

Slide 1

The 788 Safety System came under criticism a while ago and that prompted an intensive look at it. The basic complaint was how the inadvertent movement of the safety lever was possible.

— Slide 2 —

The main reasons behind this ^{are} the size of the safety button itself and the relatively low safe off forces associated with it. When we speak of low forces, we mean the amt. of force it takes to push it from the safe on position to the safe off position. The

present production made rifles have a $1 \frac{3}{4}$ ^{2 1/2} lb safe off force. ^{Note also how the button had to be filed at the rear to obtain}

— SLIDE 3 — ~~The first step to~~
^{This is a problem out in production}
~~make was to increase the safety off force~~

When the rifle is held by the ~~finger~~ ^{gr} the fleshy part of the hand between the thumb & the index finger comes in close to the safety

button when the safe is in the safe or posit
Here in this view it is clearly seen how close it.

— Slide 4 —

off the rifle is slung over the shoulder, the
rotation of the gun up to this position causes the
same part of the hand to actually come in
contact with the rear portion of the safety
button. Now, if the amt. of force exerted on
the button is higher than the ²⁰~~15~~ lb safe off
force, the safety lever will move to the safe off
position. Although this style of carry is not one
that is common with a rifle, we still have to
be concerned with it because an accidental discharge
could result ^{since} ~~because~~ the person may think the

... - - - - -

The first step to make was to increase the safety off force. To accomplish this with any degree of consistency, the two main components of the safety detent system, namely the safety detent plunger and the spring, had to be looked at separately. As an initial choice, the safety detent plunger was chosen to determine its effect on the safe off forces. Various angles on the plunger were investigated.

Slide 5. Here we can see 2 different angles that ^{were} investigated and their effects on the safe off force. By decreasing the cone angle there is an increase in the amt. of surface area that contacts the safety lever. More surface area generates more surface friction and an increase in safe off force is the result. An increase of 99% of surface area

resulted in an increase of 39% in the safe off force.

Samples were then made and sent to the test lab for evaluation. Dry cycle testing was performed and results indicated no loss in safe off force and no

part failure or wear. ^{1100 90°} Now that the plunger was checked it was on to step 2. The second part of this investigation was the safety detent plunger spring.

Again this was studied independently.

— Slide # 6. —

The existing spring was analyzed and compared to the safe off forces. The spring force at the working length played a role in this force. Here on this slide we can see that the spring load at the working distance was equivalent to the safe off force.

For this next part a new spring was designed to

provide an adequate safe off force. The proposed spring has a load of 2.85 lbs. at its working distance. When samples of these springs were assembled into rifles with the current plunger, a safe off force of 3.0 lbs was the result. ~~So now the~~ pieces start to fit together. The safety detent plunger does have an effect on the safe off force but not as much as the spring behind it. The ~~original~~ current spring and plunger together gave us an off force of 2.0 lbs. ^(.2 from the plunger and 1.75 from the spring) The proposed system together gives an off force of ~~3.0~~ ^{3.75} lbs, .75 from the plunger and $2.85 \pm .2$ from the spring. Here we can visually see the difference in the parts. Note the difference in the nose angle on the plunger & the overall length of the spring. There was no cost increase on these parts.
 .020 springs) — Slide # 8 —

The final part of this project was to redesign

possible movement of its location was desired. By changing to a one piece design, a cost savings could be realized. By moving the location of the button forward, the inadvertent movement problem could also be reduced. By changing to this one piece design, a cost reduction of 5¢ per gun could be realized. ~~This may not seem like much but when it really set out to do ^{increase} ~~it was accomplished~~, with no cost ~~increase~~.~~

— Slide 9 —

So ^{in summary} ~~overall~~, I have gone from a 2 piece design safety lever to a one piece design. The safety off force has been increased from 2.0 lbs average up to 4.0 lbs average and all at a cost minus. Here we see what the original safety lever.

looks like on the rifle. There is adequate clearance under the button to prevent it from interfering with the wood, another problem that was resolved in this safety lever redesign program.

~~- Future Work -~~

Summary Slide

NEED MORE visual Aides

SUMMARY

- ONE PIECE DESIGN SAFETY LEVER
- INCREASED SAFETY OFF FORCE
- IMPROVED LOCATION OF SAFETY BUTTON
- COST SAVINGS

MODEL 788 SAFETY IMPROVEMENTS

- INCREASED SAFETY OFF FORCE
- IMPROVED LOCATION OF SAFETY BUTTON
- ONE PIECE DESIGN SAFETY LEVER
- COST SAVINGS

1) Subject arrived in the room on 7-8-68 in the car
 driven over the date year.

2) ~~Subject~~ Distress performed in 3 stages

- 1st - In incident that started the work
- 2nd - In conversation that followed
- 3rd - In solution to the problem

3) In the Plumber
 Case Angle

4) In the Se 10
 O.H.
 W.H.

5) Safety Analysis
 2 pages - Safety Data

6) In the Se 10
 O.H.
 W.H.

7. Tell about the Potential Problem

8) View of Safety of the rifle
Sight in " location

9) Rifle held by grip
location of hand & trigger

10) Rifle in a ...
location of hand & trigger

11) The safety investigation
report had to be ... individually

12) Investigation stages

3 - 3 parts

plunger
carriage
line

13) Look at Plunger first

14) Note ...
... ..

15) Empty Tank Spillage

Don't ~~spillage~~ to look at

16) The concern

- 1) w.b.
- 2) -old
- 3) fire
- 4) size of hole

17) Spill level change

- 1) One side change
- 2) Change location of bottom

18) Conversion done

- 1) One side change
- 2) changed location
- 3) changed angles

19) The possible solution to this complaint

20) Current vs. Proposed

- 1) ~~location~~ = ~~angle~~
- 2) change cone angles

21) The change with level

the change in level
the change in level

Handwritten notes, possibly "The... of..."

Handwritten word, possibly "Summary"

See ~~in~~ 12 1/2 lbs + 4 lbs.

- 1) M 755 Cover Slide with cover of a - safety
- 2) M 752 3 stage of presentation
- 3) Plunger
- 4) Spring
- 5) Lever
on top of case slide
- 6) 2 stage Potential Problem
- 7) Safety button on gun
- 8) Holding on by ring
- 9) Slung over shoulder
- 10) 3 Stage Safety investigation
- 11) Investigation Stages
- 12) Plunger investigation
- 13) Plunger comparison 120° vs 100°
- 14) Investigation stage - Spring
- 15) Same Case

- 17) Investigation Stages - Seven
- 18) Comparison of 1st levels.
- 19) Presentation - Solution
- 20) Comparison of current vs proposed
- 21) Comparison of 2 levels
- 22) Two levels on map
- 23) Improvements slide