

Chapter 8 The Forearm

8.1 The Forearm Attachment

Two attachment plates are bonded to the forearm laminate. These provide an attachment point for the Forearm Frame and assure proper alignment.



Fig. 8.1 Attachment plates cemented to each side of the Forearm.

Screws for attaching the Forearm Frame. Study Figure 8.2 where the right side of the Frame has been attached to the underlying plate with two 8-32 x 3/16" pan head screws. These screws lie in recesses that make installation difficult. Initial installation may be done with a long-shaft screwdriver, but final tightening after applying Loctite or equivalent will be easier with an offset screwdriver.

Remove the Forearm before cutting. It is important to remove the Forearm before cutting it to length and sanding the distal end. Not only do you not want to get dust in the area of the circuit board, but even more important you want to avoid static electricity that might damage the electronics.

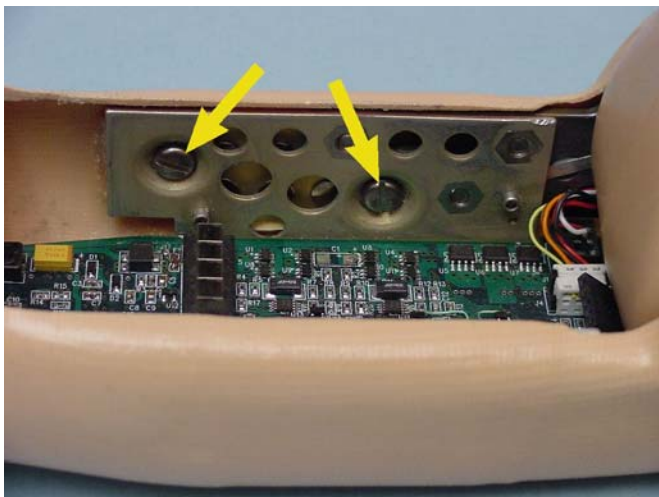


Fig. 8.2 Two 8-32 x 3/16" pan head screws are passed through the bosses on the Frame and into the attachment plate on each side. Final tightening of these screws is best done with an offset screwdriver.

8.2 Minimum length for the Forearm (Length from elbow rotation axis to distal end of wrist.)

The standard diameter wrist. The Forearm is usually supplied ready to accept an Otto Bock 10S1 50mm wrist piece. Other diameters are available to special order. You can also order any commercial wrist unit laminated to the needs of your patient. For this, LTI needs to know what wrist is needed and the length from the center of elbow rotation to the distal end of the wrist unit.

The 8.25" Forearm without Rotator. The shortest standard setup places the 10S1 piece almost directly in contact with the circuit board. This will make the Forearm 8.25' (210mm) long. You can cheat a little less by removing part of the 10S1. About 6mm was saved on one client in this way to give 8.1".

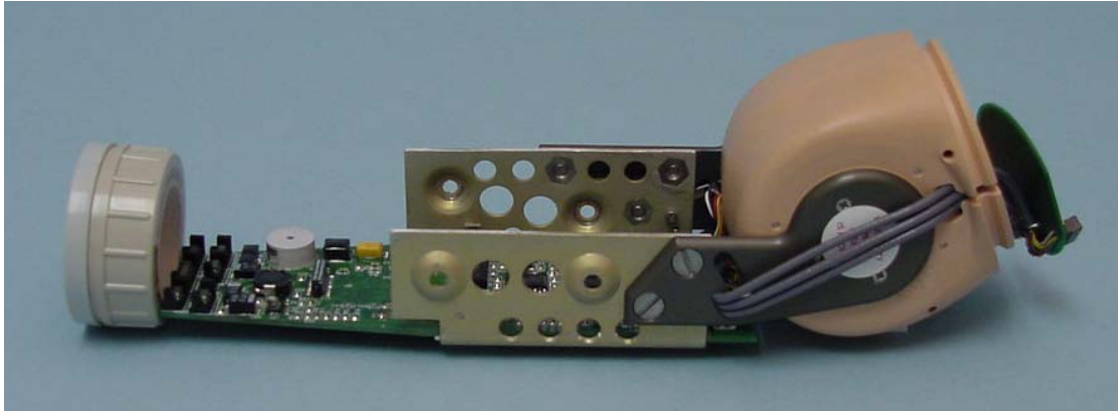


Fig.8.3. When the Bock 10S1=50 Wrist Collar just touches the Circuit Board, the distance from the center of elbow rotation to the distal edge of the wrist is 8.25" (210mm).

The 8.4" Forearm with Rotator. You can place the Bock 10S17 Wrist Rotator so that it almost touches the battery. This will yield a Forearm length of 8.4" (218mm). To do this, the center of the Circuit Board must be free of connectors. You should ask for the connectors to be removed if you plan to do this. Note that if you will use a Sensor Hand this removal will mean that LTI will have to wire in a special connector to replace the one removed. The 10S1 should not be cemented into place in the normal manner. Rather, you should install the Rotator in the 10S1, and then do the cementing. This will permit you to angle the Rotator up away from the board rather than down where it will interfere.

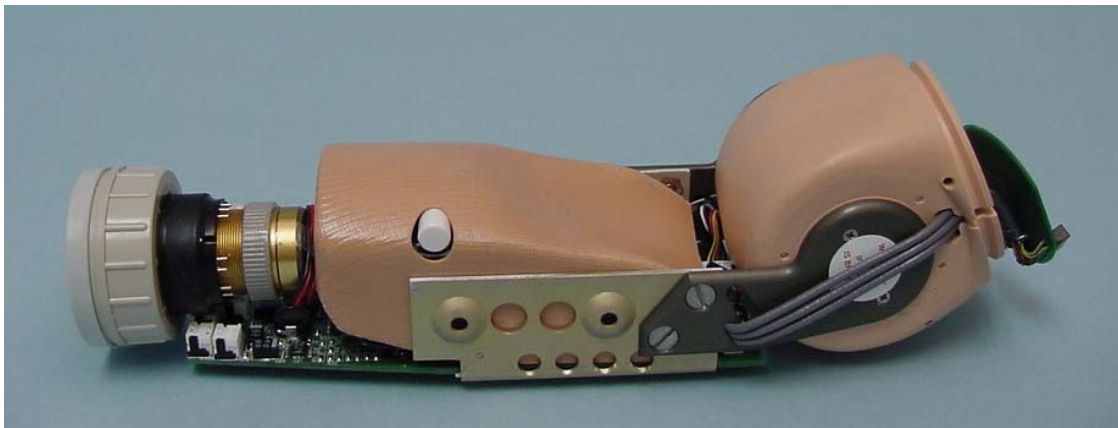


Fig. 8.4. The Bock 10S17 Rotator can be placed within a millimeter of the Battery Case. The Forearm length is then 8.4", the shortest possible length with a Rotator.

The 9.25" Forearm with Rotator. Without removing anything from the Circuit Board, you can place the Bock Rotator over the plugs until the ring that holds the Bock connectors in place just touches the plugs. This Forearm will be 9.25" (235mm) long.

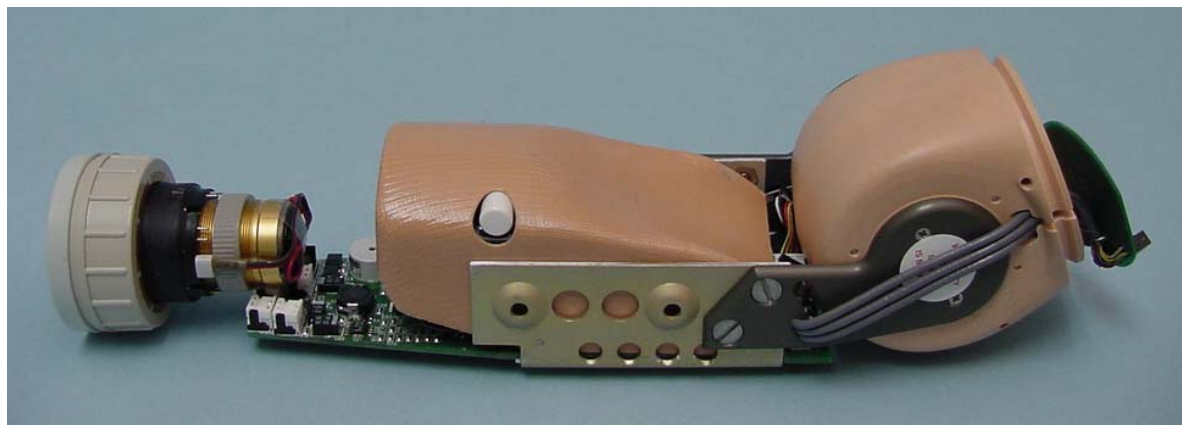


Fig. 8.5. The Rotator can be positioned over the circuit board until the gray plastic ring just touches the connectors. The distal edge is then 9.25" (235mm) from the center of elbow rotation.

Long Forearms of 9.8" to 14" length. At lengths greater than 9.8" (250mm), you can install a Rotator without contacting anything on the Circuit Board. Forearms are shipped with a length of over 14" (356mm).

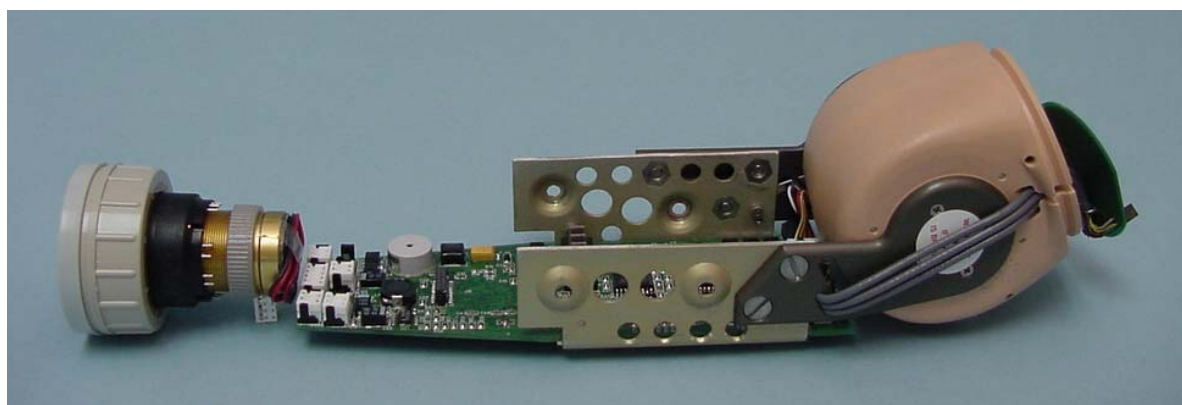


Fig. 8.6. At a center of rotation to distal edge distance of 9.8" (250mm) or greater, even the Rotator will clear the Circuit Board.

8.3 Custom colors and wrist diameters

Custom colors. Forearms are stocked in a standard Caucasian color, but it takes only a week to match a custom color. Typically you will order the lamination to match a specific glove color. LTI can match any of the manufacturer's standard colors. When the Drive Unit color would look wrong next to the Forearm, a matching Housing cover is supplied.

Custom wrist units. Some users prefer split hooks or other TD's rather than with a powered hand or gripper. The Forearm can be supplied with any of the available wrist units. Give special attention to the new five-function wrist from Texas Assistive Devices if you are working with a bilateral amputee. Special care must be taken when routing the Bowden cable. You cannot affix it to the Boston Arm battery cover which would be the normal attachment point. To allow for internal-external rotation the cable housing should be attached to the humeral section about 1.5"

(37mm) above the Clamp Ring and about $\frac{1}{4}$ " (7mm) behind the side-to-side plane through the humeral section when the Forearm faces forward.