Skiing Simplified: Drift Turns Defined as Bumps

Drift Turns (Edge Sets, or Stivots)

The purpose of this document is to define a skiing drift turn by relating it to a bump. The previous document defined a skiing turn by relating it to a bump. For example: it described an arc or "C" shaped turn. This one will describe a drift turn or "L" shaped turn. Simply stated, a drift turn is a side-slip along the line of momentum that ends in an "edge-set" or stivot that sharply turns the skier's momentum to the fall-line. It uses the combination of gravity and terrain called the "fall-line" at the edge-set to change direction. From that apex or midpoint of the turn, both turns finish the same. The only difference is in the second quarter of the turn. To understand balance, I like to relate the whole turn to a bump.

Defined as Bumps

All turns create an apparent bump when we change direction in relation to terrain, gravity and momentum. In other words, turns of both shapes seem to change the shape of the mountain (seem to create terrain). They both have a pole plant at the top of the bump and an apex at the bottom. In both we want stay on the ground over the bump while staying forward and ahead of the skis. In both we want to stay balanced over the center of the skis slightly forward. In both the top of the bump happens whenever and wherever we come forward to flatten the skis to the terrain. In both the skis are still turning to come under us as we come forward to flatten the skis to the terrain. The difference in the two turns happens after the top of the bump, after we are balanced and forward on the back side of the bump. Right there the "C" Turn begins by bending the ski to allow it to follow gravity. Right there the "L" Turn starts by putting the skis in a "drift" to continue across the line of momentum. Then they both are the same after the apex. The "C" Turn arcs to the apex and the "L" turn drifts to the apex with an edge-set (stivot) at the apex. They are identical after the apex.

The Difference

The difference is the opposite weighting at the pole plant and the edge-set at the apex. Right where we would bend the skis to follow gravity at the end of the pole plant in the "C" Turn, we do the opposite and un-weight them in the "L" Turn. This un-weighting allows us to continue in line with momentum. After un-weighting, we turn them across momentum and prepare for the edge set. In this preparation we come back down and forward on our skis so that our skibbit will be efficient, while continuing on that same line of momentum. The drift ends when we step off momentum into the fall-line with an "edge-set" at the apex. The "L" is formed by the intersection of gravity and momentum at the edge-set at the apex. As long as we stay within these two lines, the skis do the work.

Why Drift Turns

Drift turns are used to control both speed and direction. They do many things that "C" Turns cannot. Drifting to a stop is one of the first things a skier should learn. This involves using side-slip and edge sets to control speed and direction while stopping. It

also involves good relaxed forward balanced position over the skis while stopping. It also involves maneuvering over the bump caused by the turn while stopping. Drifting to a stop teaches us that we must continue to move to stay in balance over the center of our skis. Drifting to a stop introduces us to the lines of terrain, gravity and momentum. Drifting to a stop introduces us to the effect of the shape of our skis on our drift and edge-set. For example: with the shape of our skis we want to drift out from our intended line of direction so that when we set our edge we will come back to our centerline. In racing, drifts and edge sets can be used to get back on line after things do not go as planned. In other words, when we have had to place our "bump" a little low and late we want to stay on our momentum line to the apex to get back on line. In all skiing, the edge-set like a "platform" can also be used to bring us forward over our skis. This platform like a "pre-jump" is especially handy if we want to stay on the snow as we go over a bump or where a bump is right in the middle of a turn. In other words, by design they can be used to handle difficult terrain where there is not enough space, time, or terrain to link a series of arcs. Some things in skiing are just "L" shaped. The point of the "L" is the apex of the turn which corresponds to the middle of the "C". The main advantage of drift turns is that the point of the "L" can be placed with great accuracy. Another advantage of the drift turn is that it covers a shorter distance because it fits within the "C". The disadvantage is that the skis drift across the line of momentum with a natural breaking action. However, if you are trying to slow down, this can be an advantage. If we want to slow down, we drift above the line of momentum. That lets gravity help us slow down, like an up-hill "hockey stop" when we stivot.

Because of Terrain, Balance Requires Movement

Defining a turn as a bump should help us understand movement required for balance during a turn. It is the same movement used to ski over a bump. If we get this movement correct, we will get the turn with balance. The turn will be caused by the "C" shape of the ski or the "L" stivot from momentum into gravity. We want to balance in the center of the skis both laterally (side to side) and longitudinally (fore and aft). Plus, we balance a little ahead of our skis, ahead of where we want to go, so that balance point is always in the front of our boot top. But, to do this we must continually move our ankle below that point and our hips above that point. We say always because we are going up and over a bump. If we do not move, the bump will throw us off center and out of balance. The bump is a terrain change, and a turn creates an apparent terrain change. Plus, we may be required to turn in an actual terrain change. To stay centered when the terrain changes, sometimes our hips are moving forward and sometimes they are moving backward. Some people say this movement of the hips starts in the ankles. Some people say it starts in the hips. I think those muscles and bones are connected, and they work together. I know the balance point on the bottom of the foot moves in the same direction as the hips. Thinking of the turn as a bump helps understand why the balance point on the bottom of the foot must move with the hips to keep balance.

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Skiing the Bump with no Turn

As indicated before, we want to keep our balance centered and a little ahead of the skis when skiing over a bump. We also want to use our muscles to take advantage of gravity. For example: after the top of a bump we push down in line with gravity to balance. Any time we push down our hips come forward and the balance point on the bottom of our feet moves toward our toes. On the other side of the bump, we pull our heels and hips back to keep our balance as we go up the bump. In other words, we keep our balance by sucking the bump with our legs, keeping a little ahead of our skis. When we suck or pull the bump with our legs our hips move back, and when we push our hips move forward. So, to keep our balance centered and a little ahead of the skis, the balance point along the bottom of the foot must be moving fore and aft, from heel to toe and toe to heel. In relation to the bump, we go up the front side and over the top on the heel and go down the back side and into the trench on the toe. In other words, we extend the legs with our toe and shorten the legs with our heel. Using gravity for balance while going over a bump, we shorten the legs from our heels, and extend the legs from our toes. Using gravity, it is not only a smoother, but shorter more efficient ride.

Skiing a Turn with no Bump

As far as balance goes, a turn with no bump is just like a bump with a beginning trough, a top of the bump, and an ending trough. As stated before, a turn makes the terrain seem to change. At the end of one turn (the transition) we are at the top of the bump. Because it is just a turn (with no real terrain changes) it is flat at the top and our skis are flat on the snow. They are flat because they have been coming out of the turn and under us to this point. This is an important point called the pole plant.

The Pole Plant

The top of the bump relates to the pole plant. At the beginning of the pole plant we reach forward by pulling our hips and heels backward as our skis finish the turn under is, to keep our skis light on the snow with the effective terrain change. In the “C” Turn, still using a pulling motion at the middle of the pole plant we put our skis on the new edge simply by continuing to come forward with the shape of the bump. So, in the “C” Turn our skis engage because of forward pressure on the “C” shape of the skis. In the “L” Turn we use the pole plant and ski un-weighting to continue on in the momentum line while turning our skis across that line of momentum. Then at the apex, we use our toes and a pushing forward hip motion into the fall line to edge-set or stivot into the fall-line. So, at the end of the pole plant in both types of turns we shift our weight from the heels to the toes. Until the end of the pole plant, we are balanced on our heels in the center of and slightly ahead our skis. At the middle of the pole plant, continuing to pull our hips and heels back to match the shape of the hill with pressure on the top of the boot. Doing this to stay centered and balanced, we have moved our hips from side to side. In other words, to stay centered our skis finish the turn moving under us. The turn is finished when we are balanced over our heels on the flat top of the bump with our weight centered and slightly ahead of our skis. If we come forward too soon with

our toes, the top of the bump becomes a ski jump. We need pressure on the front of our skis from our heels before we use our toes. Because they are connected to the core of the body (the big muscles) the hips and heels are the only muscles that do this efficiently. The toes and smaller muscles are used to extend. At the end of the pole plant we shift our weight from heel to toe and begin the extension with hips and toes, a movement that ends at the next important point, the apex of the turn.

The Apex

In a turn with no bump, the apex or middle of the turn is like the entrance to the front side of a bump. At the apex, we begin coming out of the turn at the same rate we went into the turn. At the apex the terrain seems to build, and as we feel the terrain build we suck the bump at a rate that will be finished at the next pole plant. Note, because we are turning and the inside leg has a shorter distance to go, is going slower, and hits this terrain before the outside leg. We balance from the heel on the inside leg, which allows us to bend it and stay forward as we hit the terrain. At the apex we are done with our work, balanced, relaxing, bending the inside leg, letting the skis create the turn, but very focused on the next apex and its pole plant. At the apex, we come out of the turn using our hips and heels to keep our balance centered over the ski as the terrain increases on the downhill leg. If we do not come out of the turn, we do not stay centered on the ski (we fall to the inside). In other words, like going up the front side of a bump, if we do not move our hips back while moving the focus of our balance towards our heels, we do not stay centered on the ski (our tips hook and we fall to the inside).

Skiing a Turn with a Bump (Real Terrain in the Turn)

Real terrain in the turn (like a fall away or suck bump) just moves the pole plant and apex to match the terrain. With a bump in the turn the same things happen at the pole plant and the apex. We still extend on the back side of the bump and suck or contract on the front side of the bump. For example, if there is a fall-away it just delays the apex and the point where the terrain begins to build. Another opposite example: if there is a suck bump in the middle of the turn, then we suck the bump in the middle of the turn, putting just enough pressure on the fronts of the skis to make them turn. Real terrain in a turn may be “L” shaped and call for an “L” shaped turn. The more we focus on terrain and related terrain balance movements, the less we need to focus on turning. Focusing on terrain, means we focus on pole plants and apexes, the places where things change. Pole plants, apexes and the shape of our skis determine where we go on the mountain.

Summary: Drift Turns (Stivots) Defined as Bumps

The purpose of this document is to define a skiing drift turn by relating it to a bump. The previous document defined a skiing turn by relating it to a bump, using the “C” shaped turn for example. This document covers the same material adding the “L” shaped turn and why we to use both types. Simply stated, a drift turn is a side-slip along momentum that ends in an “edge-set” or stivot that sharply turns the skier’s momentum to the fall-line. Except for the back side of the bump, they are the same.