



# Heavy Duty Lever Release Kit Fabrication Instructions for Ratchet Lock™ and Key Lock™ Joints



Becker Orthopedic's new Ratchet Lock™ and Key Lock™ knee joints are fully compatible with our Heavy Duty Lever Release Kit. Installing the Heavy Duty Lever Release Kit on these joints, however, requires a few additional steps. To assist you we have created step-by-step fabrication instructions which illustrate the proper installation of the kit onto KAFO's with these new joints. As always, if you have any questions during your fabrication process, we are happy to help you in any way that we can.

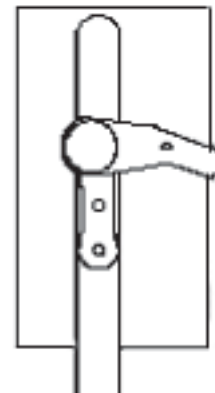
# LEVER RELEASE SYSTEM

## MODEL: MX-003HD

### Fabrication Instructions

1. Lay KAFO on a flat surface posterior side up.
2. Position the Lever Assembly on the lateral upright in a suitable position.
3. Center mark the (2) attachment holes (see Figure 1) using the lever mount on the lateral upright with a transfer punch or a #19 drill.
4. Drill the (2) attachment holes with a #28 drill and tap using a #8-32 tap.
5. Mount the Lever Assembly to the lateral upright using the upper attachment hole only. The lower attachment screw will be attached later with the cables.
6. Attach the cable loop to the Lever Assembly using the shoulder screw provided (see Figure 2).
7. Slide the (2) clear outer sheaths onto each end of the cable until they stop on the Oval Sleeve near the loop end of the cable (see Figure 2).

Figure 1



8. Slide the medial (longer) side of the cable through the cable conduit until the cap of the leading end contacts the clear outer sheath (see figure 2).
9. Locate and attach the cable conduit to the lever using the plastic cable clamps and the second #8-32 screw as shown. Rotate the cable clamp so that the cable slides free in the cable conduit and does not rub against the conduit end caps (see figure 2).
10. Trace out the path of the medial cable along the thigh shell to the medial joint trigger. **All radii formed by the cable should be larger than 2 1/2" to ensure the cable slides freely within the cable conduit. Any restriction in the free movement of the cable will inhibit the locking mechanism of the joint and could cause premature wear, incomplete locking and/or joint lock failure.**

Figure 2

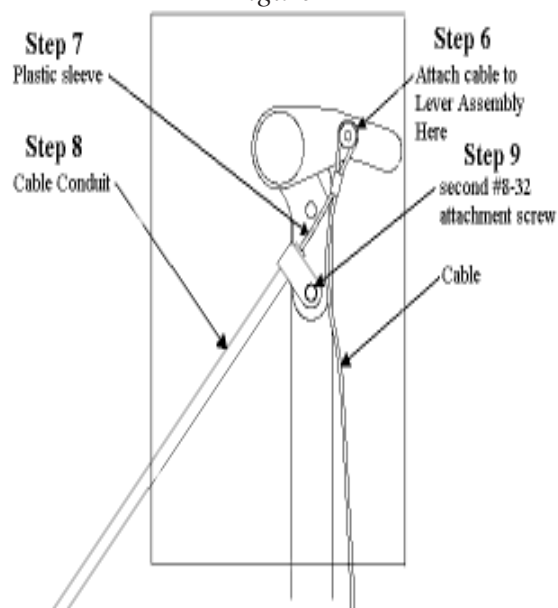


Figure 3

11. Locate and mark the positions of up to (4) plastic cable clamps along path of the medial cable traced in step 10 (see Figure 3).

12. Where the cable attaches to the trigger, ensure the cable is square to the joint in the sagittal and frontal planes.

13. Drill through the KAFO at each of the marked positions using a #7 drill.

14. Place a brass insert into each of the #7 drilled holes from the inside of the thigh cuff. Insert one of the #8-32 screws into the brass insert from the outside of the plastic. Tighten the #8-32 screw until the brass insert has been pulled completely into the plastic.

15. Remove screw and attach the cable conduit to thigh cuff using the plastic cable clamps and #8-32 screws.

16. Once the cable conduit is in place, place a mark on the conduit approximately 1/2" above the end of the joint trigger. This will allow for full motion of the unlocking mechanism.

17. Cut the **cable conduit** (not the cable) at the mark made in the previous step.

18. Remove the cable conduit from the KAFO and attach the end cap using Becker Orthopedic's cable-crimping tool.

19. Re-attach the cable conduit to the KAFO and mark the cable where it lays at the top of the hole in the trigger using a fine tip marker as shown (see Figure 4).

20. Repeat steps 9 through 19 for the lateral side cable.

21. Remove the cable assembly from the KAFO.

22. Slide the stainless steel ball onto the end of the cable up to the marks on the lateral and medial cables made earlier as shown (see Figure 5).

23. Crimp each of the steel balls to the cables using Becker Orthopedic's cable crimping tool.

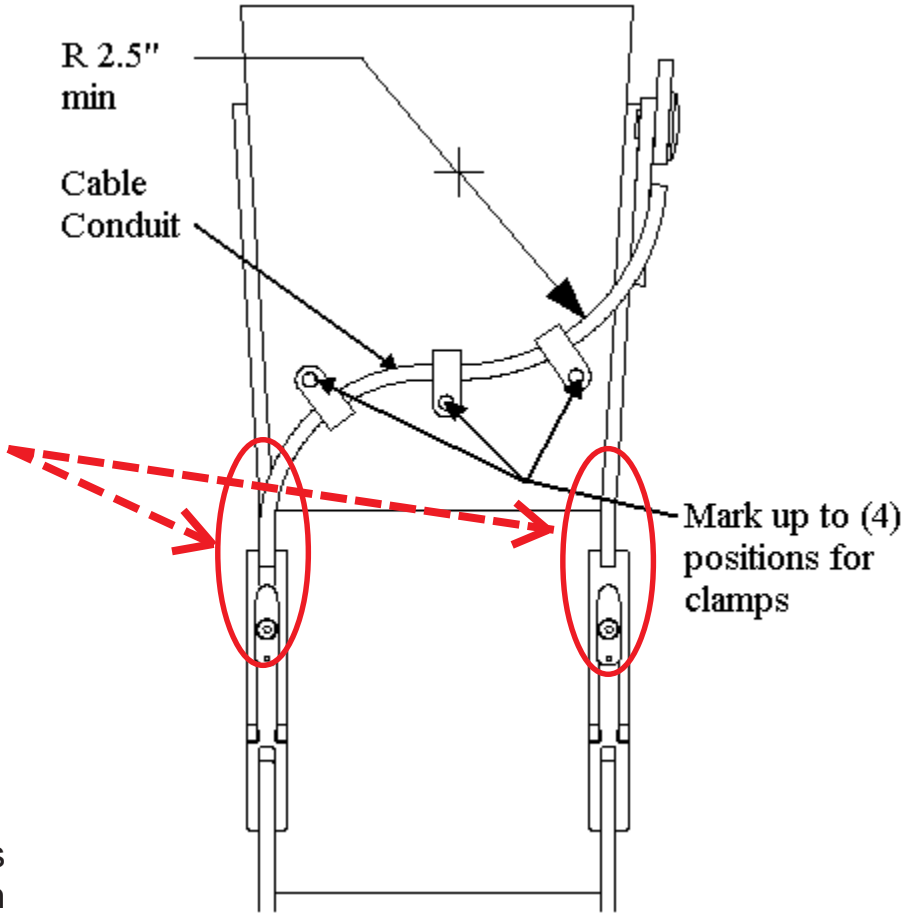


Figure 4

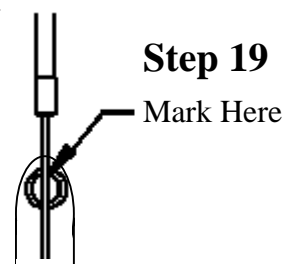
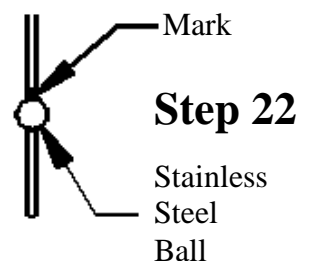


Figure 5



24. Trim any excess cable sticking out past the end of the stainless steel balls and grind the cable ends until they are flush with the bottom of the steel balls. Please note that the balls will deform when crimped.
25. Remove the black plastic plug on the triggers (see Figure 6).
26. Using a small cut off wheel or drill bit, cut a 1/16" slit in the trigger from the hole to the end of the trigger deep enough to allow the cable to pass through (see Figure 7).

Figure 6

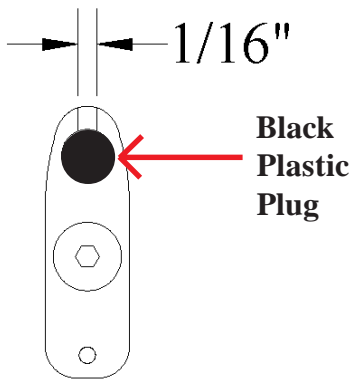


Figure 7



27. Grind the steel ball to shape so that it fits into the trigger (see Figure 8).

Figure 8



28. Re-attach the cable assembly to the KAFO and triggers.
29. Insert the steel balls into trigger and capture them using the brass plugs provided (see figures 9 & 10).

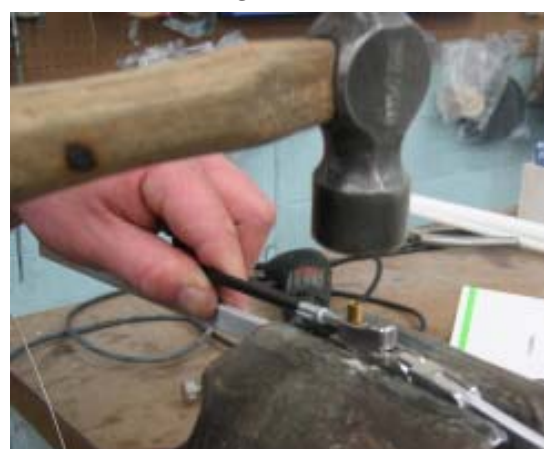
**Note: Be sure to leave space for the steel ball to move freely inside of the locking tip.**

**Note: The brass plugs should go into the locking tip threaded side out for future removal.**

Figure 9



Figure 10



30. Grind the brass plugs flush with the end of the triggers, making sure not to leave any sharp edges (see Figure 11).

Figure 11



31. Check assembly and test for proper function.
32. Installation of your Heavy Duty Lever Release Kit is now complete.

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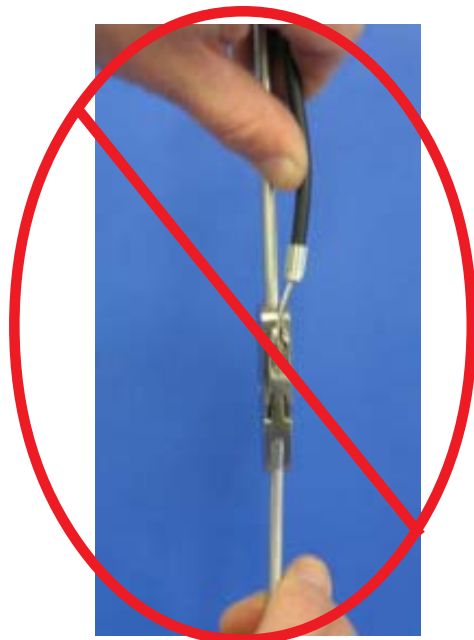
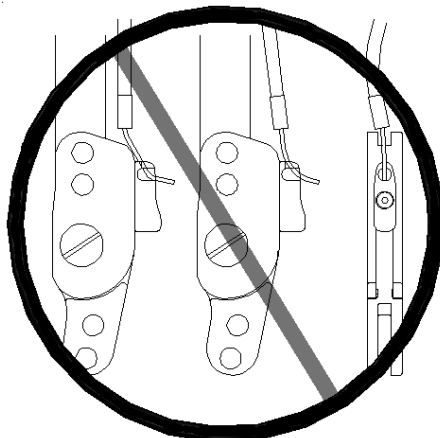
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## KEY POINTS

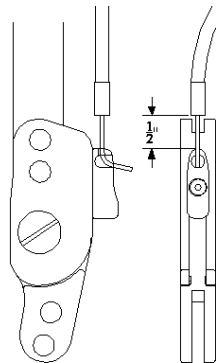
### CABLE ALIGNMENT

Frontal plain misalignment of the cable can cause the unlocking mechanism to engage thereby putting the joint into free motion. Please take special care when aligning the cable to ensure the joint does not become unlocked when it is not intended to.

#### INCORRECT ALIGNMENT

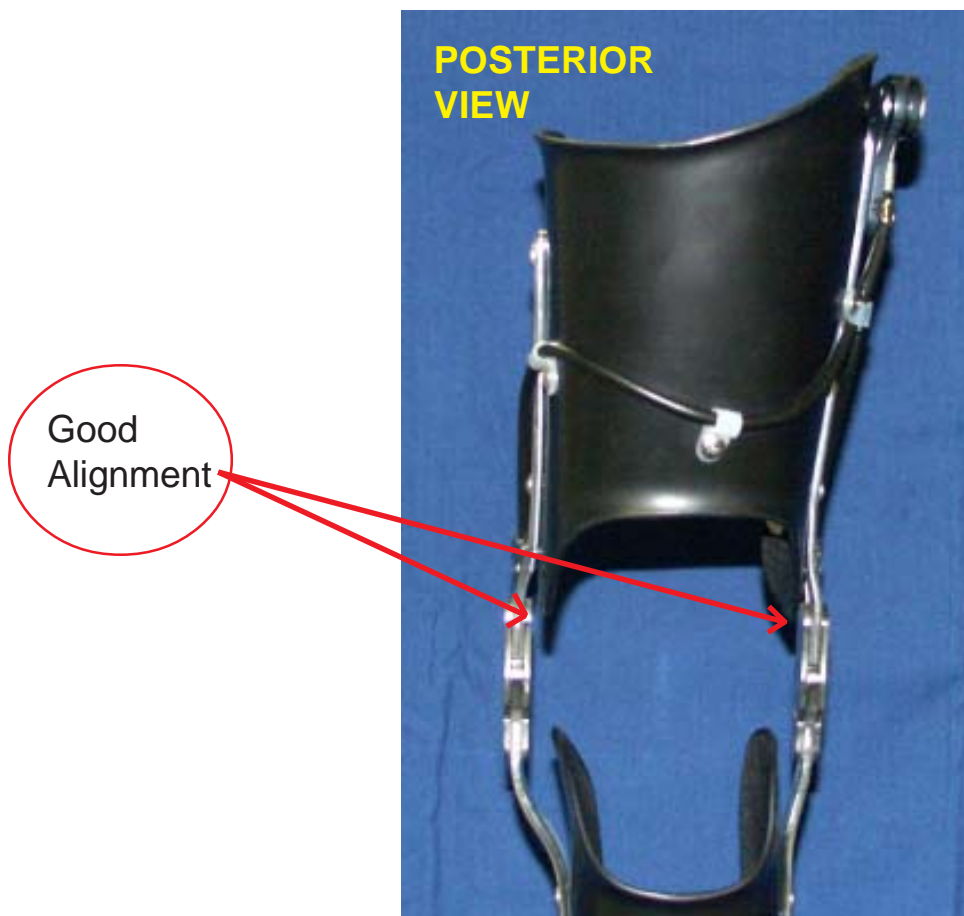


#### CORRECT ALIGNMENT

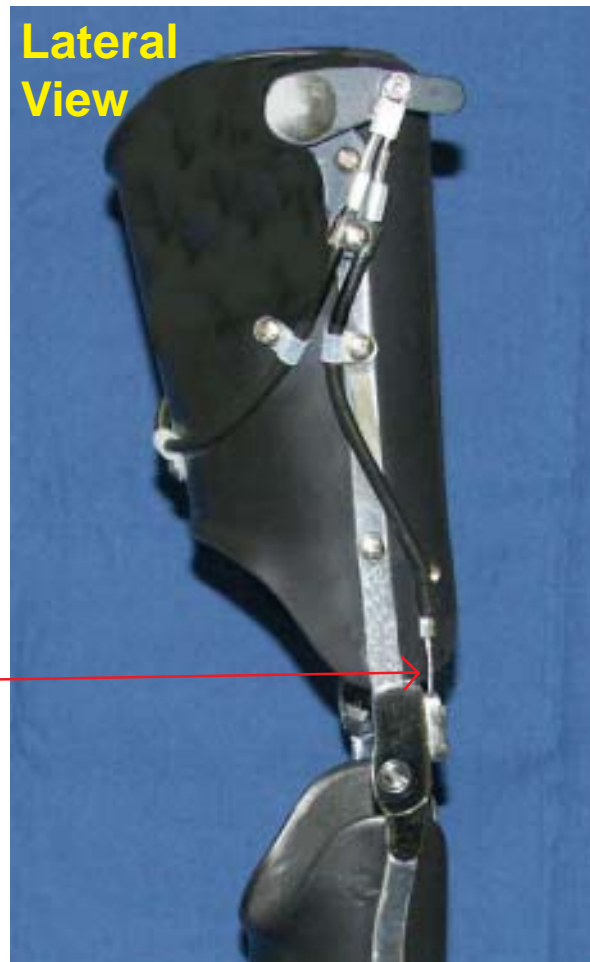


## JOINT AND CABLE ALIGNMENT IN THE CORONAL PLANE

In order to ensure that the joints function properly, please take extra time to carefully square and parallel the joints to one another.



# JOINT AND CABLE ALIGNMENT IN THE SAGITTAL PLANE



**Note: As with any of our locking knee joints, the Ratchet™ and Key Lock™ joints will NOT unlock during a knee flexion moment. To disengage the locking mechanisms, please ensure that all knee flexion forces are absent.**



**If you have any questions, or would like any additional information, please contact our customer service department. Thank you for taking the time to review these instructions.**

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