

# ARGO TECHNICAL MANUAL (READ FIRST)

Literature Number L21600, Issue 2, 8<sup>th</sup> November 1999

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This guide accompanies all of the Steeper Advanced Reciprocating Gait Orthosis products. It provides the guidelines for use by the clinic team and should be read by Orthotist, Physiotherapist and Medical Practitioner responsible for the patient.



Always refer to the latest issue of this manual, to ensure that important design or safety information is not missed. All information in this manual is correct at the time of publication and may be updated by product bulletins or later revisions.

### Revision History

L21600      8<sup>th</sup> November 1999      ARGO Technical Manual, Issue 1



For further information on the ARGO range, please contact your authorised supplier who will advise you on approved courses and supply the ARGO assessment and ordering manual, L21597.

Each ARGO is supplied with a workshop assembly manual which addresses specific information for each of the products in the range, extra copies are available on request.

 **ARGO Hot-line**

**+44 (0) 1634 226161**



### **RSL Steeper**

Riverside Orthopaedic Centre  
51 Riverside II  
Medway City Estate  
Rochester  
Kent  
ME2 4DP

Tel: 01634 297010 / Fax: 01634 297011

Email: [sales@rehab.co.uk](mailto:sales@rehab.co.uk)

[www.rslsteeper.com](http://www.rslsteeper.com)

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## Section 1

*The ARGO range of walking braces are provided in kit form to suit a wide range of patient needs. This manual addresses issues common to all products in the range.*

### Training Courses

Assembly and Fitting of the ARGOS should only be carried out by qualified personnel who have successfully attended a RSL Steeper approved training course.

It is strongly advised that all members of the clinic team are familiar of the construction of the braces and are familiar with the technical and physiotherapy manuals.

### User registration scheme

A user registration form is provided in the ARGO kit. Details of the patient should be filled in and the form returned to RSL Steeper.

This information can be used by RSL Steeper as a reference for any enquiries concerning that particular patient and can also be entered into our statistical database to provide information for the design of improved braces.

### Customer reports

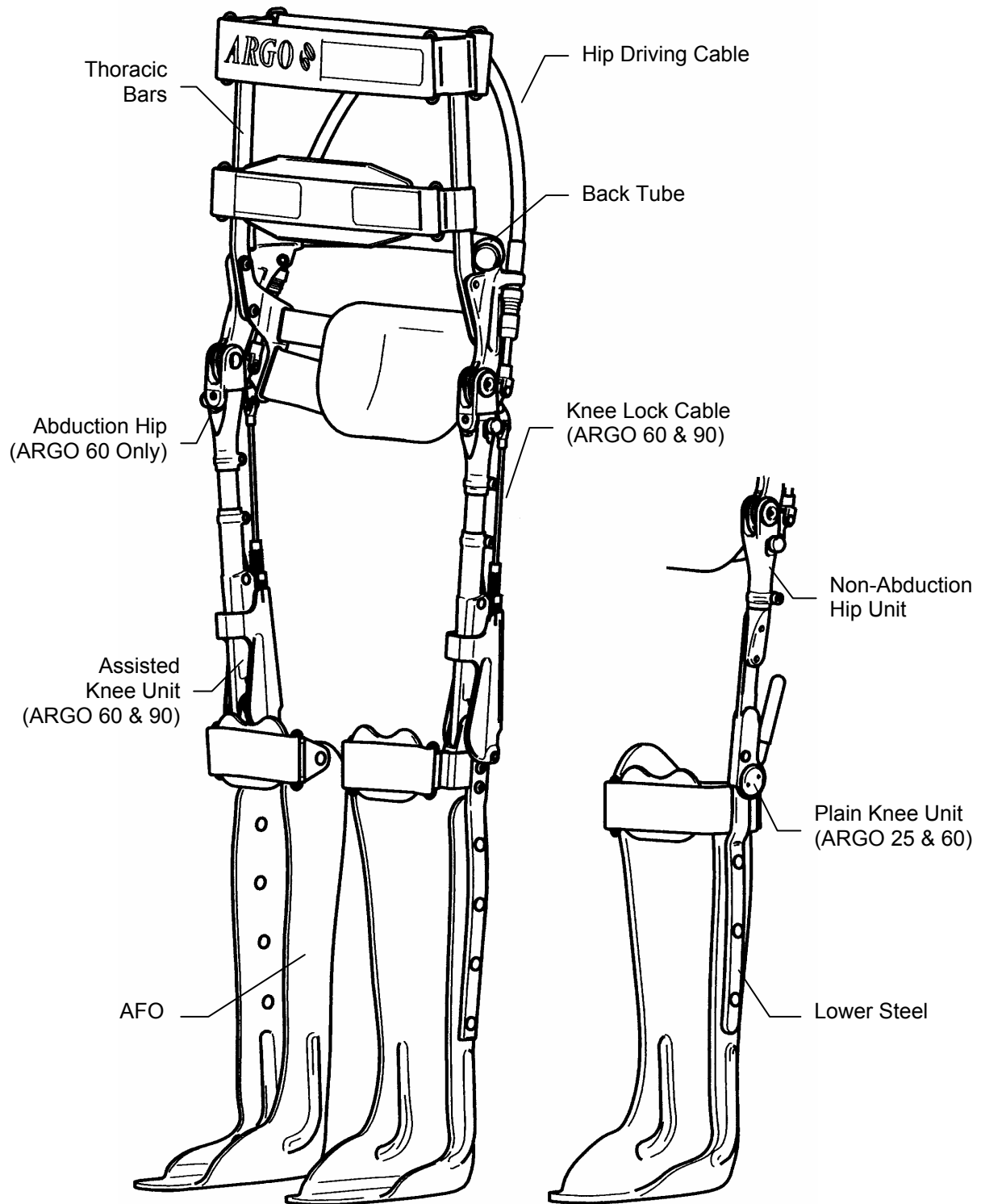
Customer Reports commenting on any aspect of the ARGO braces or their use can be sent to:

ARGO Product Manager,  
RSL Steeper  
Riverside Orthopaedic Centre  
51 Riverside II  
Medway City Estate  
Rochester  
Kent  
ME2 4DP  
England

Tel: +44 (0) 1634 297010  
Fax: +44 (0) 1634 297011

These reports are reviewed by Quality Assurance and the Design Team so that necessary and worthwhile improvements can be made to the design and construction of the ARGOS.

## ARGO Main Features



This diagram shows an ARGO 60  
on the ARGO 25 and ARGO 90 the features may look different  
but part names are similar throughout the range.

## Section 2

*The process of fitting an ARGO is outlined below in a number of key stages.*

### Fitting an ARGO

#### ***Clinic team training***

The clinic team, as a minimum, should include an orthotist, a physiotherapist, a doctor and of course the potential user. Teams with a full understanding of the ARGO product and the fitting process will achieve maximum success. Similarly, each member of the clinic team must be aware of the problems caused by:

- Poor patient selection
- Too little patient training
- Badly constructed brace
- Lack of maintenance

Ideally members of the team should have attended a RSL Steeper approved training course and will discuss with the user each of the key stages.

#### ***Assessment and Ordering***



A complete guide to the assessment and ordering of an ARGO is given in literature number L21597 which is available from RSL Steeper. This guide also contains a measure chart and it is useful at the measurement stage to trace an outline of the patient.

#### ***The Features of an ARGO***

ARGO walking braces are provided in a number of kits to cover a wide range of patient needs. However, they are characterised by a number of similar features as outlined in the diagram opposite. The team members should be familiar with the names of these components.



Every ARGO is supplied with a workshop manual which gives details of assembly specific to the each type of brace.

#### ***The Ankle-Foot Orthosis (AFO)***

There are a number of special requirements for ARGO AFOs which are covered in section 3 of this manual.

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### ***First fitting of the ARGO***

The first fitting session should be used in a number of ways:

- The primary role is to check and adjust the fit of the ARGO.
- At this stage time should also be set aside to explain how the ARGO works. Especially take time to explain the differences with other walking aids the patient may have used in the past.
- Start to establish the procedure for putting on and taking off the brace.

### ***ARGO Training***

Training will be conducted in a number of phases

- Pre-fitting training
- Training to use the ARGO
- Walking training  
&
- Training for independent use of the ARGO



The ARGO physiotherapy manual, L21747, is provided as a guide to ARGO training and clinic teams will build on this with experience.

### ***Continuing Support***

After the training period is complete the centre will need to prepare the patient for discharge and discuss arrangements for maintenance and review clinics.

## Section 3

*The making of the AFO is key to the success of the ARGO and care should be taken at this stage to prepare a good base on which to build the rest of the brace.*

### Making the AFO

#### ***The purpose of the AFO***

The AFO has a number of roles:-

- It transmits the loads of standing and walking to the rest of the ARGO.
- It fixes the patient's ankle in the correct position.
- It supports the patient's knee during standing and walking.



**The AFO is subjected to high loads when the patient walks and should be constructed to the following recommendations.**

#### ***Special features for ARGO AFOs***

Success of the ARGO AFO is dependant on a number of features:-

- Moulded in 6mm thick polypropylene homopolymer (4.5mm thickness may be adequate for the smaller ARGO 25 and 60 patients).
- The addition of strengthening ribs and, in larger patients, carbon fibre inserts.
- The ankle set at 90° accommodating the shoe pitch, except in cases of ankle plantar flexion where a small heel raise (up to 5°) can be added.
- The provision of medial knee support.
- Full support for the sole of the foot.

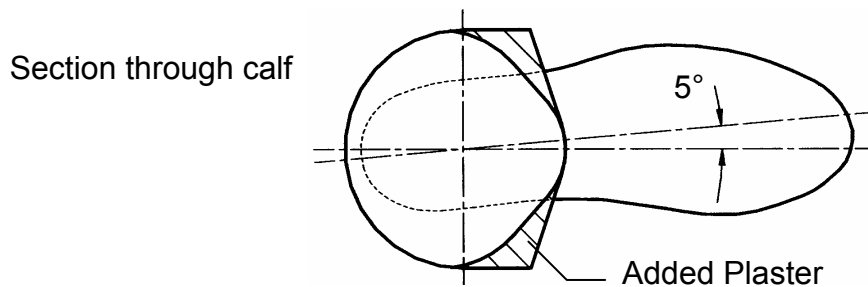
#### ***Casting the patient***

- The cast should be taken from 50mm above the knee and down to the toes. (The distance above the knee may be reduced for the smallest ARGO 25 patients).
- Set the ankle so that the leg will be vertical, allowing for the heel height of the shoes which will be worn.
- Avoid any internal rotation of the knees or ankle.

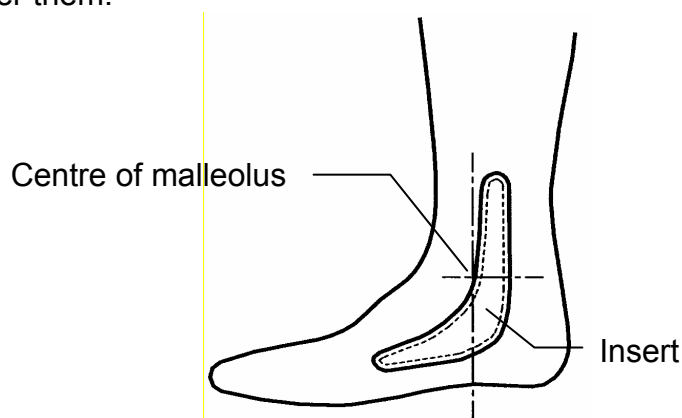
#### ***Preparing the positive mould***

- Build up any areas which may cause too much pressure on the leg. E.g.
  - medial and lateral metatarsal joints;
  - base of the 5th metatarsal joint;
  - navicular;
  - medial malleolus and lateral malleolus;
  - fibula head;
  - medial and lateral knee centres;

- Make the sides of the cast parallel so the brace can be put on easily by the patient.



- Flatten the sole of the foot.
- Strengthening ribs may be made by attaching a length of flexible cord to the cast. Alternatively carbon fibre inserts may be moulded to fit the cast and the AFO moulded over them.



### ***Moulding the AFO***

- Warm the material following the manufacturers recommendations for temperature and time. When the material is soft enough, drape by hand initially, taking care to eliminate any creases.
- When moulding the AFO take care not to weaken the support by stretching the plastic too far, especially around the ankle.
- Apply a vacuum to ensure a good moulding especially around the strengthening inserts.
- Check that the plastic has cooled thoroughly before removing it from the positive cast. Plastic which is still warm may spring back out of shape.

### ***Cutting and trimming the AFO***

- The AFOs must extend up on the inside of the leg to support the knee. Where extra stability is required it may be extended on the outside of the knee as well.
- The base of the AFO must support all of the sole of the foot.
- Take care to ensure all edges are smoothed.

### ***Fitting of the AFO***

Correct fitting of the AFO is key to good patient balance and therefore the ultimate success of the ARGO. Care should be taken to ensure that the lower steels are positioned along the mid-line of the leg.

## Section 4

*The first fitting session is used to check that the ARGO is correctly adjusted for the patient before the programme of training begins.*

### First Fitting of the ARGO

#### **Checking the brace before fitting to the patient**

Carry out the following checks before the patient puts on the ARGO.

- ◇ Check all screws for tightness.
- ◇ Operate the hip and knee locks and check the standing and sitting mechanism.
- ◇ Walk the brace manually to check the hip driving mechanism.

#### **Checking the fit of the brace**

- ◇ To put on the brace, sit the patient on a bed and lift the brace over their head.
- ◇ Make sure that the patient is sitting well back into the hip section.
- ◇ Lie the patient back carefully into the upper section of the brace.
- ◇ First check the fit of the AFOs. The patient will be more comfortable with a pillow or low backrest while the AFOs are checked.
- ◇ Check that the AFOs fit well around the knees, the popliteal region, and around the ankles.
- ◇ Put on the shoes that are to be worn with the brace. It may be necessary to remove material from the AFOs or to reshape them to avoid any areas pressing too hard against the skin.
- ◇ On an ARGO 60 with assisted knees, in particular, check the alignment of the knee joints. Any amount of twisting on the thigh tubes should be corrected by loosening, resetting and then re-tightening the clamps. DO NOT attempt to twist the knee joints with fully tightened clamps as this will weaken the joints.
- ◇ Position the knee support straps. These may be fixed permanently with the rivets provided or temporarily using countersunk screws and nuts.
- ◇ The knee support straps should be as high as possible on the tibia.
- ◇ The patient should now be laid back flat in the brace and the hip to knee distance checked.
- ◇ Check that the thoracic bars are correctly shaped to fit the chest. At first, the bars should be trimmed to mid thorax level. Further trimming can be done later if required.
- ◇ After tightening the straps the patient can be stood up between parallel bars.
- ◇ Re-adjust the straps as necessary so that the patient is standing up straight.
- ◇ Make sure that there is good support at the knees and that the knee joints are in the correct position.
- ◇ Check that the hip joints are level with each other and that there is enough room between them and the ARGO hip joints.
- ◇ Re-check the fit of the thoracic steels and that they are a comfortable length.

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### ***Adjusting the standing balance***

The patient usually cannot maintain a balanced position without some training and practice. At the first fitting it is possible to adjust the brace so that the patient has a well balanced posture.

More detailed guidelines for putting the brace on, taking it off and initial standing training are given in the physiotherapy manual.

It is likely that the patient will lack confidence at first so it is advised that they stand with hips and knees locked between the parallel bars with the therapist or orthotist facing them. The patient should stand with their arms by their sides and with the therapist or orthotist holding them upright at the waist or shoulders. The patient is then momentarily released to see which way they start to move.

If the patient falls to one side:-

- ◇ Check that the hip joints are at equal angles.
- ◇ Check that the AFOs are set at equal angles 50 -100 mm apart at the heels and angled out by 5-8° if possible.
- ◇ Make sure that the thoracic bars are not pushing the patient to one side.
- ◇ If the legs are different lengths then an insole should be fitted to the shorter side or if greater adjustment is needed extra thickness added to the sole of the shoe.

If the patient tends to fall forwards or backwards:-

- ◇ Check that the patient has a good upright posture and if necessary adjust the straps to achieve this.
- ◇ Add wedges to the shoes either as insoles or as a build up to the soles.

### ***Checking for pressure marks***

Lie the patient back on the bed and remove the brace.

- ◇ Check carefully for any marks on the patients skin where there has been too much pressure from the brace. Any areas of high pressure must be relieved to avoid pressure sores when the brace is in use.
- ◇ Check particularly, the foot and places where the edges of the AFOs touch the patient.
- ◇ Check also that the thoracic bars, the back tube and the hip driving cable do not rub on the patient.



**It is not safe to start walking in the ARGO until all the following section on finishing has been completed.**

## Section 5

*After the brace has been adjusted to fit the patient it should be finished and made ready for walking.*

### Finishing the ARGO



Full instructions for finishing are given in the workshop assembly manual, which draws attention to particular details of the ARGO 25, 60 and 90. The most important areas are outlined below for reference:

#### **Back tube clamps**

The initial setting of the clamps is useful only for fitting checks. Follow the final tightening instructions given in the appropriate workshop manual, before the patient attempts to walk in the ARGO.

#### **Thigh tube clamps (ARGO 60)**

ARGO 60s fitted with assisted knee units will also need a final setting on the screw for the thigh tube clamps, this is detailed in the ARGO 60 workshop manual.

#### **Riveting the AFO**

The AFOs should be attached using the 5/32"x1"x140° stainless steel rivets supplied. Between 3 and 5 rivets will be required depending on the size of the patient (3 typically suits smaller ARGO 25 and 60 patients, and 5 will be required on the larger ARGO 90 patients).

#### **Locking the screws**

Check that all screws are tight. Particular attention is drawn to screws which should be "thread-locked" in the workshop manuals.

#### **Straps and pads**

Where temporary fixtures have been used for strap loops, these should now be fixed in position using the fasteners provided.

#### **Final checks**

- ◇ Check that all the operations above have been done correctly.
- ◇ Check that the hip and knee locks work properly.
- ◇ Check that the sitting knee locks work properly.
- ◇ Check that there are no rough or sharp edges that could cause injury to the patient.

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## Section 6

*Before the patient is ready to walk away from the clinical team for the first time some final points should be covered.*

### Continuing support

#### ***User instruction leaflet***

Each ARGO is supplied with a User Instruction leaflet. This should be given to the user and each of the points explained.

#### ***Preparing the patient for discharge from the clinic***



**It is essential that the patient, and in the case of children, the family or carers, be thoroughly advised of the significance of pressure sores and given detailed instruction on how to check pressure areas each time they remove the brace.**

- The patient must be advised never to try to adjust the brace themselves. If they think that there is a problem with the brace they must consult the orthotist.
- The patient should check their skin for pressure areas after they remove the brace each day. If any red marks have appeared, the time taken for them to recede should be noted.
- The patient should be encouraged to wear the brace every day, for as long as is practical.
- If they have it on all the time then they will find more opportunities to get up and walk. If this is not possible then a certain amount of time should be set aside each day for walking. Missing one or two days a week is acceptable but regular walking is essential to maintain the fitness to be able to do it easily.
- Walking should be seen as an essential part of the day, not a chore to be endured.
- Maintaining an exercise programme is also important and one should be worked out to suit the patient prior to discharge from the clinic.
- The patient should be advised to try to keep to their present weight as gaining or losing weight could alter the fit of the brace and make adjustments necessary.

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### **Review clinics**

The physiotherapist and orthotist should hold joint follow up clinics. The patient should be reviewed after three months in the first instance and then six monthly unless problems arise in the meantime.

Spinal posture, technique, speed and safety of walking should all be checked prior to assessment of the patient and brace by the orthotist.

A follow up assessment should be carried out by the therapist and should include the following questions;

- ◇ Is the brace worn every day?
- ◇ How long is the brace worn for each day?
- ◇ What difficulties is the patient experiencing?
- ◇ Are they having any pain or problems with pressure areas?
- ◇ Has the patient gained or lost weight?
- ◇ What has been the effect on any spasm (if any)?
- ◇ Has there been any change in bowel or bladder habits?

A specific follow up form may be useful.

### **Looking after the ARGO**

It is important to establish a programme of inspection and maintenance. As with all mechanical components, the ARGO will be subject to wear and tear over time and will differ from patient to patient depending on the degree of use it gets. Initially checks should be made at least every three months until the pattern of usage is established.



The workshop manual supplied highlights maintenance areas specific to each brace and forms the basis of a maintenance checklist.

In general all members of the team should be trained to pay particular attention to AFOs, wear on moving joints, cables and cable attachments. Particular attention is drawn to the need to replace cables on an annual basis to ensure continuing success. They should also note the fit of the brace especially in growing younger patients.

**END**