

Bolt assembly pins from three long-term Model 710 rifles were examined. One rifle had been fired 10,000 rounds. Its pin had a single crack that was much smaller than the cracks in the 1000-cycle pin from the dry cycle test. The cracks in the 1000-cycle pin could be seen without magnification, but the crack in the pin from the 10,000-round gun could not. Pins from two 5000-round guns were examined and no cracks were found.

The cracking of the bolt assembly pin seems to be caused by a situation that occurs only when the gun is dry-fired. When the gun is dry-fired, the firing pin strikes the back of the bolt head with all of its energy. Without a cartridge in the chamber, the bolt head is free to bound forwards until the tolerance in the bolt assembly pin fit is taken up. The bolt head is then stopped by an impact between the bolt assembly pin and bolt and between the bolt assembly pin and bolt body. These events do not occur when a live round is discharged. When a live round is fired, the firing pin never reaches its full-forward position. Firing a round also places a high pressure on the bolt face, further preventing it from bounding forwards.

Breakage of the pin does not seem to render the gun inoperable or unsafe. The broken pins in the dry-cycle gun were not found until the end of the cycle level being tested.

Table 1 contains the measured values of headspace and trigger engagement.

Cycles	Headspace (in)		Engagement (in)	
	710	700	710	700
0	min	+0.007	0.0210	0.0164
1000	min	+0.008	0.0212	0.0166
2000	min	+0.008	0.0217	0.0172
3000	+0.001	+0.008	0.0234	0.0180
4000	+0.001	+0.008	0.0216	0.0181
5000	+0.001	+0.008	0.0209	0.0181

Table 1. Measured Headspace and Trigger Engagement.

Headspace grew by about 0.001 inch in each gun. In the Model 700, trigger engagement grew steadily, increasing 0.0017 inches over the duration of the test. Trigger engagement in the 710 varied more erratically. The maximum engagement measurement differed from the minimum value by 0.0025 inches, however at no time did it fall below the .020 inch minimum specification.

Pictures were taken of four areas in both guns: the firing pin head, the cam surface the firing pin head rides upon, the bolt lugs and the sear.

Two areas of the plastic bolt plug on the 710 showed noticeable wear. The non-bolt-side firing pin head ear displayed considerable flattening. This can be seen in Figure 2.