



March 19, 2012 Rev 0 (I-3)

## **TECHNICAL NOTE 105: PROBLEMS WITH “NON-OEM” COMPONENTS IN ARMALITE FIREARMS**

**SUBTITLED:**

### **ELI WHITNEY DIDN'T TELL ALL**

#### **BACKGROUND:**

Periodically, ArmaLite's Premier Services Division receives firearms from customers who claim to have major functional problems. Inspection by our Premier Services Division reveals that the firearms contain aftermarket parts that are grossly inferior to our parts. In some cases, the customer admits that he installed the parts. However, in many other cases, the customer was sold the rifle as an “original ArmaLite” when, in fact, it was not. For example, some companies are selling major components (such as upper receivers, bolts, bolt carriers, etc) as “AR-10” components. Those components are so inferior, that many times they won't even fit, much less function, on our rifles. And, some are actually unsafe!

Some unscrupulous “manufacturers” are building rifles using those components and selling them as “AR-10s”. If you have been the victim of such a scam, we highly recommend that you report it to the proper authorities.

To better understand why many aftermarket parts won't properly fit or function, let's start with a short discussion about the “creator” of interchangeable parts as taught in most history classes.

Let me quote a little history from Wikipedia

#### **“Eli Whitney and an early attempt**

[Eli Whitney](#) saw the potential benefit of developing "interchangeable parts" for the firearms of the [United States](#) military. In July 1801 he built ten guns, all containing the same exact parts and mechanisms, then disassembled them before the [United States Congress](#). He placed the parts in a mixed pile and, with help, reassembled all of the weapons right in front of Congress, much like Blanc had done some years before.<sup>[8]</sup>

The Congress was captivated and ordered [that interchangeability be] a standard for all United States equipment. Interchangeable parts removed problems concerning the inability to consistently produce new parts for old equipment without significant hand finishing that had plagued the era of unique weapons and equipment. If one weapon part failed, another could be ordered, and the weapon wouldn't have to be discarded. The catch was that the Whitney's guns were costly and handmade by skilled workmen.

Whitney was never able to design a manufacturing process capable of producing guns with interchangeable parts. Fitch (1882:4) credited Whitney with successfully executing a firearms contract with interchangeable parts using the American System, but historians Merritt Roe Smith and Robert B. Gordon have since determined that Whitney never achieved interchangeable parts manufacturing. His family's arms company, however, did so after his death.”

## **FACTS:**

So, Mr. Whitney did understand the logistics and technical advantages of interchangeable parts. And he demonstrated the feasibility of manufacturing interchangeable parts on a limited basis.

However, he also found that manufacturing interchangeable parts on a full-scale production basis is difficult to do economically.

So, let's think about interchangeability. The only reason that parts need to be interchangeable is for cost savings. (Firearms with non-interchangeable parts can perform just as well as those with interchangeable parts.) And, by cost savings, I mean total life cycle cost savings.

“Total life cycle cost” is defined as the total cost of ownership of an item including its initial purchase price and the cost of maintaining it until you dispose of it.

The military requires interchangeable parts, not because interchangeability makes the initial purchase cost of guns lower, but, because it makes the cost of supporting those guns in the field so much lower that it more than offsets the initial higher manufacturing costs of completely interchangeable parts. Without interchangeable parts, the military would need to maintain “gunsmithing” skills at all levels of maintenance. Or else, the military would need to return every firearm to the original manufacturer for all service. Neither of those maintenance options is viable for small arms that number in the millions, are scattered worldwide, and must be repairable within a few hours, or a few days at the most, if mission objectives and operational effectiveness are to be protected.

For manufacturers of commercial firearms, maintenance concerns are far different than the military's concern. Only a very small percentage of high-quality firearms are ever fired enough to need maintenance, and most of those are not required to be “back in action” before the factory can repair them.

If all samples of any part were absolutely identical (in dimensions, in hardness, and in all other design requirements), then all components will be completely interchangeable. But, as Mr. Whitney found out, there is a tradeoff. More uniformity (e.g. tighter tolerances) increases production costs. At some point, it simply becomes so uneconomical to tighten tolerances that it's more practical to “fit” some components.

Most manufacturers of firearms for commercial customers do some level of “fitting” of components that aren’t economical to manufacture to interchangeable tolerances. Manufacturers of firearms for military and law enforcement customers, like ArmaLite, tend to manufacture components to higher interchangeability standards (even if the components cost more) because of their customers’ maintenance requirements.

## **SUMMARY:**

So, what’s the point of this Tech Note for ArmaLite customers?

Remember that the only way to assure that components are interchangeable is to study the dimensions and tolerances of all mating parts to assure that they will fit and function properly regardless of whether they are manufactured to “minimum” or “maximum” dimensions.

No company has been given ArmaLite drawings and authorized to build components (for their own sales) that will interchange with our own components. Companies that are selling “aftermarket” components for ArmaLite firearms are doing so without the consent of ArmaLite and without the drawings necessary to assure that their components will fit and function in ArmaLite firearms.

In fact, recently, ArmaLite has inspected some components from some “aftermarket” sellers and found them to be grossly inferior to our components. This problem appears to be particularly prevalent for aftermarket components for our AR-10 line of firearms.

If you install non-ArmaLite-supplied parts on your ArmaLite firearm, you do so at your own risk.

If you are sold a firearm that the seller claims is an original ArmaLite and you find that it has been assembled with non-ArmaLite parts, you should consider taking appropriate legal action.

ArmaLite does sell some components manufactured by other companies. ArmaLite has inspected / tested those components and found them to be satisfactory.

We would greatly caution you against any aftermarket components that could affect reliability, durability, or safety.

Many individuals enjoy purchasing ArmaLite stripped receivers and “building” their own custom firearms. If you have the needed equipment and expertise to build firearms, we highly recommend that you use only ArmaLite-sold components for your “build”. Build for your enjoyment. Don’t build to save a few dollars by using “off-brand” components not sold by ArmaLite. You’ll likely be very disappointed in the results.

We find some unscrupulous individuals will try to sell a firearm as a “genuine ArmaLite” when it isn’t. Here’s a handy way to tell if that firearm was assembled here and sold as a complete firearm. Every ArmaLite AR-10 and M-15 manufactured in our factory has a white eagle stamped on the front of the magazine well. Every AR-30 and AR-50A1 has that same stamp on the bottom of the buttstock behind the pistol grip. That stamp obviously doesn’t mean that someone hasn’t changed components after the firearm left

here. But, at least you know that the firearm was originally manufactured here to our standards with components that we will stand behind.

And, bear in mind that ArmaLite warranties only apply to factory-built firearms.

No ArmaLite firearm that has been modified with unauthorized components will be repaired under warranty. Any aftermarket parts found on ArmaLite firearms returned for repair that might adversely affect reliability, durability, or safety will be removed and replaced with genuine ArmaLite parts at the owner's expense.

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