Socket-less Socket™ SwingBrim™

The End of Rigid Brims

MartinBionics PROSTHETICS + RESEARCH

Version 220829

Socket-less Socket™ SwingBrim™

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Introduction to the Socket-less Socket™ SwingBrim™:

The patent pending Socket-less Socket™ SwingBrim™ configuration transforms a conventional static above knee socket brim into a conforming and comfortable brim that matches to the user's body in real-time. The SwingBrim™ is similar to how a rock climber rests into a high-end ergonomic climbing harness and maintains comfort all day, which is the equivalent of bilateral above knee socket brims.
functional

The SwingBrim™ eliminates point-specific Ischial loading and dissipates the brim forces through soft compliant fabric-based materials. It's the difference of sitting into a soft swing or hammock versus onto a hard chair. Both can support the person, but a conforming swing or hammock is much more comfortable.

The groin area of the residual limb that rests into an above knee socket brim is very sensitive, and most amputees with a conventional socket suffer from brim discomfort in sitting and ambulation.

The SwingBrim™ is the simplest above knee Socket-less Socket™ configuration, as it simply replaces the proximal couple inches of the conventional socket's brim. The SwingBrim™ can be fit to users ranging from pediatric to adult, petite to obese, and short limbs to long. There is not an above knee limb type that has not been successfully fit with the SwingBrim™. It is rare to find a user who prefers a rigid socket brim over the more conforming Socket-less Socket™ SwingBrim™.

With the SwingBrim™, users should no longer feel a hump underneath them while sitting at the brim level, as in conventional sockets, and should have greater hip range of motion, as the proximal anterior brim no longer impinges into the abdomen. Not only does the SwingBrim™ uniquely provide comfort,

but its conformity helps maintain much more comfort in the brim through the life of the prosthetic, even with limb volume gain or loss.

The elegantly simple SwingBrim™ is a great design to retro-fit into a conventional socket to replace a static rigid brim, or can be integrated into a new socket without having to cast/modify/fit the brim with conventional fitting methods.

The SwingBrim™ is also a sub-component within the other above knee Socket-less Socket configurations such as the cX-Hybrid™ and Soft-Socket™, which offers added benefits of volume adjustability, un-encapsulated breathability, and increased range of motion.

Clinical Services Support:

Martin Bionics now includes Clinical Services support along with the purchase of the Socket-less Socket™ technology so that our trained and experienced clinicians can help ensure that every Socket-less Socket™ user achieves maximum comfort outcomes. Martin Bionics can coordinate to do the fitting alongside you via Zoom or Facetime video-call support.

Schedule a phone or video Consultation or Clinical Fitting Collaboration with our Clinical Services Practitioners:

Clinical Consultation: *https://calendly.com/martin-bionics-clinical-services/consultation*

Clinical Fitting Collaboration: *https://calendly.com/martin-bionics-clinical-services/clinical-fitting*

How To Place a Socket-less Socket'™ Order:

Web: MartinBionics.com/Order

Phone: 844-MBIONIC (844.624.6642) or 405.839.7326 X729

Email: orders@MartinBionics.com

Ordering Option 1 - Integration Kit: The SwingBrim™ integration kit can be ordered and assembled onto your own sockets within your clinic. Some practitioners keep these off-the-shelf SwingBrim™ integration kits on-hand to offer real-time fittings for their patients, or to even convert existing conventional sockets to a SwingBrim™ configuration. The SwingBrim™ is ordered specifically as a left or a right, and can be special ordered in pediatric sizes as well.


Left SwingBrim™ kit


Right SwingBrim™ kit

Ordering Option 2 - Customized Check Socket Integration: Mail us a well-fitting check socket or definitive socket and we will trim down your socket to the appropriate SwingBrim™ trim lines and custom assemble the SwingBrim™ components within your socket. This custom assembly should provide a fit that is about 95% complete out-of-the-box. Simply micro-adjust the SwingBrim™ components for a perfect fit.

Keep in mind that since the brim of the conventional socket will be removed and replaced with the conforming SwingBrim™ materials, the fit and comfort of the conventional socket's brim does not matter. Rather the conventional socket's brim simply needs to be at the correct brim height so that the SwingBrim™ can be integrated in the correct position.

Suspension Options:

The Socket-less Socket™ designs can use any form of suspension found in conventional sockets including, pin, lanyard, suction, vacuum, or others. If you intend to integrate a sealing liner, such as an Ossur Seal-In system, the SwingBrim™ is a great configuration, since the majority of the body of the socket remains intact. If you intend to use skin-fit suction, consider leaving the flexible inner socket at full length, and only trimming down the frame trim lines. The Swing Webbing will still provide the hammock-support under the flexible inner socket's brim just as the typical SwingBrim™, but will provide a continuous inner socket to help maintain suction.

SwingBrim™ Retrofit and Integration Instructions:

1. Adjust Frame Trim Lines: Begin by modifying the brim trim lines of a conventional socket, following the trim lines shown in the SwingBrim™ Retrofit video. The flexible inner socket trim lines are lowered about 1.5" - 2" across the anterior, medial, and posterior sides of the brim, but remain at near their full height at the Ischial seat and Scarpas areas, which become mounting points for the Swing Webbing and Arch Pads respectively. Make sure the trim lines of the flexible inner socket are not below the position of where the final Swing Webbing and Arch Pad will sit, to prevent pinching in between.

Click: https://vimeo.com/661222857/53f48d9107

The frame trim lines are lowered at the Ischial seat area about 1.5" below the Swing Webbing connection point on the Ischial seat, and at the anterior Scarpas area about 1.5" below the anterior Swivel attachment point. The frame contouring will follow a similar curvature as the flexible inner socket in between. The lateral wall of the conventional socket remains intact.

If integrating within a check socket, where there is not yet a flexible inner socket, follow the trim line modifications of the flexible inner socket example only and integrate the SwingBrim™ in similar mounting points as shown for the frame, but onto the check socket. Upon transferring to the definitive materials, replicate the frame and inner socket trim lines and mounting points shown in the SwingBrim™ Retrofit video.



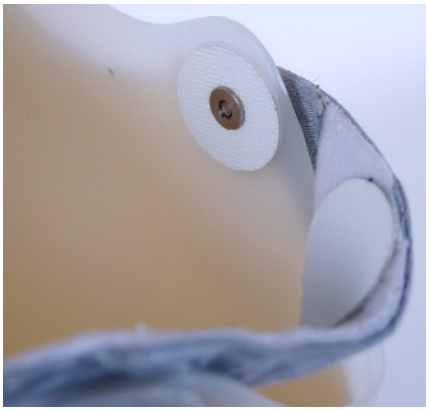
2. Drill Holes: Drill a 1/4" hole in the frame at the proximal posterior corner of the lateral wall to mount the Swing Webbing (purple circle), and another 1/4" hole about 4" below it to mount the posterior Cross Connector (blue circle). Drill a 1/4" hole at the Scarpas area of the flexible inner socket to attach the Swivel Velcro Washer (red circle), and a 1/4" hole on the frame directly below it to mount the 2-Bar Buckle for attaching the Swing Webbing (yellow circle).

   Then drill a 1/4" hole at the Ischial seat area of the flexible inner socket to mount the Swing Webbing (green circle). Drill two more 1/4" holes below on the frame to mount the AirHammock™ Petal to the frame (orange circles). Ensure that the spacing between the holes at the Ischial seat in the flexible inner socket line up with the correct spacing of the holes in the frame below the Ischial seat area to mount the AirHammock™ Petal between all three. It is helpful to use the AirHammock™ Petal as a guide for drilling the holes. If there is a thick/stiff flexible inner socket, the AirHammock™ Petal at the Ischial seat mounting area can be eliminated if desired.

3. Assemble the SwingBrim™ onto the Frame: Check to make sure you have the correct side SwingBrim™, as they come in lefts and rights. Look at the webbing from the white side with the fold facing up. If the sewn-in washer is to the left of the fold, the brim is a left. If the washer is to the right of the fold, the brim is a right.

   Attach the included AirHammock™ Petal onto the outside of the flexible inner socket, clamping the flexible inner socket between the Swing Webbing mounting point and the AirHammock™ Petal. The SwingBrim™ should be positioned such that the sewn-in 15° angle in the Swing Webbing points upward.

The AirHammock™ petal can be trimmed to length distally, and is mounted to the frame using the two previously drilled mounting holes to prevent its rotation. This AirHammock™ Petal is flexible and merely holds positioning of the SwingBrim™, but does not support loading by itself.



At the Scarpas area of the flexible inner socket only, mount the Swivel Velcro Washer using a Truss Nut. Be sure the Swivel remains free to rotate.

Next mount the 2-Bar Buckle with the Swing Webbing onto the frame in the Scarpas area using a Truss Nut. Be sure the Truss Nut is long enough to still allow it to swivel.

Attach the posterior side of the Swing Webbing to the proximal posterior corner of the lateral wall using the 2-Bar Buckle. This attachment point should be allowed to swivel. Connecting the Swing Webbing to the frame at the Scarpas area anteriorly, and to the proximal posterior aspect of the frame laterally puts the connection points at about 180 degrees apart, which becomes the 'hammock stand'. The webbing creates the "hammock". Just as in positioning a hammock between palm trees on the beach, the tension of this SwingBrim™ hammock will determine how and where the limb will be supported.

It is important that the proximal posterior connection point be as proximal as possible, to adequately support the gluteals. This connection point should create at least 3" of vertical difference between it and where the Ischial Tuberosity sits on the medial brim area (red arrows).

Attach the posterior multi-hole Cross Connector across the transverse channel between the gluteus and the hamstrings. This should be connected to the top Truss Nut attachment point of the AirHammock™ Petal that is just below the Ischial Tuberosity to 4" below the posterior lateral attachment point on the lateral wall.

4. Adjust the Swing Webbing and Add the Arch Pad: Before adding the Arch Pad, adjust the Swing Webbing to an approximate tightness - using the anterior 2-Bar Buckle to adjust the anterior end of the Webbing, and the posterior 2-Bar Buckle to adjust the posterior end of the Webbing. The span of the Swing Webbing should generally resemble the shape and size of the conventional socket's brim.

   Attach the Arch Pad to the Swing Webbing using the double sided Velcro Dots. The Arch Pad should be completely removed and put back on the Webbing any time the medial portion of the Swing Webbing is adjusted.

   The Arch Pad should be placed onto the Webbing beginning with the anterior Swivel Velcro Washer first, and then laying it onto the Swing Webbing progressing toward the back. It is helpful to weight into the Webbing as the Arch Pad is being placed so that the Arch Pad rests into a natural weighted position on the Webbing.

   The Arch Pad height can be adjusted in position with respect to the webbing, and should typically have at least 1/4" - 1/2" of Arch Pad extending beyond the Webbing. The Arch Pad can be trimmed if needed in length or width. Be sure to buff the edge you cut so that it is smooth and clean in appearance.

SwingBrim™ Fitting Adjustments:

1. Adjust Brim Tightness: The brim is like a hammock, and needs to be sufficiently tight in order to support the limb. In conventional sockets with rigid brims the specific contouring is critically important to provide comfort, and it is challenging to provide any significant amount of body weight support through the brim without being uncomfortable. However, in the Socket-less Socket™, the SwingBrim's™ unique conformity enables the user to comfortably take a significant amount of load in the brim, similar to sitting in a hammock, swing, or an ergonomic climbing harness, where the full body weight is comfortably supported in the brim. When fit correctly, the SwingBrim™ should eliminate point-specific Ischial loading and Ramus sensitivity.

   Adjust the posterior end of the SwingBrim™ Webbing length to be sufficiently tight to strongly support under the gluteals. Next adjust the anterior/medial end of the SwingBrim™ Webbing length to contour and support the adductor area of the limb.

   The SwingBrim™ shape should generally resemble the brim shape of a conventional socket.

2. Adjust Cross Connector Length: After the SwingBrim™ Webbing is sufficiently tight, the posterior multi-hole Cross Connector should be tightened enough to slightly compress over the flexible inner socket.

3. Alignment: The SwingBrim™ uses standard AK socket alignment principles. Attach the prosthetic knee and foot components to the socket with a standard 4-hole pyramid, just as you would with a conventional socket.

4. Added Stability for Very Short Limbs: Many above knee Socket-less Socket™ users will prefer the added adjustability of the cX-Hybrid™ configuration, though the SwingBrim™ is a great alternative if the limb length is too short to fit the cX-Hybrid™ components. For very short limbs, consider adding the Martin Bionics' modular Lateral Stabilizer™ to provide increased lateral stability, which is a more advanced replacement to a Silesian Belt. It will share connection points with the posterior lateral SwingBrim™ anchor to the frame, and the anterior Scarpas area SwingBrim™ anchor to the frame.

Finishing Out the Socket:

Attention to detail is very important, and the patient deserves it, so please ensure that the final fabrication and assembly has the quality workmanship you'd be proud to put your name on.

Final Lamination: The final fabrication can be completed within your own clinic or through Martin Bionics central fabrication services. The lamination layup will be similar to how it would be fabricated if making a conventional socket.

Smooth Cross Connectors: Swap out the multi-hole Cross Connectors with smooth Cross Connectors by drilling the corresponding holes in the smooth version at the same mounting positions and trimming them to length. Do not leave multi-hole Cross Connectors on the definitive socket, and do not leave extra length of Cross Connector protruding past the Truss Nut attachment points, as this results in an un-cosmetic appearance and lacks attention to detail.

Truss Nuts: Do not use the Thumb Screws for final assembly, as they are only meant for check socket use within the clinic setting. Replace any Thumb Screws with the definitive Truss Nuts and Screws for out-of-clinic and definitive use. **Be sure to apply Loctite 242 to ALL Truss Nuts prior to delivery of the socket**, as the SwingBrim™ does not come with Loctite pre-applied. If the Truss Nuts are not Loctited, they will back out over time. If they are Loctited and sized appropriately, they should not back out.

The Truss Nuts are available in 1/16" increments, and it is very important to ensure that for any parts that need to swivel, including all Swivels, Cross Connector and Adjustors, that the Truss Nut length is 1/16" longer than the build height of the various sub-components that are being attached together. If the Truss Nuts are clamped where swivel movement is desired, the screw may back out over time.

Finishing out the SwingBrim™ Webbing: SwingBrims™ must be finalized before a user takes a final product home or for out-of-clinic use. The SwingBrim's™ adjustable 2-Bar Buckles are only intended for in-office check socket use during the fitting process. Although the Buckles and Velcro hold the Webbing length secure in the office, it can loosen if the patient walks long distances.

Once the appropriate Swing Webbing length has been determined, the 2-Bar Buckles will be removed and anchor points will be sewn into the webbing for mounting it to the frame, using the steps on the following page. Keep in mind that the Swing Webbing can very slightly stretch over time. If the Webbing needs to be tightened in the future, a tuck can be sewn in the Webbing. If it needs to be made longer, a Cross Connector can be added at the end of the Webbing to the frame.

Assembly Technique: Finalizing the SwingBrim™ Webbing

https://vimeo.com/433836593/cf13082076

What do you need:

a. Swing Brim Webbing*
b. Torch
c. Tape Measure
d. Truss**
e. 2 Small Nylon Washers
f. Scissors
g. Pen or Sharpie
h. Hole Burning Tool***

** This should be the webbing used during the patient's fitting. Be sure to remove the webbing from the socket with the swing brim buckles attached.*

*** 5/16"-1/2" should work just fine.*

**** It's preferable to use a ¼" diameter steel tube, 12" long. Using something hollow, like a tube allows material to be cleanly cut, leaving the discarded portion inside the tube (like a cookie cutter). Using a wrench or awl pushes the materail out of the way and leaves a glob of melted goo on the webbing and it will not sit flat on the socket or cause the screw to be raised/angled.*

1.Measure the posterior (or flat) side of the webbing.

Use the grey side of the webbing, keep the material taught. Measure from the edge of the washer hole to the center of the swing brim buckle hole.

2. Remove the buckle and velcro. Mark the distance you just mesured.

Make sure you use the center weave stitch of the webbing to keep the hole in the center of the webbing.

3. Make 2 additional marks: 3cm and 6cm further away from the washer than your original mark.

This distance will space out the holes to accomodate the washer.

4. Measure the anterior (or angled) side of the webbing.

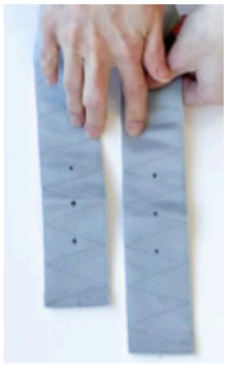
Use the grey side of the webbing, keep the material taught. Measure from the edge of the washer hole to the center of the swing brim buckle hole.

5. Remove the buckle and velcro. Mark the distance you just measured.

Make sure you use the center weave stitch of the webbing to keep the hole in the center of the webbing.

6. Make 2 additional marks: 3cm and 6cm further away from the washer than your original mark.

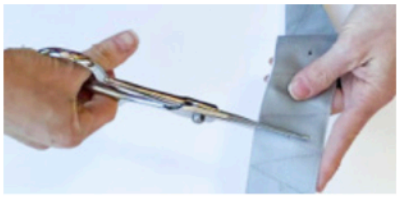
This distance will space out the holes to accomodate the washer.



CHECK POINT

At this point you should have 6 marks, 3 on each side of the webbing.

We will cut at the **6cm** marks and burn holes at the remaining 4 marks.

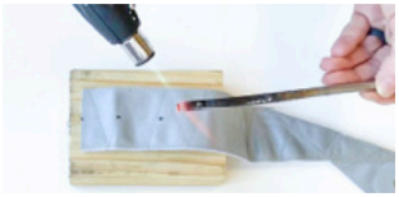


7. Cut at the 6cm (or furthest mark) on each end of the webbing.

Use clean and sharp scissors. Try to keep the cut as clean and straight as possible.

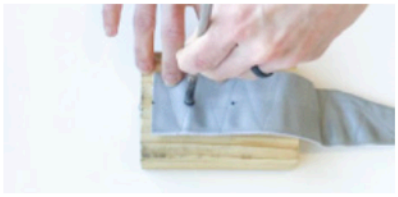
8. Lightly singe the edges you just cut.

This prevents the material from fraying over time. Try no to overdo it and burn the material.



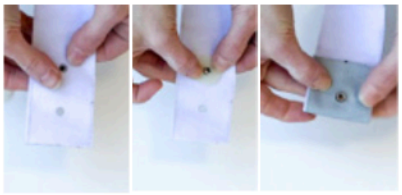
9. Heat the burning tool until red hot.

It may be helpful to place a block of wood under the webbing in lieu of burning into the bench top.



10. Burn holes at the remaining 4 marks.

Be sure to keep the burning tool straight up and down and gently turn the tool 1/4 turn to seal the edges of the hole. Avoid "wollowing" or spinning the tool in the hole. It can make the hole too large. It also does not create a clean finish to the product.



11. Using the truss to keep the holes aligned, sandwitch a washer inside the webbing.

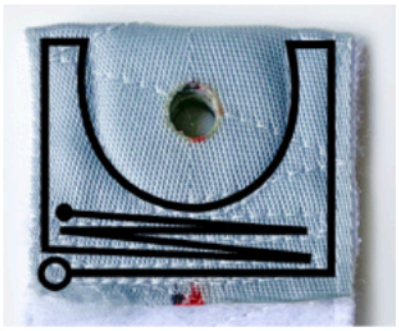
Press a truss through the hole closest to the fold. Add a nylon washer to the truss. Fold the remaining portion of the webbing over the washer and push the truss through the remaining hole.

12. Sew the webbing to secure it around the washer.

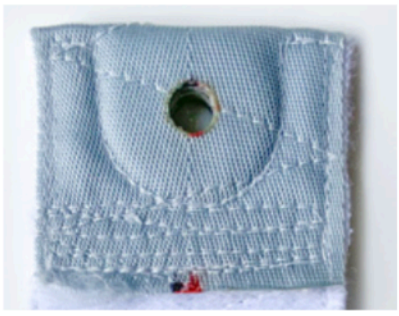
Keep the truss n the webbing to ensure the washer stays centered and the holes stay aligned. The webing can be sewn in one pass with the following pattern:

Sew the bottom and one side of the webbing. Sew around the washer. Sew own the other side and end with some kind of zig zag pattern. (see photo to the right - start at the open circle and end at the black dot)

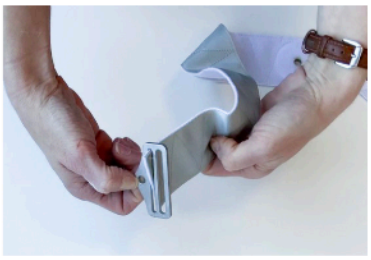
Repeat Steps 11 and 12 on the opposite end of the webbing.



FINAL SEWN END OF SWING WEBBING:



The following steps show how to properly attach the Swing Webbing through the 2-Bar Buckles.



1. Thread the webbing through the top slot.

The grey side of the webbing should be facing away from the truss hole.

2. Loop the webbing over the bar and through the bottom slot

The white side of the webbing should be facing out at this point.

3. Fold the tail back towards the buckel and secure with a half moon velcro.

Try to tuck the end just under the bottom edge of the buckle to prevent slipping while the patient walks.

SwingBrim™ Coding:

Medicare has provided approved coding for the Socket-less Socket™. The Socket-less Socket™ has numerous possible configurations including selecting various forms of suspension and tissue management options. You will bill according to the socket design you make for your patient, using existing coding. For many fittings, the coding will be similar to the code set that may be used with a conventional socket, with only minor modifications if any.

To bill the retrofit of the SwingBrim™ within an existing socket: If the patient is no longer able to tolerate their existing brim due to anatomical changes or discomfort, we suggest billing for time and materials as a repair code.

To bill the SwingBrim™ into a new socket, use existing socket coding and bill the same as you would bill for a conventional socket. See below for typical codes used for above knee sockets.

Code(s)	Description
L5321, L5590, or L5701	Base Code - Above Knee Prosthesis, Definitive, Preparatory, or Replacement Socket
L5631	Addition to Lower Extremity, Above Knee or Knee Disarticulation, Acrylic Socket
L5649	Addition to Lower Extremity, Ischial Containment ,Narrow M-L Socket
L5950	Addition, Endoskeletal Systsem, Above Knee, Ultralight Materials
L5651	Addition to Lower Extremity, Above Knee, Flexible Inner Socket, External Frame (when applicable)
L5920	Addition, Endoskeletal System, Above Knee, Alignable System
L5624	Addition to Lower Extremity, Test Socket (when applicable)
L5650	Addition to Lower Extremity, Total Contact (when applicable)
Suspension Codes	Pin/Lanyard, Suction, Vacuum, or others

Certification of Training and CEU Credits:

All practitioners fitting this Martin Bionics technology are required to confirm that they have completed this Martin Bionics socket training by clicking on the button below before fitting this technology.

Through completing this training you are eligible to receive CEU credits from the American Board for Certification. Click the button below, input your name and credential numbers, and we'll provide you with a quiz for CEU credits.

Click Here to Complete the Training and to Register to Fit the SwingBrim™

Warranty and Credits

Thorough review and understanding of the Socket-less Socket™ training materials has a significant impact on the success of the socket fitting. The Martin Bionics' Clinical Services team will support your Socket-less Socket™ fittings to help maximize comfort and ensure that every fitting is as successful as possible. In the event there are challenges in the fitting process, our Clinical Services team can join you via a Zoom or FaceTime call, where we can typically help diagnose and resolve the issue with specific socket fitting suggestions.

If the socket is ultimately not the correct configuration for the end-user, we can re-configure the socket to another configuration to better match the user's clinical needs.

If even after the Clinical Services support the patient rejects the Socket-less Socket™, we will provide a credit toward fitting another patient, at the actual Socket Component invoiced price, less check socket, final fabrication, and shipping expense as applicable. All Socket-less Socket™ components will need to be returned within 30 days and the original invoice paid in order to issue the credit toward another fitting.

While we rarely find the need to repair or replace socket sub-components, the modularity of the Socket-less Socket™ allows it to be easily repaired. Martin Bionics will support replacement parts if premature wear and tear are found based on a flaw in Martin Bionics workmanship.

You can find the most recent and additional training resources at MartinBionics.com/Socket-Soft, as we update our training regularly.

If you have any questions during your socket fitting, contact our Clinical Services team at 844-MBIONIC, or schedule for our trained and experienced Clinical Services team to join you via phone or video-call for a Clinical Consultation or Clinical Fitting Collaboration using the links below.

Clinical Consultation: https://calendly.com/martin-bionics-clinical-services/consultation

Clinical Fitting Collaboration: https://calendly.com/martin-bionics-clinical-services/clinical-fitting