

UniqueTek “Tips” File #30:

“Dillon RL 550 Spent Primer System Tips”

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The Dillon Precision RL 550 spent primer system is the most complicated of all Dillon presses. And I’ve lost count of how many customers I’ve talked to regarding problems and ways to fix them.

The spent primer system used on the RL 550C is the same as is used on RL 550B, RL 550C, BL 550, AT 500 and RL 450 presses. It is a two step system where the spent primer is first captured by the Spent Primer Chute when the press ram (aka Main Shaft) is up, and then dropped into the Spent Primer Cup when the ram is down.

The the RL 550 spent primer system has a bad habit of losing spent primers ... which end up on the bench or on the floor. And the causes are as varied ... as the solutions.

The Spent Primer Chute

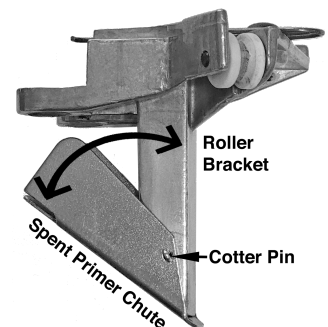
The Spent Primer Chute (#13899) is attached with a cotter pin (#13998) to the bottom of the Roller Bracket (#13631 on 550C / #14280 on 550B, BL 550 & AT 500 / #RL 450-56 on RL 450). The chute’s center of gravity is closer to the ram than the cotter pin, so the chute naturally wants to tilt open when the ram is up ... making it ready to capture a spent primer as it is punched out of the case.

Here is the sequence.

- 1) As the ram raises, the Spent Primer Chute tilts toward the ram and actually contacts the ram. This opens the top of the chute and closes the bottom.
- 2) As the ram approaches fully up, the resize/decap die is ejecting the spent primer, which falls through a hole in the Platform and into the Spent Primer Chute. In the case of Dillon dies, the spring loaded decap pin literally throws the primer downward toward the chute.
- 3) As the ram moves downward, the spent primer is held in the bottom of the Spent Primer Chute.
- 4) As the ram approaches the bottom of its stroke, the Spent Primer Chute contacts the Primer Slide (#14281 Large Primer / #14282 Small Primer) and begins to tilt back to vertical.* This action opens the bottom of the Spent Primer Chute allowing the spent primer to fall into the Spent Primer Cup.

* On the BL 550 and AT 500, it contacts the Primer Punch Holder (#16612).

* On the RL 450 it contacts the Primer Slide (#RL 450-29)



Sounds simple but there are multiple ways that spent primers can be dropped.

- 1) The Spent Primer Chute may not open as the ram rises, or may not open fully. For it to capture a spent primer it must be fully open such that the top edge of the chute is in contact with the ram. If not fully open, a spent primer may not enter the chute or a primer that enters the chute may fall out the bottom of the chute.
- 2) With the ram fully up, the top of the Spent Primer Chute is still about 1" below the hole in the platform where the spent primer drops through. That leaves a lot of “air time” before the falling spent primer enters the chute. So, even if the chute is fully open, it is still possible for the spent primer to miss the chute. You can see these gaps in the photo at right.



- 3) On the down stroke of the ram, the Spent Primer Chute starts pivoting before the ram is fully down and releases the spent primer when it is still about 1.5" above the top of the Spent Primer Cup. That leaves a lot of "air time" before the falling spent primer enters the cup.
- 4) The Spent Primer Chute is located at the far left rear corner of the Spent Primer Cup rather than at the center, increasing the possibility that the spent primer misses the cup (see photo at right).



The Spent Primer Cup

The Spent Primer Cup (#13650) is mounted on the RL Right Link Arm (#13747) and is common to RL 550C, RL 550B, BL 550, AT 500 and RL 450 presses. As the cup's opening is 1.46" x 1.90", it would appear to be a large target for spent primers to hit. But spent primers are dropped at the far left rear corner of the Spent Primer Cup (see photo at right). And, as mentioned in the previous section, there is a lot of "air time" between the bottom of the Spent Primer Chute and the top of the Spent Primer Cup. So, primers don't always make it into the cup. That said, spent primers that do make it into the cup usually stay there unless the cup is overfull to the point where they can bounce out.

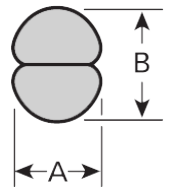
Solutions

The Spent Primer Chute:

I was unable to find anyone making a complete replacement or upgrade kit for the Spent Primer Chute. So this is a DIY project.

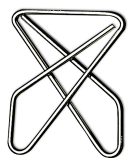
1) Replace the Cotter Pin:

The Cotter Pin may be bent or fastened too tightly such that the chute cannot pivot freely. In either case, a new cotter pin (1/16" dia x 1" stainless steel cotter pin) is needed. But I measured the diameter of a new 1/16" cotter pin and it measured A = 0.044" and B = 0.050". Not particularly round so not the best bearing.



There are many forum postings describing how they replaced the cotter pin with something else. Below are a few examples I found. Most were found on the Brian Enos forum.

- 2) **Paper Clip:** I found an "Ideal" (aka "Butterfly") paper clip (see photo at right) with 0.061" diameter wire that was only out of round by 0.001" ... more than adequate to make a pivot pin. I just cut out the longest straight section, inserted it and bent both ends over to hold it in place (making sure to leave plenty of space on either side of the chute).

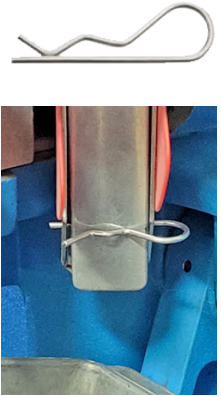


- 3) **Music Wire:** A piece of 1/16" diameter (0.062") music wire. The advantage of music wire is that it is hard, straight and the diameter is very consistent ... making it a good bearing surface for the chute to rotate upon. Again, you'll need to bend over the ends to hold it.

TIP: Instead of bending the ends over, try using a pair of Push-on Retainer Clips (see photo at right). The advantage is that since you don't need to bend the ends, the wire will remain perfectly straight. Push-on Retainer Clips can be difficult to find locally for a 1/16" stud, but there are plenty of online sources. Be sure to leave a gap between the Push-on Retainer Clips and sides of the chute. One disadvantage of these is that they are a single-use item. The get them off, you usually need to cut them and then reinstall new clips.



- 4) **Primer Pickup Tube Retainer Clip:** Use Retainer Clip (#14040) from a Primer Pickup Tube (#22028 Small Primer / #22029 Large Primer) or a 1/16" dia. Hitch Pin from the hardware store. It is straight, smooth and the tip doesn't need to be bent over for it to stay in place. And you likely already have one in the spare parts kit that came with your press.



It is simple and easy to install. The pin is nice and straight. It is comfortably smaller diameter (0.41") than the holes ... ensuring it can't bind. And you don't need to bend the end over to retain it. Plus, you don't have to replace it with a new one each time you disassemble for cleaning or service. But it must be installed from right to left (as shown in the photo) to clear the Primer Slide. I currently use this on my own RL 550B press.

- 5) **Safety Pin:** Open a safety pin, insert the pointy end through the holes in the Chute and Roller Bracket, and then snap it closed.

It was difficult finding a safety pin of the correct length. A 1.25"/32mm safety pin is the only size that works. Any shorter and it can't be latched. Any longer and it will hit either the Primer Housing (#20263) on the left or the press frame on the right. I was also not happy that the pin is arched instead of straight. That said, it can be easily removed for service and then reinstalled like the Hitch Pin described above. But I feel the Hitch Pin is a better solution.

- 6) **Check Hole in Chute:**

Over time, the hole for the cotter pin can become worn and out of round. When replacing the Cotter Pin, you should first inspect the holes. Remove any burrs and, if needed, round out the holes with a drill bit. Don't enlarge the holes, just make them uniformly round. Also check the holes in the Roller Bracket. Spinning the drill bit in your fingers may be all that is needed.

- 7) **Check Chute Clearance:**

Although unlikely, the chute could be bent such that it rubs too tightly against the sides of the Roller Bracket. The sides of the chute should be flat, smooth and square. And there should be plenty of clearance between it and the sides of the Roller Bracket. I measured mine using a feeler gauge and there was 0.015" total clearance ... plenty to ensure smooth operation.

- 8) **Add Weight to Chute:**

The chute weighs only 11.7g (0.4oz) so, adding just a little weight to the chute will entice the chute to fall toward the ram.

- A) The "Old School" Method: Take a piece of lead buckshot (#4 should do nicely), flatten it in a vice, and then glue it to the side of the chute.
- B) The "Modern" Method: Lead tape is easy to find at sporting goods shops that support golf and pickleball, and is available in rolls and pre-cut strips (see photos at right). You can use scissors to easily trim it to size and shape you need. Then just peel and stick.



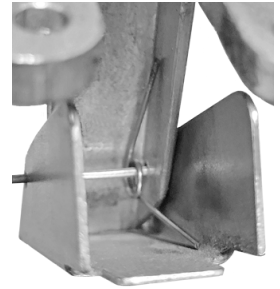
You must attach weights to the outer sides of the chute and not the back. Anything added onto the back of the chute (the side that faces the ram) will catch on the primer cup or primer slide on the down stroke of the press ram. Hmm. I haven't tried this but, since the lead tape is flat and smooth, it may be possible to attach it inside the chute on the side that contacts the ram. This would be ideal as it places the extra weight as close to the ram as possible.

9) Add a Magnet:

I've seen many forum postings about adding a magnet. I tried it and it doesn't really work the way it is intended. The magnet is just too far from the press ram (almost 1") to provide significant "attraction". It is rather the weight of the magnet that gets the chute to tilt. Of course, once the chute is tilted over against the ram, the magnet will surely help keep it there. But, once fully open, not staying open isn't a problem I've ever heard of.

10) Add a Spring Inside Chute:

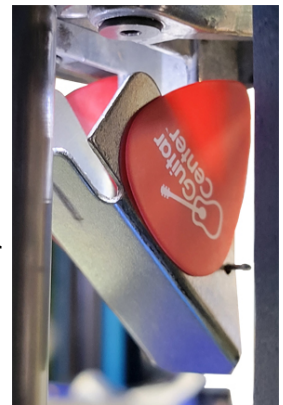
I just found this little trick on the Brian Enos Forum. The poster took a safety pin, cut off the point and latch, and then installed it inside the chute with the cotter pin passing through the loop (see photo at right). This is what's known as a torsion spring. If you do this, you can skip adding weights or a magnet as mentioned in items 4 & 5 above. In fact, I prefer it over either of those options and have one installed on my own press.



11) Block the Gaps:

Blocking the gaps present when the chute is open at the top of the ram stroke can also help. I've seen many forum postings showing various materials taped to the sides of the chute to reduce the size of the triangular gaps on both sides of the chute.

I played around with many materials and the best, by far, is a pair of guitar picks! They are thin, light weight, stiff, inexpensive and easy to find. The local Guitar Center store was nice enough to give me a few for free to experiment with. I just stuck them to the chute with Scotch® Double Sided Permanent Tape (see photo at right). I had to first clean the guitar picks with mineral spirits to get the tape to stick, but they worked great! The curved edge of the pick even matches the arc that the chute pivots through.



12) Clean the Metal Surfaces:

While working on this Tips file, I was appalled to see just how much crud had built up on the inside surfaces of the Spent Primer Chute and especially on the outer sides of the Roller Bracket where these two parts slide past each other. While you have everything apart, take a few minutes to clean up these surfaces with a little metal polish.

DO NOT apply any type of oil or grease!!!

The Spent Primer Cup:

There are many manufactures of alternative Spent Primer Cups. Most of these are designed with a hose connected to the bottom. The primers fall through the hose into a container ... so you never need to empty the cup. This prevents the cup from becoming overfilled to the point where spent primers can bounce out. But not all of these have higher sides that aid in capturing spent primers.

The photo at right shows the [550 Spent Primer Chute from UniqueTek, Inc.](#) It mounts on the Link Arm in place of the original cup. It includes both features. The sides are a full 0.9" higher than the original cup. And it has a hose to route spent primers to a container under the bench.



There are also many extensions, usually a 3-D printed part, that simply attach to the top of the original Spent Primer Cup (see photo at right). Keep in mind that these are not meant to increase the “full” level of the cup.



Putting It All Together:

The photo at right shows my own RL 550B press with several of the modifications described above, including.

- 1) Guitar Picks attached to the sides of the Primer Chute.
- 2) Hitch Pin inserted in the pivot point of the Spent Primer Chute.
- 3) Safety Pin installed as a “torsion spring” inside the Spent Primer Chute.
(Not visible in photo)
- 4) A UniqueTek 550 Spent Primer Chute.



Closing Thoughts

I hope you found this Tips file useful. I tried to include enough photos to help you visualize the parts, how they relate to each other, and solutions to problems.

If you find an alternative for Dillon’s Spent Primer Chute (#13899), or have other modifications, I’d very much like to hear about it.

After completing this Tips file, I thought it might be possible to take some of these solutions and package them together as a UniqueTek product. The package might look something like this.

- 1, Hitch Pin
- 1, Torsion Spring
- 2, Guitar Picks

If you’d be interested, please let me know.

Acknowledgements

- Scotch is a registered trademark of 3M Company.
- Images provided courtesy of their respective manufacturers.

Special Thanks to:

- Guitar Center in Mesa, AZ for providing the Guitar Picks.
- ShadeTree Golf & Pickleball in Mesa, AZ for providing the Lead Tape

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