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NO. SWERR-S-2-72

EFFECT OF M193 BALL ROUND FIRED  
THROUGH M15A1 B.F.A. WHEN ATTACHED TO M16A1 RIFLE



## TECHNICAL NOTE

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APRIL 1972

*39-CJA*

**SMALL ARMS  
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**ROCK ISLAND  
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REPORT NO. SWERR-S-2-72

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## 1.1 BACKGROUND:

It is conceivable that an M193 ball round of ammunition could accidentally be fired in an M16A1 Rifle with a blank firing attachment (BFA) installed. To preclude injury to the shooter and major damage to the weapon, the BFA should fail sacrificially when a ball round is fired. This test was conducted to determine the extent of potential hazard to personnel and/or equipment resulting from sacrificial BFA failure.

## 1.2 TEST EQUIPMENT:

1. M16A1 Rifle, serial number 3403472
2. 5.56mm M193 Ball Ammunition
3. M15A1 Blank Firing Attachment (BFA) (Figure 1)
4. Hy-Cam "400" high speed motion picture camera
5. Rigid mount firing fixture

## 1.3 TEST PROCEDURE:

A preliminary inspection was conducted on the M16A1 Rifle. Inspection consisted of both visual and dimensional examination of the last few inches of bore, muzzle, and the flash suppressor. The examination revealed no defects.

The weapon was secured in the test fixture with web straps. A high speed motion picture camera was set up on the right side of the weapon, 90° to the line of sight. The field of view included the forward end of the barrel, flash suppressor, BFA, and several inches forward of the BFA.

The rifle was loaded with a 5.56mm M193 ball cartridge. The actual firing of the rifle was accomplished by pulling the trigger with a lanyard from a protected position.

As the rifle was fired, the high speed camera malfunctioned and the action was recorded at 3,800 frames per second rather than the normal 6,000 frames per second. In addition, the field of view from the camera was obscured by smoke from the rifle.

Damage consisted of the following:

1. The "T" handle end of the restrictor tube with the rivnut (Figure 2-B) separated from the frame (Figure 2-A). This piece was found approximately 65 feet down range at an angle of approximately  $10^{\circ}$  right of the muzzle of the weapon.

2. A piece of the restrictor tube (Figure 2-C) remained lodged in the flash suppressor flutes (Figure 3).

3. The frame (Figure 2-A) dropped from the suppressor to the floor, directly below the muzzle.

4. Examination of the "T" handle portion of the restrictor tube with nut (Figure 4) revealed that more than 1-1/8 inches of the restrictor tube was blown away. Also, evidence of gilding metal (bullet jacket) was found in the depression of the remaining portion of the restrictor tube. Further examination revealed the appearance of a right angle hole through the rivnut wall at the base of the depression. An arrow in Figure 4 indicates the location of this hole. It is assumed that the right angle hole was produced by projectile fragment exit, because of the presence of gilding metal at the beginning of the hole. The direction of flight that this fragment assumed is not known.

5. The sides of the flash suppressor, all six segments between flutes, exhibited slight expansion/deformation (see Figure 5). An arrow in Figure 5 helps point out a typical bowed segment.

#### 1.4 CONCLUSIONS:

The M15A1 Blank Firing Attachment, when assembled to the M16A1 Rifle, does exhibit sacrificial failure when an M193 ball round of ammunition is fired. Firing in this condition does not result in major damage to the weapon but may produce a serious safety hazard to nearby persons/equipment and to the shooter if he fires the weapon in an area where fragments may be deflected rearward.

#### 1.5 RECOMMENDATIONS:

It is recommended that the above noted condition be pointed out during training and that personnel equipped with a BFA be cautioned on the potential hazards of firing a bulletted round in an M16A1 Rifle after a BFA has been installed.



Figure 1

11-070- 2229-22/AMC71-C

U.S. ARMY, RIA  
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M15A1 BLANK FIREING ATTACHMENT FOR M16A1 RIFLE.

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Figure 2

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RECOVERED PIECES OF B.F.A. AFTER FIRING.

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**Figure 3**

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Rock Island, Ill.

RESTRICTOR TUBE FRAGMENT RETAINED IN FLASH SUPPRESSOR FLUTES.

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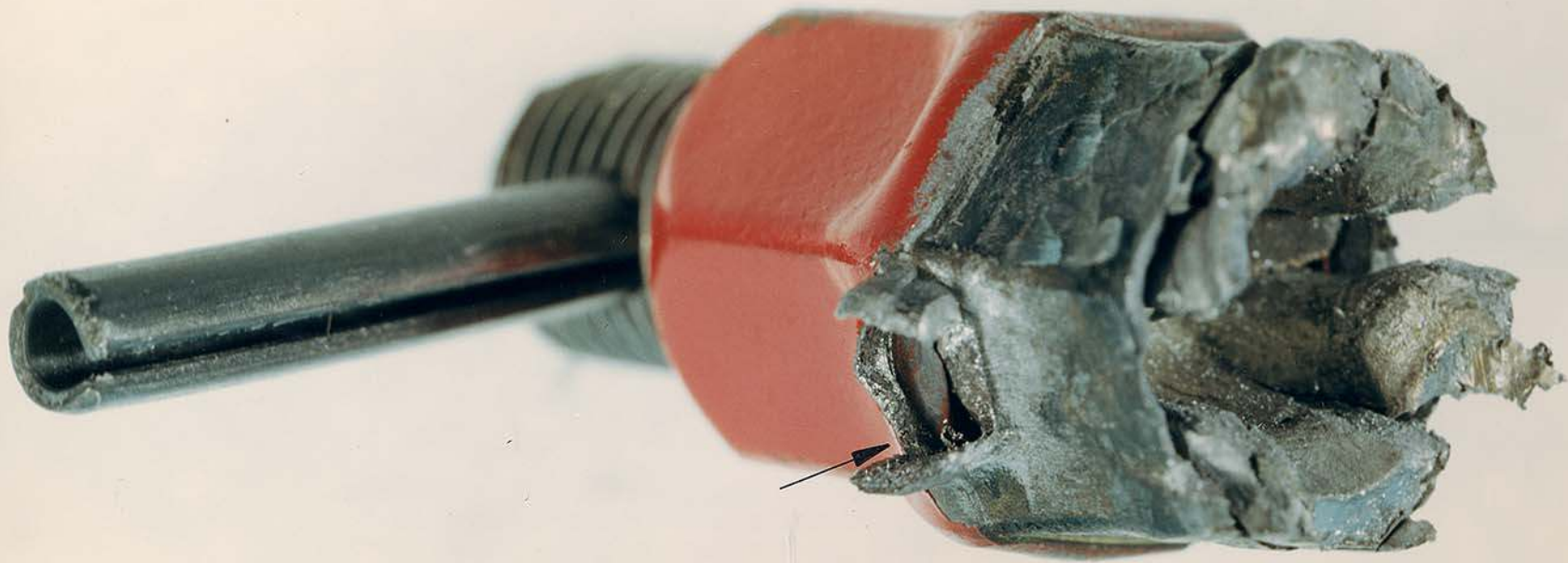


Figure 4

11-070-2229-302/AMC72-C

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HANDLE END OF RESTRICTOR AND RIVNUT OF B.F.A.

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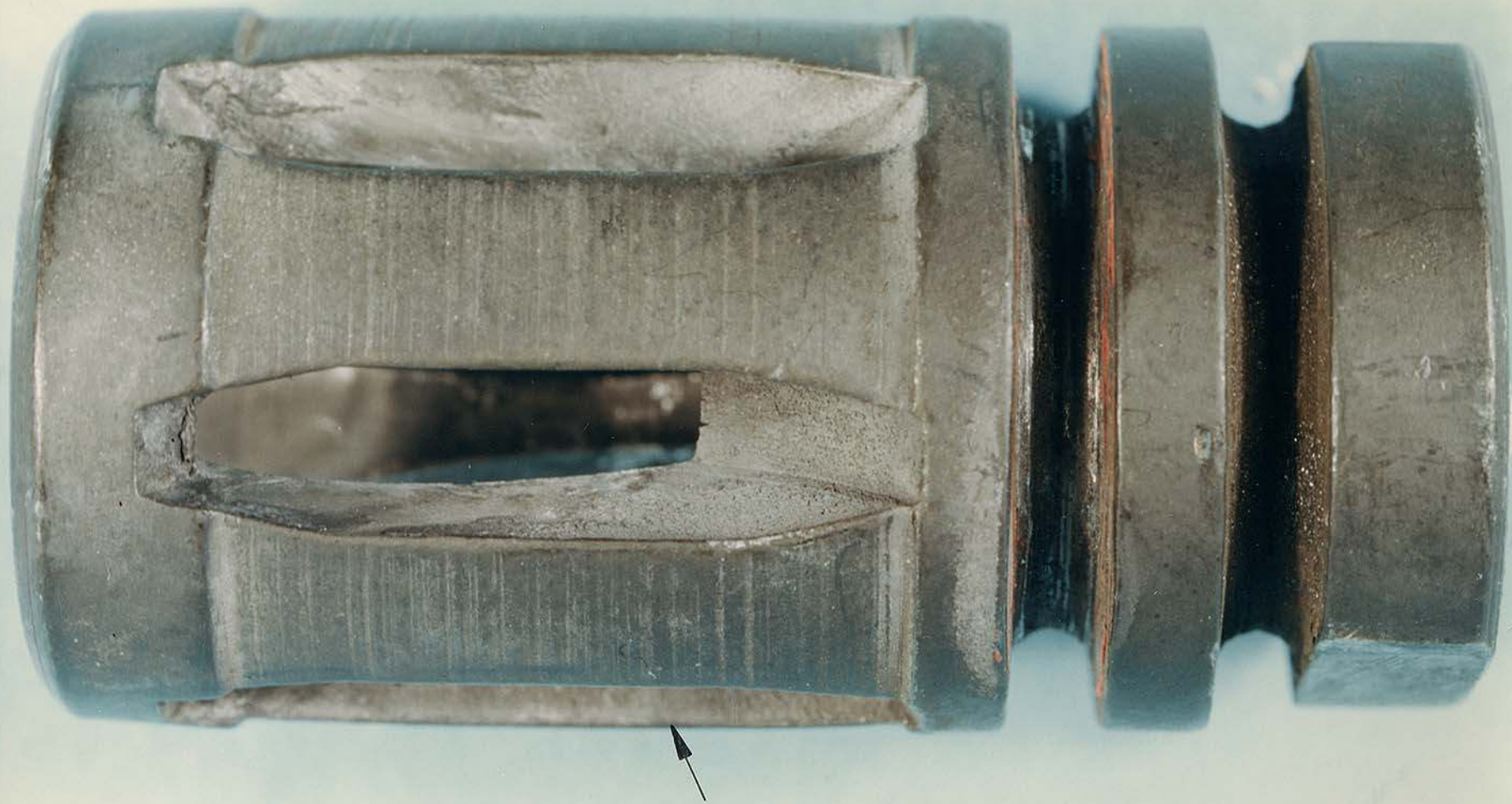


Figure 5

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Rock Island, Ill.

EXPANDED FLASH SUPPRESSOR.

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