

Ilion, New York
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The purpose of this letter is to inform you of the extremely hazardous condition found when checking over a production Model XP-100.

On February 18, 1963 John Finnegan and I were instructed by you to withdraw from the warehouse one XP-100. This gun was to be used as a standard in determining whether or not our present packaging system afforded the gun sufficient protection. The gun was to be inspected by me prior to commencing the test and following each test phase.

Initial inspection of the gun showed the following:

1. The gun had a tendency to follow down on closing of the bolt. If the action were closed with extreme care, the "follow down" occasionally would not occur. A very slight blow on the rear of the firing pin head, however, would cause the sear to release the firing pin and fire the gun.
2. The safety could not be operated by hand. In order to rotate the safety to the "On Safe" position, the safety lever had to be hammered rearward.
3. On removing the stock, it was found that the trigger had a tendency to bind in the trigger housing. The housing was opened to allow free trigger motion, but the "follow down" and "jar offs" still persisted. The sear block-sear engagement was increased to minimize the aforementioned tendencies, and the test was run.

On completion of the test, the gun was completely disassembled and critical fire control parts were inspected. This inspection showed the following:

1. Sear block-sear contact radius on sear block - .453 inches. OK
2. Sear height - .341 inches at widest point. Sear contact area appeared to be angled upward at contact point with sear block.
3. Sear block pivot hole in sear housing - OK.

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4. Receiver - distance from centerline to fire control holes - OK.
5. Firing pin head - dimension from centerline to bottom of sear contact area - .4355. OK.

The old sear housing assembly was replaced with a new one. The sear in the new assembly was inspected to insure that it was flat over its entire sear block contact area and that the contact line was sharp. All follow down or jar off characteristics previously experienced were eliminated, and the gun was found to be completely safe.

Attached to this letter you will find two sketches illustrating how the condition of a sear at contact with the sear block influences the safety characteristics of the XP-100 fire control.

Figure 1 - illustrates the correct relative location of parts when the gun is cocked and ready to fire. The lower portion of Figure 1 represents the sear block showing all external forces in their correct positions and directions. Note that all forces acting on the sear block either tend to cause rotation in a counterclockwise direction or stabilize rotation, thus tending to keep the sear block under the sear. In order to rotate the sear block in a clockwise direction, thus releasing the sear, a force must be applied by the trigger link as shown by the dotted line.

The upper diagram shows that the safety, when rotated counterclockwise, lifts the safety cam upward. This condition relieves the sear block of the load applied by the sear, thus the fire control is locked "on safe".

Figure 2 - illustrates the location of parts if the sear is not correctly shaped at the sear-sear block contact area. The sear in this diagram has been "dubbed" over at the sear block contact area.

Note that the sear and safety cam are allowed to rotate downward from their normal position. The firing pin head-sear contact surface has been markedly decreased. The safety cannot lift the safety cam properly since their contact will be direct rather than a cam action.

The lower diagram shows the forces applied to the sear block under these conditions. Note that the force applied by the sear tends to

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rotate the sear block out from under the sear, hence causing an unstable condition. Due to the fact that the sear-sear block coverage is intentionally small on this gun, the condition of the sear at contact with the sear block cannot be overemphasized. The contact line on the sear must be sharp, as indicated on the part drawing number B-15455.

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