

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE

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DELAWARE STATE SPORTSMEN’S )  
ASSOCIATION, INC; BRIDGEVILLE RIFLE )  
& PISTOL CLUB, LTD.; DELAWARE RIFLE )  
AND PISTOL CLUB; DELAWARE )  
ASSOCIATION OF FEDERAL FIREARMS )  
LICENSEES; MADONNA M. NEDZA; )  
CECIL CURTIS CLEMENTS; JAMES E. )  
HOSFELT, JR; BRUCE C. SMITH; VICKIE )  
LYNN PRICKETT; and FRANK M. NEDZA, )

Plaintiffs, )

v. )

DELAWARE DEPARTMENT OF SAFETY )  
AND HOMELAND SECURITY; )  
NATHANIAL MCQUEEN JR. in his official )  
capacity as Cabinet Secretary, Delaware )  
Department of Safety and Homeland Security; )  
and COL. MELISSA ZEBLEY in her official )  
capacity as superintendent of the Delaware )  
State Police, )

Defendants. )

C.A. No. 1:22-cv-00951-RGA  
(Consolidated)

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GABRIEL GRAY; WILLIAM TAYLOR; )  
DJJAMS LLC; FIREARMS POLICY )  
COALITION, INC. and SECOND )  
AMENDMENT FOUNDATION, )

Plaintiffs, )

v. )

KATHY JENNINGS, Attorney General of )  
Delaware, )

Defendant. )

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**DECLARATION OF JAMES E. YURGEALITIS  
IN SUPPORT OF DEFENDANTS’ OPPOSITION TO  
PLAINTIFFS’ MOTION FOR PRELIMINARY INJUNCTION**

I, James E. Yurgealitis, the undersigned, declare as follows:

1. I have been engaged by the Delaware Department of Justice to provide research and opinions related to Delaware HB 450 and SS 1 for SB 6. More specifically, I have been asked to provide information and opinions about the banned weapons and accessories, their history, and their uses.

2. This declaration is based on my own personal knowledge, research, and experience, and if I am called to testify as a witness, I could and would testify competently to the truth of the matters discussed in this declaration.

3. I am being compensated at a rate of \$400 per hour for my work on this report as well as any additional work required. My travel + work rate is \$1600 per day.

#### **I. PERSONAL BACKGROUND AND QUALIFICATIONS**

4. I am currently self-employed as a Legal and Forensic Consultant, providing firearms related technical and public policy consulting, testing and training services to corporations, legal counsel, and the public sector. A detailed description of my work experience, education, and training are included in my Curriculum Vitae, which is attached as Exhibit A to this report. I have also included, as Exhibit B, a statement of my qualifications as an expert witness in the areas relevant to my experience.

5. I am a former Senior Special Agent/Program Manager for Forensic Services for the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF), U.S. Department of Justice, a position I held for nine years prior to my retirement. In that capacity, I was responsible for all ATF firearms and forensic firearms related training and research at the ATF National Laboratory Center (NLC) in Ammendale, MD.

6. Prior to my tenure at the ATF NLC, I was employed as a federal law enforcement officer, in various capacities, for approximately 16 years.

7. As detailed in Exhibits A and B, I have extensive training and experience with respect to firearms in general, as well as their history, manufacture, operation, and use.

8. I have been provided with, and have reviewed, copies of documents filed in this case which I have referenced in doing this work. These documents are listed in my bibliography. Some of them are also enclosed as Exhibits.

9. I have also reviewed current firearms statutes and regulations relative to the transfer and possession of firearms within the State of Delaware.

10. I have also reviewed numerous materials, periodicals, publications, corporate websites, and documents in furtherance of my research and in formulation of my opinion(s) in this case. To further illustrate my opinions, I may rely on photographic and / or video images during any deposition and any subsequent testimony. A listing of the materials I specifically reference in this report is included in my bibliography.

## **II. GENERAL FIREARMS TERMINOLOGY AND OPERATION**

11. In discussing modern firearms, it is important to understand how they are defined under statute, how they function, and the differences between types commonly available to the public.

12. Gun related terminology and usages may vary significantly, particularly in connection with legal definitions adopted in various jurisdictions. For example, under Section 222 (13) of Title 11 of the Delaware Code, a Firearm is defined as follows:

“Firearm” includes any weapon from which a shot, projectile or other object may be discharged by force of combustion, explosive, gas and/or mechanical means, whether operable or inoperable, loaded or unloaded. It does not include a BB gun.”<sup>1</sup>

By contrast, under Section 921(a)(3) of Title 18 of the Federal Code, a Firearm is defined

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<sup>1</sup> 11 *Del. C.* § 222(13).

as:

- a. Any weapon (including a starter gun) which will or is designed to or may readily be converted to expel a projectile by the action of an explosive; or
- b. the frame or receiver of any such weapon; or
- c. any firearm muffler or firearm silencer; or
- d. any destructive device.<sup>2</sup>

Such term does not include an antique firearm, as defined in Section 921 (a) (16), e.g., an antique ignition system firearm (e.g., matchlock, flintlock, percussion cap, etc.) or a firearm made in or before 1898, etc.

13. In using relevant nomenclature throughout this report, I will adopt the Delaware legal definitions wherever applicable, except that I refer to all non antique or otherwise unregulated guns as “firearms” consistent with federal law. I will define and explain other relevant terms in this and the following section.

14. Modern Firearms operate utilizing the expanding gases generated by the rapidly burning gunpowder contained in modern ammunition. Gunpowder (or smokeless powder) is the propellant contained within metallic cartridges or shotshells utilized by modern firearms. A single cartridge or shotshell is also referred to as a “round” of ammunition. Once a cartridge or shotshell is “chambered” (or loaded) into a modern firearm and the trigger is pulled, the primer at the base of the cartridge or shotshell is struck by a firing mechanism. The primer contains a pressure sensitive explosive compound which ignites when struck. The ignition of the primer, in turn, ignites the main powder charge contained in the case of the cartridge or shotshell. The main powder charge then burns rapidly in what is essentially a contained explosion. This contained explosion generates gases at enormous pressures. The generated gases push the projectile out of the mouth of the cartridge, down the barrel of the firearm and out of the firearm through the muzzle.

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<sup>2</sup> 18 U.S.C. § 921(a)(3).

15. More simply defined, a firearm is a weapon which utilizes gas pressure generated by explosively burning gunpowder in a modern ammunition cartridge to propel a projectile through the barrel and out of the firearm through the muzzle.

16. All modern breech loading firearms,<sup>3</sup> no matter the type, operate according to a nine-step process known as the “Cycle of Fire” as identified by the Association of Firearm and Toolmark Examiners (AFTE), a professional organization for Forensic Firearm and Toolmark Examiners that, in conjunction with the U. S. Department of Justice (USDOJ), National Institute of Justice (NIJ), has created a training program for apprentice forensic firearm and toolmark examiners.<sup>4</sup> As these steps will be referenced throughout this report, they are included here for reference:

1) Feeding:

Feeding refers to the process for insertion of cartridges into the chamber; the breech bolt pushes the cartridge into final position. Typically, the incoming round slides across the bolt or breech face during this caroming action. The feeding function can be manual or performed by various kinds of magazines and clips. For example, machine guns use belts of cartridges.

2) Chambering:

Chambering is the insertion of the cartridge into the chamber. If a cartridge of the incorrect length or diameter is used or if there is foreign matter in the chamber, chambering may be obstructed, causing a malfunction. Excess oil or grease in the chamber may cause overpressure, resulting in a ruptured cartridge case and potentially serious accidents.

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<sup>3</sup> A Breech Loading firearm is one in which the cartridge is loaded and fired from the breech (back) end of the barrel as opposed to a Muzzle Loader wherein the propellant / powder and bullet are loaded from the muzzle (front) end.

<sup>4</sup> *Cycle-of-Fire Steps*, Firearm Examiner Training (2008), [https://projects.nfstc.org/firearms/module08/fir\\_m08\\_t04.htm](https://projects.nfstc.org/firearms/module08/fir_m08_t04.htm).

3) Locking:

The breech bolt mechanism locks the cartridge into position in the barrel before firing. Most quality firearms are equipped with an interrupter mechanism that disconnects the trigger from the firing pin, thus making it impossible to fire until the mechanism is safely locked. This critical relationship is referred to as timing. (Blowback mechanisms involve a spring-held bolt; the mechanism is not technically locked, but is held together by spring tension and bolt inertia.)

4) Firing:

When the breech is fully locked, a pull on the trigger mechanically translates to the firing pin release. In the cocked position, the firing pin has a hammer behind it with a spring forcing it towards the primer, restrained only by a sear that is engaged by the trigger. A pull on the trigger trips the sear from the engaging notch in the hammer. The hammer, actuated by a cocked spring, drives the firing pin sharply against the percussion sensitive primer, which ignites the explosive compound and fires the cartridge.

5) Obturation:

Obturation occurs when powder gases under high pressure (e.g., two and one-half tons per square inch in the .30 06 Springfield cartridge) are sealed to prevent them from jetting between primer cup and cartridge case, cartridge case and primer wall, and projectile and bore. Cartridge cases must be sufficiently flexible to expand against the chamber wall and transmit the instantaneous powder pressure to the barrel metal that surrounds the chamber. When the chamber pressure has returned to zero, the cartridge case must also be flexible enough to release itself from the chamber wall (even though it is now pressure form fitted to the chamber). Likewise, the primer cup has been pressure held against the side of the cartridge case and depends upon the face of the breechblock for locked support during the interval of

high chamber pressure. Obturation also occurs with the projectile; bullets are made sufficiently larger than the bore diameter to extrude into the rifling grooves and seal the gases. The sharp hammer action of the instantaneous high pressure and temperature may upset the projectile base, which means the cartridge case must be sufficiently flexible to expand against the chamber wall and transmit the instantaneous power pressure to the barrel metal that surrounds the charge. When the chamber pressure has returned to zero, the cartridge case must also be flexible enough to release itself from the chamber wall (even though it is now pressure form-fitted to the chamber).

6) Unlocking:

This is the reverse of the locking process and is frequently performed in conjunction with extraction.

7) Extraction:

Although cartridge cases do not commonly exceed their elastic limit during firing, they have a tendency to stick to the chamber after firing. After firing, cartridge cases are larger in diameter than before firing. If the fired cartridge case is intended for reloading, it must be full length resized in a reloading die. All cartridge cases are designed with a rim or groove (cannelure) at the base so that an extractor claw can grasp this edge in order to achieve extraction.

8) Ejection:

In the final stages of extraction, the cartridge case encounters a projection that is usually at right angles to the exit portal of the breech. Rotating on the fulcrum of the extractor, the case base is contacted on the opposite side by the ejector, which flips the case out of the actuating mechanism.

9) Cocking:

The hammer spring is usually cocked when the bolt of a rifle, pistol, or repeater shotgun is retracted. An exception to this is the M1917 Enfield Rifle, which cocks upon forward motion of the bolt. Exposed hammer may be cocked by manual retraction, using the thumb. The Walther series of pistols provides for manual cocking or trigger pull cocking (double action), as do most open hammer revolvers.

17. Additional definitions often used when classifying firearms (in general) are Semiautomatic, Full Automatic and Select Fire:

a. Semiautomatic:

Refers to a repeating / self-loading firearm that fires one shot for each pull of the trigger until the ammunition supply is exhausted. The energy of the fired cartridge is utilized to cycle the mechanism of the firearm to feed and chamber the next shot.

b. Full / Fully Automatic:

Refers to a firearm that will continuously fire successive shots when the trigger is pulled, and will only stop when the trigger is released or the supply of ammunition is exhausted. Commonly referred to as a machine gun.

c. Select Fire:

A firearm capable of switching between and functioning in either fully automatic or semiautomatic fire mode. Alternatively, some firearms can fire in “burst mode” meaning automatically with a mechanical limitation on the number of shots.

18. Also relevant to any discussion regarding firearms in general, and to this report in particular, are the terms Rifling, Caliber and Gauge.

a. Rifling:

Rifling refers to a series of grooves cut or impressed inside the barrel in a spiral



pattern. The “high” portions of this pattern are called “Lands.” The “lower” portions of this pattern are called “Grooves.” When a projectile (or bullet) is fired in a “rifled” firearm it comes into contact with the lands as it leaves the chamber and begins to travel down the barrel. Because the lands are oriented in a spiral pattern, the rifling imparts a spin to the projectile, which improves stability and accuracy.

b. Caliber:

Caliber is a dimensional measurement of the inside (or bore) of a rifled barrel. In the United States caliber is traditionally expressed in fractions of an inch. For example, a .22 caliber firearm is designed to chamber and fire a projectile which measures .22 inches (or slightly less than a quarter of an inch). A .50 caliber firearm chambers and fires a projectile which is approximately a half inch in diameter.

In Europe, and the majority of other countries utilizing the metric system, caliber has historically been expressed in millimeters (mm). Therefore, a 9mm firearm is designed to chamber and fire a projectile with a diameter of 9mm. European caliber designations may also include measurement of the length of the cartridge case (9x19mm, 7.62x39mm, *etc.*).

A number of firearm calibers widely manufactured have two separate caliber designations, one in inch measurements and one in metric, which are equivalent and interchangeable. For example, .380 caliber ammunition in the US is referred to as 9x17mm caliber in Europe.

It is important to note for the purposes of this report that the caliber designation of any given ammunition cartridge usually refers only to the diameter of the projectile (bullet) and not the relative “power” of the cartridge itself (in terms of muzzle energy,

effective range and muzzle velocity). For example, there is an important distinction between cartridges commonly referred to as .22 caliber and cartridges commonly referred to as .223 caliber.

.22 caliber ammunition is a popular and relatively low power cartridge developed in the 1880's. It is also known as “.22 rimfire” as the primer mixture in the cartridge is seated in the rim of the cartridge and not contained in a separate primer cup in the cartridge base. It is commonly used for target shooting as well as hunting small game and can be fired from both handguns and rifles chambered in that caliber. Bullet weights for .22 caliber projectiles / bullets are typically between 30-60 grains (0.08 to 0.13 ounces). Muzzle velocities are usually in the 1100-1300 feet per second (fps) range.

.223 caliber ammunition by comparison is a high velocity cartridge developed in the 1950's in part for use in the original AR-15 and M16 rifles. It is a “centerfire cartridge.” Although the diameter of the projectile / bullet is only slightly greater (approximately the width of a human hair) than the .22 caliber cartridge mentioned previously, it is a vastly more powerful cartridge in terms of muzzle velocity and range. This caliber ammunition is also somewhat interchangeable with 5.56mm ammunition. Here is a side-by-side comparison of .223 (left) and .22 caliber cartridges (right) with a quarter for size reference:



Common bullet weights for .223 / 5.56mm caliber projectiles are approximately 50 to 62 grains (0.11 to 0.14 ounces)—heavier than .22 caliber projectiles. And common muzzle velocities are approximately 3,200 to 3,500 feet per second—about three times as fast as .22 caliber projectiles. A heavier bullet and increased velocity equate to more of the cartridge’s energy being transferred to the target. The National Rifle Association (NRA) *American Rifleman Magazine* tested the U.S. Army’s new .223 caliber cartridge (M855A1) in 2014 and the results can be read here: <https://www.americanrifleman.org/content/testing-the-army-s-m855a1-standard-ball-cartridge/>.<sup>5</sup>

c. Gauge:

Gauge is a dimensional measurement which is traditionally used to denote the bore of a non-rifled or “smoothbore” firearm (i.e. a shotgun). Shotguns were initially designed to fire a mass of round shot as opposed to one solid projectile and therefore, a caliber designation is not readily applicable. Gauge refers to the number of lead spheres which will fit inside the bore and equal one pound. For example, in a 12-gauge

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<sup>5</sup> Plaster, John L., *Testing the Army’s M855A1 Standard Ball Cartridge*, *American Rifleman* (May 21, 2014), <https://www.americanrifleman.org/content/testing-the-army-s-m855a1-standard-ball-cartridge/>.

shotgun you can fit 12 spheres of lead, which are approximately 18.52mm or .73 inches in diameter, the total weight of which will equal one pound. If the diameter of the spheres is increased, it will require less of them to equal one pound. Therefore, the smaller the “gauge,” the larger the dimension of the bore. The exception to this measurement system is the .410 gauge shotgun, which is actually a caliber designation.

### **III. TYPES OF MODERN FIREARMS**

19. Modern firearms as currently manufactured for civilian ownership fall into two general types: handguns and long guns (or shoulder weapons).

#### **Handguns:**

20. Handguns are generally defined as a firearm having a short stock (grip), and are designed to be held, and fired, with one hand. The term “Handgun” defines two distinct types of modern firearms, the revolver and the pistol.

21. A revolver is a handgun designed and manufactured with a revolving cylinder to contain, chamber and feed multiple rounds of ammunition. In a modern double action revolver, pulling the trigger rotates the cylinder bringing an unfired cartridge of ammunition in line with the barrel and firing pin. Pulling the trigger also cocks the hammer and then releases it either directly (or indirectly via a firing pin) to strike the primer of the cartridge, initiating the firing sequence as stated previously. In this type of revolver, the trigger must again be pulled to rotate the cylinder in order to fire another cartridge. When all cartridges have been fired, the cylinder is unlocked from the frame and swings out to facilitate removal of expended cartridge casings and insertion of unfired cartridges. The cylinder is then closed and relocked within the frame and the handgun is again ready to fire when the trigger is pulled. This animation details the overall operation and key components: <https://www.youtube.com/>

[watch?v=TXliIJ\\_66FQ](#)

22. A pistol is a handgun designed and manufactured with the firing chamber as an integral part of the barrel and utilizes a “box” magazine to contain and feed multiple rounds of ammunition. In this type of handgun, generally, the box magazine is inserted into the firearm, and the slide or bolt is pulled back and released which springs forward and feeds a cartridge into the chamber. When the trigger is pulled, a firing pin or striker is released, impacting the primer of the cartridge and initiating the firing sequence of the ammunition.

Some pistols have no internal magazine capacity and require the operator to manually reload the firearm after each shot fired. These are called single shot pistols. Many pistols, however, are capable of holding multiple cartridges and can operate semiautomatically in that a portion of the recoil or gas pressure generated by firing the cartridge is utilized to move the slide rearward, extract and eject the expended cartridge case and chamber another round from the magazine. This sequence can be repeated by pulling the trigger once for each shot. The pistol can then be reloaded by removing the empty magazine and inserting a loaded magazine (or refilling a permanently affixed magazine if the pistol is so configured). The overall operation of a Colt 1911 .45 Caliber pistol is illustrated in this animation: <https://www.youtube.com/watch?v=EjQrhDKDWFk&t=12s>

### **Long Guns / Shoulder Weapons:**

23. In terms of modern firearms, long guns are generally of two distinct types: rifles and shotguns.

24. A rifle is a firearm which is designed and intended to be fired from the shoulder. It fires a single shot through a rifled bore for each pull of the trigger.<sup>6</sup> A shotgun is

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<sup>6</sup> Machine guns (any firearm with the capacity to fire more than one shot with each pull of the trigger) are defined separately under federal law.

a firearm which is also designed and intended to be fired from the shoulder. It fires either a number of ball shot (commonly termed “buckshot” or “birdshot”) or a single projectile (commonly termed a “slug”) through a smooth (non-rifled) bore for each pull of the trigger.

a. Rifles:

In terms of “types” of rifle, there are numerous variations. All of these variations, generally speaking, are defined and distinguished by the way they are loaded and reloaded. For example, single shot rifles fire one shot for each pull of the trigger. They have no internal or external magazine capacity and must be reloaded with a new unfired cartridge by hand for each shot. Many of these have a hinged or “break open” receiver (or frame) to facilitate loading and unloading.

A Pump Action Rifle requires the operator to manually manipulate a forearm piece, which is traditionally found underneath the barrel. After firing the forearm is pulled backward which unlocks the bolt, extracting and ejecting the fired cartridge case. Pushing the slide forward feeds an unfired cartridge from the magazine, cocks the firearm mechanism and locks the bolt for a successive shot. Pump action rifles have been manufactured with both tubular and detachable box magazines. The overall operation of a pump action rifle is illustrated in this animation: <https://www.youtube.com/watch?v=jyyQqXGUSx8>

Bolt Action Rifles require the operator to manually manipulate the bolt of the rifle. After firing, the bolt is first unlocked from the chamber and then moved rearward. This action also extracts and ejects the expended cartridge case. The bolt is then moved forward which feeds an unfired cartridge from the magazine into the chamber. Once the bolt is then again locked by the operator, it is ready to fire. Bolt

action rifles usually have an internal fixed magazine or tubular magazine which will facilitate reloading via manipulation of the bolt until that capacity is exhausted. Bolt-action rifles were generally the choice of military forces, hunters and sportsmen through the end of World War II. The overall operation of a bolt action rifle is illustrated in this animation: <https://www.youtube.com/watch?v=u9Luu7R4WVw>

A lever action rifle is similar to the bolt action rifle in that the operator is required to manipulate the mechanism, or “action”, of the firearm. A lever at the bottom of the receiver of the rifle is manipulated in an up and down motion in order to unlock the bolt and move it rearward, extract and eject the expended cartridge case, feed an unfired cartridge into the chamber and lock it. The operator’s action is required for each shot fired through the rifle. Generally speaking, lever action rifles are manufactured with tubular magazines which will vary in capacity depending on the caliber of the firearm. The overall operation of a lever action rifle is illustrated in this animation: <https://www.youtube.com/watch?v=58LbxVd4buo>

A semiautomatic rifle utilizes the energy generated by the firing of the cartridge to power the cycle of fire. This is accomplished by siphoning off a portion of the gases generated by firing to operate the mechanism or by utilizing the recoil generated by firing much as in a semiautomatic pistol as described previously.

Once a semiautomatic rifle is loaded, the operation of this cycle of fire is not dependent on the operator to effect any portion of the process other than to pull the trigger. Semiautomatic rifles are, and have been previously, manufactured with both fixed internal magazines and a capacity to accept detachable external magazines. As such this type of rifle is capable of firing with each pull of the trigger until the supply of ammunition is exhausted. The overall operation of a semiautomatic rifle is

illustrated in this animation: <https://www.youtube.com/watch?v=jlCV6yellTI>

As stated previously, the majority of military firearms until the end of World War II were bolt action. The exception to this rule was the United States entering the war with the semiautomatic M1 (Garand) .30-06 caliber rifle as standard issue. The Garand had a fixed internal magazine with an eight round capacity. As discussed below, since the end of World War II, virtually every military organization across the Globe has adopted a form of semiautomatic or select fire rifle, from among one of a series of designs.

b. Shotguns:

Modern shotguns, as stated previously in regard to rifles, are generally classified and characterized by their operating system (i.e. the manner in which they function, are loaded and reloaded). Shotguns with multiple barrels are defined by placement or orientation of their barrels.

Single Shot shotguns function similarly to the single shot rifle. They may have a hinged receiver which allows the operator to open the action at the chamber area to facilitate loading and unloading of the firearm. There are also single shot models that are loaded and unloaded through a bolt action mechanism and have no additional magazine capacity.

Bolt Action shotguns are manufactured, as stated above, as single shot, or with internal or detachable magazines to facilitate easier and faster reloading. They function in the same way as a bolt action rifle and require manual manipulation of the bolt by the operator to unload and reload.

Lever Action shotguns, again function in the same fashion as a similarly



designed rifle. Manual manipulation of the lever is required for successive shots.

Pump Action Shotguns have the same general operating system as a similarly designed rifle. The “action” of the shotgun must be worked forward and back by the operator to unlock the bolt, extract and eject the expended shotgun shell, reload, and relock the bolt for firing.

Semiautomatic Shotguns, as with their rifle caliber counterparts, utilize energy (either recoil or gas pressure) generated by firing ammunition to “power” the operating system of the firearm. These are manufactured with a number of different magazines, both internal and fixed, as well as external and detachable. They are capable of firing a single shot with each pull of the trigger until the supply of ammunition in the magazine is exhausted.

Break Open, Double Barrel and “Tip Up” Shotguns have a hinged receiver which facilitates access to the rear of the chamber for unloading and reloading. They are manufactured in single shot and double barrel variations. Double barrel variations are further delineated by the placement of their barrels. Side by Side shotguns have two barrels situated next to one another in a horizontal arrangement. Over and Under shotguns have two barrels superimposed upon one another in a vertical plane. The mechanisms in each of these allow staggered firing of each of the two barrels with a separate pull of the trigger. When the hinged action is opened the expended shotgun shell hulls can be manually extracted although more complex designs with auto ejectors perform that function when “opened” without action by the operator. The overall operation of a double barrel break open shotgun is illustrated in this animation: <https://www.youtube.com/watch?v=XXOYekeYIPo>

### **Other Types of Firearms:**

25. There are additional types and classification of firearms not discussed at length here for brevity and because they are less relevant to my opinions. An example of this type of firearm is a “Drilling” which consists of a shotgun and rifle mounted to the same receiver. Other types of firearms such as smoothbore revolvers, Short Barreled Shotguns, Short Barreled Rifles and Machineguns are regulated by ATF under the auspices of the National Firearms Act (NFA). Manufacture, transfer, and ownership of these “NFA Firearms” is subject to more stringent regulations that include registration in a Federal Database.

### **IV. DEVELOPMENT OF ASSAULT WEAPONS**

26. In recent years there has been an increase in the availability in the United States of semiautomatic rifles, pistols and shotguns with features initially designed (or patterned after those designed) for a military purpose.

27. “Assault Weapons” have been defined at the Federal, State and local levels under various relevant legislation. Under Delaware HB 450 “Assault long guns” are defined as:

“Any of the following or a copy, regardless of the producer or manufacturer: [a] American Arms Spectre da Semiautomatic carbine. [b] Avtomat Kalashnikov semiautomatic rifle in any format, including the AK-47 in all forms. [c] Algimec AGM-1 type semi-auto. [d] AR 100 type semi-auto. [e] AR 180 type semi-auto. [f] Argentine L.S.R. semi-auto. [g] Australian Automatic Arms SAR type semi-auto. [h] Auto-Ordnance Thompson M1 and 1927 semi-automatics. [i] Barrett light .50 cal. semi-auto. [j] Beretta AR70 type semi-auto. [k] Bushmaster semi-auto rifle. [l] Calico models M-100 and M-900. [m] CIS SR 88 type semi-auto. [n] Claridge HI TEC C-9 carbines. [o] Colt AR-15, CAR-15, and all imitations except Colt AR-15 Sporter H-BAR rifle. [p] Daewoo MAX 1 and MAX 2, aka AR 100, 110C, K-1, and K-2. [q] Dragunov Chinese made semi-auto. [r] Famas semi-auto (.223 caliber). [s] Feather AT-9 semi-auto. [t] FN LAR and FN FAL assault rifle. [u] FNC semi-auto type carbine. [v] F.I.E./Franchi LAW 12 and SPAS 12 assault shotgun. [w] Steyr-

AUG-SA semi-auto. [x] Galil models AR and ARM semi-auto. [y] Heckler and Koch HK-91 A3, HK-93 A2, HK-94 A2 and A3. [z] Holmes model 88 shotgun. [aa] Manchester Arms ‘Commando’ MK-45, MK-9. [bb] Mandell TAC-1 semi-auto carbine. [cc] Mossberg model 500 Bullpup assault shotgun. [dd] Sterling Mark 6. [ee] P.A.W.S. carbine. [ff] Ruger mini-14 folding stock model (.223 caliber). [gg] SIG 550/551 assault rifle (.223 caliber). [hh] SKS with detachable magazine. [ii] AP-74 Commando type semi-auto. [jj] Springfield Armory BM-59, SAR-48, G3, SAR-3, M-21 sniper rifle, and M1A, excluding the M1 Garand. [kk] Street sweeper assault type shotgun. [ll] Striker 12 assault shotgun in all formats. [mm] Unique F11 semi-auto type. [nn] Daewoo USAS 12 semi-auto shotgun. [oo] UZI 9mm carbine or rifle. [pp] Valmet M-76 and M-78 semi-auto. [qq] Weaver Arms “Nighthawk” semi-auto carbine. [rr] Wilkinson Arms 9mm semi-auto ‘Terry.’”

HB 450 also regulates “Assault Pistols,” which are defined as:

“Any of the following or a copy, regardless of the producer or manufacturer: [a] AA Arms AP-9 pistol. [b] Beretta 93R pistol. [c] Bushmaster pistol. [d] Claridge HI-TEC pistol. [e] D Max Industries pistol. [f] EKO Cobra pistol. [g] Encom MK-IV, MP-9, or MP-45 pistol. [h] Heckler and Koch MP5K, MP7, SP-89, or VP70 pistol. [i] Holmes MP-83 pistol. [j] Ingram MAC 10/11 pistol and variations, including the Partisan Avenger and the SWD Cobray. [k] Intratec TEC-9/DC-9 pistol in any centerfire variation. [l] P.A.W.S. type pistol. [m] Skorpion pistol. [n] Spectre double action pistol (Sile, F.I.E., Mitchell). [o] Stechkin automatic pistol. [p] Steyer tactical pistol. [q] UZI pistol. [r] Weaver Arms Nighthawk pistol. [s] Wilkinson ‘Linda’ pistol.”

Delaware HB 450 also regulates other similar copycat assault weapons containing features shared by Assault Long Guns and Assault Pistols.

#### **Development of Assault Rifles:**

28. It is generally recognized that the first “Assault Rifle” or “Assault Weapon” is the German StG 44 (Sturmgewehr Model 1944) which appeared in production form late in World War II. Noted firearms historian and expert Ian Hogg referred to it as:

“The Father of all today’s assault rifles”<sup>7</sup>:

<sup>7</sup> Hogg, Ian V. & Weeks, John S., *MILITARY SMALL ARMS OF THE 20TH CENTURY*, at 243 (7<sup>th</sup> ed. 2000) (Exhibit C). A brief history is also documented in Long, Duncan, *THE COMPLETE AR-15/M16 SOURCEBOOK, WHAT EVERY SHOOTER NEEDS TO KNOW*, at 4 (2001) (Exhibit D).



(image source: <https://www.recoilweb.com/sturmgewehr-the-first-assault-rifle-100907.html>). Earlier pre-production variants included the MP 42 and MP 43 (Machinenpistol 1942 and 1943, respectively). The Germans termed the rifle “Sturmgewehr,” literally “Storm Rifle,” and a number of the features included utilization of a portion of the gas generated by the burning cartridge propellant to reload and operate the rifle, extensive use of steel stampings in its construction, a detachable magazine, a separate pistol style grip (not integrated with the shoulder stock), a barrel shroud, a bayonet mounting lug and a threaded barrel to facilitate the attachment of a grenade launcher. It fired a cartridge that was smaller dimensionally and less “powerful” (in terms of muzzle velocity and foot pounds of energy) than the standard 8mm Mauser cartridge in use by the German Army in their standard issue bolt action Mauser K98 rifles.

29. It is important to note that the features designed into the German StG 44 were intended to increase potential ease of carry & lethality in battle:

Gas-powered semiautomatic fire: this feature enabled far more rapid fire than

was possible using the previous standard-issue bolt action rifles.

Steel stampings: as previous standard issue firearms used machined steel, this feature made for a substantially less heavy gun, increasing maneuverability.

Detachable magazine: because detachable magazines allow for the replenishment of multiple cartridges with one motion, this feature allowed for more rapid re-loading than previous standard issue firearms.

Separate pistol style grip: this feature greatly enhanced the ability of combat soldiers to quickly maneuver their firearms into firing position and retain stable control and aim while firing rapidly.

Barrel shroud: this feature encircles and protects the end of the barrel, keeping the barrel safe from damage caused by collision with objects and giving the soldier using the firearm an auxiliary grip on the barrel without burning his hand.

Bayonet mounting lug: this feature provided combat soldiers with an additional weapon for use in close combat.

Threaded barrel for attachment of grenade launcher: this feature also provided combat soldiers with an additional weapon, albeit for use at a greater distance.

It is widely accepted that in the design of military small arms, “form follows function.” Each of these innovations primarily served to increase the firepower and lethality of the individual combatant.

30. Following the end of the war, captured StG 44s were analyzed by the Allies, as well as the Soviets, and although there was reluctance to move to a smaller caliber cartridge a number of the features of the StG 44 found favor in the design of successive European, American and Eastern Bloc military rifles. Noted firearm expert and historian Jim Supica

wrote in his forward to the book “Guns”:

“Most military establishments hesitated to “downsize” the range and power of their primary rifles in the early Cold War years. The semi-auto detachable magazine concept was an obvious success and there was something to be said for full auto capability.”<sup>8</sup>

As Lewis, Campbell, and Steele explain, allied and Eastern Bloc powers were realizing that:

“Warfare favoring static defenses was a thing of the past. ... Rapid deployment forces and superior firepower were ... the watchwords of the future.”<sup>9</sup>

As Supica further writes:

“The assault rifle concept wouldn’t go away. The Soviet Union accepted the lower power round idea in its fixed magazine semi-auto chambered for an intermediate power 7.62 x 39 mm round in 1945, the SKS, which saw wide distribution and production in Soviet client states.”<sup>10</sup>

Two years later in 1947 the USSR followed the SKS with what Supica terms “The quintessential assault rifle – the Kalashnikov designed AK-47.”

31. The design of the AK-47 carried forward a number of the features introduced on the German StG 44. These features include a gas powered operating system, use of steel stampings in its construction, a separate pistol grip, separate shoulder stock, a detachable magazine, a bayonet lug, and provision for attachment of a grenade launcher. Due to the separate stock and pistol grip, the AK, much like the StG 44, also utilized a barrel shroud at the forward third of the rifle. Some variations of the early AK-47’s (AKM) also featured a compensator at the muzzle that deflected gas upward and to the right to “compensate” for the rifle’s tendency to kick up and to the right with every shot.

32. In the 1950’s numerous Nations sought to replace World War I and World War

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<sup>8</sup> Supica, Jim, Introduction, GUNS, at 26 & 28 (2005) (Exhibit E).

<sup>9</sup> Lewis, Jack, Campbell, Robert K & Steele, David Eds., THE GUN DIGEST BOOK OF ASSAULT WEAPONS, at 78 (7th ed. 2007) (Exhibit F).

<sup>10</sup> Supica, Jim, Introduction, GUNS, at 26 & 28 (2005) (Exhibit E).

II vintage bolt action and semiautomatic rifles with these newer and more effective designs. With the birth of the North Atlantic Treaty Organization (NATO), however, utilization of Soviet Bloc AK or SKS Assault Rifles was not possible. Accordingly, a number of firearms manufacturers outside the Soviet sphere of influence developed military rifles which carried forward these same features to one extent or another. Fabrique Nationale (FN) of Herstal, Belgium and Heckler Koch (HK) of Oberndorf, Germany are two noteworthy examples.

33. FN developed the FN-FAL (Fusil Automatique Leger) and HK the G3, which found a ready market amongst nations that did not favor the Soviet AK type designs. Both incorporated features which, like the AK, were derived directly from the StG 44. Their designs featured some parts made from metal stampings as opposed to heavier and more expensive machined steel pieces. A separate pistol grip, shoulder stock, detachable magazine and barrel shroud followed the basic design of the StG 44. As noted in paragraph 29, all of these features were designed by the Germans to maximize effectiveness in combat. A flash hider and / or muzzle brake also appeared in production variations of both the FN-FAL and HK G3 rifles. These rifles were destined from inception to become widely exported, as the domestic market in both countries was relatively limited. The FN- FAL and G3 have been in production since the 1950's and both FN and HK have licensed production to numerous countries in South America, Africa and the Middle East.

34. By the late 1950's through the late 1960's most nations who could afford to do so had replaced early 20th century rifle designs with these newer and more effective rifles for their military forces.

35. In the United States, progress in this arena moved at a significantly slower pace. The prevailing wisdom here was to stay away from lighter, smaller rifle calibers and cartridges as the .30-06 cartridge used in the M1 Garand Rifle during World War II had proven to be

more than successful. The United States' answer to the burgeoning move towards Assault Rifles was a variation of the basic M1 Garand operating system, the T44, or M-14. Outwardly, the M-14 retained a full length wood stock as did the Garand, but it featured a detachable magazine, select fire (both semiautomatic and full automatic) capability, and a flash hider. It competed directly against the FN-FAL (designated T88) in U.S. Army trials and was selected in 1957.

36. In the mid 1950's, ArmaLite Corporation's chief engineer, Eugene Stoner, developed a number of lightweight assault rifle designs which resulted in the AR-10 in .308 caliber. Its design closely paralleled what was now becoming standard assault rifle design: light weight (aluminum forged receivers as opposed to machined steel), separate pistol grip and shoulder stock, foregrip / barrel shroud, detachable magazine, and numerous flash hider / muzzle brake variations. ArmaLite continued to refine the basic design of the AR-10, which resulted in the AR-15.

37. In 1961, the Department of Defense purchased a quantity of AR-15 rifles from Colt for evaluation. A number of these were subsequently shipped to US Army advisors in Vietnam to further test their suitability for issue to South Vietnamese Army forces. Following the field evaluation, the Department of Defense Advanced Research Projects Agency prepared a report<sup>11</sup> summarizing the results. Amongst the data compiled via surveys of the US Army Advisors are a number of comments regarding actual use of the AR-15 in the field and the resulting lethal injuries:

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<sup>11</sup> *Final Report of ASD / ARPA Research and Development Field Unit – Vietnam* (Aug. 20, 1962) (declassified at AD343778) (Exhibit G).



9. (C) Remarks. Unit Commanders' and Advisors' remarks concerning the value of the AR-15 to Vietnamese Units and its worth as a combat weapon in the war in South Vietnam as opposed to existing weapons were also requested. Generally, the comments were extremely favorable to the AR-15. All of the comments received are presented below in their entirety and in the form in which they were received.

(1) (C) "On 160900 June 62, one platoon from the 340 Ranger Company was on an operation vic. YT260750 and contacted 3 armed VC in heavily forested jungle. Two VC had carbines, grenades, mines, and one had a

4

ANNEX "A"

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SMG. At a distance of approximately 15 meters, one Ranger fired an AR-15 full automatic hitting one VC with 3 rounds with the first burst. One round in the head-took it completely off. Another in the right arm, took it completely off, too. One round hit him in the right side, causing a hole about five inches in diameter. It cannot be determined which round killed the VC but it can be assumed that any one of the three would have caused death. The other 2 VC ran, leaving the dead VC with 1 carbine, 1 grenade and 2 mines." (Rangers)

(2.) (C) "On 9 June a Ranger Platoon from the 40th Inf Regt was given the mission of ambushing an estimated VC Company. The details are as follows:

- a. Number of VC killed: 5
- b. Number of AR-15's employed: 5
- c. Range of engagement: 30-100 meters
- d. Type wounds:
  1. Back wound, which caused the thoracic cavity to explode.
  2. Stomach wound, which caused the abdominal cavity to explode.
  3. Buttock wound, which destroyed all tissue of both buttocks.
  4. Chest wound from right to left, destroyed the thoracic cavity.
  5. Heel wound, the projectile entered the bottom of the right foot causing the leg to split from the foot to the hip.

These deaths were inflicted by the AR-15 and all were instantaneous except the buttock wound. He lived approximately five minutes.

38. The AR-15s were also shipped to the Navy SEALs for testing. As with the Army troops, the SEALs found the AR-15 to be an effective and lethal weapon. Both sets of

troops reported on the AR-15's light weight and low recoil, making it instantly popular.<sup>12</sup> In fact, the AR-15 was so effective that the U.S. Army concluded that it was:

**“Found by its users and by MAAG advisors to be superior in virtually all respects to ... [the] Thompson sub-machine gun and [the] Browning automatic rifle.”<sup>13</sup>**

39. Part of what made (and makes) the AR-15 so effective in certain combat settings was that it was (and is) designed to chamber and fire the 5.56 x 45mm cartridge (somewhat interchangeable with .223 Remington caliber). It is therefore important to note the respective characteristics of the 5.56mm / .223 caliber cartridge that influenced the US Military's decision to switch over from the 7.62 x 51mm / .308 caliber round used in the preceding model M-14 rifles.

40. Dimensionally the 7.62 x 51mm cartridge is 71mm (2.8 inches) long overall and weighs approximately 0.9 ounces. By comparison, the 5.56mm cartridge is 57mm (2.24 inches) long overall and weighs approximately 0.4 ounces:

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<sup>12</sup> Long, Duncan, THE COMPLETE AR-15/M16 SOURCEBOOK, WHAT EVERY SHOOTER NEEDS TO KNOW, at 19 (“popular with troops”) (Exhibit D); Dockery, Kevin, SPECIAL WARFARE: SPECIAL WEAPONS, THE ARMS & EQUIPMENT OF THE UDT AND SEALS FROM 1943 TO THE PRESENT, at 127 (Emperor's Press 2001) (SEALs “enthusiastically” using AR-15s) (Exhibit H).

<sup>13</sup> *Final Report of ASD / ARPA Research and Development Field Unit – Vietnam*, ¶ 3 (Aug. 20, 1962) (declassified at AD343778) (Exhibit G).



(image source: <https://www.intherabbithole.com/e176/>). Five pounds (80 oz.) of 7.62 ammunition consists of 89 cartridges. Five pounds of 5.56 consists of 200 cartridges. The lighter weight and smaller dimensions of a 5.56 / .223 caliber cartridge allowed more ammunition to be carried by an individual combatant for an equivalent weight. The shorter overall dimensions of the 5.56 also commensurately allowed for smaller detachable magazines and / or larger Capacity magazines for the same size. A 30-round magazine for a 5.56mm AR-15 rifle is smaller than a 20 round magazine for a 7.62mm M-14 rifle.

41. Performance in terms of muzzle velocity was also a consideration. The 7.62x51mm cartridge has a muzzle velocity of approximately 3200 feet per second (fps). The 5.56 cartridge has approximately the same velocity (for reference a 9mm pistol cartridge has a muzzle velocity of approximately 1100 fps). But upon contacting tissue, 5.56mm bullets will “yaw.” A bullet “yaws” when its nose begins to turn away from its direction of travel, contributing to the creation of large wound cavities. By comparison, because they are heavier

and travel at a lower velocity, handgun bullets do not typically yaw upon contact with tissue and do not create as large a wound cavity or commensurate destruction of tissue. The yaw movement of a 5.56/.223 bullet can also cause it to fragment upon striking bone, which contributes to additional tissue damage not immediately adjacent to the cavity itself.

42. Noted Wound Ballistics expert Vincent DiMaio writes in “Gunshot Wounds,”

“As the bullet enters the body, there is ‘tail splash’ or backward hurling of injured tissue. This material may be ejected from the entrance. The bullet passes through the target, creating a large temporary cavity whose maximum diameter is up to 11-12.5 times the diameter of the projectile. The maximum diameter of the cavity occurs at the point at which the maximum rate of loss of kinetic energy occurs. This occurs at the point where the bullet is at maximum yaw, i.e., turned sideways (at a 90-degree angle to the path) and / or when it fragments. If fragmentation does not occur and the path is long enough, the yawing continues until the bullet rotates 180 degrees and ends up in a base-forward position. The bullet will continue traveling base first with little or no yaw as this position puts the center of mass forward.

The temporary cavity will undulate for 5-10 msec before coming to rest as a permanent track. Positive and negative pressures alternate in the wound track, with resultant sucking of foreign material and bacteria into the track from both entrance and exit. In high-velocity centerfire rifle wounds, the expanding walls of the temporary cavity are capable of doing severe damage. There is compression, stretching and shearing of the displaced tissue. Injuries to blood vessels, nerves, or organs not struck by the bullet, and a distance from the path, can occur as can fractures of bones, though, in the case of fractures, this is relatively rare. In the author’s experience, fractures usually occur when the bullet perforates an intercostal space fracturing ribs above and below the bullet path.”<sup>14</sup>

DiMaio further states,

“Projectile fragmentation can amplify the effects of the temporary cavity increasing the severity of a wound. This is the reason for the effectiveness of the 5.56 x 45-mm cartridge and the M-16 rifle. For the M-193 55-gr. bullet, on the average, the yaw becomes significant at 12 cm with marked tissue disruption occurring most commonly at 15-25 cm due principally to

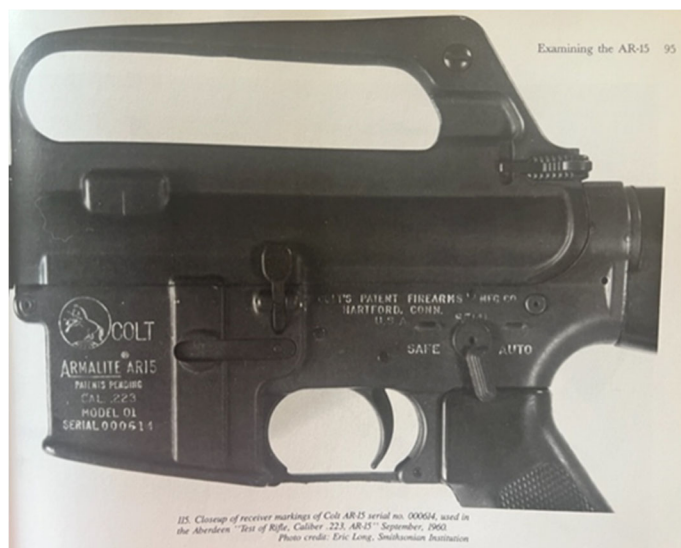
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<sup>14</sup> DiMaio, Vincent J.M., *Gunshot Wounds, Second Edition*, CRC Press, New York, NY, 1999 (Exhibit I).

bullet fragmentation.”<sup>15</sup>

The animation in the following video illustrates the temporary wound cavity DiMaio describes: <https://www.youtube.com/watch?v=8HM96wpPVoQ>

43. Despite some initial reliability problems due to improper maintenance by operators, the AR-15 was adopted as standard issue by the US Army in the mid 1960’s. The production of the rifle had been licensed to Colt and initially the model designation was, as produced, AR-15:



(image source: Ezell & Stevens, *The Black Rifle*, at 95<sup>16</sup>). Shortly thereafter, Colt made a series of minor engineering adjustments requested by the U.S. military (aimed at improving reliability), and the AR-15 was designated standard by the U.S. military under the name M16. The rifle proved to be as reliable and accurate as the AK type rifles deployed by the opposing forces in the Vietnam Conflict.

<sup>15</sup> DiMaio, Vincent J.M., *Gunshot Wounds, Second Edition*, CRC Press, New York, NY, 1999 (Exhibit I).

<sup>16</sup> Ezell, Edward C. & Stevens, Blake R., *THE BLACK RIFLE*, at 95 (2004) (Exhibit J).

### **Development of Assault Pistols:**

44. Like Assault Rifles, Assault Pistols derive from firearms initially designed and intended for use by the military in combat. Specifically, the modern assault pistol is based on submachinegun designs.

45. A submachine gun can generally be defined as a short or compact shoulder fired firearm which chambers and fires pistol caliber ammunition in select fire or fully automatic mode. They are a pistol caliber (i.e. “subcaliber”) machinegun.

46. Submachineguns share many construction and design features with assault rifles, including the StG44. Like the StG44, submachine guns arose from World War II. Nazi Germany entered the war with the innovative “MP38” (Maschinenpistole 38). It was chambered in 9mm and later, after several engineering changes, re designated the “MP40.” Like the Sturmgewehr rifle, its design features, commonly found in modern assault weapons, included an adjustable stock, separate pistol grip, detachable magazine, and use of steel stampings in its construction.

47. While the United States initially entered World War II with a military variant of the Thompson .45 caliber submachinegun, it was heavy and expensive to manufacture, as a number of the major components were machined from solid steel. Before the end of the war, the Thompson had been supplemented by the M3 “Greasegun” initially produced by General Motors. The receiver was a stamped and welded sheet metal assembly with an adjustable sliding shoulder stock. Like the MP38 the MP40, it had a separate pistol grip, a sliding / adjustable shoulder stock, and a detachable box magazine with a 30 round capacity. In a utilitarian sense it was as effective as the Thompson, and at approximately \$20, it was less than half as expensive for the US Government to purchase.

48. The United Kingdom produced over one million Sten Submachine guns during World War II. A rugged and reliable firearm made largely from welded steel stampings, it was utility and ease of manufacture both combined and perfected. Features shared with the M3 and MP40 included an adjustable and / or collapsible shoulder stock, a detachable box magazine and, on some variations, a barrel shroud allowing the operator to utilize the area surrounding the barrel as an auxiliary grip point without coming into contact with a heated barrel.

49. Prior to and during World War II a number of other nations developed submachine guns, which followed the same design and construction philosophy. Notable examples include the Soviet PPSH41, the Italian Beretta Model 38/42, and the Swedish Carl Gustav Model 45.

50. Following World War II, most new submachine gun designs continued the design philosophy which combined utility, ease of manufacture and the features of wartime firearms. In the early 1960's, HK introduced the MP5, which became an immensely popular choice for military and Law Enforcement agencies worldwide due to its inherent reliability and accuracy. Israeli military Industries also successfully marketed their UZI and Mini Uzi submachineguns for export.

## **V. DEVELOPMENT OF LARGE-CAPACITY MAGAZINES**

51. The term "Large Capacity Magazine" (LCM) under Delaware Law refers to any magazine with a capacity exceeding seventeen (17) rounds, subject to certain exceptions.

52. Modern semiautomatic rifles that are designed, manufactured and marketed as "hunting rifles" traditionally have had an internal magazine capacity of less than 10 rounds depending on caliber. For example, the Browning BAR, as manufactured, has an internal magazine capacity of 4 rounds. Modern assault weapons, including rifles and pistols, also do

not require large capacity magazines to operate. In fact, based on my training, knowledge, and experience, I am not aware of a single firearm that requires a large-capacity magazine, as defined in SB 1 for SB 6, to operate.

53. Large capacity magazines were not initially designed or intended for the civilian marketplace. Instead, as with assault rifles and pistol caliber assault weapons, the lineage of high capacity detachable magazines can be traced directly to a military heritage. World War I introduced numerous magazine fed light machine guns to combat, and the trend continued through World War II. As far as the individual infantryman's rifle was concerned, in World War II the standard issue semiautomatic rifle for the US Army as well as the US Marine Corps was the M1 "Garand" chambered in .30-06. The M1 has an internal (non detachable) magazine with a capacity of eight (8) rounds. It was not until the mid 1950's with the adoption of the M-14 that a rifle with a detachable magazine was approved for general issue to the US Military. Loading and unloading of a M1 rifle is detailed here: <https://www.youtube.com/watch?v=q9JPKQqiEL4>

54. From 1911 until 1985, the standard issue US Army handgun / sidearm was the Colt Model 1911. The US Marine Corps and Navy also adopted the pistol in 1913. Chambered in .45, it has a standard magazine capacity of seven (7) rounds. It was replaced in 1985 by the Beretta 92 in a smaller caliber (9mm), which has a standard capacity of fifteen (15) rounds. A brief Colt Model 1911 pistol animation is shown here: [https://www.youtube.com/watch?v=SMC\\_gfza6Mk](https://www.youtube.com/watch?v=SMC_gfza6Mk)

55. Magazine fed light machine guns developed or deployed prior to, during, and after World War I, and thereafter refined, improved the capability and reliability of this type of feeding mechanism on a large scale. The ability to fire an increased quantity of cartridges without reloading increases the lethality and effectiveness of small arms in combat. Less time



required to reload can equate to more time spent acquiring targets or shooting.

## **VI. PROLIFERATION OF THE ASSAULT WEAPON PLATFORMS**

56. In the 1950s and 1960s, the move towards adoption of semiautomatic and select fire rifles by military forces became a global phenomenon. Soviet Bloc nations rearmed with AK type rifles (and their variants), while NATO Nations adopted a number of designs from Colt, HK and FN, as stated previously, around a standardized caliber rifle cartridge.

57. Colt sought to capitalize on the military acceptance of the AR-15 / M16 and soon proposed production of these rifles for sale to the civilian market. Colt submitted a sample to the Treasury Department on October 23, 1963 for approval. The sole difference between the military and civilian versions was removal of fully automatic capability. This modification was achieved through nine changes to the fire control system. These modifications did not change the general overall appearance or semiautomatic rate of fire of the rifle:

- “1. Removal of the automatic sear.
2. Elimination of the automatic sear hole in the lower receiver.
3. Elimination of the automatic sear well in the lower receiver.
4. Removal of the automatic sear hook on the hammer.
5. Removal of the automatic sear trip notch from the bottom rear portion of the bolt carrier.
6. Modification of the selector to eliminate the automatic setting.
7. Elimination of the “AUTO” position identification marking on the lower receiver.
8. Mechanical restriction of selector lever movement to two positions only: SAFE and FIRE.
9. Enlargement of the front pivot pin holes in both the upper and lower receivers, and use of a larger-diameter front pivot pin.”<sup>17</sup>

The U.S. Treasury Department approved Colt’s semiautomatic version of the rifle, called the Model R6000 Colt AR-15 SP-1, in December 1963.

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<sup>17</sup> Bartocci, Christopher R., *THE BLACK RIFLE II*, at 234 (2004) (Exhibit K).

58. All of the other features on these rifles that enhanced their capability as combat military firearms remained. For example, the civilian versions retained the performance capacities of the military weapons they were based on, including the effective range, muzzle velocity and semiautomatic rate of fire. In addition, the weapons retained the capability to accommodate large capacity magazines (more than ten rounds) as originally issued for military use. The R6000 Colt AR-15 SP-1 even included the bayonet lug and flash hider. As Popular Science magazine reported in 1965:

“Out of the jungles of Vietnam comes a powerful, battle-proven rifle .... The sport version is an exact duplicate of the military weapon except for one alteration.”<sup>18</sup>

The animation in this video illustrates the function of both semiautomatic and full automatic AR type rifles. Note that the difference between the two consists of only a few parts in the trigger control group. The same basic configuration and function of the military rifle, including its cartridge and firing velocity, is shared with the semiautomatic models: <https://www.youtube.com/watch?v=omv85cLfmXU>

59. Like their assault rifle counterparts, post-World War II submachine gun manufacturers also created semiautomatic pistol versions. HK’s MP5, introduced in the early 1960s, included a pistol variant without a provision for a shoulder stock (HK SP89) (image source: [https://www.gunsinternational.com/guns-for-sale-online/pistols/9mm-pistols/excellent-condition-factory-german-hk-sp89-9mm-pistol.cfm?gun\\_id=101037518](https://www.gunsinternational.com/guns-for-sale-online/pistols/9mm-pistols/excellent-condition-factory-german-hk-sp89-9mm-pistol.cfm?gun_id=101037518)):

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<sup>18</sup> *Popular Science*, at 171 (Feb. 1965) (Exhibit L).



Israeli military Industries also successfully marketed their UZI and Mini Uzi submachineguns for export in civilian semiautomatic pistol variants (image source: [https://www.military-today.com/firearms/uzi\\_pistol.htm](https://www.military-today.com/firearms/uzi_pistol.htm)):



60. Additionally, a number of submachine gun designs proved unsuccessful in terms of Military and Government sales but nonetheless found a ready market when marketed as a semiautomatic pistol. Notable examples include the Cobray MAC-10 (and successive variants) and the Intratec TEC-9, which began life as a Swedish designed submachine gun, the

Interdynamic MP-9 (image sources: <https://www.armslist.com/posts/11522946/st-louis-missouri-handguns-for-sale--vulcan-mac-10>; [https://www.egunner.com/intratec-tec-dc9-9mmpara.name,11952922.auction\\_id,auction\\_details](https://www.egunner.com/intratec-tec-dc9-9mmpara.name,11952922.auction_id,auction_details)):



These assault-type pistols derive directly from their military counterparts.

61. From the start, firearms manufacturers and their marketing agents promoted the similarities between the semiautomatic civilian and full / select fire military versions of their assault weapons:

## Arm your men with confidence

# Colt's AR-15 Semi-Automatic Rifle



### MODEL R-6000

- Lightweight
- Easy to handle
- Straight line construction
- Weighs only 6.3 pounds
- Extremely accurate
- Simple to maintain

Colt's answer to the law enforcement agencies' demands for a semi-automatic version of the M16 automatic rifle purchased by the United States Armed Forces. Painstaking engineering redesign efforts have resulted in government-approved conversion of the automatic military rifle to a semi-automatic police weapon without sacrificing any performance or weight characteristics.

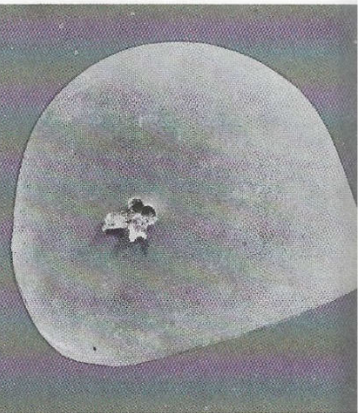
**Colt Industries**  **Colt's Small Arms Division  
Security Equipment**  
150 Huyshope Avenue, Hartford, Conn. 06102

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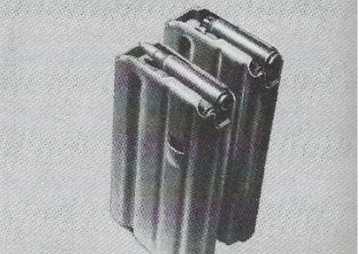
**ACCURATE, POWERFUL  
AT LONG RANGE**


Unsurpassed as a Sniper Rifle both accurate and lethal, at 500 yards the AR-15 makes a complete penetration of 10 gauge steel, or both sides of a steel combat helmet. On impact the tumbling action of the .223 caliber ammunition increases effectiveness.



**GRENADE LAUNCHER**

Converts instantly without the use of supplementary attachments or adjustments with complete interchangeability of grenade launching or combat ammunition.



 MANUFACTURED UNDER LICENSE FROM FAIRCHILD ENGINE AND AIRPLANE CORPORATION AND FAIRCHILD ARMS INTERNATIONAL LIMITED BY COLT'S PATENT FIRE ARMS MANUFACTURING COMPANY, INC., HARTFORD 15, CONNECTICUT, U.S.A. PATENTS PENDING. CABLE "COLT" HARTFORD, U S A

*117. From the first Colt AR-15 brochure, produced in a desperate attempt to interest somebody - anybody - in the merits of the AR-15's "unmatched superiority".*



**COLT AR-15 SPORTER  
SEMI-AUTOMATIC RIFLE  
.223 CALIBER**

Colt's answer to the demand for a semi-automatic version of the AR-15 automatic rifle purchased by The United States Armed Forces. Painsaking engineering redesign efforts have resulted in a Government-approved conversion of the Colt AR-15 automatic rifle without sacrificing any performance or weight characteristics. The semi-automatic AR-15 Sporter weighs only 6.3 pounds. Its recoil is light and barrel rise minimal.

**MODEL R-6000**

**RETAIL  
PRICE\*  
\$189.50**

Lightweight • Extremely accurate • Easy to handle • Straight line construction — barrel, bolt, recoil buffer unit and stock assembled in a straight line • Rapid semi-automatic fire is more controllable than with rifles of commercial design • Simple to maintain.

CALIBER	BARREL LENGTH	OVERALL LENGTH	CAPACITY	SIGHTS	SAFETY	WEIGHT
.223	21"	39"	5 rounds	Double tang rear peep sight adjustable for windage. Post type front sight adjustable for elevation.	Rotary safety— selector lever	Approx. 6¼ lbs.

\*The suggested retail price of the Sporter is \$189.50 and includes two magazines (each blocked for five rounds), sling, flash suppressor, rubber recoil pad, cleaning rod assembly, cleaning brush, and the Colt AR-15 Sporter Operation and Maintenance manual.

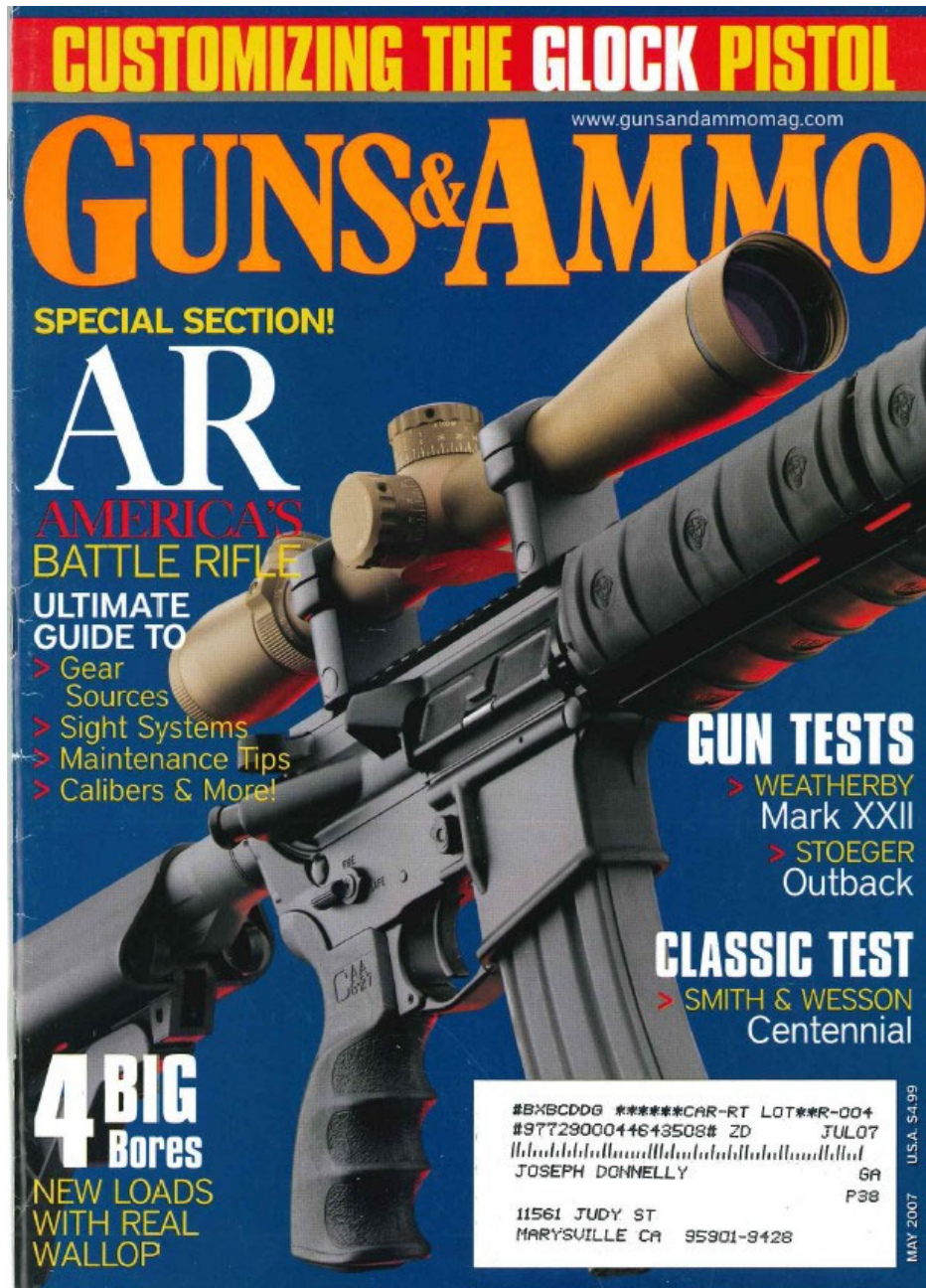
(image sources: <https://gearsofguns.com/old-ar-15-ads/>; Ezell & Stevens, *The Black Rifle*, at 98<sup>19</sup>; 1964 Colt Catalogue<sup>20</sup>). In the advertisements, Colt repeatedly advertised the AR-15 as its “answer to the demand for a semi-automatic version of the AR-15 automatic rifle purchased by the United States Armed Forces” that did not “sacrifice[e] any performance.”<sup>21</sup>

<sup>19</sup> Ezell, Edward C. & Stevens, Blake R., *THE BLACK RIFLE*, at 98 (2004) (Exhibit J).

<sup>20</sup> 1964 Colt Catalogue (Exhibit M).

<sup>21</sup> 1964 Colt Catalogue (Exhibit M). Colt’s 1970 advertisement said substantially the same thing (Exhibit N), as did its 1978 advertisement (Exhibit O) (“The semi-automatic version of the U.S. Military M16A1 which meets the highest standards of function and dependability.”). Importantly, Colt’s 1964 Colt also advertises the AR-15 for use with five-round magazines. As noted previously in paragraph 52, no firearm, including assault weapons

62. The firearms industry has continued to highlight their respective assault weapons' military origins throughout the ensuing decades. For example<sup>22</sup>:



This includes manufacturers of assault pistols, who advertise their firearms as such<sup>23</sup>:

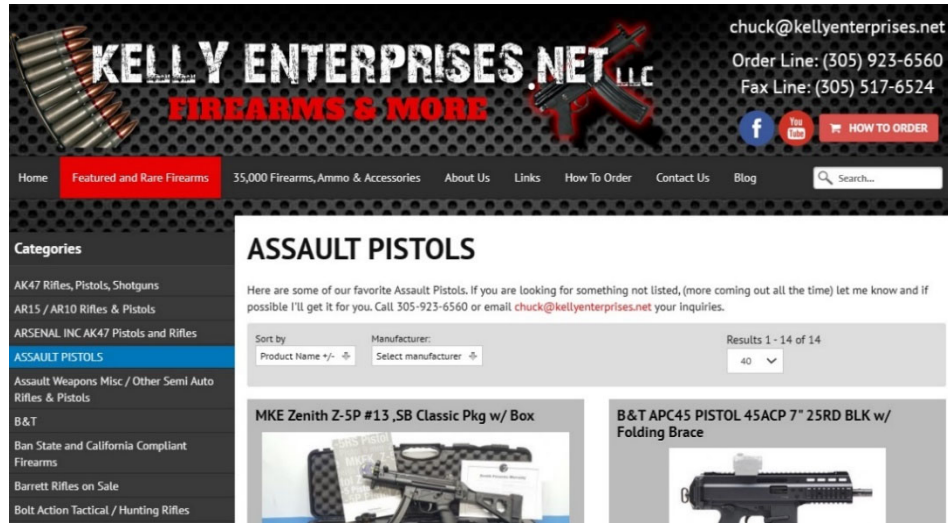
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like AR-15s, needs a large capacity magazine to operate.

<sup>22</sup> *Guns & Ammo Magazine* (July 2007).

<sup>23</sup> Kelly Enterprises, <https://www.kellyenterprises.net/firearms/assault-pistols.html>.





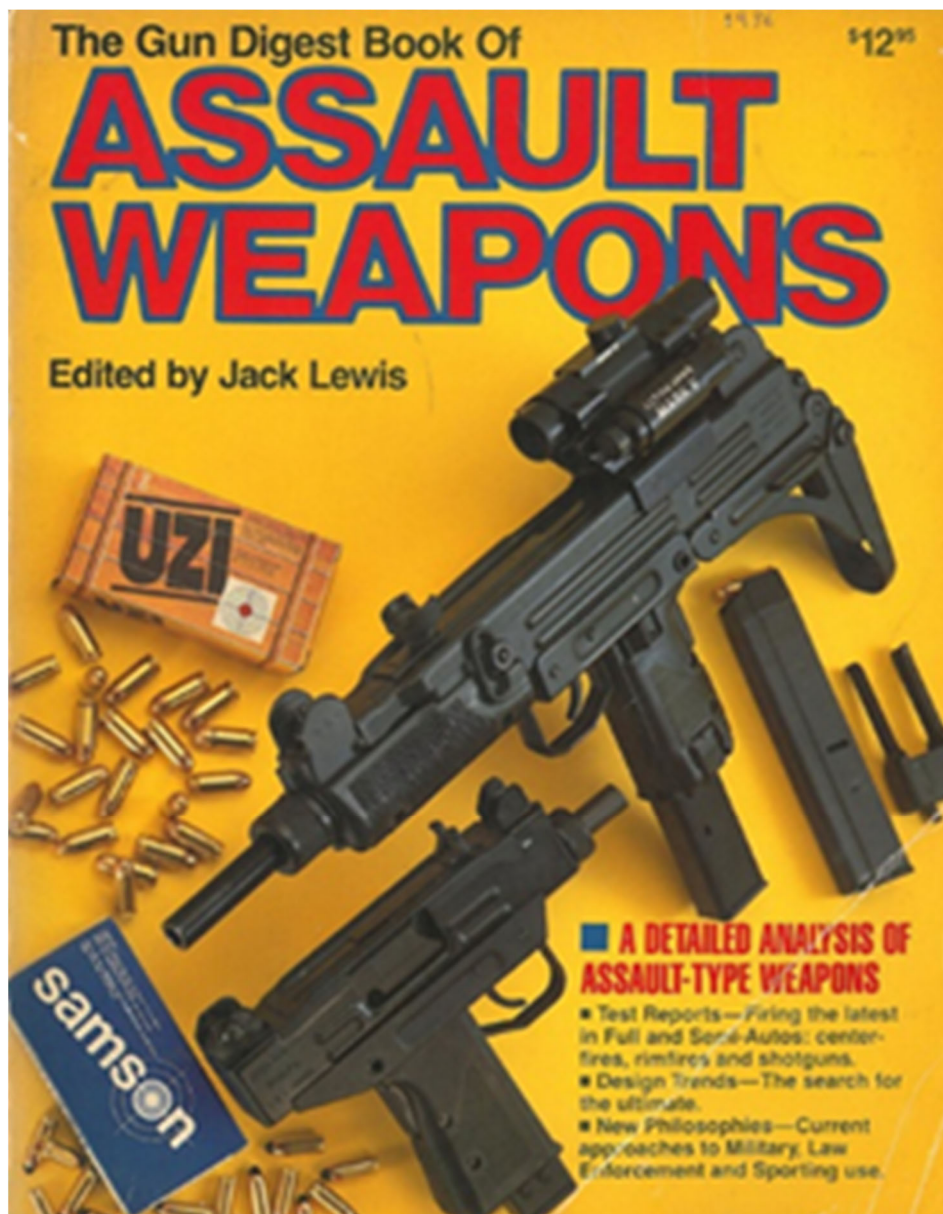
63. On page 15 of their Amended Complaint for Declaratory and Injunctive Relief, the plaintiffs incorrectly claim:

“35. The State of Delaware mislabels scores of common rifles, common shotguns, common pistols, and “copycat” weapons with a misnomer of “assault weapons.”

They again claim on page 24:

“What is more, the designation “assault weapons” is a complete misnomer, developed by anti-gun publicists” in their crusade against lawful firearm ownership.”

Contrary to the plaintiffs’ claim of political contrivance, the term “assault weapon” derives directly from the StG 44 sturmgewehr, which literally means “storm rifle,” or “assault rifle.” The AR-15 was advertised as such consistently through the 1960s, 1970s, and 1980s, by which point references to “assault weapons” were common in the firearms community. Consider the 1986 first edition of the “Gun Digest Book of Assault Weapons”:



In the book, which contains “detailed analysis of Assault Type Weapons,” editor Jack Lewis reviewed and test fired the Springfield SAR-48 (among other firearms), which is a reproduction of the Fabrique Nationale (FN) FAL rifle. He found it to be “a weapon of war.”<sup>24</sup>

64. Following the passage of the Federal and numerous State and local Assault Weapon Bans in the 1990’s, the firearm industry via the National Shooting Sports Foundation

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<sup>24</sup> Lewis, Jack, Gun Digest Book of Assault Weapons, at 88-93 (1st ed. 1986) (Exhibit P).

(NSSF, a firearm industry trade and lobbying organization) reversed course and coined the moniker “Modern Sporting Rifle” to describe semiautomatic variants of the fully automatic / select fire M16. But the semiautomatic variants of the select fire M16 are not sporting rifles at all. Instead, assault weapons are semiautomatic copies of fully automatic (or select fire) firearms designed and intended for use by the military. They retain features and performance characteristics (in terms of muzzle velocity, range etc.) originally designed and intended for use on the battlefield.

## **VII. PROLIFERATION OF COPYCATS**

65. The expiration of Colt’s patents in the late 1970’s naturally spawned competition in the marketplace, and that competition accelerated in the years following the 2004 expiration of the federal assault weapons ban. Yet the basic configuration, appearance, construction, and operation of the internal gas operating system (as designed) has remained unchanged since its initial design and introduction as a military weapon. Their specifications similarly remain standardized industry wide. In fact, due to their modular construction, AR type rifles are easily constructed / configured with parts made by other manufacturers to suit the owner’s personal preference. The rifle receiver itself (i.e., its frame) is designed as a two-piece unit, and the “upper receiver” and “lower receiver” can be swapped out for other interchangeable pieces made by the same or another manufacturer with ease. The design also facilitates replacement of internal fire control components and assemblies, which are generally completely interchangeable between military M16’s manufactured in the 1960’s by Colt and an AR-15 type rifle produced today by any one of hundreds of U.S. manufacturers that produce either receivers or internal operating parts. For example, a Bolt Carrier manufactured in 1967 by Colt will fit, and function as designed, in an AR copy manufactured in 2023.

66. The same is true of the overall configuration of “copycat” AR rifles, which

remain essentially identical to the original production design of the early 1960's. The basic design configuration is exactly the same: a two piece hinged receiver frame, a shoulder stock in line with the chamber and barrel, an identically placed magazine, and the same external switches and other features. The following video illustrates how the rifle's hinged two-piece upper and lower receiver can be swapped out for other similar pieces with relative ease and facilitates replacement of internal fire control components and assemblies: <https://www.youtube.com/watch?v=F00FEJZbrb0>

67. While employed at the ATF NLC, I was a custodian of the Laboratory's Firearms Reference Collection. The firearms in the collection were regularly used by students in the National Firearms Examiner Academy and often required repair. I have personally replaced internal parts in older Colt AR type rifles and Eastern Bloc manufactured AK rifles with recently manufactured parts from aftermarket vendors. The parts fit without issue and the firearms functioned as designed after the repair.

68. In fact, individual component pieces are so standardized and interchangeable that an individual can build a custom AR type rifle from the "ground up" as opposed to purchasing a complete firearm.<sup>25</sup> A good illustration of this ease of customization, and the plethora of interchangeable parts and accessories, is the fact that Brownell's Inc., an established gun supply retailer in Iowa, currently devotes the first 107 pages of their "Big Book" (74th edition) catalog of parts and accessories to AR type rifles alone: <https://www.brownells.com/asp/bapid=835/ClientPage/brownells-catalog-74-pdfs>.

69. The same holds true for AK type rifles and, more recently, pistols available in the civilian market. Although the design (and variants) of the AK-47 are more numerous

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<sup>25</sup> Under Federal Law, the lower receiver of the AR platform is considered the "firearm" and requires a serial number. Thus, a background check is required to purchase a completed lower receiver, but it is not required to purchase other components.

than the AR type rifle (as far as military production and use is concerned), it lags behind the AR in regard to domestic civilian popularity. Nonetheless whether the AK Type rifle is of Russian, Chinese or other former Eastern Bloc manufacture, there is a robust secondary market in the United States for accessories, parts, sub- assemblies etc. Although not as easily modified as an AR style rifle due to its less “modular” design, there are customization options available, including a variety of shoulder stocks, sighting and illumination, etc.

70. Additionally, much as with AR type rifles, there are numerous vendors selling all the necessary component parts needed for an individual to build an AK style rifle from “the ground up” as opposed to purchasing a complete rifle and subsequently modifying the firearm. In actuality, the receiver of many AK rifles is simply a stamped metal “flat” which is available from numerous vendors online for as little as \$14.99 (image source: <https://www.buymilsurp.com/ak-receiver-flat-and-rails-p-3028.html>):



71. The AK ‘flat’ is bent into the correct configuration using a jig which can also be found from numerous vendors (image source: [https://ak-builder.com/images/detailed/1/ak\\_builder\\_flat\\_bending\\_die\\_set.jpg](https://ak-builder.com/images/detailed/1/ak_builder_flat_bending_die_set.jpg)):



72. As with the AR, the general configuration and specifications of internal AK operating parts and assemblies have remained consistent. Regardless of the place of manufacture, there are numerous internal fire control, feeding and gas operating system components that are interchangeable between AK rifles produced by manufacturers over the past 40-plus years. Again, as with AR type rifles, the overall configuration of the AK rifle receiver, internal operating systems and their parts, and performance (in terms of semiautomatic rate of fire, muzzle velocity, range etc.) are comparable to the military versions from which they evolved.

73. As stated previously, the expiration of Colt's AR patent in the late 1970's spawned numerous "copycat" rifles from other vendors. A similar situation occurred with respect to AK type rifles on an international scale. These foreign manufacturers, including Norinco (China), Romarm (Romania) and Valmet (Finland), were or still are state owned enterprises, and tens of thousands of complete AK copies were imported into the U.S. by a number of foreign manufacturers before additional Federal regulation, Title 18, Section 922(r), required that a certain percentage of the rifle's parts be manufactured domestically.

74. Regulation of imports, however, has not slowed the development of AK

“copycat rifles,” and numerous domestic manufacturers are producing rifles in the U.S. based on the original design and operating system.

75. As with the assault rifles, the performance characteristics of pistol caliber assault weapons in regard to semiautomatic rate of fire, muzzle velocity, and effective range have not changed since their initial incarnation as military weapons, and their copycats likewise remain remarkably similar to the originals.

### **VIII. PREVIOUS ASSAULT WEAPONS LEGISLATION**

76. Following previous longstanding legislation such as the 1934 Firearms Act, the 1968 Gun Control Act, and the 1986 follow-up ban on machine guns, in September 1994 Congress passed, and President Clinton signed, the “Public Safety and Recreational Firearms Act,” which was part of a larger omnibus crime reduction act. Commonly known as the Federal “Assault Weapons Ban” (AWB), the act banned the possession, transfer or importation of “semiautomatic assault weapons,” defined as:

- a. any of the firearms, or copies or duplicates of the firearms, known as—
  - i. Norinco, Mitchell, and Poly Technologies Avtomat Kalashnikovs (all models)
  - ii. Action Arms Israeli Military Industries UZI and Galil
  - iii. Beretta AR-70 (SC-70)
  - iv. Colt AR-15
  - v. Fabrique National FN/FAL, FN/LAR, and NC
  - vi. SWD M-10, M-11, M-11/9, and M-12
  - vii. Steyr AUG
  - viii. INTRATEC TEC-9, TEC-DC9 and TEC-22; and
  - ix. revolving cylinder shotguns, such as (or similar to) the Street Sweeper and Striker 12
- b. a semiautomatic rifle that has an ability to accept a detachable magazine and has at least 2 of—
  - i. a folding or telescoping stock
  - ii. a pistol grip that protrudes conspicuously beneath the action of the

- weapon
- iii. a bayonet mount
- iv. a flash suppressor or threaded barrel designed to accommodate a flash suppressor; and
- v. a grenade launcher
- c. a semiautomatic pistol that has an ability to accept a detachable magazine and has at least 2 of—
  - i. an ammunition magazine that attaches to the pistol outside of the pistol grip
  - ii. a threaded barrel capable of accepting a barrel extender, flash suppressor, forward handgrip, or silencer
  - iii. a shroud that is attached to, or partially or completely encircles, the barrel and that permits the shooter to hold the firearm with the nontrigger hand without being burned
  - iv. a manufactured weight of 50 ounces or more when the pistol is unloaded; and
  - v. a semiautomatic version of an automatic firearm; and
- d. a semiautomatic shotgun that has at least 2 of--
  - i. a folding or telescoping stock
  - ii. a pistol grip that protrudes conspicuously beneath the action of the weapon
  - iii. a fixed magazine capacity in excess of 5 rounds; and
  - iv. an ability to accept a detachable magazine

77. The Federal AWB list of “named” firearms (specific models) (Part A of the above definition) and their “copies or duplicates” can be described as the “named firearms” list. The firearms defined by review of their features were banned based on an evaluation that has often been called the “features” test. Because of the conjunction “and” in the statute, both the named firearms (together their copies or duplicates) and firearms with certain features were banned.

78. Subsequent to the passage of the Federal Assault Weapons Ban (AWB), firearm manufacturers and importers implemented modifications to a number of their firearms that were now banned under the “features test.” The majority of these modifications were of a



cosmetic nature only in order to pass the test. For example, features of a “pre ban” Colt AR-15 rifle could easily be removed / modified to meet the features test by removal of the bayonet lug, affixing a non-folding / collapsible or “fixed” shoulder stock, removal of the flash hider and removal of any attachment to accommodate a grenade launcher. Modifications such as these had no appreciable effect on the operation and performance specifications of the banned firearms in terms of ammunition capacity, accuracy, semiautomatic rate of fire, effective range, or potential muzzle velocity of projectiles etc. Cosmetically the rifles were different, but the lethal performance characteristics designed into these firearms when initially designed for battle remained identical.

79. The larger crime reduction bill included a sunset provision for the AWB wherein the restrictions on named firearms, and those subject to the ban based on features, would expire in September 2004 unless extended by subsequent legislation. The Federal AWB expired in September of 2004 and was not replaced or renewed by any subsequent Congressional legislation.

80. For the purposes of this report it is important to emphasize two provisions in the State’s legislation. First, as with the Federal AWB, it contains a list of “enumerated” (by make and model) banned firearms. Second, the statute also bans “copies or duplicates” of those same specific enumerated firearms. Third, state law also bans firearms that meet the features test which incorporates the same characteristics as had been present in federal law. Based on my training, knowledge, and experience, the enumerated firearms and copycats share specific features designed for military combat, described at length above, that are reflected in the features test portion of the regulation.

**IX. RIFLE CALIBER ASSAULT WEAPONS AND SPORTING, HUNTING, AND SELF / HOME DEFENSE**

81. At numerous points throughout their complaint the Plaintiffs claim (without any supportive statistical data) that self defense is one of the primary reasons for the purchase of a banned firearm. It is my opinion that an AR, AK or other banned assault weapon is a poor choice for this task.

82. I have been asked on numerous occasions during my career what I would recommend for home or self-defense. My recommendation is based upon my inquiry in return regarding the individual's (and their family members') personal experience and comfort level with firearms. In over 25-plus years I have never recommended an AR, AK or other similar assault rifle as a home defense weapon.

83. Home defense and / or self-defense situations are rarely, if ever, lengthy shootouts at long ranges with extensive exchanges of gunfire. Banned assault weapons were designed to be effective at battlefield ranges of up to 500 yards. The typical muzzle velocity of a .223 caliber bullet is 3,200 feet per second (+ or -). Common muzzle velocities for 9mm or .38 caliber handgun bullets are less than half of that. Projectiles travelling at such high velocities pose a serious risk of over-penetration in most home construction materials such as gypsum board / sheet rock, and typical 2x4 lumber. When this cartridge was designed for the AR-15 / M16, it was intended to kill or incapacitate enemy combatants at distances of hundreds of yards, not dozens of feet.

In August 2014, the National Rifle Association's "American Rifleman" published an article by Stanton Wormley called "The AR-15 for Home Defense: Penetration Tests."<sup>26</sup> Wormley conducted penetration tests on nine different types of .223 / 5.56mm ammunition by

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<sup>26</sup> American Rifleman, *The AR-15 for Home Defense: Penetration Tests* (Aug. 5, 2014), <https://www.americanrifleman.org/content/the-ar-15-for-home-defense-penetration-tests/>.

firing them through simulated wall sections constructed of gypsum board / sheet rock and wooden 2x4 studs. When fired at a 90-degree angle to the walls all nine (including “frangible” rounds designed to disintegrate when hitting a hard surface) easily penetrated the wall section as well as water jugs placed three feet behind:

“But just how much energy did the penetrating projectiles carry? All the loads, including the Glaser, exploded one-gallon water jugs placed 3 feet behind the wall sections.”<sup>27</sup>

The tests conducted by Wormley also included firing longitudinally through the wall sections resulting in the penetration of three successive 2” thick 2x4 studs by a number of the projectiles. These tests vividly highlight the inherent dangers of utilizing assault weapons with high velocity ammunition in a home defense scenario.

84. In reference to the NRA American Rifleman article mentioned in paragraph 18(b), current U.S. Army issue .223 caliber ammunition is capable of penetrating 3/8” hardened steel at 350 yards. Potential over-penetration in a confined environment is problematic in terms of risk to bystanders or family members outside the target location. Most jacketed, commercially available 5.56mm ammunition has impressive penetration capabilities in this regard. Additionally, the (former) NATO issue M855 SS109 5.56mm is readily available for purchase by civilians. This ammunition was designed to penetrate up to 3mm of “soft”, (non-hardened) steel.

85. During a stressful situation such as a home invasion or break in, there may be multiple steps required by the operator to bring the weapon from a safe condition to a firing condition. Manipulation of a charging handle, safety switch, or inserting a magazine may be difficult to accomplish under stress, particularly if the operator has not adequately trained or

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<sup>27</sup> American Rifleman, *The AR-15 for Home Defense: Penetration Tests* (Aug. 5, 2014), <https://www.americanrifleman.org/articles/2014/8/5/the-ar-15-for-home-defense-penetration-tests/>.

practiced with their firearm. Other family members may not be familiar with bringing the weapon to a firing condition or fail to complete adequate steps to do so under duress.

86. While I was employed as a Special Agent with ATF in the early 2000's, the agency transitioned to an AR type rifle. Each Agent was required to attend, and successfully complete, a one week / 40 plus hour transition training class in order to familiarize themselves, and qualify, with the firearm. The training included repetitive live fire drills under stressful conditions. Additionally, we were required to requalify with these firearms quarterly and repeat the same drills as during the initial transition training. Nonetheless I witnessed Agents make errors during those drills, although they had performed them repeatedly under stress, that resulted in a failure of the weapon to fire. It is worth noting here that the M4 carbines issued to ATF Field Offices were select fire rifles (i.e. machineguns capable of full automatic fire) that were converted to semiautomatic fire only.

87. In terms of home defense and personal protection, I am of the opinion that assault weapons, whether in the form of a rifle or a pistol, are a poor choice for either purpose. Due to their weight and length many Assault Pistols enumerated in HB 450 require two hands to effectively aim and shoot. Certainly the same can be said for a rifle. In a home defense situation an individual may be required to use one hand to call 911 while attempting to operate a "two handed" firearm with one hand. Such a situation would also preclude the homeowner from utilizing their "non gun hand" to pick up or guide a small child during such an event.

88. It is also my opinion, based upon my training, knowledge, experience and research, that assault weapons were not designed for, are not well suited for, and are generally not preferred for traditional hunting purposes. Neither was the .223 caliber cartridge developed for civilian hunting applications. Because of the .223 caliber / 5.56 mm round's proven record of causing significant damage upon impacting living tissue (when fired from an

AR type rifle), it is a counterintuitive choice. There are numerous other traditional sporting rifles (and in fact military surplus rifles such as the M1 Garand) that are not banned by HB 450 and are chambered in a caliber more suitable for hunting than .223 caliber / 5.56mm. The ATF found similarly in 1989 and again in 1998 when at the request of the Department of the Treasury it reviewed the features, characteristics, design, and capabilities of “assault-type rifles” and determined that those weapons should not be importable under federal law because they were not suitable for sporting purposes, including hunting and target shooting. The ATF instead found that the assault weapons were “designed and intended to be particularly suitable for combat.”<sup>28</sup>

89. If the individual seeking a home defense firearm has a preference for shoulder weapons, I have recommended a pump action 12 or 20 gauge shotgun (Remington 870, Mossberg 500 etc.) loaded and stored with the “hammer dropped” on an empty chamber, safety off. The only action required to bring the shotgun from a safe unloaded condition to a firing condition is to work the pump action of the shotgun. The advantages of this type of firearm and storage condition are unmatched stopping power, low probability of over penetration (as compared to rifle caliber and velocity projectiles), and little manipulation of safety mechanisms required in a high-stress situation. The loading / chambering process itself is an audible deterrent. Training and familiarization with this type of a firearm is simple and straightforward.

90. For a handgun, my first inclination is to recommend an eight shot revolver in

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<sup>28</sup> Department of the Treasury: Bureau of Alcohol, Tobacco, and Firearms, REPORT AND RECOMMENDATION ON THE IMPORTABILITY OF CERTAIN SEMIAUTOMATIC RIFLES, at 12 (Jul. 6, 1989) (Exhibit Q). The ATF concluded similarly in 1998 (Department of the Treasury, THE SPORTING SUITABILITY OF MODIFIED SEMIAUTOMATIC RIFLES (April 1998)) (Exhibit R), and again as to assault shotguns in 2011. (Department of the Treasury: Bureau of Alcohol, Tobacco, and Firearms, STUDY ON THE IMPORTABILITY OF CERTAIN SHOTGUNS (2011)) (Exhibit S).

.38 caliber or .357 Magnum (Similar to S&W Model 627, Taurus Model 608, etc.) loaded with hollow point bullets. As with my rationale for recommending a pump action shotgun, there are no complicated safety mechanisms to manipulate in a high stress situation, low probability of over penetration and ease of reloading with a speed loader should more than eight shots be required. Revolvers are also easier and less complicated for other family members to learn to operate especially if they have less familiarity with firearms.

91. In terms of a carry handgun, I value concealability over ammunition capacity. The advantage of concealed carry is protection without broadcasting the fact. In a street robbery scenario, I believe the best course of action is to quickly extricate yourself from the “kill zone” and not engage in a protracted gunfight. When I was employed as a Special Agent with ATF we were issued a Sig Sauer P229 in .40 S&W caliber as a primary duty weapon. We were also given the choice of a Sig Sauer P239 in .40 S&W or a five shot Smith and Wesson Model 640 in .357 Magnum as a backup firearm. When off duty I carried the S&W 640 and a speed loader extensively as opposed to the P229. I found it easy to conceal and am of the opinion that ten (10) rounds was an adequate amount of ammunition to enable me, or myself and my child, to extricate myself from a street or retail location robbery should I encounter one. Consequently, I have most often recommended either a lightweight small revolver (S&W Bodyguard, Ruger LCR, Smith and Wesson Model 36,640 or variant) carried with a speed loader or a low profile small semiautomatic pistol (Sig Sauer P236, Ruger LCP, Colt Pocketlite etc.) with a spare magazine.

92. The types of firearms classified as assault weapons under the HB 450 are direct developmental descendants of military weapons designed for use in combat. The “civilian” AR-15 type retains the same performance characteristics (in terms of muzzle velocity, range etc.) as does the Military M16 and its variants (M16A2, M-4 etc.). According to the US Army

Rifle Marksmanship M16A1, M-16A2/3, M16A4, and M4 Carbine Manual,<sup>29</sup> the maximum range of these rifles is 2650-3000 meters. They were not designed, nor are they particularly suitable, for home defense in short range close quarter situations.

FM 3-22.9(FM 23-9)

**CHAPTER 2  
CHARACTERISTICS, AMMUNITION, AND  
ACCESSORIES**

*This chapter describes the general components, characteristics, ammunition, and accessories for the M16- and M4-series weapons to include a brief explanation of how to mount the various accessories.*

**2-1. CHARACTERISTICS**

The M16-/M4-series weapons are 5.56-mm, magazine-fed, gas-operated, air-cooled, shoulder-fired weapons. This section describes the general characteristics (Table 2-1) and the components of the M16-/M4-series weapons. Table 2-2 (page 2-2) shows the characteristics of various accessories.

CHARACTERISTIC	M16A1	M16A2/A3	M16A4	M4
<b>WEIGHT (pounds):</b>				
Without magazine and sling	6.35	7.78	9.08	6.49
With sling and loaded:				
20-round magazine	6.75	8.48	9.78	7.19
30-round magazine	7.06	8.79	10.09	7.50
Bayonet knife, M9	1.50	1.50	1.50	1.50
Scabbard	0.30	0.30	0.30	0.30
Sling, M1	0.40	0.40	0.40	0.40
<b>LENGTH (inches):</b>				
Rifle w/bayonet knife	44.25	44.88	44.88	N/A
Overall rifle length	30.00	39.63	39.63	N/A
Buttstock closed	N/A	N/A	N/A	29.75
Buttstock open	N/A	N/A	N/A	33.0
<b>OPERATIONAL CHARACTERISTICS:</b>				
Barrel rifling-right hand 1 twist (inches)	12	7	7	7
Muzzle velocity (feet per second)	3,250	3,100	3,100	2,970
Cyclic rate of fire (rounds per minute)	700-800	700-900	800	700-900
<b>MAXIMUM EFFECTIVE RATE OF FIRE:</b>				
Semiautomatic (rounds per minute)	45-65	45	45	45
Burst (3-round bursts) (rounds per minute)	N/A	90	90	90
Automatic (rounds per minute)	150-200	150-200 A3	N/A	N/A
Sustained (rounds per minute)	12-15	12-15	12-15	12-15
<b>RANGE (meters):</b>				
Maximum range	2,653	3,600	3,600	3,600
Maximum effective range				
Point target	460	550	550	500
Area target	N/A	800	600	600

**Table 2-1. Characteristics of the M16-/M4-series weapons.**

**NOTE:** For further technical information, refer to TM 9-1005-319-10 and TM 9-1005-249-10.

2-1

## X. ASSAULT WEAPONS AS A GENERAL THREAT TO PUBLIC SAFETY

97. As mentioned previously in this report, many of the firearms prohibited by statute directly trace their origins to those developed for use in combat. As such, they were never initially intended for general distribution / sale to the public.

As tragically demonstrated by recent mass shootings such as the Pulse Nightclub in Orlando Florida in 2016 (49 fatalities, 50+ wounded), the 2017 Las Vegas shooting (60 fatalities, 400+ wounded), the 2022 Uvalde Texas School shooting (21 fatalities + 17

<sup>29</sup> U.S. Army Manual FM 3-22.9 on Rifle Marksmanship M16A1, M16A2/3, M16A34 & M4 Carbine, at 2-1 (April 2003) (Exhibit T).

wounded), and the July 4th 2022 shooting in Highland Park (7 fatalities + 48 wounded), the assault weapons (in conjunction with high capacity magazines) identified in the statutes are capable of inflicting significant carnage upon civilians in a short period of time.

98. Assault weapons as prohibited under HB 450 pose a significant risk to Law Enforcement Officers. It has been my experience that soft body armor issued to most Uniformed Officers has a “Level II” or “Level IIIA” National Institute of Justice (NIJ) protection rating. These two ratings are suitable for protection against most handgun bullets as those projectiles range up to a 1200FPS (+ or -) velocity. Rifle caliber assault weapons (AR & AK type) can, as stated previously in this report, achieve muzzle velocities of 3200FPS (+ or -), which can readily penetrate Level II & IIIA Body Armor (as well as some Level III hard body armor, which is not universal standard issue amongst Law Enforcement Agencies nationwide). Not only do these firearms pose a threat to overall public safety, they increase the likelihood that first responders charged with stopping such a threat, or attending to wounded citizens, may be injured or killed in the performance of their duty.

This online video illustrates the capability of commonly available .223 / 5.56mm caliber ammunition to penetrate Level III body armor. The author / narrator states that this test was performed at a distance of “about seven yards”: <https://www.youtube.com/watch?v=oMYkEMhPsO8>.

99. The argument that commercially available AR type rifles are somehow less dangerous or lethal simply because they fire only in semiautomatic mode is misleading. They retain the identical performance capabilities and characteristics (save full automatic capability) as initially intended for use in combat. With even minimal training, an operator can fire 40-50 shots per minute in semiautomatic mode, which is the U.S. Army’s standard



“rapid fire” rate in combat scenarios.<sup>30</sup> According to the U.S. Army’s Field Manual, the most effective use of the M16 at ranges beyond 25 yards is rapid semiautomatic fire.<sup>31</sup> Not full automatic fire:

**7-8. RAPID SEMIAUTOMATIC FIRE**

The most important firing technique during modern, fast moving combat is rapid semiautomatic fire. Rapid-fire techniques are the key to hitting the short exposure, multiple, or moving targets described previously. If properly applied, rapid semiautomatic fire delivers a large volume of effective fire into a target area. The soldier intentionally fires a quick series of shots into the target area to assure a high probability of a hit. (Figure 7-10, page 7-8 shows the current training program for rapid semiautomatic fire.)

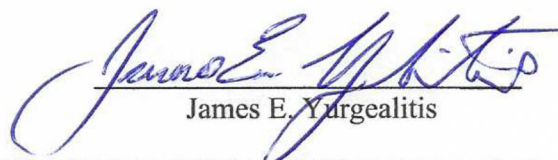
**Figure 7-10. Rapid semiautomatic fire training program.**

a. **Effectiveness of Rapid Fire.** When a soldier uses rapid semiautomatic fire properly, he sacrifices some accuracy to deliver a greater volume of effective fire to hit more targets. It is surprising how devastatingly accurate rapid fire can be. At ranges beyond 25 meters, rapid semiautomatic fire is superior to automatic fire in all measures (shots per target, trigger pulls per hit, and even time to hit). The decrease in accuracy when firing faster is reduced with proper training and repeated practice.

Such capability, combined with the performance characteristics of .223 / 5.56 ammunition originally intended for combat, can, and have, resulted in catastrophic civilian mass casualty events.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on January 29, 2023

  
James E. Yurgealitis

<sup>30</sup> U.S. Army Rifle & Carbine Manual, at 8-17 through 8-22 (2016) (Exhibit U).

<sup>31</sup> U.S. Army Manual FM 3-22.9 on Rifle Marksmanship M16A1, M16A2/3, M16A34 & M4 Carbine, at 7-8 (April 2003) (Exhibit T). In fact, the U.S. Marine Corps adopted the M16A4 in 1998, which replaced fully automatic fire capabilities with a three-round burst. Military Today, *M16 Assault Rifle*, <http://www.military-today.com/firearms/m16.htm>.

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in Support of Defendants' Opposition to Plaintiffs' Motion for Preliminary Injunction**

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