#### Functioning Factors By Bob Marvel

## Marvel 1911-.22 Conversion Units One and Two

The following are some of the factors that effect the functioning of our 1911-.22 conversion:

- 1. Magazines
- 2. Ammunition
- 3. Recoil Spring Weight
- 4. Length of the recoil spring
- 5. Slide Weight
- 6. Interference with the travel of the slide
- 7. Mainspring Weight
- 8. Sear Spring Tension
- 9. Quality of the Frame and Parts and/or the quality of the work on the frame and/or the parts
- 10. Ejector
- 11. Maintenance
- 12. Environmental
- 13. Damage

#### Magazines

Without going into all of the factors regarding magazines, a few of the problems that can occur are:

**Magazine Lips.** If not wide enough at the rear the round might not be picked up by the slide. If too wide at the rear the round could "pop" out. The correct approximate spread in the rear is .224 to .227 The release point of the magazines has the same problem of being too wide or too narrow where the rim leaves the magazine. The approximate spread of the forward release point is .205" to .208". The inside edges of the release point should be deburred and smooth.

*Magazine Spring Tension:* When the magazine is in the gun, the follower or a round on top of the follower is pushing directly against the disconnector rail inside the slide. With just increasing the number of rounds in the magazine, you also increase the pressure against the slide. This is why some brands of ammo work well when there are only five rounds in the magazine, but will malfunction when the magazines is fully loaded.

Something that we started to do in December of 2002 is to cut the standard 7" spring by 4 coils making it a 6" spring. We cut the coils off the bottom and bent the "tag" up so that the bottom of the spring is relative flat. This still allows enough spring tension and yet makes the gun les likely to malfunction with certain types of ammo.

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Something that can appear to be a magazine problem is when the round goes partly into the chamber or is stuck on the feed ramp. This can be that the ammo is not right for the recoil spring weight or the hammer spring weight.

There is also some ammo that will just not work in our conversion units.

The magazine seriously affects accuracy. I found this out by building bullseye pistols and ransom rest testing at fifty yards for 10- shot groups. Thousands of rounds were fired and recorded to prove the effect of the magazine (as well as other factors). A bad magazine can increase the size of the group by as much as 50%. That is why we test every magazine before shipping and why we continue to try to improve on the details.

*Wide Body Magazines:* The lip on the base pad is to stop the upward travel of the magazine. If your Magazine well has been dressed/relieved, you might need a spacer installed onto the lip of the base pad. The problem shows up as a magazine sticking too high into the magazine well. Which would not allow the slide to go forward.

If the two side screws are too tight, the rounds cannot come up easily enough to feed the lower two screws can be tight. Loosing the four screws and then repositioning the magazine within the outside plates and retightening them is used to make small adjustments. Usually the back of the magazine is level with the backs of the side plates.

# Ammunition

We have tested a wide range of .22 ammunition for accuracy at 50 yards on the ransom rest. We have also shot tens of thousands of rounds function firing different ammunition to correct any unit problems or ammunition problems. IN the year 2000 we filmed the conversion unit firing from various angles with the latest high-speed equipment. All of this has given us a great understanding of the functioning of the gun and of the ammunition that was tested. The test have shown that some ammo is better suited for riles than for our conversion unit. Other ammunition might not shoot well because of the nose shape or power used.

Sometimes an ammunition company may change how the ammunition is made or a retailer may change who supplies their house brand. We have tested certain lots of ammunition have had good results when the re-order the same brand to find that it will not function at all. Although not common, it does happen, usually in the less expensive bulk ammunition.

A factor for proper functioning is when the powder reaches its' peak pressure. If the peak is reached too late (regardless of the velocity) the slide may not cycle fully. We have tested ammunition at 940 feet per second that cycled the gun every time and the shot ammunition at a higher velocity (1130 feet per second) and have had it malfunction consistently. This proved out over thousands of rounds over a period of time and with many different conversation units.

Standard velocity .22 ammunition has been shown to be more accurate than the high velocity ammunition For instance, if you unit shot a group of .650" at fifty yards with standard velocity ammunition, the group would most likely be approximately 1" with high velocity ammunition.

We have found that the groups that we fire from the ransom rest us a good indication of how the conversion unit will perform. However, we get a fair amount of feedback that there are people who can out shoot the machine rest. This is rare but I have seen it happen at least three times with custom bullseye guns that I build and again with our .22 unit using a four-power pistol scope mounted onto the scope mount.

# **Recoil Springs and Mainsprings**

The standard recoil spring that we use is nine pounds. This allows the round to be stripped out of the magazine easily and limits serious banging of the slide against the frame with standard velocity ammunition.

Because of the many kinds of ammunition and the various pressures that different ammunition creates, we are now offering three different spring weights to fit the requirements of the shooter. The five-inch recoil spring comes in eight pounds for lighter loads, nine pounds for most shooting, and in ten pounds for the high/hyper velocity ammunitions.

I suggest that you replace the recoil spring about every three to four thousand rounds to prevent damage to the slide. Over repeated firing the spring will compress and will allow the slide to hit the frame harder than it should.

The standard 1911 mainspring is 23-pounds, which with some guns and ammunition could be too much resistance of the hammer against the slide. I suggest a 19-pound spring, which creates a good balance of setting the round off and giving the correct hammer resistance to the slide.

Another problem can be that the hammer strut can bind on the sear spring, the grip safety and/or the lip of the mainspring housing. This can create too much resistance for the slide to overcome. This problem will show up by slowly cocking the hammer and seeing if you can feel the hammer "stacking".

#### Misfires

If the trigger over travel screw is set too close, the half-cock hook of the hammer may catch the sear on the way down. When this happens the hammer movement is interrupted and results in al light hit on the rim. I have found this true in many custom guns that have come into our shop for repair. The overtravel must be checked with the magazine in the gun. The reason is that the overtravel screw stop/pushes against the magazine catch and the magazine may put pressure against the magazine catch. This changes the release point of the hammer.

Too light of a mainspring may cause misfires. I suggest a minimum hammer spring of 18pounds.

A poorly fed round may also cause a misfire because it did not chamber fully.

## Slide Weight

When I designed the marvel 1911-.22 conversion units one and two, my first concern was reliability. For this reason I used aluminum instead of steel simply because of the total mass that has to move using various types of ammunition balanced with a recoil spring that will strip all 10 rounds out of a magazine. The list below might be of interest:

1911 45 ACP	Pounds	Ounces
1911 45 ACPSlide - Government - Bald	.769	12.5
Slide - Unique - Bald	.804	13
Slide with parts, sights, barrel, and Ext. Guide Rod	1.211	19.5
Marvel 191122		
Marvel 191122 Unit One with All Slide Parts (Slide Only - No Barrel):	.273	4+
Unit One Complete - Scope Mount Version	.921	15+
Unit One Complete - Adjustable Sight Version	1.027	16.5
Steel Compensator	.218	3.5
Unit Two with All Slide Parts (No Barrel)	.414	6.5
Unit Two Complete	.857	13.5
Caspian Frame Complete with All Parts	1.015	16+
STI Standard Frame Complete with All Parts	.814	13+
STI Long and Wide Frame with All Parts	.962	15.5

#### Slide Interference

Anything that interferes with the movement of the slide will affect the reliability and the accuracy. Things that can interfere with the slide movement are:

The top rib rubbing the slide on:

- 1. The underside of the rear of the rib against the top rear of the slide
- 2. The slide rubbing the barrel

- 3. The forward edges of the slide rubbing the underside edges of the rib (these were problems with earlier conversion units prior to the time when we began putting the serial numbers onto the slides)
- 4. Too much disconnector tension (uncommon)
- 5. Too much hammer tension or strut "stacking"
- 6. Dirt, carbon and/or powder build up
- 7. Shooter's thumb riding the slide
- 8. Lack of oil on frame rails

## Doubling

With the original units we had a few that would double. The problem was that I had the firing pin too close to the face of the breech. This didn't happen often and I believe we have since fixed all of those early units. If your gun doubles with our unit on the frame but not with the 1911 slide, 95% of the time it is because the sear is too short (less than .778" OAL).

Because our slide is traveling so fast it can shake the hammer off of the sear when the slide breech hits the barrel face. Replace the sear and it will most likely never happen again.

Another area is bad trigger jobs, they are much more common than one would think. If you have any questions, please give us a call; we want everyone to be satisfied with our products - we take this very seriously.

#### Rim Thickness

Three thousand rounds were fired to find out that worrying about the rim thickness was not a major issue unless you are shooting bench rest rifle.

# Dry Firing

The marvel conversions were designed to be dry fired, however it is suggested that a leather tap be placed behind the firing pin if you dry fire excessively.

#### Ejectors/Ejection/Extraction

The ejector can be bent by pulling the slide back away from the barrel without first securing the unit to a frame and locking the barrel down with the recoil rod. It is not a serious problem to correct, but it has happened.

The ejector on our conversion is attached to the barrel and its' position relative to the bore is important. The best way to check the correct position is to turn the conversion over and look at the relative position of the ejector to the side of the disconnector rail. The ejector should be very close to the side of the rail but not touching it (about .025" to .035" apart). If it requires that it needs to be bent in: secure the barrel only into a vise with only the ejector exposed and lightly tap the ejector in.

The reason you need to secure the barrel in the vise is to insure that the ejector does not come out of the barrel where it is staked in.

Because our units have match chambers, they sometimes will not extract a live round out of the chamber. This requires that the round be fired down range or that you put thumb pressure against the extractor as you pull the slide to the rear. Make sure the weapon is pointed down range. If this is not acceptable to you, please let us know and we will slightly enlarge the chamber. This will cause some loss in accuracy but not to an unacceptable level for most people.

If brass is going forward of the gun it usually means that the ammo is not cycling the slide fully. Try different ammo, different spring, or check for interference.

#### Maintenance

The reliability of the Marvel 1911 .22 conversion is excellent. If for some reason it is not let us know right away - we want to know and we want to fix anything that is a problem for you. We have had times where we would shoot a number of conversion units for 2000 to 4000 rounds in an afternoon and not have any malfunctions. However, I suggest that you clean your unit at least every 500 to 1000 rounds. If you use a brass rod or a "safe" rod, you can clean the bore from the front. But it is still best to remove the barrel from the slide by unscrewing the recoil rod, then clean the barrel from the rear.

There is no need to remove the rib from the barrel. The insert from the slide, nor the firing pin from the insert.

Use a light oil on the slide rails/ways but keep the oil from the bore if you are going to shoot for good groups. If you did oil the bore, you will need to fire about 20 fouling rounds before shooting for accuracy.

Use a toothbrush on the breech face and the barrel face. If the crown is damaged so is the accuracy. Keep heavy dust away from the gun if possible.

If you have any questions or comments please let us know.

Sincerely,

Bob Marvel