

1 Stage

AK & BK Lamination Adapter Manual

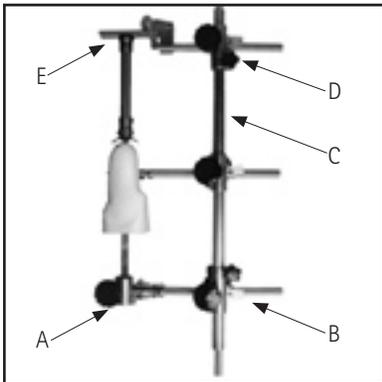
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Ref.1 220821, 220823 One Stage Adapters



Ref.2 61443 Universal Transfer Fixture



Ref.3

Introduction

The One Stage Lamination Adapter evolved from the Fillauer B.K. (L.U.E.P.) system used and taught at Fillauer Inc. The one stage straight adapter (P/N220821) and the 10 degree adapter (P/N220823) allow a very fast and simple way of fabricating an endoskeletal A.K or B.K. prosthesis; from bench aligned, or pre-aligned, for prototype or definitive prosthesis. Utilizing a fabrication fixture to hold and protect the lamination socket adapter in the present alignment, this technique uses a carbon fiber, fiberglass, and acrylic resin composite, to produce a very lightweight prosthesis.

The prosthesis is fabricated in a duplication fixture so that the relationship between the socket and the adapter may be established and maintained during lamination of the socket, duplicating the alignment in one lamination. The result is a unitized endoskeletal structure, that preserves the capability of height, toe-out, and angular adjustment that may be required after fabrication.

The one stage adapters as illustrated in straight and 10 degree models(ref. 1), are used in place of other 30 mm pylon tube clamp/pyramid receivers. They have 4 set screws to secure to the pyramid in a 0 degree alignment, and an "O" ring to seal to the dome of the adapter to prevent resin leaking around the pyramid. It also has two set screws to secure the pylon in the orientation of the pylon tube-clamp/ pyramid receiver.

Transfer Procedure

1. If the positive model is not available, pour the check socket with plaster and place a pipe that protrudes 8" to 10" from the bottom of the plaster.
2. Attach a mandrel bushing (P/N61443) to the pipe, leaving enough room between the model and the bushing for the lay-up and PVA sleeve to be tied off.
 - a. Secure the pipe in the mandrel bushing tube (A), locking all four screws securing the collar to the pipe.
 - b. Loosen all the adjustment screws of the ankle base arm (E) (ref. 2), and adjust the arm to the pre-aligned assembly, lining up the hole of the ankle base to the hole of the sach foot adapter of the prosthesis being transferred.
 - c. Working progressively back from the sach foot adapter to the support column (C) of the fixture, tighten the five (5) adjustment screws of the ankle base arm.
 - d. The moveable alignment locking collar (D) (ref. 2) on the vertical shaft is raised and secured under the ankle base arm, locking in the alignment of the pre-walked and aligned prosthesis.
3. Loosen the wing screw in the ankle base plate and raise the ankle base arm to permit removal of the prototype prosthesis.
4. Smooth and make any model modifications that may be necessary. Dry the model in an oven when acrylic resin is to be used. (or use an isolating latex balloon P/N199091 to prevent moisture from coming in contact with the resin.) Then return the model to the transfer fixture.



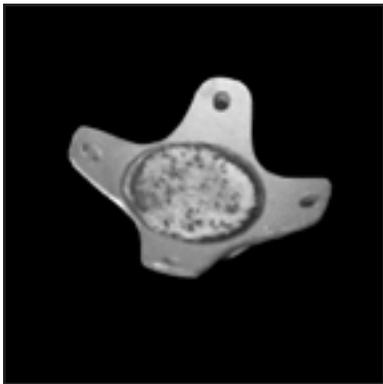
Ref.4 Attach 124160, 124121, 124170, 124181

5. Return the ankle base arm to its alignment position and build the components from the ankle base to the distal end of the model. (ref. 4) Attach a sach foot adapter (P/N124160) a pylon tube with adapter (P/N124121), a pylon tube clamp (P/N124170) with a socket adapter (P/N124181) to the ankle base (B) of the transfer fixture. Cut the pylon tube so that there is a 1/8" to 1/4" gap between the socket and the lowest point of the socket adapter.

6. Fill the bottom of the socket adapter dome (P/N124181) with a filler made with polyester resin. (ref. 5)

7. The ankle base arm (E) can be raised to provide working room.

8. Measure from the socket adapter (P/N124181) to anywhere on the pylon (this is only for reference), so that the pylon tube clamp/ pyramid receiver (P/N124170) can be replaced with the one stage lamination adapter. (P/N220821) Or 10 degree one stage adapter P/N220823 when necessary. Place a mark on the pylon approx. 3" from the socket adapter. (P/N124181) (ref. 6)

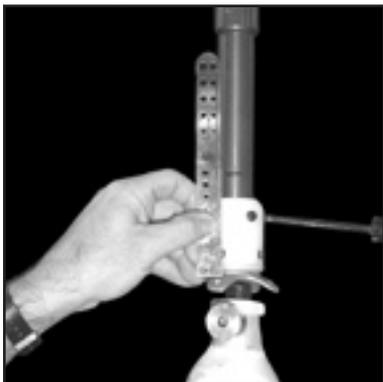


Ref.5 Fill 124181 w/ Polyester Resin

Replace the pylon tube clamp/pyramid receiver with the one stage adapter. (ref. 7) Make sure that the distance between the socket adapter and the mark on the pylon is the same as the measurement of the pylon tube clamp/pyramid receiver. Check the orientation of the pyramid. Protect the one stage adapter with two layers of stretch tape.(ref. 7)



Ref.6 Measure for Adapter



Ref.7 Replace Clamp/Receiver w/ Adapter



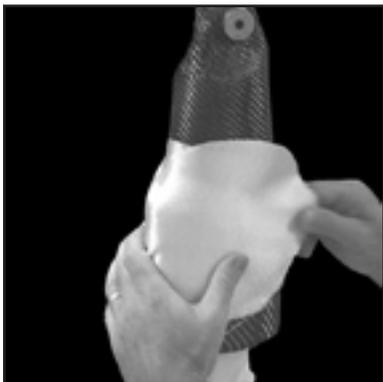
Ref.8 Apply PVA Sleeve



Ref.9 Apply Ipos Fiberglass/ Stockinette



Ref.10 Apply Carbon Fabric Et Fiberglass Strip



Ref.11 Fiberglass Over MPT Area

One Stage Lamination - Materials Needed

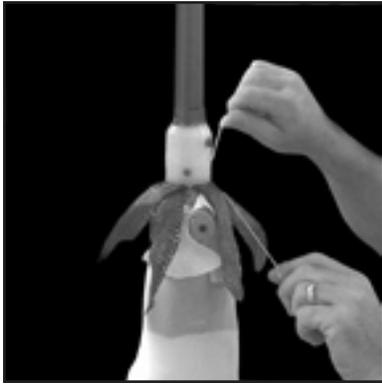
To laminate small to medium BK socket

- * Nylon stockinette (P/N192021)
- * Ipos fiberglass/nylon stockinette (P/N190867)
- * Carbon fabric(P/N211140)
- * Fiberglass fabric (P/N211037)
- * Ortholon stockinette (P/N199903)
- * 1" Carbon tape (P/N211144)
- * PVA sleeve (P/N9043)
- * Bulldog polyester thread (P/N199438)
- * Stick wax (P/N990035)
- * Isolation rubber (P/N199091)
- * Clear stretch tape (P/N199430)
- * Conforming gauze (P/N193390)
- * One stage adapter (P/N220821) or for 10 degree (P/N220823)
- * Acrylic Resin
- * Pigment
- * Transfer fixture (P/N220810) preferred

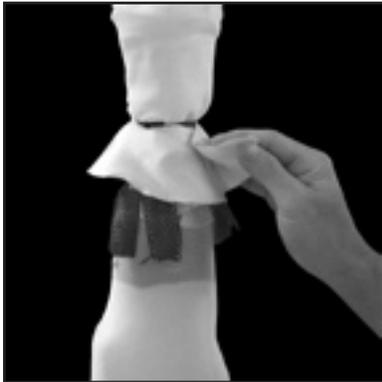
Note: This lay-up is considered sufficient for most wearers. Additional material can, of course, be added if deemed necessary to accommodate higher weight and activity.

Lamination Procedure

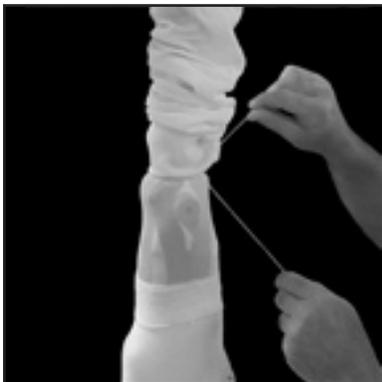
1. Apply the appropriate PVA sleeve to the model.
* If the model is a 3-S be sure to cover the distal socket plug (P/N125315) with the PVA sleeve and apply stretch tape (P/N199430) over the PVA sleeve and the distal socket plug.(ref. 8) Then install the mounting nut on the threaded plug (P/N125314) and the plug screw (P/N125348) for the button shield.
2. Cover the model with two layers of nylon stockinette (P/N192208) with the ends sewn.
3. Apply one layer of Ipos fiberglass/nylon stockinette (P/N190867) with the end sewn.(ref. 9)
4. Apply one layer of carbon fabric (P/N211140) over the entire socket. (ref. 10)
5. Apply a 2" to 2 1/2" strip of fiberglass fabric (P/N211037) long enough to go around the posterior popliteal area over the hamstring. Next wrap over the ears of the model crossing in the MPT area in the anterior of the model and wrapping back into the medial lateral condyle area. (ref. 10)
6. Place a fiberglass fabric circle that is large enough to cover the entire side of the model over the condyle area to the trim line, and lay over the hamstring and MPT area.(ref. 11)
7. Place one layer of Ipos fiberglass/nylon stockinette (P/N190867) over the model.



Ref. 12 Tie Carbon Tape into Groove



Ref. 13 Fiberglass Over Adapter & Tape



Ref. 14 Pull Down Layers



Ref. 15 Apply Isolation Rubber

8. Apply a circle of fiberglass webbing over the distal end of the model (*Then move the arm of the transfer fixture back over the model*)

9. If needed place a piece of nylon stockinette under the socket adapter to fill any gaps between the adapter and the model.

10. Using polyester thread (P/N199438) tie three 1" carbon tape strips (P/N 211144) into the groove of the socket adapter (P/N124181) (ref. 12)

11. Place a Fiberglass circle with a hole cut in the center and slit, over the adapter and carbon tape.(ref. 13)

12. Prepare the following in order listed and apply over the ankle base arm.

- a. One ortholon (P/N199903) long enough to go over the model twice.
- b. One piece of nylon stockinette (P/N192021) long enough to go over the model twice.
- c. One piece of Ipos fiberglass/nylon stockinette (P/N190867) long enough to go over the model twice.

14. Pull down one layer of the double Ipos fiberglass/nylon stockinette and tie it into the groove of the socket adapter , then using conforming gauze (P/N193390) wrap the gauze over the Ipos fiberglass/nylon stockinette about half way down the model and cut off the proximal section underneath the gauze, then reflect the other layer and repeat the first half of step #14. Make sure to stagger the layers and to remove the gauze by pulling it out from underneath the material. (ref. 14)

15. Pull down each double length of remaining material that is over the ankle base arm, tie into the groove of the socket adapter, then reflect material back down over the model.(ref. 14)

16. Loosen two of the set screws from the pylon tube clamp/pyramid receiver at the bottom of the ankle base arm and move the arm out of the way to start the lamination procedure. Make sure to mark the two loosened set screws so that after the lamination procedure alignment can be accurately restored.

17. Apply an isolation rubber (P/N199091) over the pylon tube clamp/pyramid receiver, the pylon tube and the one stage adapter. Tape it off using stretch tape (P/N199430) also tape over the screws of the pylon tube clamp/pyramid receiver at the top of the pylon. (ref. 15)

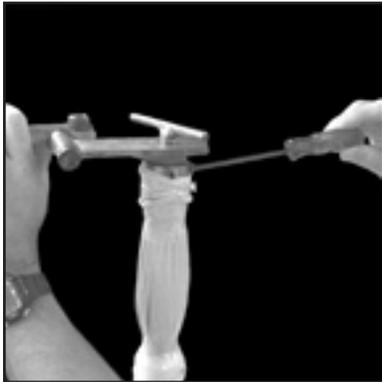
18. Apply a PVA sleeve over the model and prepare for lamination. Apply approximately 5 in. Hg. of vacuum to the model.

19. Mix approximately 650ML. of pigmented acrylic resin (80:20) with catalyst. 650ML. of resin has been proven sufficient for most prostheses

20. Let the resin stand about 10 minutes to allow air, dispersed through the resin during mixing, to rise to the surface and dissipate. Ideally this is done with a vacuum chamber at about 15 in. Hg. of vacuum.



Ref. 16 Introduce Resin



Ref. 17 Expose Distal End



Ref. 18 Finish Socket

21. Introduce the resin into the PVA sleeve (ref. 16) and impregnate the fabrics, taking care to thoroughly work the resin into the heavy buildup of material at the distal end of the model around the one stage adapter.

22. When the fabric has been thoroughly impregnated string out excess resin. Beginning at the stage adapter tape the entire adapter up to 1" of the pylon tube to remove all the resin from the adapter.

23. Leave enough excess resin around the pylon tube to create a reservoir of resin so that if the vacuum pulls at all it will pull resin down instead of air. Then tape off the end of the pylon tube clamp/ pyramid receiver.

24. Next expose the distal end of the pylon tube clamp/pyramid receiver by cuttings back the PVA sleeve and isolation rubber and reflect them down. Back out the two marked set screw and reposition the ankle base arm into alignment, tighten the two set screws to maintain the transferred alignment.(ref.17)

25. Allow the resin to finish setting. When the resin is fully cured, remove the prosthesis from the transfer fixture and replace the one stage adapter with the pylon tube clamp/pyramid receiver be used with the prosthesis.

26. The prosthesis is now ready to be removed from the plaster or foam model, so that finishing of the laminated socket can be completed and installation of components, foot, and cover can be accomplished. (ref. 18)