

From The Downwind NC Rigging Loft #11 – For the want of a Pilot Chute

The following fatality report was forwarded to us from Portia “Lymey Witch” Hill about an incident recently in Australia. Several of our previous articles have dealt with pilot chutes, their maintenance, and pilot chutes in tow. Please refer to our website for the previous articles.

In previous years I had also used reverse 3 ring risers but came to the conclusion that they were more of a fad than a valid improvement in equipment. I have read articles by such experts of Bill Booth of Relative Workshop and John Sherman of Jump Shack explaining the risks of such systems and reverted back to conventional 3 ring type 17 risers a few years ago. This however is the first time I have heard of reverse 3 rings being a consideration in a fatality. The true culprit here appears to be a poorly maintained or operated main pilot chute. Had the pilot chute been properly maintained and used, the main stows would more than likely have not locked, and the rings would have released as needed (let me emphasize that this is only my opinion based on the report noted below). Remember, there is no excuse for “forgetting” to cock your pilot chute. Do not rely on the packers to examine your gear. Our packers do a great job catching stuff but that is not their responsibility. Based on the report below, had the pilot chute been properly maintained and used, a normal deployment might have occurred.

Checking your pilot chute:

1. Make sure it is cocked by checking the kill line inside the PC making sure it is at least as long as the 3/8” apex tapes if not longer (in other words there is slack in the PC)
2. Do not rely on the [F@\\$ing](#) colored window.
3. Examine (occasionally) the bridle and connection points to the bag and canopy apex. If it looks broke, it probably is.
4. Pull your main out, and the pilot chute (especially if you don't pack for yourself) and examine how the collapsible PC works, it's very easy.
5. Make sure the rapide links (one inside the bag locking the bridle in place and one attaching the kill line and bridle to the canopy apex) are intact and at least finger tight.

Downwind Rigging can replace and repair most kill lines and pilot chute bridles for much less than the price of a new pilot chute in a relatively short amount of time.

The following was referred to us by Portia Hill.

The fatality report is out.

FATALITY REPORT

A B7HCB7K licensed jumper on a 9-way celebrating her 200th jump died following a main/reserve entanglement at a Victorian DZ last month.

The jump had proceeded normally until main deployment which was thought to commence at about 3,000 B7" 3,500 feet. Unfortunately there were no witnesses well placed to follow events after this - the jumpers on the load were busy with their own deployments and ground observers were a considerable distance away.

The equipment inspection provided most of the evidence as to what happened, which, while mostly circumstantial, fits well with the few known facts.

The examiners initially believed that the collapsible pilot- chute (PC) had not been cocked prior to the jump but subsequent investigation revealed a problem with the collapsible PC mechanism involving the Rapide link that should have been attached to the inside of the bridle as a stop, and should have prevented the bridle from pulling out of the bag. This Rapide link was found looped around the kill-line but not attached to anything else. This, it is believed, caused the PC to collapse prematurely (possibly while the parachute was still in its deployment bag). The loop of webbing to which this Rapide link should have been attached was not found although some remnants of the bartack that held it were still in place.

Also found was a strong, mil-spec rubber band, still entangled with the line groups and still wrapped twice around the main lines. This combination of low drag (collapsed PC) and strong double stowed rubber band would agree with the impression of witnesses that the deceased experienced either a PC-in-tow or a bag lock, or both in succession.

The final link in the chain leading to this fatality was the use of reverse risers on a rig (in this case a Javelin) never intended for them (see separate box on reverse risers). Since the low drag malfunction probably did not even produce enough pull to drag the jumper upright (she may, in fact, have even gone further head-down as both arms came in to pull the cutaway/reserve) the riser rings would not be able to separate.

It appears that the jumper did not check or wait for main separation but simply pulled the cutaway, followed immediately by the reserve ripcord. The reserve then began to deploy, but tangled irretrievably with the main bag and lines. The Cypres fired some time after manual activation of the reserve.

Impact was feet first at high speed with both the main and reserve canopies out of their respective deployment bags but each incapable of inflating due to the excessive amount of entanglement of the lines and risers. Questions all jumpers should consider:

• Does my packing method have a back-up if I accidentally forget to cock my pilot-chute? This sequence may have initially started with a prematurely collapsed PC and the commonest cause of this is forgetting to cock the PC during packing. The kill-line system has proved to be the best method for safely launching the main deployment sequence which (in most cases) also allows for a simple check at the bridle window prior to gearing-up.

• If I break a line stow band while packing do I have spares, or just grab the nearest thing that will keep the lines in place? To test the effectiveness of your line stows you can drag the main bag across a smooth surface by the pilot-chute and the lines should unstow evenly at between 3 to 5 kgs (6 to 12 lbs) of pull (line stows too lightly stowed can be equally of concern as too tightly stowed).

• Have I ever thought about what I would do if a riser failed to separate on cutaway? Members have in the past waited a second or two to complete their reserve pull, or even manually separated their risers from the harness, possibly in response to a low drag situation or because they had failed to maintain their 3-ring as specified.

• Is my rig still the way it was designed by the manufacturer, or has it been modified? Even simple things can change the operation of a rig, for example some after-market riser cover mods (aimed at making the risers more secure for freefly) have resulted in reports of the covers failing to release even under the load of a fully open canopy. On a small canopy this could produce a radical spiral that could not be immediately cutaway. All these individual things and many other similar circumstances have resulted in repeated incident reports to the APF. As has been said many times, one thing going wrong can be inconvenient but a combination of circumstances can be deadly.

Reverse risers

Type 17 webbing 1 to 2 risers were developed quite a number of years ago in response to jumpers support of smaller, lighter gear. However it was found that conventional construction utilising the grommet to pass the locking loop through

the riser weakened the system to such an extent that a riser could break on opening shock.

Since RSLs were also coming into wide-spread usage at the time it was quickly realised that a broken riser on the RSL side could release the reserve into the still attached main. The initial solution was to recommend that 1" risers should not be used with an RSL.

This lasted for some time until new construction methods were developed, basically reinforcing the type 17 (one inch) risers to make it stronger, which is the situation in most rigs today.

A totally different solution was followed by a few rig manufacturers - the development of Reverse Risers. As the picture shows, these placed the two smaller rings on the inside of the riser and did not need a hole punched through to lock the system - obviously this made the riser much stronger. However, rigs that used this system needed their main harness ring placed higher on the shoulders, something that sometimes detracts from the comfort when suspended in a harness (ask most tandem passengers). There must also be enough drag to open the riser covers and pull the jumper at least partly upright in order for the system to operate.

Remember, 3-rings are designed to require very little force to operate, conversely this also means that very little force can keep them closed. It is important to know the limitations of your equipment and ensure the operation of the system as a whole.

--

Arching is overrated - Marlies