

How to Re-Key the Topbox Lock Or The Panniers Lock To Use a Single Key for Everything

by

Fariborz

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When I got my NonFango topbox, it had its own lock and key that looked similar to my pannier keys. I decided that I did not want to carry two different keys so I re-keyed my topbox to use the same key as my panniers key.

The way the locking mechanism of the topbox or the panniers on a Ducati ST works is that the lock tumbler has numerous spring-loaded sliding plates. When the key is removed from the tumbler all of the plates are pushed to one side by their springs. This forces the ends of all the sliding plates to stick out of the side of the tumbler into a groove in the lock barrel. This prevents the tumbler to rotate inside the barrel, preventing the locking arm that is attached to the end of the barrel to rotate away from the latch on the lock. This prevents the latch from opening.



Figure 1. This is how the tumbler looks with the key removed. You can see all the sliding plates sticking out the side of the tumbler.

Once the right key is inserted into the tumbler, each and every sliding plate is retracted back into the tumbler allowing the tumbler to rotate inside the barrel and therefore allowing the locking arm to clear the latch and consequently allowing the latch to open.



Figure 2. When the right key is inserted into the tumbler, all the sliding plates are pulled into the tumbler, allowing it to rotate inside the barrel.

If a wrong key is inserted into the tumbler, some of the plates may stick out of the tumbler (partially or fully) and some may not. Only one plate sticking out is enough to prevent the tumbler from rotating inside the lock barrel.



Figure 3. When the wrong key is inserted into the tumbler, one or more sliding plates will stick out of the side of the tumbler into the groove in the barrel, preventing it tumbler to rotate inside the barrel. This will not allow the latch to open.

Each sliding plate has a slot. The location of the slot in the plate with respect to one end of the plate determines how well that plate matches the cut groove in the key. Depending on the position of the slot in the plate, the wrong key may cause the plate to fully or partially stick out of the side of the tumbler.



Figure 4. This picture shows two different sliding plates. Note the position of the slots in the plates with respect to the end of the plates.

To make the tumbler work with a different key, either the plates need to be shuffled to match the hills and valleys of the key or some of the plates need to be removed or grounded using a file. In theory only one plate is enough to prevent the tumbler to rotate inside the barrel. But on the other hand anyone can cause a single plate to slide to the side using a small screw driver, or partially inserting a different key. It is therefore best to shuffle around as many plates as possible to match the key. This makes it a lot harder to pick the lock. But if one does not have many different sliding plates shuffling the plates might not be feasible. In that case, one can simply remove a plate from the tumbler or just file down the end of the plate after the new key is inserted into the tumbler.

Now that you know the theory of how the lock in the pannier or the topbox works and what is needed to make the lock work with a new key, I can explain how I re-keyed my topbox.

To re-key my topbox I first removed the lock from the topbox. That was done by removing a small screw from the inside of the topbox which was holding the lock assembly to the topbox. By the way, the lock is attached the same way to the panniers. Once the screw was off, I was able to slide the whole lock assembly off the topbox by moving it toward the open part of the lid. Again the same thing is true with the lock assembly in the panniers.

Once the lock was off the topbox the first thing that I did was to remove the locking arm plate. The locking arm plate was held in place by an 'E' Clip.

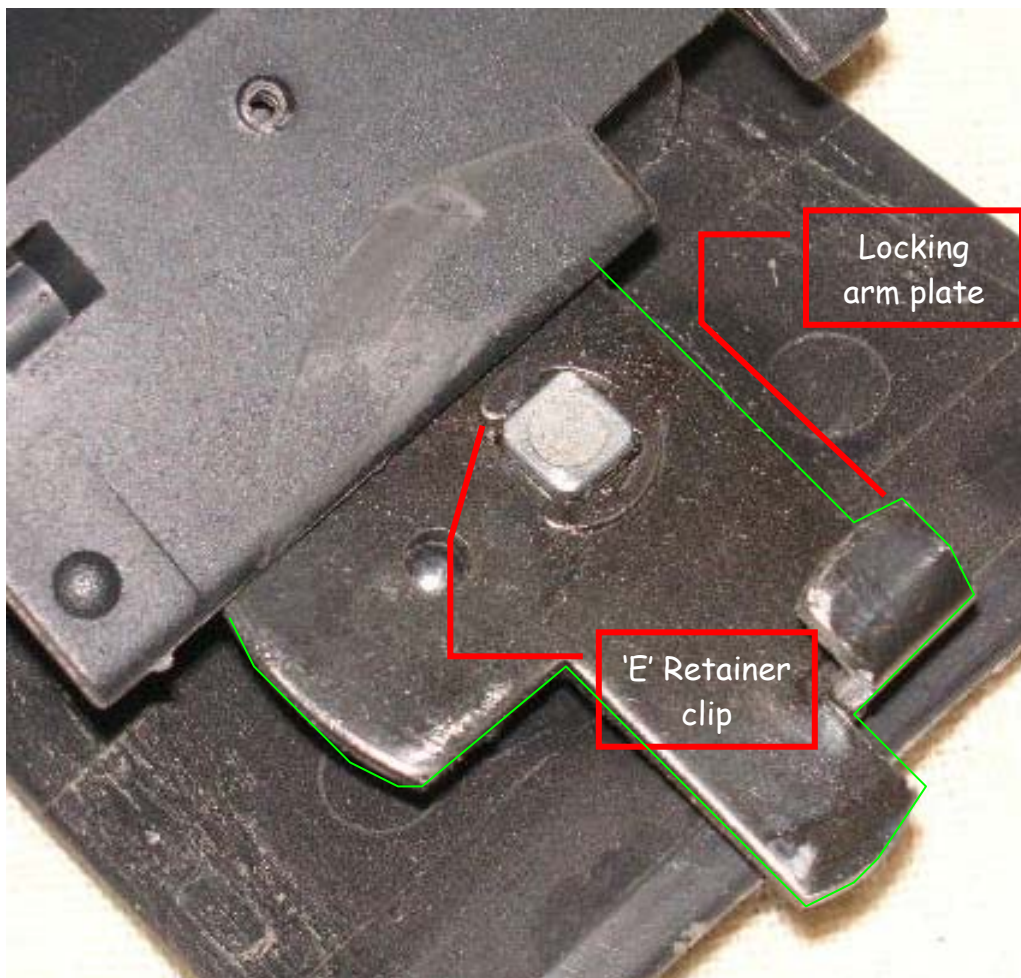


Figure 5. 'E' retainer clip securing the locking arm plate (green outline) to the lock tumbler.

After the retainer clip was off the locking arm plate, I was able to remove the locking arm and expose the lock tumbler and barrel.

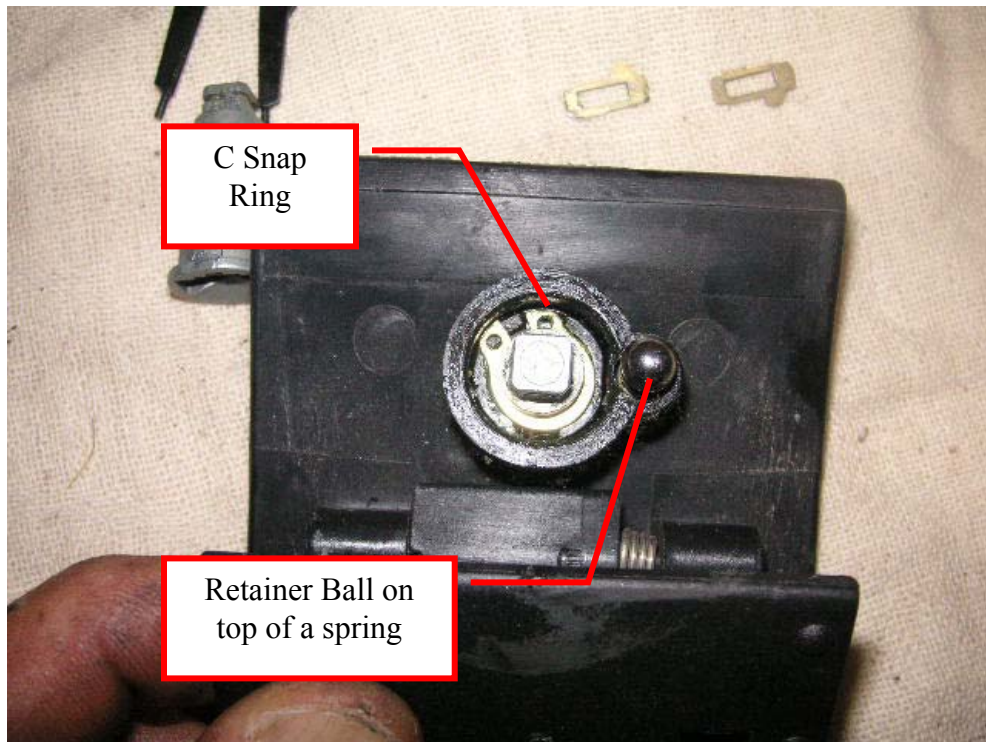


Figure 6. Tumbler inside the lock barrel, held in place by a C snap ring.

There is a spring loaded stainless steel retainer ball that snaps into a hole on the locking arm plate. This ball holds the locking arm plate in place once the lock is moved to the unlock position. When removing the locking arm plate, I paid particular attention not to lose this ball or its spring!

To take the tumbler out of the barrel, first I had to remove the 'C' snap ring off the end of the tumbler. I have a [snap ring pliers](#) that I used, but one can use a needle nose pliers to do the same thing.



Figure 7. Snap ring pliers to remove the snap ring from the end of the tumbler.

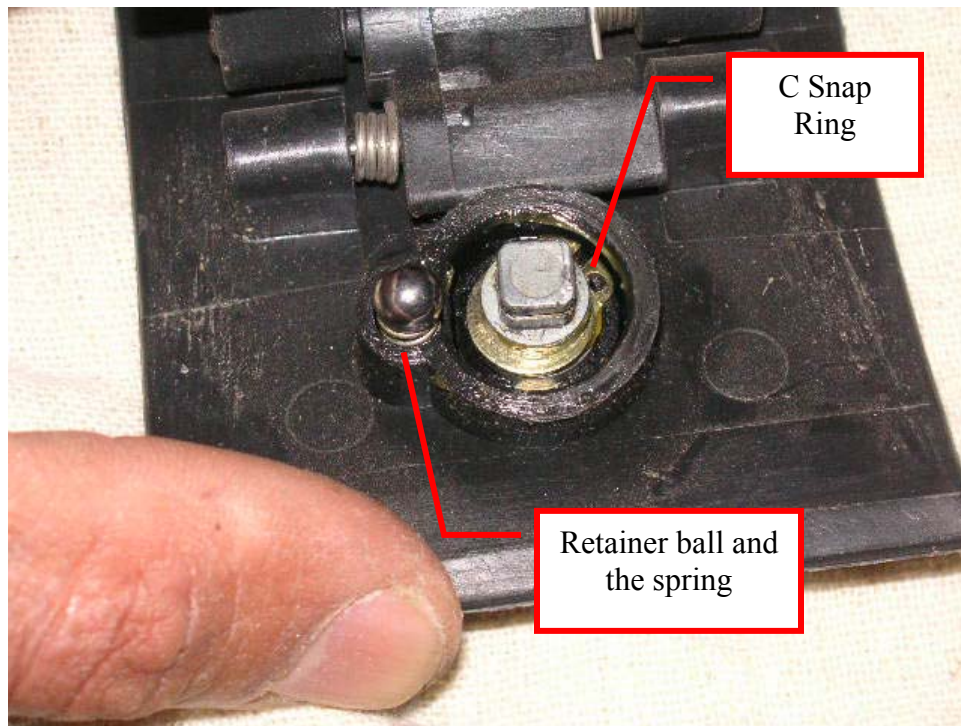


Figure 8. Another view of the C snap ring and the retainer ball.

Once the Snap ring was off the tumbler, I simply inserted the right key into the tumbler (to retract the tumbler's sliding plates into tumbler) and then pulled the tumbler out of the lock barrel. The following two pictures show how the sliding plates in the tumbler look with the right key and with the wrong key inserted.



Figure 9. Right key inserted causing all the sliding plates to be retracted into the tumbler.



Figure 10. Wrong key inserted. Three of the sliding plates are still sticking out of the side of the tumbler.

In my case three out of the five sliding plates were sticking out when the pannier key was inserted into the topbox tumbler. I pulled the three plates out of the tumbler using a set of needle nose pliers. I pulled them out from the side where the slots looked wider. There is a larger opening at one end of each slot that holds a spring. I paid particular attention not to lose those springs when pulling out the sliding plates. Each plate has its own spring. When pulling the plates out, the plates were kind of snug, but a little tug with the pliers was enough to dislodge the plates from their slots.

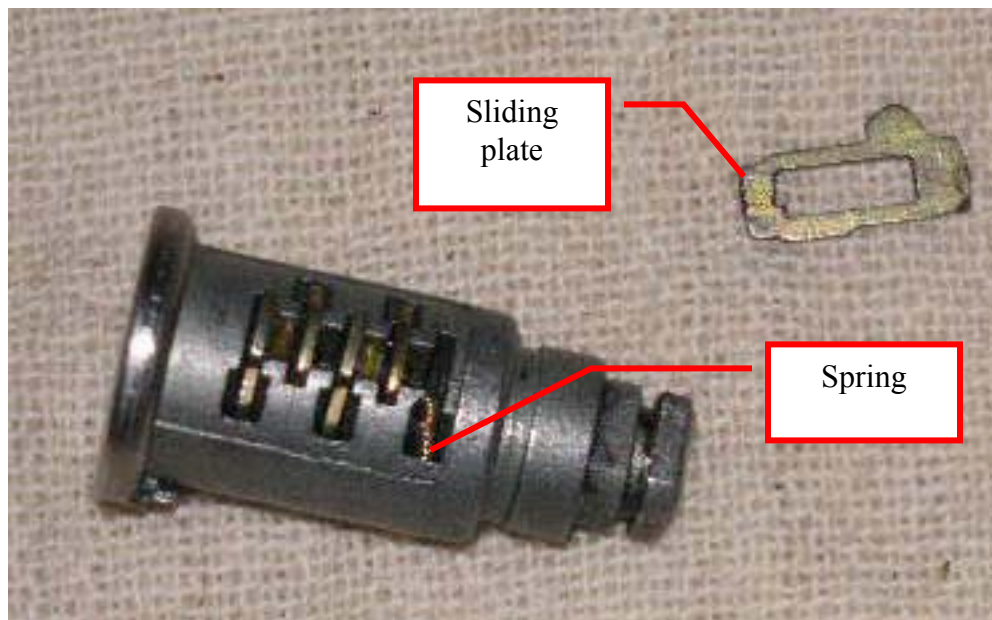


Figure 11. Picture showing one sliding plate removed from the tumbler with its spring still inside the tumbler. Note the orientation of the tumbler where the plate was removed from the tumbler.

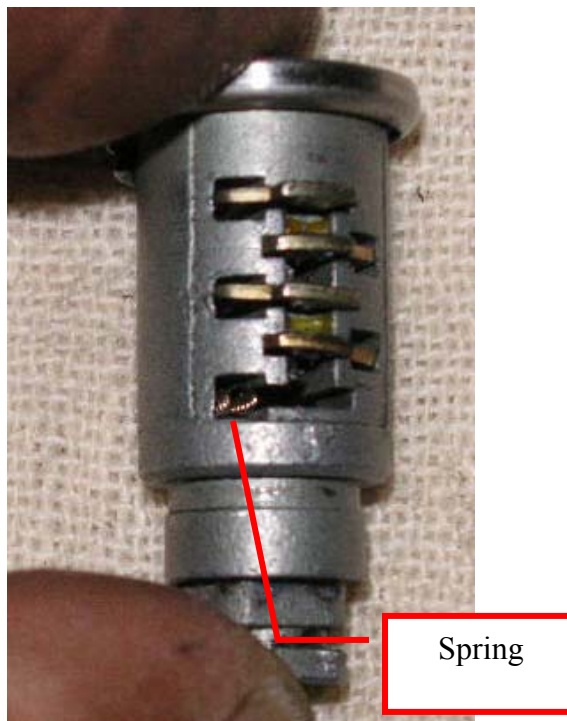


Figure 12. Another view of the sliding plate spring inside the tumbler.

In Figure 11, the little arm sticking out from the side of the sliding plate is where the spring presses against the sliding plate to push its end out of the tumbler. I was able to swap two of the plates with each other. They were a perfect match. As Einstein once said, "Sometimes a little luck is all you need!"

The third plate was sticking out half way when using the pannier key. So I simply ground off half of the end of the plate with a table grinder and put it back into the tumbler and all was good again.

I followed the reverse steps to reassemble everything back together. I can now use my panniers key in my topbox lock and only have to carry one key.