

Skiing Simplified: Separation, Curves, and Lines

Lines and Curves for Separation and Balance

The purpose of this document is to define two lines for separation used to balance when skiing. In other words, it defines the upper and lower body separation used to balance in terms of two momentum curves and two corresponding straight lines used to maintain that balance. Obviously, balance is most important, and this understanding of lines and curves is required to maintain balance when skiing. Everything described here applies to all levels of skiing: beginning to expert; and all types of racing: Slalom to Downhill.

Momentum Curves, their Points, and Pole Plants

Because of the shape of skis, the lower part of the body is on a momentum curve. Likewise, the upper part of the body centered at the heart is on a second momentum curve. These two curves intersect at the pole plant. The pole plant begins at the fall line below the center of the turn. Here we will call the center of the turn “the gate”. In free skiing it could be the center of a bump. The pole plant is where we use separation to change the upper body orientation to the next fall line. Likewise, for the other momentum curve, the rise line is where we use separation to change lower body orientation to the next rise line. So, we are defining points, lines and curves for the separation required to maintain skiing balance.

Two Lines for Balance, and Constant Separation

The two lines for balance are the straight line from your heart to the fall line point, and the straight line from your feet to the rise line point. So, even though your heart and your feet are traveling in curves, they are always oriented straight to a point. The orientation changes at the pole plant for the heart, and at the rise line point for the feet. To keep both these lines straight requires constant upper and lower body separation.

Fall Line Points and Rise Line Points

The two lines for balance are the lines between the points from one turn to the next. The radius of the turn defines the points above and below the center of the turn. The point on the fall line is also the beginning of the pole plant. So we have a fall line point and a rise line point; in other words, a point above the gate and a point below the gate.

Heart Reference Point and Feet Reference Point

The two lines are the reference lines between the gates from one turn to the next. So, we have an upper body point of reference down below the gate on the fall line, and a lower body point of reference above the gate on the rise line. At the pole plant the upper body faces the next fall line point below the gate. Likewise, at the pole plant the lower body is facing the next point above the gate. In transition from one turn to the next, the heart continues to face its reference point and the feet continue to face their reference point.

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The Radius of the Turn, Balance, Ankle Flexion

The radius of the turn is related to the radius of the skis. Other factors in the radius of the turn are the result of these separation points, lines and curves, plus gravity and terrain. The shape of the ski is responsible for the curves of momentum, and a separate curve of momentum for the upper body is required for maintaining balance while putting the skis on edge. Maintaining balance is defined as keeping the center of mass between the feet and the center of the turn. This document focuses on the separate lines and separate curves associated with upper and lower body separation required for balance. The next document will address the ankle flexion required to stay balanced so we can easily change lines, and actually have the pole plant at the fall line.

Summary: Two Lines for Separation and Balance

The purpose of this document is to define two lines for separation used to balance when skiing. Using these lines it defines the upper and lower body separation used to balance in terms of two momentum curves and two corresponding straight lines used to maintain that balance. Obviously, balance is most important, and this understanding of these lines and curves is required to maintain balance when skiing. Everything described here applies to all levels of skiing: beginning to expert; and all types of racing: Slalom to Downhill.