Skiing Simplified: Forward Movement

Forward Movement

The purpose of this document is to define fore and aft movement over the skis. In previous "Skiing Simplified" documents, I have defined the tools we use in skiing besides the skis themselves, tools like the "L" Shaped Tool (ski boot), the Arms for Balance, and using forces as tools like Momentum, Gravity and Terrain. I have also talked about the Down portion of a turn and separated it from the Left and Right Transitions. Using these tools, fore and aft movement starts in the transition. In fact, fore and aft movement seems to require each of these tools to be used separately. Doing so, we develop a pendulum effect. Because the result of not using each of these tools separately results in too much backward movement, everyone seems to want forward movement. Therefore, to match popular demand I am calling this document just "Forward Movement".

Backward Movement Required

Forward movement requires aft or backward movement. Like speeding up or slowing down, they are opposites. One uses the boot one way and the other uses the boot the other way. They both have their part in any type turn, and their parts are related to the forces of terrain and gravity in transition. In the down part of a turn we stay centered on the ski, use lateral movement (lateral extension and contraction), feet centered with no fore or aft movement. But, to take advantage of terrain and gravity in transition we move our balance point a little bit up and down the length of the ski. In other words, for the same reason we like to move our balance forward (feet back) at the beginning of a turn, we want to move it backward (feet forward) at the end: to use the tools of terrain and gravity to our advantage. Plus, gravity causes a pendulum (child's swing type) effect that helps us move fore and aft.

Inside the "L" Shaped Tool

These subtle fore and aft movements help us balance. Focusing the balance point within the stiff "L" shaped tool (called a ski boot) this slight movement shifts the focal point from the heel and outside of the foot to the toe and inside of the foot throughout the transition. Therefore, in both the down portion of a turn and the middle of the transition the weight is evenly distributed over the whole foot (both feet and centered), with no torque. The transition or left and right portions of the turn includes the exit from and entry to the turn. In 180 turn degrees (no matter where the turn starts or ends) each part would cover no more than 45 degrees, with the two-part down portion covering no more than 90 degrees. Each part uses the tools in opposing ways. So, I believe the secret for balance is to never combine tools. In other words, never combine movements or combine (in the boot) turning leverage. But, combine a movement with its corresponding turning leverage for each of the four turn-parts. For example: forward movement (feet back) goes with front of the foot torque when moving away from the terrain. Backward movement (feet forward) goes with the back of the foot torque (top leg of the boot "L") when moving into the terrain. In both down-parts, lateral Extension Movement upside-down into the fall line goes without torque equally balanced in the middle of the foot, and ends with no more than 45 degrees of turn, and

lateral compression movement (also equally balanced in the middle of the foot and without torque) ends with no more than 45 degrees of turn.

Pendulum (Child's Swing) Transition Movements

There are four parts to a turn, two of them are in transition when we are going left or right and two of them are in the down-part of the turn. No matter what type of turn (accelerating (arching) or decelerating (pivot)), the lateral movements are in the down portion of the turn and these fore and aft movements are in transition. The transition (left and right portions) of the turn includes the (no more than) 45 degree entry to and the (no more than) 45 degree exit from the turn. The pendulum (child's swing fore and aft) transition movements begin at the end of the lateral movement. They begin with the (previously mentioned feet forward gravity assisted) aft movement causing release of torque or edge angle initiated by the outside of the feet and heels. Using gravity, from our down position the skis move back underneath us where we again use gravity to pendulum forward (feet back) into the next turn using the front lever of our boots around the inside of our feet and our big toes. Depending on where we extend in the turn or what we want to do while the skis are un-weighted, they are either toe to heel or heel to toe pendulum movements. A 45 degree foot forward skating move (a backward movement) would be toe to heel and the opposite movement (a skis stay parallel, foot back, forward movement) would be heel to toe. As far as hip movements go, the first is like running forward and the second (a heel to toe, feet back, pendulum movement) is like running backward. Here are three slow motion pendulum movement examples. It is very important in this second part of the transition to stay down until we get the skis completely on edge.

Terrain Dictates

Fore and aft movement is pendulum movement, and the steeper the terrain the more we need pendulum movement. In other words, terrain dictates how we use boot leverage. For example, as we come out of the down portion into a left or right transition, terrain dictates we use our boot the opposite way we used it at the beginning of the turn (also in transition). At the beginning of the turn (like a pendulum or child's swing) our feet moved back as we moved forward. Likewise, at the end of a turn our feet move forward as we move back (like a pendulum or child in a swing). Therefore we finish a turn with the upper leg of our "L" shaped tool and balanced on the outside parts of the feet and our heel: left on the left foot and right on the right. As we come back over them, this torque in the opposite direction of the turn will allow our skis to naturally come back under us, and like a pendulum this aft movement in transition (in combination with gravity) will naturally bring us forward (as our skis come back under us) so we can roll into the next turn from the heel to the front part of the boot (moving feet back). As far as the hips go, we run forward into terrain and run backward when terrain falls away from us. For example, if the terrain is on our left, to run into it we step forward to our left heel, and to run or turn away from it when it is still on our left we step back to our left toe or down and backward with our hips and up and forward with our arms (like we do in the child's swing) to get our weight on

the front of the feet. Therefore, terrain dictates that in both the down-part of the turn and the middle of the transition we are centered over our skis.

Pendulum Examples

Like a bell on a pendulum for every pull goes both "ding" and "dong", every pendulum has two movements. In skiing, the pendulum starts and ends with leg extension. Using gravity, that extension can happen either down the hill from the rise line (above the gate or point of the turn) or across the hill from the fall line (after the turn point). Like that bell, the pendulum movement is fore and aft on the skis, therefore from toe to heel or heel to toe in the boots. Depending on what we want to do with the turn, the extension can come from either heel or toe.

Two Pendulum Movements

Each turn has only one extension, but there are two pendulum movements. Because pendulums work with gravity, every pendulum has both forward and aft gravity movements. Like with the bell where we get two rings for every pull, between turn extensions we get both forward and aft gravity assisted movements. In skiing we rock our weight forward (feet back) from our heel to toe and rock our weight backward (feet forward) from our toe to heel. Every pendulum (swing) movement also has a pause (after gravity rings the bell) that pause helping us move in the other direction. Therefore, if we extend across the hill we will rock backward (feet forward, ring, pause) and rock forward (feet backward, ring, pause), ringing the bell twice before we get to the other side of the transition.

Forward Heel to Toe Feet Back, Backward Toe to Heel Feet Forward

Like ringing a bell, these two movements start with the one extension. If we extend from our heel (feet extending backward), we have the same two pendulum movements, except it would be forward (feet backward heel to toe ring), pause, and backward (feet forward toe to heel ring), pause, and extend again. Notice, we are always centered on the feet and skis in the middle of both the down-part turns and transitions. Remember, terrain dictates the need for any pendulum movement: the steeper the terrain, the more pendulum movement. Now that we know what to look for in pendulum movements (using gravity, after extension, forward heel to toe, and backward toe to heel) we may be able to see them in each of our slow motion examples.

Feet Forward and Feet Backward

The purpose of this document is to define fore and aft movement over the skis. Forward movement requires aft or backward movement. These subtle fore and aft movements help us balance. There are four parts to a turn, two of them are in transition when we are going left or right and two of them are in the down-part of the turn. Fore and aft movement is pendulum movement, the steeper the terrain, the more we need pendulum movement. Like a bell on a pendulum for every pull goes both "ding" and "dong", every pendulum has two movements. Like ringing a bell or swinging a swing, these two movements start with the one extension, and that extension is also a feet forward movement. In other words, if the down portion of a turn begins on the front of

the feet, and the middle of the down portion of a turn is on the middle of the feet; then the feet are coming forward when you extend. This is a subtle forward move that continues until (like a swing) gravity tells them to go back. Plus with our forward feet (to stay balanced with the skis as the feet are moving forward) we naturally contract our legs during the lower down turn-part. So, like in a swing the feet move forward in the down portion and backward in transition: toe to heal feet forward and heel to toe feet backward, with both movements beginning like a swing or pendulum in transition (arms forward feet back, and arms back feet forward). Its subtle, but we can see it in those YouTube videos.

Summary: Forward or Pendulum Movement

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