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FLEXING ;)

SNOWBOARD UPDATE | WHAT'S NEW IN EDUCATION | SNOWSPORTS DIRECTORS UPDATE | THE 4 EDGES OF A SNOWBOARD

The “4 Edges” of a Snowboard

By Chuck Roberts

In the 1980’s, when snowboarding at most ski resorts was in its infancy, snowboards resembled stiff planks with little flexibility. Figure 1 is a photo of a 1987 Burton V-Tail, a stiff board with a running surface that resembled a V-bottom fishing boat. It also had a location for a skeg (similar to a surf board) to aid when riding in powder. It appeared to work well in powder but had its limitations on groomed slopes. Turning the board involved unweighting and upper body rotation, resulting in skidded turns on groomed slopes. There was virtually no way to torsionally flex the board (torsional flex refers to the design features of a snowboard which allows it to twist along the longitudinal axis of the board), Figure 2).

Fig. 1
1987 *Burton V-Tail “Cruiser”*

Fig. 2
Torsional flex

Fig. 3
1991 K2 TX “Gyrator”

Fig. 4
Modern twin tip snowboard

Snowboards evolved into more flexible structures in the early 1990’s as shown by the Gyrator in Figure 3. There was some torsional flexibility but the narrow stance (rider’s feet close together) made it difficult to torsionally flex the board. Despite this, snowboarders discovered that torsionally flexing the board aided in turning.

Figure 4 is a photo of the current snowboard technology characterized by a wide (more A-frame related) riding stance and the ability of the board to be torsionally flexed. This has resulted in the notion that there are truly 4 edges to a snowboard: lead toe edge, lead heel edge, trailing toe edge and trailing heel edge.

To further illustrate this, a review of Figure 5 is helpful. Figure 5A shows the rider with the lead heel edge engaged. At heel side turn initiation this move helps pull the rider into the heel side turn. Figure 5B shows the trailing heel edge engaged. This move aids in the shaping and completion phases of the turn.

Likewise, the leading toe edge of the snowboard is engaged in Figure 5C and the trailing toe edge is engaged in Figure 5D.

The torsional flexing of the board when turning is performed with the lower body and virtually no upper body influence, resulting in a quicker and cleaner edge engagement with a more stable ride.

In Figure 6, we see a diagram of a generic carved turn. Applying the torsional flex and edge engagement varies depending on conditions and what

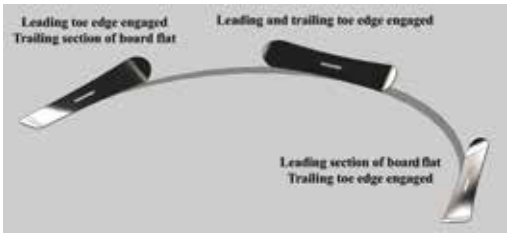

Fig. 6
Generic carved turn

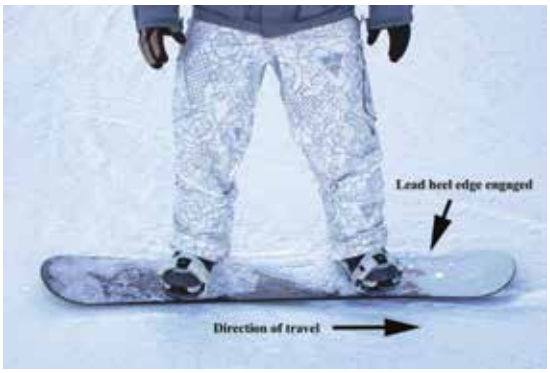

Fig. 5A

Fig. 5B

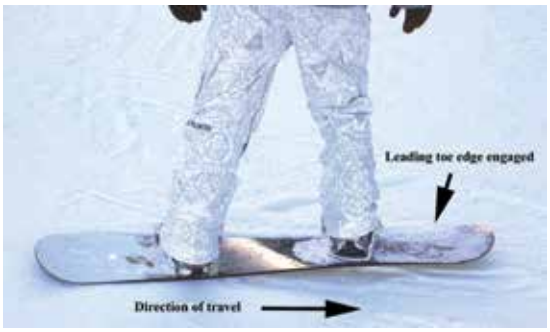

Fig. 5C

Fig. 5D

the rider wants to do. At toe side turn initiation, the toes on the lead foot are pressed downward to engage the lead toe edge (often called the gas pedal move). The trailing edge is not engaged as the trailing surface of the board is flat. In the shaping phase of the turn, the trailing foot is pressed downward at the toes so that both the leading and trailing edge are engaged. At the completion phase of the turn, the lead foot toes are raised and the toe edge is released while the rear edge is still engaged. The release of the leading toe edge allows setting up for the initiation of the heel side turn. In a quick transition from toe to heel side, the lead heel edge is engaged in the snow and the trailing toe edge is engaged in the snow, reducing the chance for a skid.

Fig. 7

Figure 7 shows a rider transitioning from a heel side carved turn to a toe side carved turn. The arrow points to the tip of the board which is twisted in the direction of the turn, releasing the lead heel edge while the trailing heel edge is still engaged.

Conclusion:

Fully utilizing the torsional flex of modern manufactured snowboards has resulted in a change in riding technique. The lower body is nearly totally involved, leaving the upper body in a stable riding position. The wider A frame stance has resulted in greater torsional flexing of a board when compared to the earlier narrow foot stance. Torsional flex has evolved to the point that there truly are “4 edges” to a snowboard.

Chuck Roberts teaches at Wilmot Mountain, in Wisconsin. He is a Level III Ski Instructor and a Level II Snowboard Instructor. He has been teaching skiing since 1970 and snowboarding since 1987.

Chuck Roberts is president of his own consulting firm performing accident reconstruction and failure analysis. He has written several books and articles on skiing, WWII history, accident reconstruction and failure analysis. He is a member of the ASTM Committee F27 on snow skiing. He has taught skiing since 1972 (Level III Certified) and snowboarding since 1987 (Level II Certified). He started skiing in 1953 and has been going downhill ever since.