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80% Firearm Receiver

Rick Vasquez is the former Assistant Chief and Acting Chief of the ATF Firearms Technology Branch. Rick Vasquez Firearms provides technology assistance to the firearms industry.

This informational paper has been prepared as an effort to clarify the status of “80% firearms castings (receivers) under the United States firearms regulations.

There are many advertisements for so-called 80% firearms in the United States firearms market. These items that resemble a firearm, both pistol and rifle, have become common accessories sold by firearms dealers. Due to their resemblance to complete firearms receivers, the manner in which they are sold always brings up questions. How are these partially complete castings classified under United States code and do they require markings?

The first issue is, “What is an 80% receiver and how is it regulated?” For background knowledge, the following guidelines are provided prior to an explanation of 80% receivers:

The Gun Control Act, 18 U.S.C. § 921(a)(3), defines the term “firearm” to include *any weapon (including a starter gun) which will or is designed to or may be readily converted to expel a projectile by the action of an explosive...[and] ...the frame or receiver of any such weapon....*

Note: The Bureau of ATFE, which is the regulatory agency with oversight on firearms, uses the following terms to describe certain items:

*The term “**receiver blank**” is used to describe forgings, castings, or machined bodies (defense articleⁱ) such as AR-15 receiver castings, AK receiver flats, etc., in various stages of folding/machining which are **not** classified as firearms.*

*The term “**incomplete receiver**” is used to describe forgings, castings, or machined bodies (defense articles) which have been classified as firearms but are not completely machined for use as a functional firearm receiver.*

*The term “**receiver**” is used to describe functional firearm frames or receivers.*

80% Receiver

The term “80% receiver” is an industry term that infers that a receiver blank has 80% of the machining processes performed on the casting/blank that are required to classify it as a firearm,. In this incomplete stage, it is not regulated as a firearm and can enter commerce unregulated. When manufacturers of unfinished receivers wish to distribute these in commerce, they generally solicit an opinion from ATFE on the classification of their product prior to selling these partially complete machined bodies. This is not required, but it is recommended. Under U. S. firearms laws, based on opinions on these castings by the Bureau of ATFE, these 80% incomplete castings are not firearms as defined under the GCA.

There are many manufacturers who have received ATFE opinions on incomplete castings they are marketing and have shared their opinion and drawings on the internet. Additionally, ATFE has posted a ruling 2014-1 that clearly demonstrates the requirements of a partially-machined body (AR15) to not be classified as a firearm. The result is that there is no scarcity of 80% receivers for sale.

Since these unfinished castings are not firearms, the sale of these items require no regulatory oversight in the U.S. They do not have any requirements for markings such as a serial number.

Purchasing and Finishing:

Unlicensed individuals are authorized to purchase these 80% castings and make a firearm for personal use. Therefore, individuals can purchase castings or machined/molded or other manufactured bodies (sometimes referred to as “blanks,” or “80% receivers”) that have not yet reached a stage of manufacture in which they are classified as “firearm frames or receivers.” Once purchased, individuals may perform the required machining on these castings and make a receiver classified as a “firearm frame or receiver” under the federal statutes.

It is also important to note that individuals, who make a firearm for personal use, are not required under federal statutes to identify the firearm with a serial number or other markings such as model or maker. If a person has made a firearm for personal use with no intent to sell it, but at a later date decides to sell the firearm, he does not incur the same requirements of marking a firearm as a manufacturer does. These unmarked firearms enter commerce with no markings and no traceability. There are differing opinions that come out of ATFE concerning marking requirements for individuals that complete these castings into firearms. For clarity this author solicited an official opinion on individual marking requirements to ATFE headquarters and received an official answer that individuals do not have to mark firearms they manufacture prior to selling them. The marking requirements are based on are you a licensed manufacturer; are you an individual making a firearm with the intent to sell. If an individual makes a firearm and later decides to sell the firearm to liquidate his personal weapons, they did not make with the intent to manufacturer for personal gain so it does not need to be marked.

When a licensed manufacturer produces firearms, they are required to mark their firearms with specific markings. These markings, listed in order below, include a serial number. The serial number must be applied to the frame in a manner that makes the serial number difficult to alter or obliterate. The marking regulations also specify a height and depth for the letters and numbers used to mark a firearm.

ATFE Approved 80% Casting

The following are depictions of a solid casting and an approved 80% casting. A majority of the machining functions required to complete the firearm casting into a firearm receiver are finished. The only machining left is to cut out the cavity that accepts the trigger and hammer and remaining internal components. Additionally, the holes for the hammer pin, trigger pin, and selector lever need to be drilled in the proper location through the body of the receiver.

80% Percent receiver:

Solid Casting: Not a firearm.



Not a firearm 80% casting



No holes or dimples for the selector, trigger, or hammer pins



Area for the fire control components is solid.

Unfortunately, the criminal element is continuously looking for unlawful methods of attaining firearms, and partially complete receivers are one of these sources. If there is a suspicion of a

clandestine facility or an individual manufacturing firearms from castings, there are certain items that should provide clues to this process. Please see the link below.

<https://www.youtube.com/watch?v=Qkt7vi0Bn5g&t=12s>

A new phenomenon that is gaining popularity in the 80% firearms field is the 80% polymer Glock. There have been other 80% pistol frames marketed that did not gain much notoriety. However, due to the simplicity of the Glock, it is extremely popular.



Polymer 80

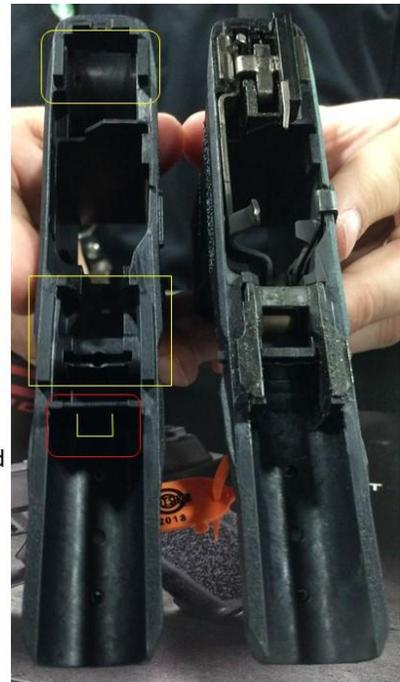
Features not machined that make this casting a non-firearm:

The areas highlighted must be removed. The rear rails are removed to insert the after market metal rail where the slide will ride.

The rails in the center area must be completely removed so a slide can be installed.

The red area with the yellow horseshoe must be cut out in a circular shape to allow the installation of the recoil spring.

Additionally, the holes to accept the trigger pin/locking block, slide stop pin and sear assembly, must be drilled in the receiver.



Clues that Indicate Clandestine Gun Building

Of course the reason for this discussion is that 80% castings are entering countries where they are prohibited and entering the hands of criminals. These castings get completed and become firearms. Without markings they cannot be traced.

When observing a clandestine firearms manufacturing facility, there are certain items a person should look for besides firearm receivers and firearm parts. Be vigilant for basic hand tools that are specific to building guns. Most hobbyists that make firearms for themselves have an interest in firearms and other mechanical devices. These people will have a large assortment of hand tools, specialized tools and some electrical machines.

The two most prolific types of firearms that are being made from 80% receivers are the AR- and AK-type firearms. Simply do a Google search of 80% AR receivers or AK flat/channel, and you will receive tens of thousands of hits. When making an AR, at the minimum, the maker will own a drill press with a milling table or a portable milling machine. The advanced maker of these firearms, who are making large numbers to enter into commerce, may have a CNC milling machine. For bending AK flats into a receiver, a metal brake or hydraulic press with a specialized fixture is required. A metal brake is a machine that bends flat metal into angles. There are commercial brakes and homemade brakes available. A hydraulic press is a hydraulic tool mounted in a stand that allows a person to put tons of pressure on an item.

Let's discuss what a milling machine is capable of doing. A manual milling machine cuts in planes. It can cut flat items, squares, and drill holes. However, without additional fixtures, it cannot cut cylindrical items. The user must direct each cut.

The next level of technology is CNC machines. CNC stands for **Computer Numerical Control**. This means a computer converts the design produced by Computer Aided Design software (CAD) into numbers. The numbers are the coordinates of a graph and they control the movement of the cutter. In this way, the computer controls the cutting and shaping of the material. CNC machines can cut anything that is programmed into the computer. It will cut radiuses, planes, and squares. It is up to the skill level of the CAD programmer. What is also important to note is that a person can purchase a program without having to do the CAD work. Once you have your coordinates of the device you want to make, it can be loaded into the computer. A person with general machinist's skills could be instructed on how to load and operate this machine. With the correct program installed, an operator loads the items to be machined, sets a "zero" and pushes the start button. The machine does all of the work.

A drill press is a machine that has a drilling engine mounted on a stand that is made to drill in one direction. Small portable traversing milling tables can be mounted onto the drill press table. This allows a person to do minor and low-precision milling cuts.

To circumvent purchasing expensive machines to complete the work on partially complete receiver frames, fixtures for each cut of metal that have to be performed have been developed. With these fixtures, a person with moderate mechanical ability can complete an 80% AR or AK type into a complete firearm receiver.

Attachments:

80% Percent receiver:

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Bench Top Milling machine

This machine is capable of basic milling and drilling operations. Low cost between \$1,100.00 and \$1,500.00 average price.



Standard full-size milling machine

80% Percent receiver:

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Capable of more complex milling operations. Prior to CNC, these types of machines were used for all milling operations. Operators were skilled in mathematics, design, and blueprints.



CNC Milling machines

CNC milling machines have the same overall features of a standard milling machine except a CNC machine has a computer attached that guides the machine



80% Percent receiver:

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Drill Press with cross slide or milling table

This machine will operate as a crude milling machine.



Metal brake

For bending sheet metal



Hydraulic press

Used to apply a bending force onto objects



AK flat bending fixture

80% Percent receiver:

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In combination with the hydraulic press, it can bend an 80% AK flat into the shape of a receiver.



AR 80% receiver finishing fixtures

The fixtures hold an 80% AR receiver for the maker. All necessary cuts and holes required are automatically aligned.



Pertinent authority: The following are some of the statutes and regulations that regulate firearms in the United States.

Definition of a firearm: 18 U.S.C. 921(a)(3):

- (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;
- (B) the frame or receiver of any such weapon;
- (C) any firearm muffler or firearm silencer; or any destructive device

Serial Number required by: 18 U.S.C. 923(i)

Licensed importers and licensed manufactures shall identify, by means of a serial number engraved or cast on the receiver or frame of the weapon, in such a manner as the Attorney General shall by regulations prescribe...

Definition of Firearm Frame or Receiver

27 CFR 478.11:

That part of a firearm which provides housing for the hammer, bolt or breechblock, and firing mechanism, and which is usually threaded at its forward portion to receive the barrel.

Per 27 CFR 478.92, Required Markings on a Firearm:

- Model (if assigned)
- Caliber or Gauge
- Manufacturer Name
- City and State of Manufacturer (if domestic); or
- Importer Name, City and State (if foreign)
- Country of Origin for Imported Firearms

Defense articles. Any item designated in § 447.21 or § 447.22. This term includes models, mockups, and other such items which reveal technical data directly relating to § 447.21 or § 447.22. For purposes of Category XXII, any item enumerated on the U.S. Munitions List (22 CFR Part 121).

Subpart C—The U.S. Munitions Import List
§ 447.21 The U.S. Munitions Import List.

The U.S. Munitions List compiled by the Department of State, Office of Defense Trade Controls, and published at 22 CFR 121.1, with the deletions indicated, has been adopted as an enumeration of the defense articles subject to controls under this part. The expurgated list, set out below, shall, for the purposes of this part, be known as the U.S. Munitions Import List:

THE U.S. MUNITIONS IMPORT LIST

CATEGORY I—FIREARMS

(a) Nonautomatic and semiautomatic firearms, to caliber .50 inclusive, combat shotguns, and shotguns with barrels less than 18 inches in length, and all components and parts for such firearms.

(b) Automatic firearms and all components and parts for such firearms to caliber .50 inclusive.

(c) Insurgency-counterinsurgency type firearms of other weapons having a special military application (e.g. close assault weapons systems) regardless of caliber and all components and parts for such firearms.

(d) Firearms silencers and suppressors, including flash suppressors.

(e) Riflescopes manufactured to military specifications and specifically designed or modified components therefor.

NOTE: Rifles, carbines, revolvers, and pistols, to caliber .50 inclusive, combat shotguns, and shotguns with barrels less than 18 inches in length are included under Category 1(a).

Machineguns, submachineguns, machine pistols and fully automatic rifles to caliber .50 inclusive are included under Category 1(b).

§ 447.22 Forgings, castings, and machined bodies.

Articles on the U.S. Munitions Import List include articles in a partially completed state (such as forgings, castings, extrusions, and machined bodies) which have reached a stage in manufacture where they are clearly identifiable as defense articles. If the end-item is an article on the U.S. Munitions Import List, (including components, accessories, attachments and parts) then the particular forging, casting, extrusion, machined body, etc., is considered a defense article subject to the controls of this part, except for such items as are in normal commercial use.

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