

To Open a Ski Lift to the Public: A Behind the Scenes Look
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Most of the skiing public is aware on some level of what ski patrol does. They mark bare spots, they do first aid on the injured and they bring injured skiers down the hill; and in some places, they even do avalanche control. Similarly, most people know what Learning Centers, cafeterias and lift-ticket sellers do. But beyond helping people to load chairlifts, what do Lift Attendants do?

Richie Berger, Head of Lift operations at Crotched Mountain, gave me a first-hand tour of what it takes to open a lift. About an hour before the lifts open to the public, the activities begin.

First, the entrance and the exit to the lift must be prepared. This preparation requires coordination with the snow grooming team. If the entrance has the snow too high, the skier enters the loading area too fast. If the exit ramp isn't properly set, the chairlift will clip the exiting skier in the back. So to begin with, there is some shoveling. The grooming team pushes snow up onto the unloading ramp as needed and smooths the area around the loading area, but the lift crew is ultimately responsible for the loading and unloading areas.

Most of the lift attendants are good reliable people, but the truth is, lift attendants are low paid. Since these people are interacting regularly with the guests, they must be personable and presentable. Getting and retaining good people for the salary offered is no small challenge.

My tour of the lift began at the bottom of the West Double Chair, which is a combination of Hall parts with CTEC drives and electronics. (Hall and CTEC are both major lift manufacturers.) The morning begins with throwing the high-voltage and low-voltage power switches. The main motor runs on 480 volts AC; the electronics and control systems run on 24 volts DC. All of this is contained the "Loading Station" Building.



Each lift tower is equipped with a switch or relay that trips if anything is wrong with the interface between the cable (known as a "haul rope") on which the chairs are attached and the wheels on which the haul rope travels (known as sheaves). If all are OK, a green light on the front panel as shown on the right, second light from the bottom, is on. If one or more of the switches or relays is not engaged, the panel must be opened. From this, one can determine at which of the towers is the problem is located.

Fixing a switch or relay could require climbing a tower and making repairs. I asked Jeramey Whiteley, one of the more senior lift attendants, what it was like working up there. He said, “The platforms we stand on are solid. It’s only a problem if you are afraid of heights!” Shown to the right is a lift tower with the maintenance platforms on the left and right of the tower. Note that many towers have more sheaves on the uphill side. This is because there is more weight on that side and distributing it over more sheaves makes for a smoother ride.



At the Unloading Station, the lift attendant has 4-buttons at his disposal. Yellow changes the speed from regular speed to slow speed. A large red button allows the operator to stop the lift gently. A smaller red button allows the operator to stop the lift far more quickly in case of a more serious emergency. Richie Berger told me that they test that button once a day, but try not to use it because the sudden stop puts stresses on various parts of the system which would ultimately result in more frequent maintenance.

Other items that are monitored by the electronics that could go wrong with a lift include:

- Haul rope moving too fast or too slow.
- Brake adjustments
- Improper tension on the haul rope

If the electric motor stops due to catastrophic failure or a power interruption, there is a diesel backup motor, called an Auxiliary Power Unit (APU), which they are required to start every day the lift operates. The motor will allow the lift to unload guests, albeit slowly, without doing an evacuation. Evacuations are time consuming, not to mention traumatic for the guests!



There are all kinds of issues with the effect of weather on operations. Excessive lateral winds can create the possibility of the haul rope derailing, so in these cases, the lift goes on “wind hold”, namely, the lift is run until all skiers are off and turned back on when winds diminish. Ice storms and snow storms create a layer of ice or snow on the haul rope. If this happens, the lift is started and immediately stopped a number of times. This is called “bumping the haul rope”. Bumping allows the haul rope to bounce in the interval between towers and causes the ice or snow buildup to fall off and to make sure the haul rope is fully engaged with the sheaves.

Many of the lift attendants are very competent skiers or riders. As such, I always wondered why the lift attendants always ride up down chairlifts rather than skiing or boarding down. In theory and hopefully in practice, the lift attendant is listening for and looking for sheaves that are

malfunctioning. This includes sheaves that are making bearing noises, are not properly aligned or are not turning.



State inspections of lifts are frequent and lift accidents are a rarity. Shown to the left is the license plate associated with the lift.

So before you ever get on a lift, there is a lot going on behind the scenes that results in a safe ride up the mountain.

A Glossary of lift terminology:

- APU (auxiliary power unit): A back up diesel engine used to off-load guests if there is either an engine failure or a power failure.



- Bull wheel: Essentially a pulley at the top or bottom where the haul rope changes direction.



- Cable (see Haul Rope)

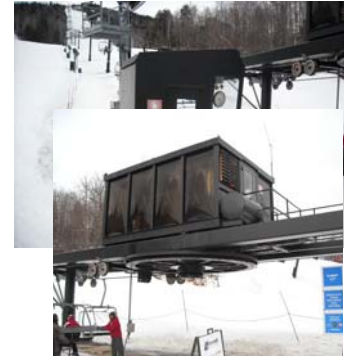
- Clip: The connection between the chair and the Haul rope



The Hall clip on the left is bolted to the haul rope. The Riblet clip on the right has the connection to the haul rope integrated into right into the haul rope.

- Haul Rope: A stranded cable to which the chairs are attached that moves the chairs up the hill.

- Loading Station: A small building at the base that includes many of the control systems and provides a place for the lift attendants to stay warm.
- Motor Room: A building sometimes at the top, sometimes at the bottom, that contains the drive gears, the main motor, the backup motor, the breaking system, hydraulic pump that maintains proper tension on the haul rope.



- Main Motor: The primary power source to move the haul rope.



- Pedestal: A movable control panel usually placed right next to the lift attendant, so that he/she can stop, slow, speed up the lift and to signal the lift attendant at the top of the impending change in speed



- Sheave: Wheels on towers on which the haul rope rides.



- Splice: Place where the two ends of the haul rope are connected together. It is an arcane skill and very few people know how to do it. Occasionally, one might notice a slightly enlarged spot on the haul rope where the ends of the splice are tucked in.

- Tower: Most lift towers hold the haul rope off the ground. Occasionally, the tower serves to pull the haul rope down and maintain tension on the haul rope. An example is shown to the right



- Unloading Station: A small building at the summit that includes a control panel and provides a place for the lift attendants to stay warm. Some of these are nicer than others. Note the nice view from the Unloading Station looking down the lift line.

