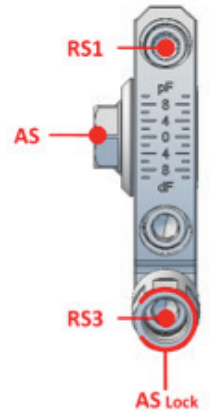


Triple Action® Stance/Swing Control Ankle Joint

This clinical guide describes the features and application of the Triple Action® Stance/Swing Control Ankle Joint. The guide includes a quick reference for the experienced user and a detailed optimization procedure intended as a starting point for component adjustment. The procedure is intended to simplify optimization and help ensure the most positive clinical outcome. For patients undergoing rehabilitation, the procedure may be repeated to keep pace with the patient's therapeutic needs. The goals of component optimization include patient safety, knee stability and gait symmetry with the greatest active range of ankle motion for ambulatory patients.

	EFFECT OF ADJUSTMENT	ADJUSTMENT RANGE	REFERENCE	OPTIONS
Alignment Setting (AS)	Changes ankle angle with component locked or neutral angle with component active	AS XX D/P ¹ AS 10D - AS 10P (± 10°)	0° corresponds to fabrication angle. The alignment setting (AS) is read directly from the scale on top of the component body.	None
Resist Setting 1 (RS1)	Adjusts plantarflexion resistance and ankle range of motion (5°/turn) ²	RS1 XX ^{3,4} RS1 00 ⁵ - RS1 30 (Max ROM of 15°)	Full CW corresponds to RS1 00 with component locked. Count turns CCW away from RS1 00 to meter setting.	Standard torque spring and pin installed. Optional high torque spring and pin included for patients with high tone or greater than 80 kg [180 lb].
Resist 2	Resists dorsiflexion to stabilize knee in 2 nd rocker	R2 Not Adjustable	None	None
Resist Setting 3 (RS3)	Adjusts dorsiflexion resistance and ankle range of motion (3°/turn) ⁴	RS3 XX ^{3,4} RS3 00 ⁵ - RS3 40 (Max ROM of 12°)	Full CW corresponds to RS3 00 with component locked. Count turns CCW away from RS3 00 to meter setting.	None



¹ Nomenclature for Alignment Setting - replace XX with degrees, D for dorsiflexion or P for plantarflexion. Ex. 4° of dorsiflexion would be AS 04D.

² Turning the adjustment screw CCW decreases the resistance and increases the active ROM.

³ Nomenclature for Resist Settings 1 and 3 - replace XX with the number of turns away from full CW. Ex. One and a half turns CCW would be RS1 15.

⁴ The RS1 and RS3 adjustment screws are pre-coated with a thread locking adhesive. The coating will allow up to 3 adjustment cycles without the application of additional thread locking adhesive.

⁵ When locking RS1 and RS3 do not over tighten the adjustment screws. Doing so will bind the stirrup.

Making Adjustments



Alignment Setting [AS]

1. Loosen the alignment lock nut ¼ turn.
2. Adjust the alignment setting.
3. Lock the alignment by tightening the alignment lock nut ¼ turn.



Resist Setting 1 [RS1]

1. Insert the adjustment tool in the adjustment screw, and rotate the screw clockwise to increase resistance, counterclockwise to decrease resistance.



Resist Setting 3 [RS3]

1. Loosen the alignment lock nut ¼ turn.
2. Adjust the RS3 adjustment screw while holding the alignment lock nut.
3. Lock the alignment by tightening the alignment lock nut ¼ turn while holding the RS3 adjustment screw.

Quick Reference Optimization Procedure

- Step 1. Install the appropriate RS1 standard or high torque spring, and **Bench adjust** the component to AS 00 / RS1 00 / RS3 00.
- Step 2. With the patient standing, **Adjust AS** to improve the patient's sense of balance and center the weight line over the mid foot.
- Step 3. With the patient walking, **Optimize AS** to achieve appropriate toe clearance in swing and foot positioning at initial contact. With the patient walking, **Decrease the resistance to plantarflexion by adjusting RS1** to maximize ankle ROM while maintaining toe clearance in swing and foot position at initial contact.
- Step 4. With the patient walking, **Optimize the adjustment of RS1** to the minimum resistance needed to prevent foot slap secondary to plantarflexion and resist knee hyperextension in early stance. During this optimization, if possible maintain a minimum 3° of active plantarflexion. If higher resistance to plantarflexion is necessary to control knee extension, try alternatively adjusting AS toward dorsiflexion with a minimum RS1 setting of RS1 05 to improve knee position.
- Step 5. With the patient walking, **Adjust RS3** to improve knee position in mid and late stance, and maximize knee flexion in pre-swing.

Detailed Optimization Procedure

Step 1. Bench Adjustment

OBJECTIVE

- To pre-set the Triple Action component settings in preparation for static adjustment.

PROCEDURE

- For patients with high tone or weight greater than 80 kg [180 lbs], install the high torque RS1 spring, pin and adjustment screw.
- If the component has been adjusted 3 times previously, add a drop of Blue Loctite to the RS1 and RS3 adjustment screws.
- Adjust the component to the following settings: AS 00 (fabrication angle) / RS1 00 (locked) / RS3 00 (locked).

NOTE

- When setting RS1 00 or RS3 00, fully tighten the adjustment screw CW then back off by ¼ turn to avoid binding the stirrup.

Step 2. Static Adjustment for Balance and Stability

OBJECTIVE

- To optimize the alignment setting for the patient's sense of balance and comfort in quiet standing with the patient maximally supported, and to initialize the alignment setting for dynamic adjustments.

PROCEDURE

- With the patient standing, observe the weight line with respect to the hip, knee and ankle joints and the mid foot.
- Adjust AS to improve the patient's sense of balance and center the weight line over the mid foot.

NOTE

- Use discretion when adjusting AS towards dorsiflexion. If the patient has insufficient range of motion in dorsiflexion to achieve desired alignment due to contracture, wedge the heel of the orthosis or shoe to incline the shank to the desired angle.

Step 3. Dynamic Swing Phase Adjustment for Toe Clearance and Foot Position

OBJECTIVE

- To optimally position the foot for toe clearance in mid swing and for heel strike at initial contact by adjustment of AS and RS1. RS1 should prevent plantarflexion during swing while permitting as much active ankle ROM as possible.

PROCEDURE

- With the patient walking, observe foot position in mid swing. Also observe foot position at initial contact by noting the acute angle between the sole of the shoe and the floor (foot to floor angle (FFA)).
- Adjust AS to achieve appropriate toe clearance in mid swing and foot position at initial contact.
- After adjusting AS, Adjust RS1 to allow ROM at the ankle while maintaining toe clearance in swing and heel strike at initial contact.

NOTE

- In some cases, AS may not significantly affect toe clearance or FFA due to biomechanical compensation at the knee and/or hip.

Step 4. Dynamic Stance Phase Adjustment for Knee Stability in Early Stance

OBJECTIVE

- To provide knee stability in early stance while maintaining controlled active plantarflexion in 1st rocker, toe clearance in mid swing and heel strike at initial contact.

PROCEDURE

- With patient walking, observe the rate of change in FFA and knee position through loading response and early stance.
- Adjust RS1 to the minimum resistance needed to prevent rapid changes in FFA secondary to plantarflexion at loading response.
- If knee hyperextension is present in early stance, increase RS1 resistance until knee position is improved. If possible, maintain RS1 05 or higher setting to preserve 3° or more of active ankle plantarflexion. If higher resistance is required to resist knee hyperextension, alternatively set RS1 05 and adjust AS towards dorsiflexion to reduce knee hyperextension in early stance.
- If an increase in AS towards dorsiflexion causes a knee flexion instability, return AS to the previous setting and adjust only RS1.

Step 5. Dynamic Stance Phase Adjustment for Knee Stability in Late Stance

OBJECTIVE

- To provide controlled tibial progression and stability through mid to late stance.

PROCEDURE

- With patient walking, observe knee position in mid to late stance.
- If the knee is neutral or hyperextended in late stance adjust RS3 until an appropriate amount of knee flexion is achieved.
- If the knee flexes excessively in late stance, leave RS3 in the original, locked setting and adjust AS toward plantarflexion to reduce knee flexion while ensuring toe clearance in swing and heel strike at initial contact are maintained.
- If AS is manipulated in this step, but does not have an effect on knee flexion, return AS to its previous setting.

NOTE

- For patients with limited dorsiflexion ROM, adjusting RS3 may not have a large impact.

