket fixture to <1 mTorr
  - a. **DO NOT PROCEED** if the pressure does not get below 1 mTorr as this could indicate a leak present in the system or a fault in the pump
  - b. Verify pressure using gauge near pump
11. Engage plunger into pump-out port **\*MUST have hands on training of port prior to using this procedure**
12. Remove pump-out port plug and fully retract fixture plunger
  - a. Plunger **MUST** be fully retracted before continuing

13. Close valve "B" on fixture
14. Remove plunger guide bell using quick connect KF40
15. Perform work on plug as required
16. Re-install plunger guide bell using quick connect KF40
17. Close valve "A" on fixture \* CRITICAL
18. Open valve "B" on fixture
19. Verify critical vacuum of  $<0$  mTorr on fixture before continuing \*CRITICAL
20. Open valve "A"
21. Continue pumping on system to reach desired ultimate vacuum
  - a. Use rotary vane oil pump or turbo
  - b. Document final pressure achieved
22. Re-install pump-out port plug into system
23. Disengage plunger from pump-out port \*MUST have hands on training of port prior to using this procedure
24. Shut pump isolation valve and bleed up fixture
25. Safely remove Noisy Cricket from vacuum system as well as any supports used
26. Cap pump-out port on system with appropriate cap
27. Remove vacuum pumps and all associated equipment and return area to previous state
28. Procedure is complete!



## References/Associated/Relevant Documentation

Associated THA and Chapter 6151 of ES&H Manual

Hall A Vacuum pump-out port repair procedure figures

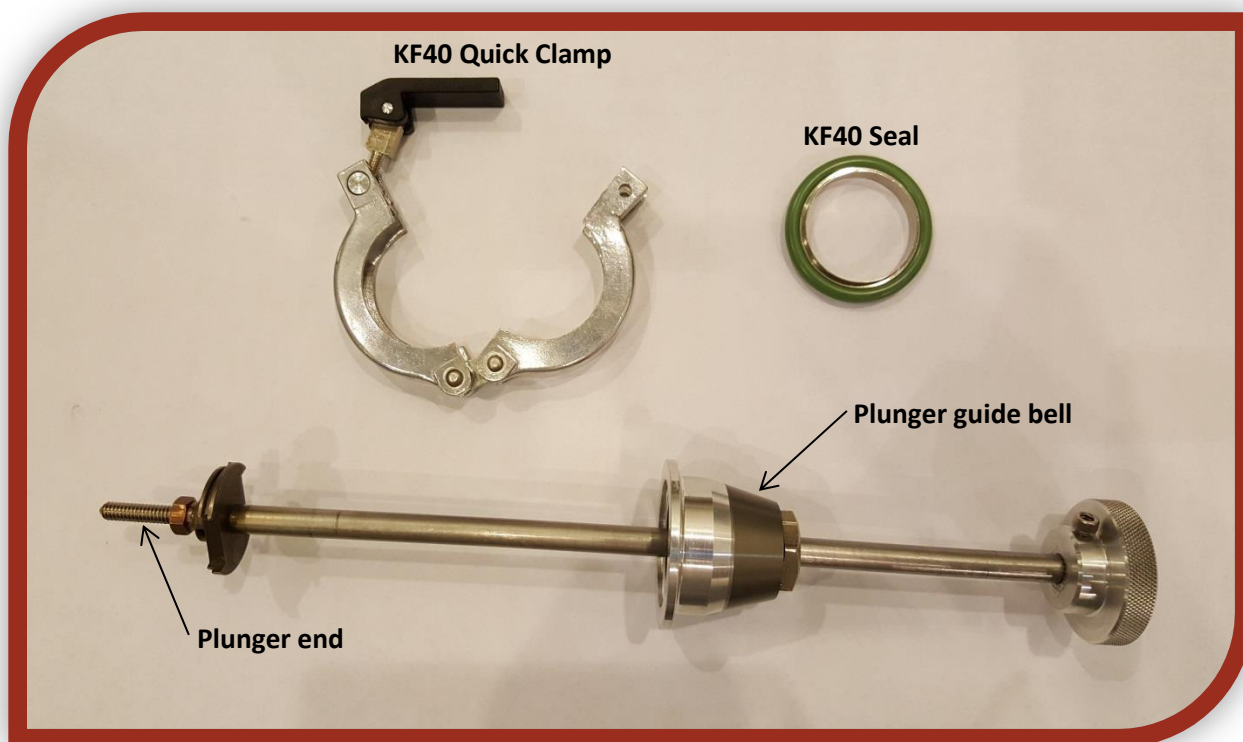
Associated OSP titled: Hall A vacuum pump-out seal inspection and/or replacement

ESH&Q Manual Chapter 3210 Appendix T3 Risk Code Assignment

[http://www.jlab.org/div\\_dept/train/poc.pdf](http://www.jlab.org/div_dept/train/poc.pdf)

Environment, Safety, Health & Quality (ESH&Q) Manual

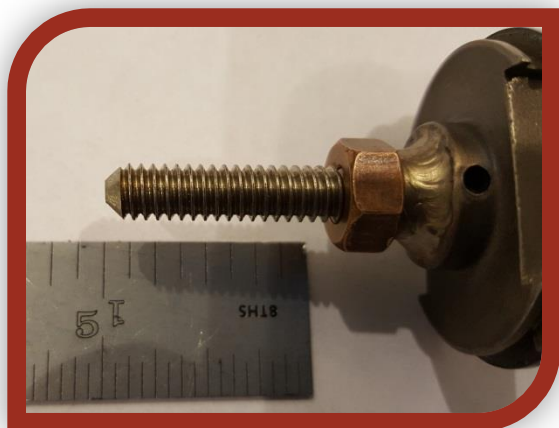
## Reference Photos



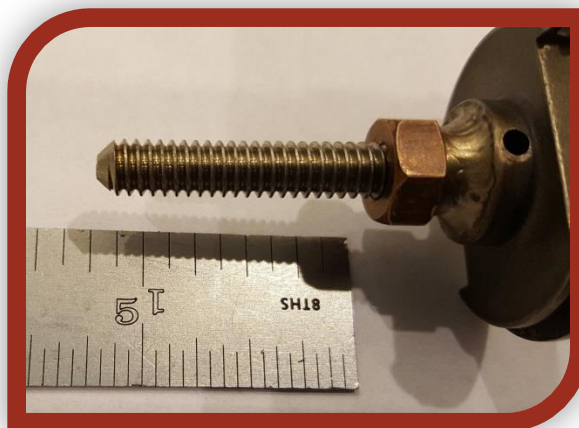
*fig. 1.1*



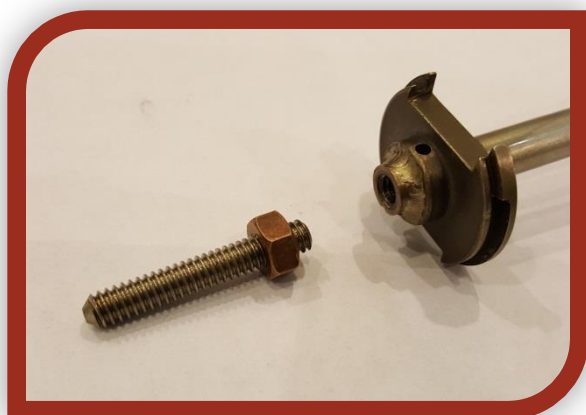
Reference Photos continued



*fig. 1.2*



*fig. 1.3*



*fig. 1.4*



*fig. 2.1*



**Title:** COVID-19 Pandemic Controls

OSP Checklists

**Pre-job Checklist for Task or Area-Specific (T)OSP/LOSP**

**Obtain COVID-19 OSP and THA, OSP and THA for Work or Task-Specific (T)OSP and/or LOSP. Attach to this pre-job briefing.**

**(T)OSP and /or LOSP Number(s):**

**Brief Job Description:** Hall A vacuum pump-out seal inspection and/or replacement (OSP)

**Lead worker or Supervisor/Manager General Pre-job Talking-points:**

**1) Do you understand the requirements for performing work?**

- Remember to stay within scope of work and work to your document as written.
- If you find yourself outside the scope of work, or are unable to work to the document as written, use your stop/pause work authority and bring it to my attention immediately.

**2) PPE for work at distances of less than 6 ft. from your next nearest coworker: Tyvek® coveralls with hood, nitrile gloves, face shield, N95 respirator**

**3) Other task-specific PPE:**

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**Additions for (T)OSPs or LOSPs that result from careful application and consideration of this checklist shall be recorded in the Additional Notes section or appended as a separate form.**

**Those who sign this checklist in the Signature Section verify that they understand and agree to abide by the (T)OSPs and or LOSPs identified above and any additions to those (T)OSPs and/or LOSPs as appended or listed in the Additional Notes section of this checklist.**

**Discuss steps associated with planned work**

- use the (T)OSP and/or LOSP description of work to discuss the steps involved
- use the (T)OSP and/or LOSP THA to review the consequences and mitigations associate with work
  - special attention to most hazardous task steps OR elevated hazards
  - discuss the overall risk
  - what controls are needed AND what controls are already in-place

are there any Credited Controls involved

**Discuss human performance implications** of planned work - including potential error traps (additional requirements that increase the likelihood of an error, e.g. increased task requirements, resource limitations, new requirements, lack of familiarity)

**Are there issues related to**

- Training – do any of the instructions in ESH003, COVID-19 Hazard Awareness and Controls create complications or present conflicts for existing training, how are they resolved
- Communications – what additional communications may be needed to augment your work, and how frequent
- Planning and Scheduling
  - time differential between work planning and work execution
  - added time for staging, donning, doffing and storing PPE for reuse
  - added time for cleaning work surfaces, tools, commonly reused surfaces
- Design/Process Change – what new processes are required to implement COVID-19 controls in your work area, during your work
- Are there adequate resources to perform the work
- Values, Priority, Policies – do you have a clear understanding of the priority and the role for COVID-19 controls
- Procedural Development or Work Practices – what general changes do you anticipate and do these changes require additional instructions for work
- Supervisory Involvement – what additional roles have supervisory staff taken on
- Organizational Interfaces – do you have clear lines of communication worked out with the primary resource providers for COVID-19 controls?

**What are the unique task demands associated with COVID-19 controls?**

- time / schedule pressure
- high workload
- simultaneous multiple or complex interrelated tasks
- unclear requirements
- PPE resource limitations / need for PPE cleaning procedure for reuse
- reliance on other groups or dependencies on other unfinished work?
- other \_\_\_\_\_

**Are there challenges with respect to individual capabilities – are there new limitations due to any inability to use COVID-19 PPE?**

- new techniques
- lack of knowledge
- unfamiliar or first time task
- illness, fatigue, heat stress from PPE
- fear of COVID-19 or COVID-19 controls?
- other \_\_\_\_\_

**Are there challenges with respect to the work environment during the implementation of COVID-19 controls?**

- distractions and interruptions
- changes
- possible unexpected conditions?
- other \_\_\_\_\_

**Are there tendencies or habit patters that can interfere with implementation of COVID-19 controls; can they contribute to errors?**

- habit patterns
- assumptions
- complacency
- peer pressure to return
- anxiety / mental health issues
- other \_\_\_\_\_

**When working indoors,**

- contact FM&L for increased ventilation **or**
- open windows and/or doors, where possible, to increase air flow and ventilation?

**Discuss possible interferences / complications related to COVID-19 controls with planned work**

- added time to complete work (include PPE donning / doffing)
- additional physical stress from PPE use
- emotional stress form new working conditions ( conditions at home)
- task steps in THA most impacted by COVID-19 controls
  - added complexity
  - limited dexterity
  - obstructed vision

- limited assistance
- discuss how tasking can be adjusted to respond to interferences / complications
- avoid sharing work equipment and tools to the greatest extent possible
  - if you need to share tools/equipment – clean/disinfect before and after use and consider the use of gloves. Don't share personal items.
  - Clean/disinfect your work surfaces/area frequently, e.g. workstations, keyboards, telephones, door handles, routinely.
- Discuss whether a P95<sup>®</sup> or an N95<sup>®</sup> respirator is specifically required for this work and for which tasks if not all tasks
  - organize tasks to minimize the number of times you don / doff covering N95<sup>®</sup> respirator
  - focus on avoiding touching the inside of your face covering or N95<sup>®</sup> respirator
  - clean hands with soap and water or an alcohol-based hand sanitizer ( $\geq 60\%$  alcohol) before and after donning/doffing or adjusting your face covering or N95<sup>®</sup> respirator.
  - facial hair interferes with the ability to generate a good seal between your face and an N95<sup>®</sup> respirator which reduces the effectiveness of the protection provided by the N95<sup>®</sup> respirator - make sure you have a good seal between your face and your N95 respirator prior to starting work
  - inspect N95<sup>®</sup> respirator for physical damage each time prior to use
  - replace N95<sup>®</sup> respirator when it becomes damaged, soiled or if it becomes difficult to breathe through
  - store N95<sup>®</sup> respirator in a clean paper bag according to the JLab PPE Reuse Policy and discard paper bag after use
  - if N95<sup>®</sup> respirator causes labored breathing, discomfort or irritation, or thermal fatigue, rest and to allow your breathing to return to normal
- contact Occ. Med. and consult with IH on thermal stress during respirator use and for ways to adjust respirator to minimize discomfort or irritation

**Additional Notes** on issues that develop during the pre-job briefing:

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