7/96 Fatimation

## 6BFC

- The 6BFC is a six bar linkage configured to operate as a retrofitable fire control for the model 700 Remington bolt action rifle.
- Figure 1 displays the 6BFC as it would be in a model 700.
- The 6BFC consists of six links: the left trigger plate, sear, sear-green-bar connector, green-bar, green-bar-trigger connector, and the trigger.
- The sear-green-bar connector is the most important link of the mechanism.
- The sear-green-bar connector works as a toggle. When the connector is in the
  position shown in Figure 2, it is between .055 inches and .075 inches past true toggle.
  When the fire arm is cocked, this position creates a moment about the green-bar
  which seats the trigger against the green-bar.
- Figure 3 shows the 6BFC in the true toggle position. Notice the toggle position is not obtained when the sear-green-bar connector is in the vertical position, but rather when it is rotated 2.87 degrees past vertical. If one disregards the effects of the reset spring, this is when the sum of the moments about the green-bar become zero.
- The reset spring is used to induce the effect of regain into the system when the 6BFC is in the toggle position.
- The odd shape of the sear-green-bar connector and the green-bar-trigger connector is
  due to balancing of the 6BFC as a mechanism. No one piece is balanced about its
  pivot point. The center of masses of the links are arranged such that moments of
  inertia cancel each other out when excited from any direction (jar off or slam tests).
  Balancing of the mechanism was obtained through the Lowen and Berkof method.
- When the 6BFC is in the fired position, Figure 4, the reset spring resets the fire control when the bolt is opened. By applying a force between the sear and green-bar trigger-connector, the sear is lifted while the trigger is reset.
- The purpose of the green-bar in the 6BFC is mechanical advantage and locking the trigger when the fire control is in the cocked position. The mechanical advantage comes from the force with respect to displacement as an input, on the green-bar, has been optimized with respect to the force with respect to displacement as an output. An effective force of 3 pounds and .04 inch radial displacement of the top connector pin joint of the green-bar produces an effective 1.7 pound force and .3 inch radial displacement of the bottom pin joint. The locking of the trigger is obtained by the mating surfaces between the green-bar and the trigger.

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- Incorporated into the green-bar trigger lockup system is an inertial loop which is used to negate any effect slamming of the bolt may have on the system. When the bolt is slammed, the downward force applied to the sear-green-bar connector is greatly magnified. This induces a counter clock wise moment about the green bar, raising the contact force between green-bar and the trigger. This would normally lead to the green-bar rebounding off the trigger interface, and potentially firing the mechanism. Due to the nature of the interface between the green-bar and the trigger, a counter clock wise moment is applied to the trigger by the slam. A resulting force is then applied along the green-bar-trigger connector which counter acts the rebounding force induced by the bolt slam. This inertial loop effectively dampens any shock induced in the system by slamming the bolt.
- The effective mechanical advantage of the 6BFC as a whole is a 3 pound force producing .02 inch displacement of the trigger to overcome the 23 pound force of the firing pin head with a .1 inch radial drop in the sear at the sear-firing pin head interface (the fire arm is discharged with a three pound trigger pull).

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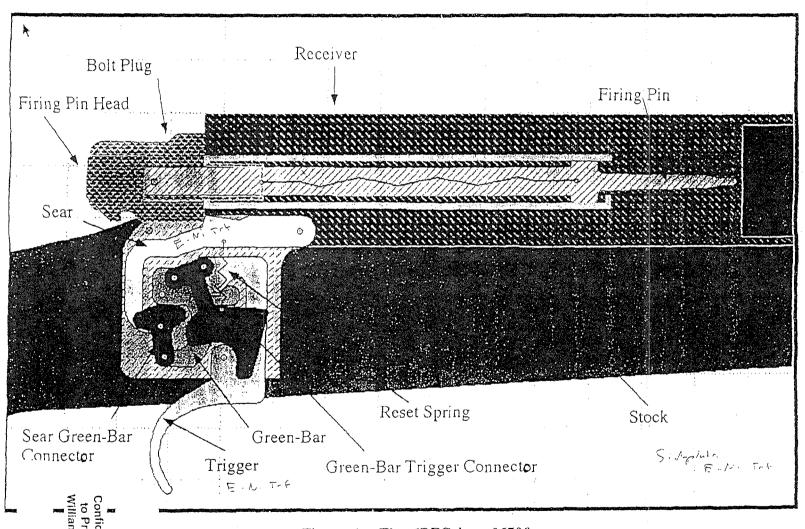


Figure 1. The 6BFC in a M700

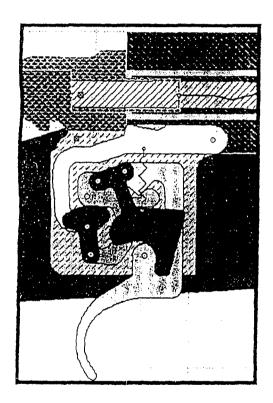


Figure 2. 6BFC Unfired

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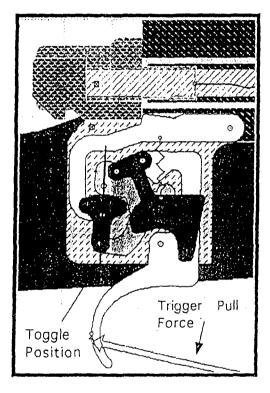


Figure 3. 6BFC in the Toggle Position

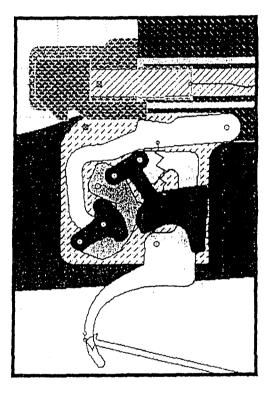
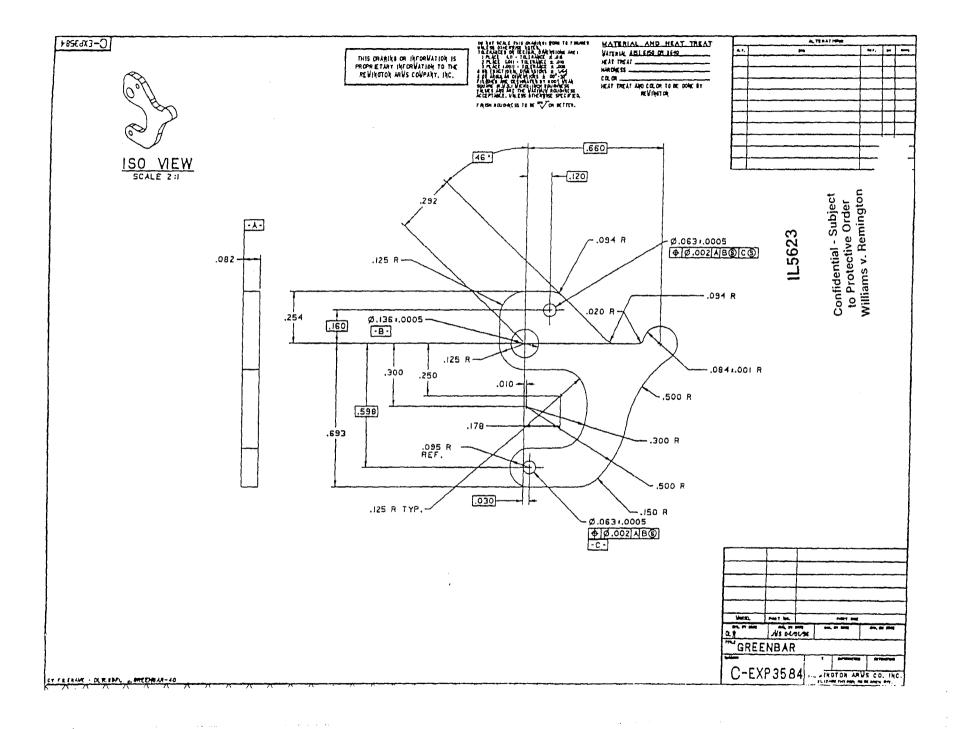
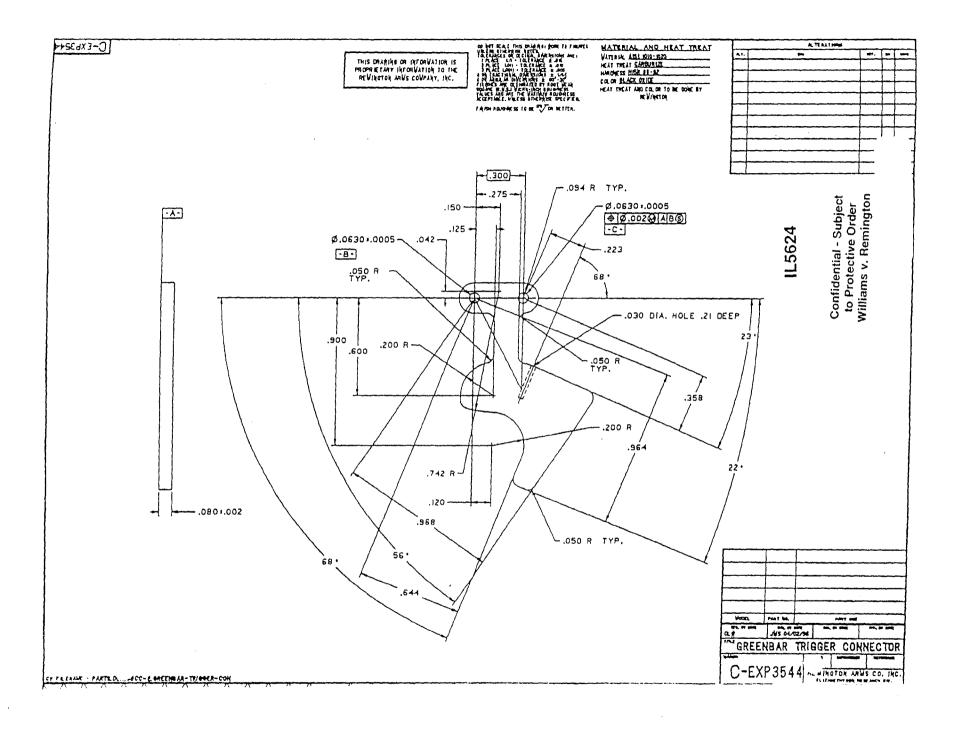


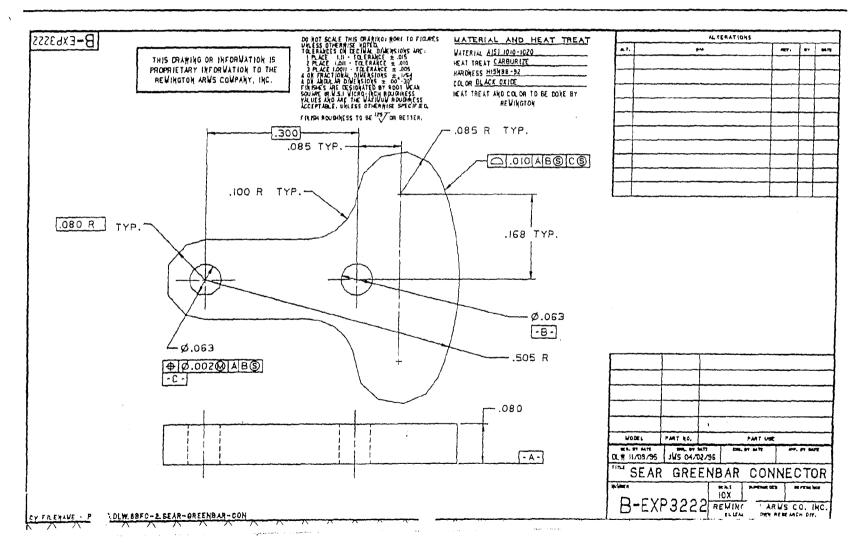
Figure 4. 6BFC in the Fired Position



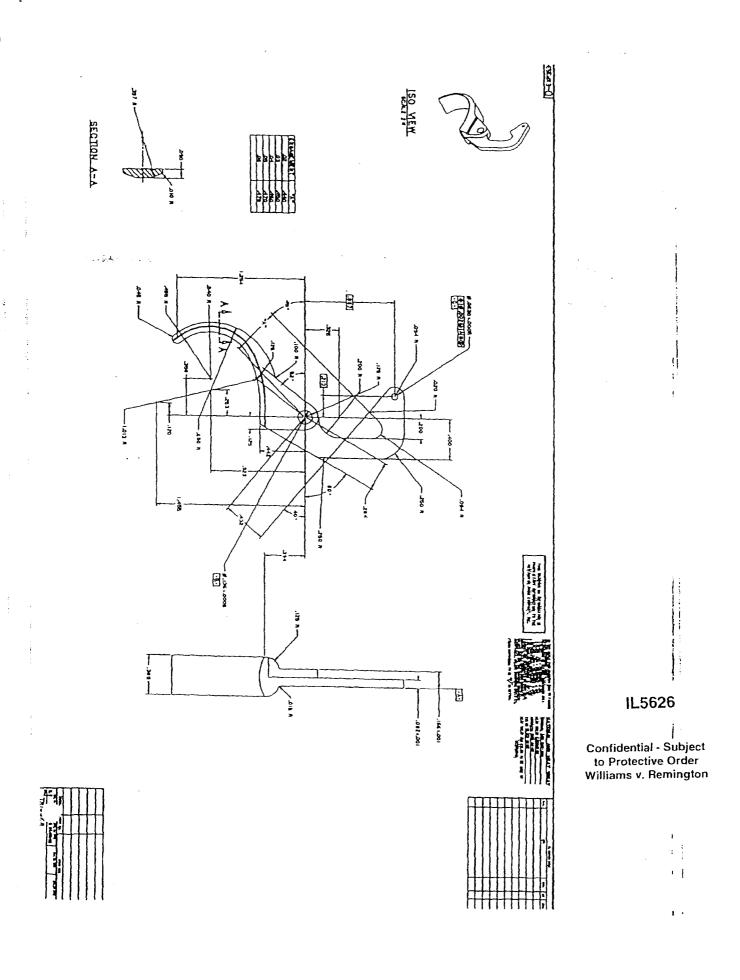


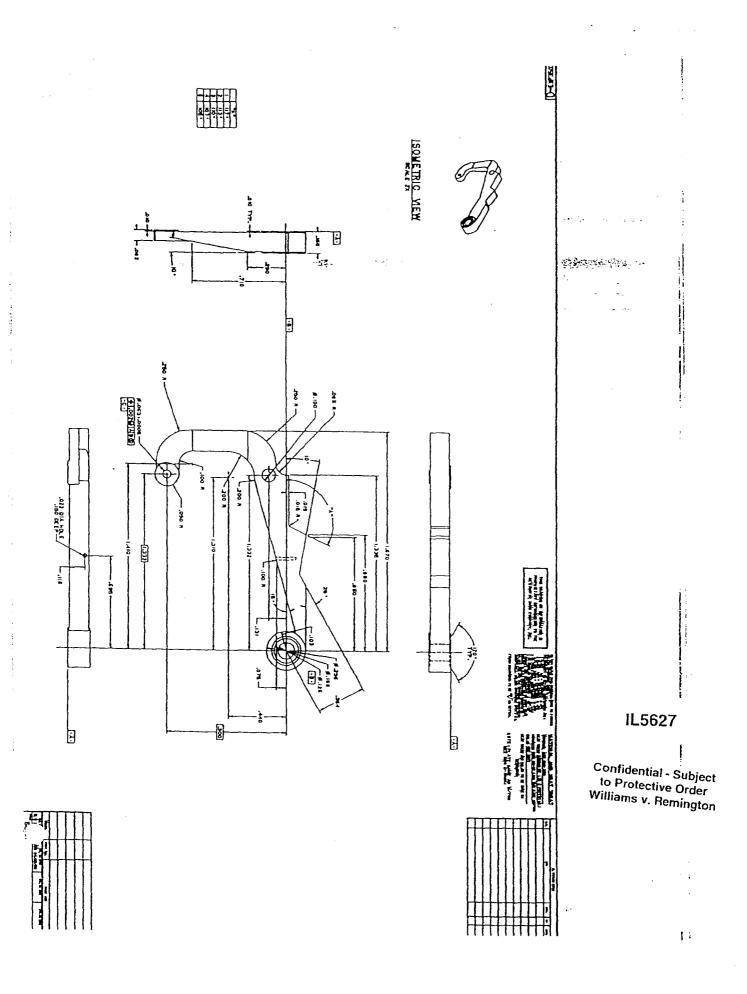
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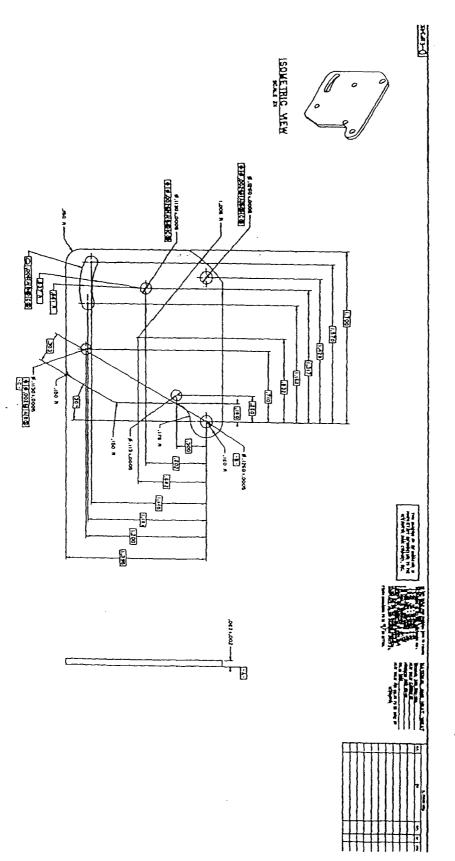
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