

3/8/63

To: CB workman
From E.W. Yetter Jr.

Model Seven Floor Plate Latch

Explanation of the problem.

Vibration measurements were taken of the trigger guard, floor plate base, and floor plate latch using miniature accelerometers. The following conclusions have been drawn from these measurements: 1. The shock from recoil starts the trigger guard vibrating. 2. The trigger guard forces the floor plate base to vibrate. Before the floor plate base catches up to the trigger guard (that is before their vibrations are in phase) the interaction between the two parts forces the latch to vibrate and "walks" it off the floor plate cover. 3. The shape of the trigger guard causes a net force on the floor plate base ^{away from} ~~out of~~ the stock. When both are vibrating in phase this force causes very high accelerations (up to 500 g's) which exceeds the yield point of the floor plate base enough to bend it noticeably out of the stock.

A small experiment was run to illustrate this explanation. A stock with a brass reinforcing pin was used with a gun whose floor plate consistently opened. The floor plate base was securely wired to the stock's cross pin thus preventing it from vibrating. Several ~~guns~~ rounds were fired

From this gun. The floor plate cover opened only after about 10 shots. The gun was disassembled and it was discovered that the ~~trigger guard~~ ^{floor plate base} vibrations actually broke the wires. Therefore, in about 10 shots the force from the trigger guard broke the wires, freeing the base to vibrate and open the latch.

The downward force on the floor plate base from the trigger guard is caused by the $6^{\circ}20'$ angle on the rear of the guard (see drawing). It was felt that if the trigger guard could be modified to change the direction of the force there would be enough additional support to the floor plate base to attenuate the vibrations that opened the latch. This was done by changing the angle on the rear of the trigger guard. Testing to date confirms this to be an adequate solution although there is sensitivity to certain other conditions such as the fit of the stock and the dimension of the latch spring.

~~18 confirmed~~

Summary of Testing

18 confirmed floor plate openers were fitted with modified trigger guards. The problem was cured in 16 guns. Two of these were picked for endurance to 500 rounds. The modified angle on one of the two

trigger guards changed enough in 160 rounds to permit the floor plate to begin opening. It was decided to heat treat the guards to prevent this. Nine guns were fitted with modified and heat treated guards and field function tested. Of these one gun opened. This gun was found to have a large latch spring. There were no other malfunctions in this test (150 rounds). Three guns from the field test were selected for endurance. All three went 3000 rounds with no floorplate openings and no significant change in trigger guard angle or latch opening force. — trigger guards were bent, heat treated and colored. These were assembled into guns previously rejected for F.P.O.. The assembly and testing was done by production. 28 guns were made on 3/7/83. One gun was rejected in the gallery for floor plate opening. A sample of 8 guns was selected by research for a field cycle test. One gun experienced 2 F.P.O.'s. This was the gun that was originally rejected. A sample of two of these 8 was selected for endurance.

See attached outline for additional test results.

Results of testing 308win pinned stocks

One 308 model seven stock developed a small crack behind the recoil lug on the inside at 1500 rds. After 3000 rounds the crack never reached the outside surface of the stock.

We have several guns with pinned stocks with no cracks:

2	at	500 rounds
2	at	3000 rounds
2	at	350 rounds
13	at	150 rounds
56	at	~15 rounds,

MEASUREMENTS

o 20 Guns Measured

Only correlation between measurements and F.B.O.s was large spring dimension on one bad gun.

Latch opening forces range from 2.25 lbs. to 7.50 lbs.

Latch coverage range from .060 in. to .091 in.

o Seven (7) Stocks measured

Mounting holes .020 in. to .030 in. farther apart at bottom than top on all stocks.

Fire Control cut up to .050 in. too large. Four out of seven Stocks inlet cut in bottom up to .018 in. too narrow.

Magazine Box cut up to .100 in. too far forward.

Recoil lug slot to front mounting hole - good on all stocks.

o Stock Firing Force Measurement: (Spreading force on X-pin)

<u>Caliber</u>	<u>Load</u>	<u>First Shot Higher By</u>
308	100 lbs.	20%
7mm-08	95 lbs.	45%
243	40 lbs.	60%
6 mm	60 lbs.	50%
222	20 lbs.	45%

308 w/epoxy bedding 100 lbs. 0%

o 6mm stocks were endurance (No Pins)

one cracked at 560 rnds

one at 1700 rnds no cracks

one at 1000 rnds no cracks

o 243 stock were ~~also~~ endurance. (No pins)

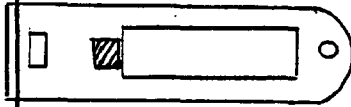
one at 2000 rnds no cracks

one at 460 rnds no cracks

one at 140 rnds no cracks } test in progress

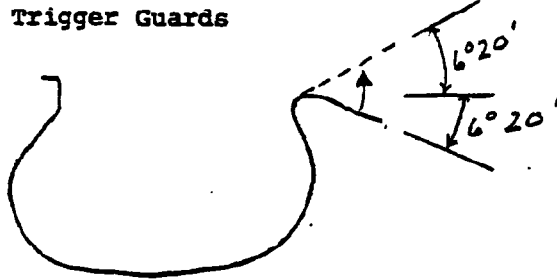
FIXES TRYED

- Tab soldered under spring



3 Guns tested
2 - F.P.O.

- .062 thick Trigger Plate (.050-orig.)
6 tested 3-F.P.O.s
- Double thick Trigger Plate (two standard plates together) 2 tested 0-F.P.O.s
- Stocks swapped. 4 guns tested
F.P.O. problem followed Stock once
- Bent Trigger Guards



18 bad guns tested
2 guns enduranced

16 were fixed
500 rounds

1 - No Problem
1 - F.P.O.s began 160 rounds
Trigger Guard had bent back

FIXES TRYED - Contd.

o Heat Treated Trigger Guards

5 @ 6° 20'
5 @ 3°
5 @ 0°

Nine (9) guns from Assembly were tested - Stocks replaced w/pinned Stocks - shot and confirmed F.P.O.

Three (3) Trigger Guards of each type were used. (0°, 3°, 6° 20')

One (1) gun F.P.O. (0° T.G.) T.G. replaced with 6° 20'.

All nine (9) field function tested

One gun F.P.O. twice - latch spring dimension large latch and spring replaced after test.

No Other Malfunctions

Three (3) guns - one of each type T.G. Enduranced - 3000 rounds.

No malfunctions

One (1) Stock cracked - inside front @ 1500 rounds

Latch opening force and T.G. angle checked every 500 rounds. - no significant change in either.

Latch showed signs of wear from contact w/ trigger guard. This wear did not effect latch operation.

o Pinning Cracked Stocks

Two (2) guns with cracked stocks were pinned and shot 50 rds. each to determine if cracks will propagate further. Crack propagation was stopped by the re-enforcement pin.

o Modified Latch Spring

Latch Springs were re-bent to a new configuration. This change was made to decrease vertical and latch movement. Parts have been received and will be tested.

