

Canting for ski racers

The purpose of canting is to address a stance issue, typically pronation. Most skiers have some level of pronation, very few go to boot fitters to address it. In adult ski boots there is a limited amount of cant adjustment, usually found in the upper cuff of higher end boots. Kids boots rarely have this adjustment, most racers are kids so other means are necessary to adjust cant.

The need for canting is apparent from a coach perspective when coaching and drills is not able to address a more active inside foot and leg. This shows up in skiing when knees are closer together than the feet as illustrated to the right--> It is an issue as tipping both skis is limited by the inside ski. In order to progress as a skier and racer, this must be addressed.



Measuring cant is challenging and refined incrementally by trial and error. Pronation occurs mostly in the ankle, though it is often attributed to flat feet or collapsed arches. Foot beds can help and are recommended for adults, but are impractical for growing kids. Even with custom footbeds, pronation is not usually addressed with just foot beds. Footbeds are great for supporting the foot and specifically the arch while increasing the comfort of being in ski boots for hours (8-12).

Cant measuring tools are a bit elusive and generally not available on the market. The tools around are typically in the hands of baby boomers and were picked up in Europe often 30-40 years ago. Methods used are coaches lore unless time is spent in Colorado, Utah, or Vermont boot fitting shops. The goal here is to layout repeatable and measurable methods to benefit skiers of all types.



The central element of cant measuring tends to be a rocking platform to balance on, an upright with a centerline and some means of measuring how much off center the stance is usually by referencing the knee. Additional equipment needed are anthropometric calipers for establishing overall knee width and finding center.

Other than that, methods seem to vary a bit in how that is accomplished. This is an attempt to outline the commonalities as well as the differences. All with the same

purpose of addressing a skier's cant. When working with a small group of skiers (under 20), measuring knees and cant at the same time can be beneficial. This example is in the image here. See how the skier is standing in their skiing stance on both the cant device as well as a block of wood so the height off the floor is the same. These calipers have centimeter measurements on the inside edge. Placing the

calipers against the cant upright ensures that the calipers are perpendicular to the upright for consistently. In this example, the knee was 90mm or 9cm wide, measured from the top of the fibula head on the outside of the knee. The center of the knee would then be 45mm or 4.5 cm. A 0 cant would have had the center of the upright gap right at 45. However the upright leaned to the inside of the knee, placing the gap center at 50mm or 5 cm. The difference between actual center and cant measured center is 5mm or half cm. This equates to a 1/2 degree cant angle. This skier pronates by half degree on his right foot. This method uses a singular center line represented by the 10mm gap. Measuring the actual center while allowing the cant center to be visible and taking the difference, understanding that every 5mm inside is 1/2 degree pronation.



Limitations of this method are if there is a greater than 1.5 degree cant angle. The position of the upright between the calipers, limits the movement of the upright when more extreme angles are present. Fortunately, most skiers are within 1.5 degree cant, but not all.

Another method would be to keep the upright outside the calipers, resting against the back edge and using measurements along that side of the calipers. This allows

the upright to more easily swing beyond the calipers when more extreme cant angles are present.



Here is a great video on boot canting. This is two cant measurement devices side by side.

<https://www.youtube.com/watch?v=CiopQ1Rv7as>

This Utah boot fitter measured the knee at the fibula head and marked the knee center first. This allows



different boots and cant shims to be used while maintaining a constant knee center mark. With these cant devices the upright is clear with a single line down the center. Instead of measuring how many millimeters off, placed shims in 1/2 degree increments provide that dimension by seeing what gets the center line to align with the knee center mark.

Ideally everyone could afford a trip to a shop like this one and get this work done. That's not always an option.

Another way to measure cant would be to measure the knee at fibula head and mark the knee center. This is just below the knee cap. Using a plumb bob on a string hold the string at the center point on the knee. With a centimeter ruler at the toe piece lined up to the molded center line of the boot, note the plumb bob position in millimeters inside (big toe side) of the centerline.