

# The Cast Off Valve: An Improved Method for Removing and Retaining Above Knee Casts and Prosthetic Sockets

by Albert F. Rappoport, M.A., C.P.

## INTRODUCTION

The fabrication of a prosthesis continues to be a labor intensive process. The advent of pre-fabricated components, together with the use of central fabrication, has allowed many prosthetists to utilize their time more effectively. Time saving devices have always been welcomed by the prosthetic practitioner, especially when the quality of work is not compromised.

Removal of an above-knee socket from a plaster model is a common procedure in most prosthetic facilities. There are several methods for removing the socket from the cast. These

methods will be addressed later in the text and the problems of each discussed. The most improved method is the Cast Off Valve (Figure 1). The Cast Off Valve uses compressed air, linking it directly to the above-knee socket (Figure 2). The female coupling of the air hose is attached to the male connector of the Cast Off Valve (Figure 3). The Cast Off Valve is then threaded into the suction valve housing of the above-knee socket. This method saves manpower, time, and energy by allowing removal of the socket from the cast in a matter of seconds. It is also effective in the duplication of any definitive above-knee suction socket. The concept is credited in its design to Judd Lundt, B.S.A.E., Assistant Director at UCLA's Prosthetic Education Program.



Figure 1. The Cast Off Valve.

## METHODS OF REMOVING SOCKET FROM CAST

Several methods have been used, with varying degrees of success, in removing an above-knee socket from a plaster model. The oldest method involves breaking the plaster out of the socket with a cold chisel and hammer, or air chisel. This is a labor intensive process which is still practiced by many prosthetists (Figure 4). This process is not always necessary to facilitate the removal of a definitive socket.



Figure 2. Female couple of air hose to male connector on Cast Off Valve.



Figure 3. Cast Off Valve attached to female air hose coupling.

## BIVALVING

Many times, the prosthetist would like to save the plaster model for further modification or reference. One approach to saving the model is to bivalve the socket with a cast saw (Figure 5). Once the socket has been bivalved, the cast can be touched up with minor plastic additions and used again. After the socket is bivalved, it

cannot be reused. This process is not only time consuming, but can be eliminated in many circumstances.

## COMPRESSED AIR

The use of compressed air is by far the most popular method. It saves labor, time, sockets, and casts. A newly formed check socket or

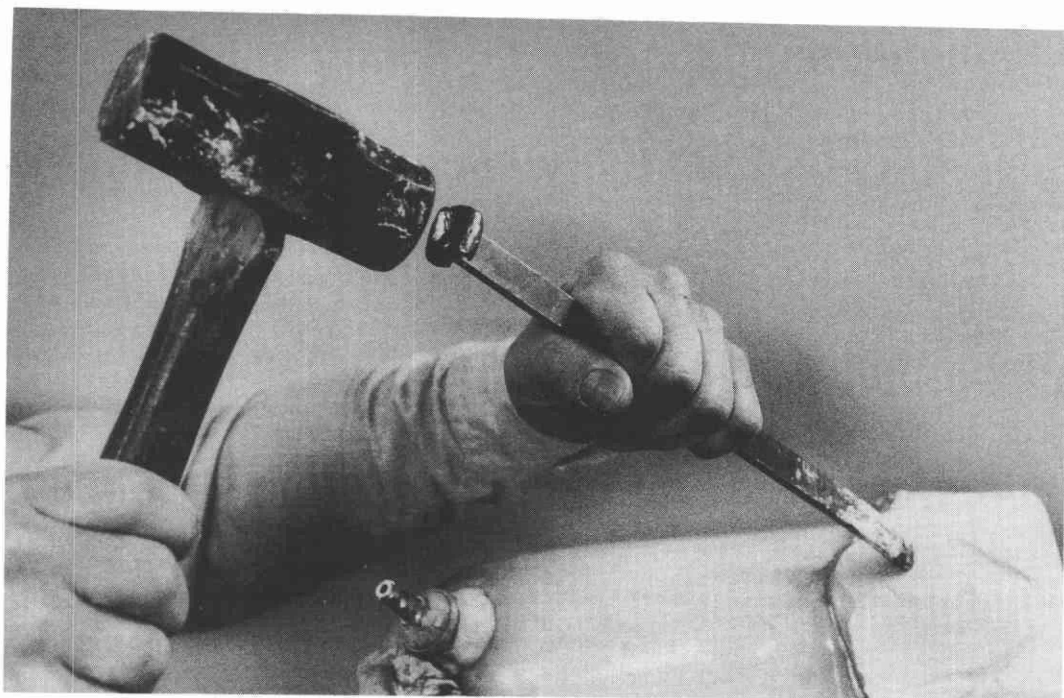


Figure 4. Age old method of removing socket by breaking out plaster by hand.

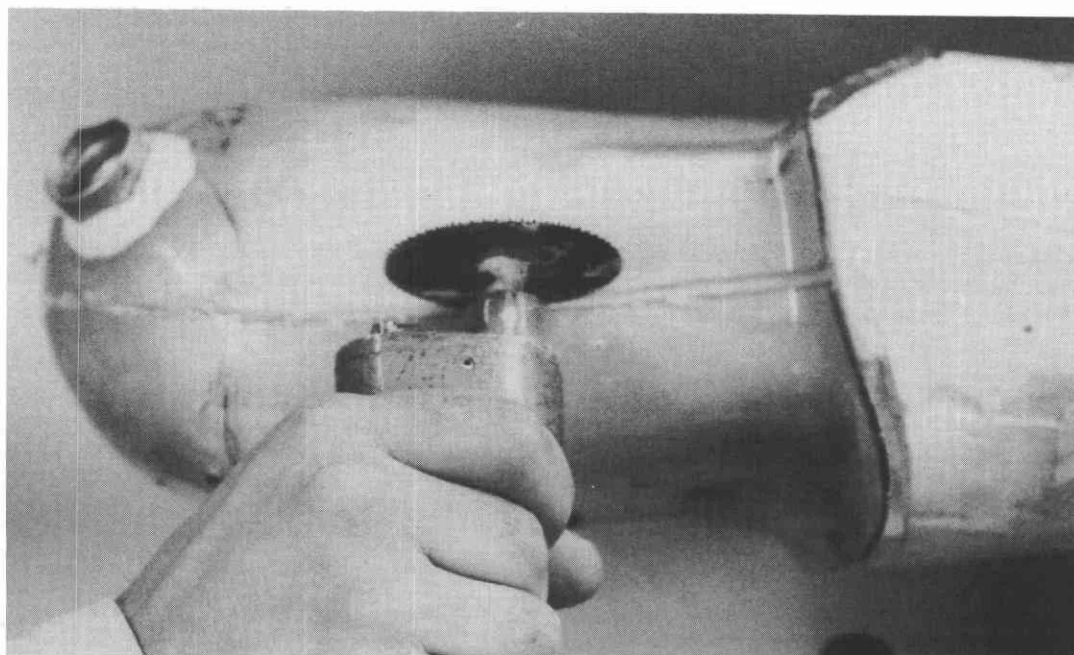
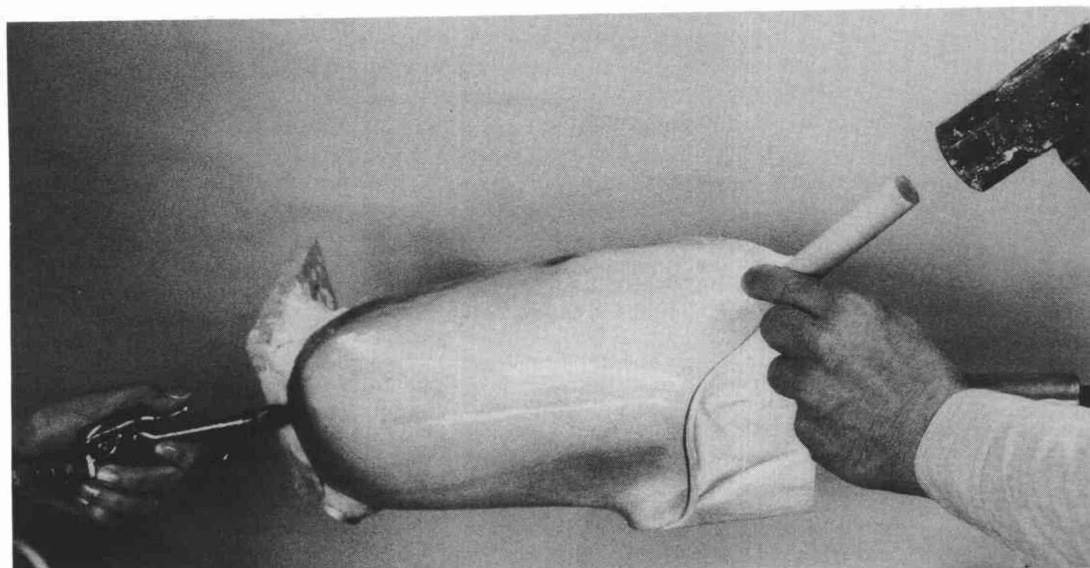


Figure 5. Bivalving socket to retain cast.



**Figure 6. Removing socket from cast using compressed air. This two-person operation requires one person to use air gun to direct air through hole in bottom of socket and second person to tap proximal socket.**

laminated socket may be easily blown off using an air gun. The newly fabricated socket must be trimmed just proximal to the desired trim line. A hole must then be drilled at the distal end of the socket to correspond in size to the tip of the air gun (Figure 6). One person holds the air gun with compressed air in the hole at the distal end of the socket, while the other person gently taps, trying not to fracture the socket, at the proximal brim. This is continued until the air is forced through the socket and assists in forcing the socket off the cast. Some radical socket shapes may prevent the ease of this technique, in which case it may be helpful to attempt this procedure while the socket is still warm or to refer back to the previously mentioned methods. The compressed air technique is an effective way to remove the socket from the cast without damaging either one. Two drawbacks to this method are: 1) it requires two persons to remove the socket, and 2) it is possible for air to leak through the hole where the air gun is held at the socket's distal end.

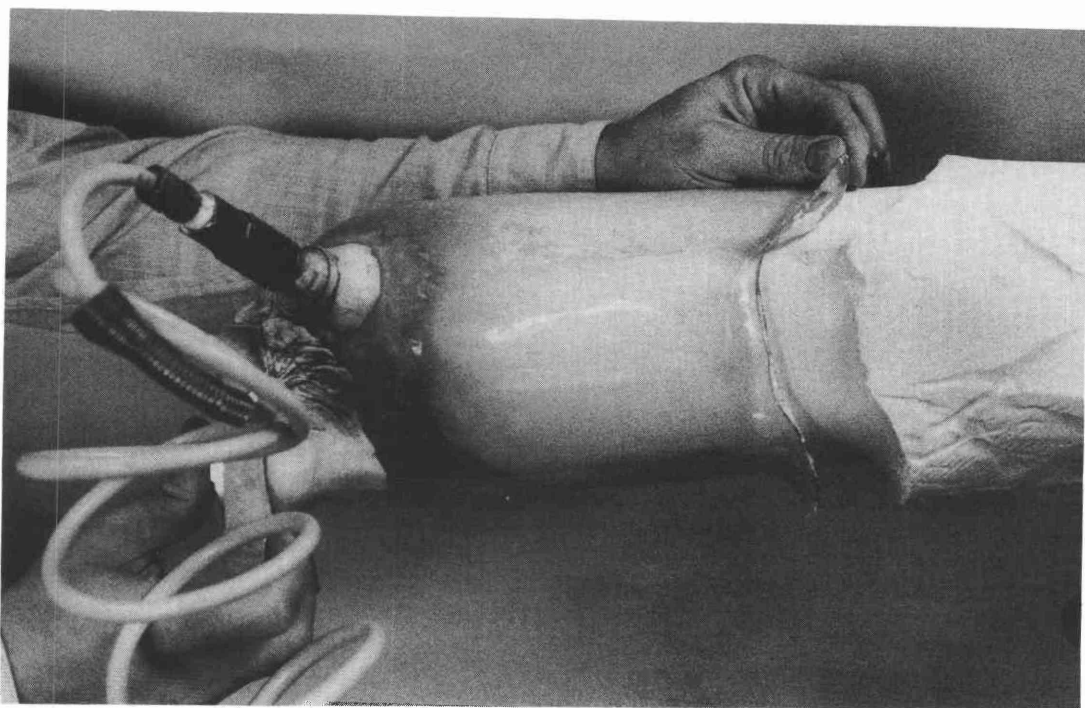
## **CAST OFF VALVE**

The use of the Cast Off Valve can improve the effectiveness of the compressed air method

(Figure 7). This improved technique can be employed whenever a valve housing is used in either a laminated socket or clear check socket. The Cast Off Valve is designed to fit the valve housing and link the air hose coupling directly to the socket. This approach allows a stronger air pressure to be obtained and little chance for air leakage. The use of this method requires only one person, freeing the hands of a second person who holds the air gun in the hole (Figure 6). First, the proximal brim of the socket should be trimmed with a cast saw. Once the Cast Off Valve is installed, the air hose can then be connected and the socket will blow off without any further effort. One may need to gently tap the proximal brim with a piece of wood dowling and hammer to assist the removal. (Note: certain radical socket shapes may prevent the use of this method.) In summary, the Cast Off Valve requires only one person to remove a socket from the cast with a minimum amount of effort, reduction of time and improved results over methods previously discussed.

## **SOCKET DUPLICATION**

The Cast Off Valve also is excellent when an above-knee suction socket is to be duplicated



**Figure 7.** The Cast Off Valve is threaded into valve housing and air hose is connected to blow socket off with minimum effort and maximum results.

from a definitive limb. No longer is an alginate impression or use of duplicating foam necessary. The patient's socket should be filled with plaster and a holding pipe inserted once the plaster has set. The valve housing must be cleared of any material so the Cast Off Valve can be inserted. The air hose coupling can then be hooked up and the socket is blown off in a matter of seconds. The socket is duplicated exactly in plaster and ready for lamination or check socket fabrication.

## SUMMARY

The Cast Off Valve has been well accepted and tested clinically with great success for the past two years by the staff at UCLA's Prosthetic Education Program and Prosthetic-Orthotic Laboratory. The UCLA prosthetic staff has found this device to be valuable, in many cases, in removing an above-knee socket in both quadrilateral and CAT-CAM designs. This method allows the cast to remain undamaged for further reference and can be useful

when duplicating a definitive socket. When working with an appropriately shaped cast, the Cast Off Valve allows the removal of the socket from the cast with improved results from the previously aforementioned methods.

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