

Steeper ARGO

Knee-lock adjustment

Precautions

- When a patient is standing upright and the hips are locked, it is essential that the knee-release cables be slack (no tension on the knee-lock levers) - otherwise the knees may unlock when the patient ambulates.
- The knee-locks must disengage before the hip driving links (where the reciprocating drive cable attaches) strike the hip yokes - to enable the knees to unlock. The knee-locks disengage when the knee-release cables are pulled as the patient leans forward.
- When the patient leans forward, the knees must unlock simultaneously to avoid twisting and possibly falling.

Principle of Operation:

The principle of operation is quite simple; flexion of the hips tightens the knee-release cables, thus unlocking the knees. The thoracic steels act like "release levers" that must move forward to disengage the knee-locks. If hip flexion is inadequate, the knees will not unlock. Patients who have difficulty releasing the knee-locks to stand, probably do not obtain enough hip flexion or they flex sufficiently initially, then they sit up-right just before standing which causes the knees to relock. This is the most common problem when learning to stand with an ARGO.

Adjustment:

- 1) With the ARGO fully assembled and AFOs installed, place the orthosis in a standing position (no patient) with the hips and knees locked. Make sure that the knee-release cable shrouds are straight. If the shrouds are curved, heat carefully and straighten. Loosen the knee-release cable turnbuckle* until the cable is slack (fig. 1)..
* note: when assembling the turnbuckle, make sure that the upper and lower threads begin simultaneously
- 2) Hold the cable link casting against the hip yoke (fig. 2) and tighten the knee-release cable by rotating the turnbuckle until the knee-lock lever just begins to move. Then back off one full revolution on the turnbuckle and secure the turnbuckle locking collar.
- 3) Repeat this process for the other knee.
- 4) Check to see that the knees unlock simultaneously when the hips are unlocked and flexed. If not, slacken (i.e. 1/4 turn) the knee-release cable for the side that unlocks first and test again. Continue this process until both knees unlock simultaneously, then secure the turnbuckle locking collars.
- 5) Have the patient don the brace and check to see if they can stand (with assistance from PT) using parallel bars or a walker. Check to see that they flex sufficiently at the hips (10-15 degrees) to unlock the knees. If either knee fails to unlock, tighten (1/4 turn increments) the knee-release cable on the side that does not release. Secure the locking collar on the turnbuckle and have the patient repeat this process. Continue until both knees unlock satisfactorily.
- 6) Have the patient stand between parallel bars with the hips and knees locked, hold the cable link casting against the hip yoke and check to see that the knee-release cable is slack. This will assure that the knees will not unlock while the patient is walking. If the knee-release cables are too tight, it may allow the knees to unlock prematurely when the patient begins to sit down.
- 7) Have the patient flex at the hips to see that the knee-locks release simultaneously allowing the patient to sit down (assisted by PT).
- 8) Repeat this standing and sitting process several times to confirm that the knee-release cables are properly adjusted. Check to see that all fasteners are tight and confirm that the locking collars on the knee-release cable turnbuckles are secure.
- 9) All screws on the brace must be secured with Loctite thread locking compound once the adjustments have been completed. This is especially important for the turnbuckles. The locking collar alone is insufficient to assure that this adjustment will not change.
- 10) Periodically check the cables for kinks and fraying. Readjust and replace knee-release cables as necessary. The knee-release cables may bow slightly due to the upward pressure caused by sitting in soft chairs. This will shorten the cable and as a result, you may need to straighten these periodically or lengthen the cable.