The H-Bar

Jakob Roberts
Bogdan Fanea
Scott Andreen

Need

The frequency of unretained deropements of surface lifts in BC is unacceptably high.

Goal

Improve current surface lifts to increase the safety in regards to deropements involving snowboarders.

Objectives

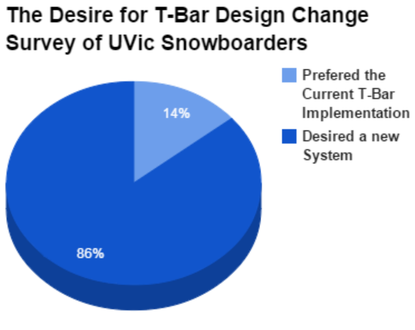
- ☑ Doesn't slow current operating speed
- ☑ Inexpensive solution
- ☑ Low implementation time
- ☑ Simple to use for the general public.

Constraints

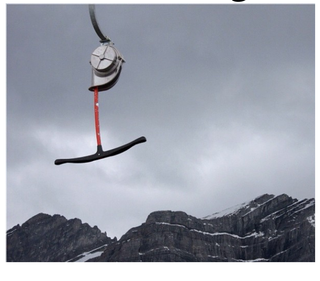
- ⚠ Can't add >20% of current weight to system.
- ⚠ New design is compatible with older systems.
- ⚠ Resistance against all elements causing corrosion or failure of components.

Background Info

- Current T-bar design and alternatives are flawed for snowboarder use.
- Connection design between T-bar, attachment cable, and main lift cable causes deropements from horizontal force.
- BCSA representatives claim minimal research into reducing snowboarder caused deropements.



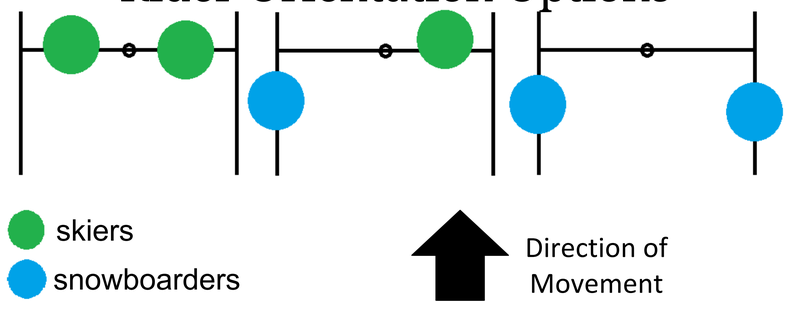
Current T-Bar Design



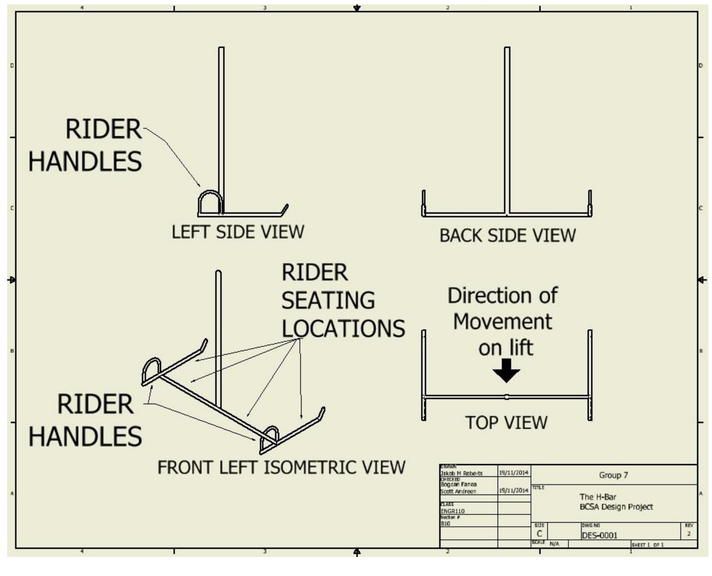
Benefits & Features

- Same material, new design
- Easy implementation
- Cost effective
- More comfortable
- Less awkward rider stance
- Reduces horizontal motion of snowboarders
- Unique design accommodating snowboarders

Rider Orientation Options



New H-Bar Design



Validation Testing Procedure

1. Select several (approx. 3-4) resorts with T-bar surface lifts from across BC.
2. Form a control group of skiers and snowboarders (approx. 20-30 of each) for each resort.
3. Outfit every other carrier on surface lift with prototype H-Bar design.
4. Control group rides both original design and prototype design in different combinations of skier and boarder.
5. Observer rides behind each set of people in control group to observe sideways motion in each case.
6. Have each member of control rate Yes or No for increased comfort in each combination of riders.
7. If new design is considered more comfortable and manageable for the test subjects, the new design is a success.

Cost Requirements (Dollars per H-Bar)

Material requirements: 500-700
- Injection moulded and extruded aluminum
- Impact and cold shock resistant polypropylene

Manufacturing Requirements: 200-300

Installation Requirements: 100-200

Lift Shutdown Cost: 200-400

Total: $1000-1600 per H-Bar

References

- http://www.abc-of-snowboarding.com/pistelifts.asp
- http://www.faigle.eu/products-solutions/industry-solutions/general-liftingconveying-systems/ski-lift-t-bars.aspx
- http://www.custompartnet.com/estimate/injection-molding/
- CSA Z98-14 Standards Manual