Prosthetist Technical Guide

AP-100 (v.1)

5280 PROSTHETICS, LLC | 1-800-460-0288

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EC REP

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Before Starting:

Ensure the bottom external surface of the socket is parallel to the interior surface on the distal end of the socket. This can be accomplished by fabricating the socket with the proper tooling. This is critical to prevent shear forces on bolts and attachment components.

Installation

1) Lubricate the soft seal on the AirPuck™ with Dow Corning 111 Vacuum sealant. Also be sure to lubricate the proximal aspect of the socket void (The area the seal will seat).

2) Gently insert the AirPuck™ into the void at the bottom of the socket. Make sure the soft seal does not roll up as the puck is inserted. Align the four hole pattern and side hole as the puck is pushed into place. There should be resistance as the puck is pushed into place. This is the compression of the soft seal as it slides into the void. Ensure there is good even compression on the seal. The seal should appear to be a 1/2" solid wet looking band (when using clear socket material).

3) In the instance there is NO resistance when the AirPuck™ is inserted (basically a poor socket pull where the socket material did not conform to the molding dummy) a seal tensioner can be used. Slide the tensioner band under the soft seal of the puck so that it lies fl at and is not visible after application. This will increase the seal dimension and improve the ability to get an air tight seal at the bottom of the socket. We recommend re-pulling the definitive socket when this occurs. The tension bands can migrate over time.

4) Secure AirPuck™ to the bottom of the socket by connecting external hardware into the four hole pattern of the AirPuck™. Make sure the attachment screws do not thread into the puck body more than 13mm (1/2″). The thread holes do not penetrate the Puck interior. Tighten opposite screws to pull the puck down into the void evenly.

NOTE: For best results: Use circular attachment components to reduce stress and better distribute forces to the bottom of the socket. Make sure the component has a center hole.

5) Place the filter disk over the AirPuck™ lid. This 1/2 micron disk will reduce the instance of having to replace the primary filter in the AirPuck™. The filter disk should be placed felt side down (facing puck lid).

6) Install distal pad or flexible inner liner on top of the puck and filter disk. Pictures shown without socket for clarity.

NOTE: When drilling the air flow through hole in the flexible liner, drill the hole off center up the side of the flexible liner. This will act as a third filter system to catch debris before it can reach the filter located on the puck lid. NEVER drill a hole in the flexible inner socket directly on the bottom in alignment with the puck filter. (An air wick may be necessary between the two sockets).

7) Lubricate the VacLoc valve on the face O-Ring as well as the piston O-Ring. Use Dow Corning 111 vacuum sealant or Vaseline. Make sure not to apply any lubricant to the valve export hole in-between the two O-Rings as this can affect air flow.

8) Insert the valve into the puck body. Ensure the valve does not bind on the socket wall.

Removal of AirPuck™

1) Remove all external hardware including the connection pyramid.

2) Thread in four 30mm screws into the bottom of the AirPuck™ through the four hole pattern in the bottom of the socket

3) Place the socket on a flat work bench and apply even pressure to the top of the socket. This will slowly push the AirPuck™ out of the void.

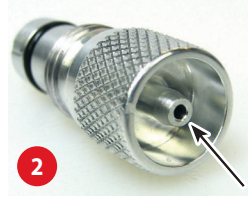
Valve Operation

The VacLoc is a bleed valve design NOT an auto expulsion valve (the wrong valve for vacuum). The VacLoc valve is a two position valve. It is either open or closed. In the closed position, NO air can leak into the system nor can air be evacuated.

1) Open the VacLoc valve by turning the valve 180° or more in the counterclockwise direction.

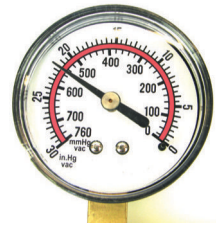
2) Attach the vacuum source to the barb fitting located inside the valve housing.

3) Evacuate the air inside the socket with a vacuum pump.



NOTE: The Actron pump needle should hold steady after the initial body of air has been evacuated. Pump to the maximum pressure initially.

If the needle drops, there is a leak in either the proximal sealing sleeve, internal mechanical seal or the pump itself (see pump integrity test).



The AirPuck™ will not leak air.

4) Close the valve by turning it clockwise 180°. Keep the vacuum source attached and the vacuum applied until the VacLoc is completely closed. Finger tight tension is enough to keep the valve seated.

NOTE: Do not disconnect the vacuum source until the valve is closed.

5) Evacuate air out of socket as needed or just before higher activity. Vacuum typically lasts 8-10 hours from a single air evacuation (with a good proximal seal).

Removing the socket with an Internal Mechanical Seal

6) If the socket design has an internal mechanical seal such as a Seal-In™ liner or Aura Sleeve,™ to remove the prosthesis simply open the VacLoc valve.

This will allow air to enter the bottom of the socket and facilitate removal of the prosthesis.

Suction Valve Function

When **NO** vacuum is applied to the AirPuck™ the system functions as a suction valve.

Vacuum Sources

Actron CP7835 Brake Bleed Pump
These are durable pumps and have a gauge on the manifold. The gauge feature is beneficial for checking vacuum levels. Use Tygon tubing to connect to the Puck (1/8"ID 1/4"OD).

Food Saver Vacuum
An effective rechargeable electric vacuum pump.

Electric Pump (Facility Build)
Contact 5280 for parts list.

Tips and Tricks

1) To minimize the chance for air leaks between the sealing sleeve and the socket, place a tension band over the distal aspect of the sleeve to improve the air seal.

2) To improve the air seal and adhesion between the liner and proximal sealing sleeve, use a water based lubricant between the two.

3) Use tension band to improve the seal when the socket pull is less than adequate.

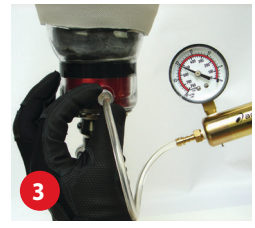
Vacuum Levels Check

With the AirPuck™ system, it is easy to check the vacuum level inside the socket at any time.

1) Connect the Actron CP7835 vacuum pump to the barb located inside the valve housing of the socket that is already under vacuum.

2) Pump the the handle twice to remove all of the air out of the line (Tygon tubing). The VacLoc valve should still be in the closed position. The gauge should read 18-20 in/hg.

3) Open the AirPuck™ VacLoc valve while the vacuum pump is still connected. The needle on the gauge on the pump will read the actual pressure inside the socket cavity.



4) Close valve while vacuum pump is still attached.

5) Disconnect vacuum source.

6) Check vacuum level frequently to monitor how much vacuum the system holds. Typically with a good proximal seal the AirPuck™ will maintain 12-15 in/hg of vacuum all day with one evacuation.

IF THE VACUUM GAUGE DOES NOT READ CONSTANT (the needle is dropping when pulling vacuum).

Pump Integrity Check

1) Disconnect the Tygon hose from the pump.

2) Plug the end of the pump with your finger and cycle the pump. The gauge should read around 20 in/hg and remain there. If the needle drops, the pump has an internal leak and should be discarded.

Mechanical Pump Attachment (Advanced)

The AirPuck™ Valve can be modified to be a flow through system when connecting the puck to an active mechanical vacuum pump such as the Otto Bock™ or Ossur™ weight actuated pump systems.

1) To make the valve a flow through system simply drill through the small hole in the center of the barb with a small drill bit. This will allow constant air flow through to the cavity of the puck. The vacuum source will have to be connected all of the time to prevent air leaks into the socket.

2) NOTE: Drilling through the valve will render the AirPuck™ useless unless it is attached to a vacuum source.

3) Use Loctite on the VacLoc thread to maintain its position. There will not be a need to open and close the valve.

Maintenance

1) Lubricate O-Rings as needed. Use Dow Corning 111 Vacuum sealant or Vaseline. Ensure the air export is not blocked with lubricant.

2) Clean the valve inlet cavity inside the puck with a Q-Tip dipped in alcohol to remove dirt and old lubricant.

3) Replace the secondary filter disk on a regular basis or as needed.

4) Replace the top filter in the puck lid as needed. We use a dental hook to grab the filter and remove it. It is also possible to remove the lid and push the filter out from the back side.

5) Replace the O-Rings on the VacLoc valve once they pack out or no longer maintain an adequate air seal.

6) Replace primary soft seal if the puck has been used numerous times and the seal is torn or weathered. (Remove all four screws in the lid to remove the soft seal.)

7) All of the AirPuck™ Components can easily be replaced or repaired.

Liner Configurations / Recommendations

Any liner configuration can be used with the AirPuck™. This includes:

- Any Silicone or Urethane liner with an available sealing surface of 3" or more. (Used with a sealing sleeve configuration)
- The Otto Bock™ Anatomic 3D PUR liner is a great Polyurethane choice.
- Liner Reflection Method (for use with fabric covered liners):
  We Primarily use Ossur™ Dermo / Activa liners with a sleeve suspension. The liner is left long and the top half of the liner is reflected down such that the silicone faces outward. The suspension sleeve is then rolled onto the reflected liner portion (at least 3" of sealing surface) to solidify the air seal.

We **DO NOT** recommend Thermo Elastomer Gel liners or any gel liner for our vacuum systems.

The following Internal mechanical seal (the air seal is formed by sealing to the inside of the socket wall) systems work great as well:

- Ossur™ Seal In liners (X5 and Seal-In V)
- Evolution Aura Seals™
- ESP Secure Ring™
- Otto Bock ProSeal™

Sleeve Recommendations

The General Rule for sleeve selection is to choose sleeves that are tight and sticky. Remember we are trying to keep air molecules out of the socket and it needs to be an intimate fi t!

We recommend the following sleeves:

- Ossur™ Iceross Sleeve
- Euro International™ Contex Gel Sleeve

Warranty Terms

5280 Prosthetics, LLC warrants all of its products and services, to the original purchaser, to be free from defects in materials and workmanship. This warranty applies, subject to normal wear and tear, when the products are used as intended, without modifi cations, and following all of 5280 Prosthetics, LLC instructions and requirements.

The duration of our Limited Warranties is 12 months effective from the date of receipt. 5280 Prosthetics, LLC's sole obligation under this Limited Warranty shall be to repair, replace, or refund the cost of the item to the original purchaser, at 5280 Prosthetics's sole discretion.

This limited warranty does not cover damage due to accidents, neglect, misuse, or operation beyond capacity, parts damaged by improper installation, any alteration or repair by other that, in 5280 Prosthetics, LLC's judgment, materially or adversely affects the product.

Use of this product is not a guarantee against injury. This Limited Warranty excludes liability for any personal injury, property damage, or special, incidental, or consequential damages arising out of, related, or incident to use the product, even if 5280 Prosthetics, LLC has been advised of the possibility of such potential loss or damage, unless state law otherwise precludes this exclusion.

Return Policy

Please inspect all orders immediately upon receipt. In the event items were ordered or shipped in error, you must notify 5280 Prosthetics, LLC for a return authorization number. 5280 Prosthetics, LLC must be contacted within five (5) business days of the receipt of the items.

No returns will be accepted without prior authorization. Please call 800-460-0288 to obtain a Return Authorization number. When returning a product for credit or replacement, please provide either the original or a copy of the invoice or packing slip.

Credit or replacement of goods is subject to inspection and evaluation. 5280 Prosthetics, LLC will not issue a credit or replace any products returned to 5280 Prosthetics, LLC that are not in new or salable condition. The determination about whether returned products are new or salable will be made at 5280 Prosthetics, LLC sole discretion. Altered products are not returnable.

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