

# Handloader

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Publisher: Wolfe Publishing Co  
2625 Stearman Rd.  
Suite A  
Prescott, AZ 8630

Toll Free: 1-800-899-7810  
Phone: 928-445-7810  
Fax: 928-778-5124

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## Trust Your Star

*While the following discussion is specifically directed at the Star Progressive Reloader, we find it is particularly applicable for progressives offered by other manufacturers, especially in terms of cleaning and maintenance. In the interest of safety, if nothing else, we offer Don's observations as they might pertain to any progressive reloader. – Ed.*

Competitive Pistol shooters burn literally thousands of rounds while honing their skills. Unless your income is the likes of Rockefeller's, or you have a military/police sponsor, it is probable that you will spend most of your time at the loading rather than shooting bench. A progressive loading machine can whittle those unbalanced scales down to close to even keel.

I went through this experience, saw the light and purchased a Star Universal Reloader (new) in 1968, including the Hulme automatic case feeder. That investment was one of the smartest I ever made, and the Star was always a reliable pleasure to use. The only criticism I might have is that the instruction manual is very scant when it comes to maintenance suggestions, although the operational and safety section is well done. This apparent shortcoming gave me an excuse to make a trip to San Diego in those early years to talk to the folks at Star Machine Works. Elard Mock, partner of Willis Brenizer at Star, has been the head honcho at the final assembly bench for 57 of his 82 summers. Mr. Mock generously took me through the maintenance procedures in his soft spoken, patient and gentlemanly manner.

My competitive pistol shooting days were interrupted for several years by business and family pressures. The interim time has offered a host of horror stories and articles about the mass detonation of primers, column-stacked, in automatic primer feeders, a key ingredient in the progressive reloader. These tales never seem to mention what brand of reloader was involved so the generic term "progressive reloader" becomes laden with a fear taboo.

More recently I spoke with Elard Mock about the possibilities of a mass detonation of primers in the Star. To his great credit, and my infinite appreciation, he didn't try to con me that it couldn't happen. His opinion is that no matter how precise the process controls on primer manufacture, there will be a remotely occasional, high anviled, overly sensitive primer come through the system. That baby is a disaster waiting to happen unless treated with kid gloves. As a result, always wear safety glasses and, preferably, a safety face shield when reloading. Treat all primers like beautiful women, very solicitously and gently. Keep away from the pointed direction of primer magazine and pick-up tubes and be especially gentle when introducing the primer follower rod down onto a column of primers. He cited an example of a gentle man who absentmindedly was tapping his index finger on the primer follower rod resting on a tube full of primers. There was a sensitive cap in the column that detonated, costing the man the end of his shooting finger. Personally, I would say it speaks well for the explosion containment capabilities of the Star primer magazine tube – if that is all he lost.

It pays to be alert for any apparent change in the machine operational smoothness or force required (binding). Do not be heavy handed in your quest for production speed; stop and investigate for the cause.

Keep all solvents, extra primers and powder (other than those loaded in the machine) far away and shielded from the machine area. There is enough potential hazard without adding to it.

Maintain the Star progressive reloader properly, especially the primer slide and storage mechanism, and follow the rest of the operational and safety procedures outlined in the booklet accompanying the Star reloading machine.

In summary, almost the entire maintenance take-down sequence has the cleanup of the primer slide and punch as the final objective. The reciprocating motion of the primer slide tends to pack debris at the end of its slot next to the column shaft. If allowed to accumulate, it will restrict the primer slide travel; tend to bind up the mechanism; and worse yet, cause misalignment between the primer slide and primer, the awaiting brass cartridge case and the primer punch. A heavy-handed operator who ignores the binding resistance could cause damage to himself and his machine. Mr. Mock indicated there was a known case where a primer exploded at this station. Fortunately the explosion did not transfer its energy to the nearby column of primers in the primer tube. No injury resulted to the operator. The inherent design of the primer slide makes the adjacent magazine well shielded from the punch station, but the example makes an argument for good housekeeping of any powder spills at the next station. There's a two barreled moral here: keep the primer slot end and slide free of debris by regular inspection and maintenance, and when the machine tends to bind, stop and investigate the cause. Be gentle, never complacent that an overly sensitive primer couldn't happen to you.

Another important cleaning area is the hole in the steel base where the primer punch is housed. The mating cylindrical surface between the large diameter of the punch base and the floor base hole does wear if not kept reasonably clean and greased, but **no grease** is to be on the actual punch (upper end) and its bushing. Grease must remain out of the proximity of the primer slide and its slot. Use dry graphite lube on the primer slide, slot, punch and bushing interfaces. Also, put a match-head-sized glob of grease under the large diameter base of the primer punch where it mates with the rocker arm. Aside from the underside of the thrust nut and the inner race of the shell plate, the only other location for grease is a small dab in the keyway slot at the top (left side) of the column shaft, before re-assembly of the tool head thereon.

There should be no oil or grease on the steel floor base or the steel ball detent, only graphite. The steel ball can be cleaned with a rag dampened in Shooter's Choice and well dried, do not soak it in solvent, just dampened. I tend to shy away from Hoppe's No. 9 for this job because of its oily base and residue. The powder slide tends to lube itself with graphite from the powder. Never allow solvent or oil around the powder slide area or the powder reservoir.

Keep an eye on the rocker arm screw. This tends to loosen up with use, causing wear on the rocker arm and poor primer seating. Late models (within the last four years) have a set screw to keep it tight. The simple remedy is to tighten it every once in a while.

The Hulme auto case feeder tends to get gummed up after long usage. I clean mine with Birchwood Casey's Gun Scrubber (off the machine), blow dry and relube with graphite.

Run a dry patch several times through the primer magazine tube and primer pick-up tube using the primer follower rod. This will keep the inner surfaces of the tubes clean, bright, and slick for friction free movement of the primers down the column.

That is all Mr. Mock has to say about maintenance. It seems complex, but is made simple when you understand why you are doing it."

Mr. Mock then handed me a piece of aircraft steel tubing saying, "Take this along. Some of our customers feel better protected with this encasing the primer magazine tube. They gave me some samples of what they use and you're welcome to the last one."

How safe is this? Elard Mock is the sort of fellow who wouldn't be satisfied until he found out, so he started testing. The final "safe" combination he derived empirically by test is as follows: A protective mild steel seamless tube slips down over the brass primer magazine tube as far as the knurled ferrule. Its dimensions are 7/16-inch O.D. x .049-inch wall x 11-3/4 inches in length. Also, a stainless steel protective collar encloses the primer magazine socket with dimensions of 1/2-inch O.D. x .028-inch wall x 1-1/16 inches in length. The collar cannot extend higher, otherwise it would interfere with the tool head at its lowest operating position. Also, the collar may not clear the knurled ferrule in some cases of tolerance built-up. If so, file down the knurled ferrule to fit.

Mr. Mock has run five primer column detonation tests in this configuration to date. These have all been run with a primer magazine tube full of Large Pistol primers in an actual Star reloading machine. All detonations have been initiated from the bottom of the column of primers in the primer slide. In each test the socket remained intact and attached to the machine. Also, all tests found the brass primers tube remaining intact. Four of the five tests blew the primer follower rod right through the bottom of an empty 55 gallon steel barrel which was inverted over the test setup for protection. The fifth one almost made it through. The holes looked as though they have been shot by a .45 ACP. In four of the five tests the brass primer magazine tube remained in the socket along with its 7/16-inch O.D. protective steel tube. The brass tube swelled out tightly against the steel tube in each case. In the fifth test, which I witnessed, the brass magazine tube and its steel protective tube were blown up and out of the socket. A surrounding cardboard box revealed that 95 percent of the primer debris and fragments were blown straight up with the follower rod. The remaining 5 percent of the fragments blew out radially from the bottom of the tube as it flew upwards clearing the socket. If detonation is initiated at the top of the column of primers, it has been demonstrated you don't need the steel protective tube. Brass has far less tensile strength than steel, but it has more ductility by a long shot. This means that any detonation in the primer magazine tube will expand a brass tube farther and sooner (as a lower pressure) than with an equivalent thickness of steel tubing. This translates into better gas venting relief around the sides of a column of primers and, probably reduces the intensity of the explosion. As the chain of explosions proceeds downward, the primer fragments tend to be self-cleaning out of the tube. If the detonation starts at the bottom of the primer column (i.e., a "cocked" primer crushed between the primer slide and magazine socket by a heavy-handed operator) then the overhead mass of primers are not self-cleaning. This will build up the intensity of the pressure in the tube and is far more hazardous. This is where a steel reinforcing tube (at sufficient radial clearance from the O.D. of the brass tube) is absolutely required to contain the destructive pressures.

In addition to using the steel protective tube and collar defined by Mr. Mock's testing, I'm upping the ante as follows:

I prefer to work with the Star on my right side. This exposes my right arm and hand to the primer tube area, but the tool head shades the primer magazine base from my face. I wear a face mask, safety glasses and a heavy leather glove on my right hand. I have considered ear plugs, but a failure to detect sound changes in machine operation would create more problems than it would solve. I'm going to place a 1/2-inch plywood shield between my right side and the left front area of the machine (back as far as the Hulme case feeder and across to the right link). The shield will protect my body from primer debris if the primer magazine tube is blown out of the socket and readily removable for maintenance purposes. It must not interfere with function or access for minor adjustments. My loading procedure rhythm will have to be modified to assure that my left hand is away from the rear of the machine at the time the right hand lowers the crank handle.

The vent hole in the top of the powder magazine cap worries me a little. I have dropped the shank of a large headed dressmakers pin down this; snipped the point off; and bent a "J" shape on the bottom of the shank to retain it in the cap. I hope this vents adequately, but I would hate to have hot gasses blasted into the powder magazine as the primer magazine rockets by after detonation.

I have fitted a 4130 steel reinforcing tube over the longer (brass) pick-up tube leaving 3/8-inch exposed at each end. The reinforcing tube is 1/2-inch O.D. x .065-inch wall x 7-3/4 inches in length. It is spaced over the brass pick-up tube (large primer tube at .314-inch O.D.) by a rubber band flat-spiral wound around and contact cemented to the primer pick-up tube. This method appealed to me because it allows for radial expansion and gives a little shock isolation to the pick-up function. In operation, the cotter key is omitted from the pick-up tube until all primers have been picked up. That way nothing restrains the column of primers from being blown out the top of the pick-up tube in the event of a detonation of one of our "loose cannons."

Now lets face it, product liability law being as biased as it is against firearms manufacturers, neither Mr. Mock and Star Machine Works, this publication, nor I are going to warrant the Star reloader, expressed or implied, as absolutely safe when the preceding maintenance and operating procedures and suggested reinforcing tubes are used. None of the aforementioned has any control over the components, judgment or operating techniques that you or anyone else employ in using same, and we specifically disclaim liability to all persons (readers, users or bystanders). Be aware that as a user you assume the risk. What more can I say except, "Ya pays your money and takes your chances." Thanks to Elard Mock your chances have improved by a quantum leap if you follow his lead. Also, don't forget that other old saw, the one that goes "A stitch in time saves nine." What really has been saved is my confidence in reloading with the Star.