

## Rifle Notes

### General Information:

- **Barrel Codes** discontinued from August 1999 and reinstated in 2001
- **Free Floated barrels-** Sendero and VS but not VLS
- **Rate of twist=** the number of turns the bullet will make in a designated length of barrel. (i.e. 1 in 10 means the bullet will make 1 turn in 10". For a 22" barrel this means the bullet will turn a little over 2 times.)
- **Ultra Mag vs. Mag-** Ultra Mag is a non belted magnum; other mags have a belt around bottom of case. These are NOT interchangeable.
- ALL barrels are marked with gauge/caliber on left hand side.
- **Stainless Steel-** these are not completely "Stainless Steel" they do have some carbon content. They still need to be cleaned and maintained like any rifle.
- **ISS (Integrated Security System)** was introduced around April of 2000. Cannot be added to 300 Ideal (or any over/under). Can be added to older model.
- 7mm STW (Shooting Times Western) was introduced in our firearms in 1997.
- Windage & elevation hex head screws= 5/64 Allen wrench
- Receivers for centerfire made of steel
- Receivers for rimfire made of aluminum (except 504)
- New bolt for rifle-If customer in U.S. firearm must go to the factory. Bolt has to be fit for headspace. Must be a Remington barrel and action.
- **Copper in bore-** can't always get all the copper out, can affect the firearm's accuracy. The copper can sometimes "bond" to the bore.
- **Finish on wood-** we have our own product that we use for refinishing. Can use standard wood refinishing procedures.
- **Button rifled-** Stock metal cut down and drilled with mandrill with reverse rifling to cut out rifling. This is push buttoned through the barrel. Used for our Custom Shop & 710 rifles.
- **Hammer forged-** Starts with cylindrical metal and it's hammered around the mandrill. This stresses the metal. To relieve this stress, the barrel is heat treated. Used for our standard production rifles & shotguns.
- The BDL Custom Deluxe always has a shiny walnut stock, white line spacers, black fore end tips and either a hinged floor plate or a detachable magazine.

- ADL is satin finish, lower grade wood, no black fore end tip. Blind box magazine.
- Both ADL & BDL come with swivel studs. These are both standard contour hunting barrels. Contour barrel is a heavy barrel (sometimes called a bull barrel). It has a bigger outside diameter.
- We have bull barrels are on the 700 varmint or Sendero.
- All of our varmint guns are short action caliber.
- Sendero's are mostly just long action versions of a heavy barrel.
- To site a firearm in we suggest that you shoot 3 shot groups, let cool for 15 to 20 minutes and shoot another group.
- Headspacing- alignment of the bolt, receiver, barrel, ammo. Necessary to keep from having too much room where excessive pressures can build up and cause damage. For excessive head space every bolt has different specs on the locking lugs.
- Barrel Assembly= barrel & receiver.
- Barrelled action= bolt, barrel, receiver, trigger assembly (basically everything but the stock)
- Nylon 66- Lifetime guarantee on the stock. Customer has to send stock to the factory for exchange. If they send the entire gun, we will charge approximately \$35-\$50 to install the new stock.
- Receiver Plug Screws: Designed to plug up holes in barrel when you remove the front and rear sights.
- Varmint & Sendero: Swivel Studs are not sold through parts. They are only in the guns from the factory. Check with Ken or Tom Nagle for extra if needed. Recoil Pad is glue on. All other stocks, they are screwed on.
- Heavy Barrel: Better for accuracy, less movement, better heat dissipation for multiple shots.
- 710 parts: Used to come from OHL but switched to shipping out of Ilion as of August 2004.
- XP-100: Considered a handgun. Customer needs to over night or send through FFL.
- Crown: Muzzle end of barrel called the crown. On the end of the barrel is called the crown. Our guns have recessed crowns. This is so that when you bang the gun you don't knock the barrel. If you did knock the barrel you would destroy the accuracy.
- Free bore is there for safety reasons. Amount of space between the bullet and lands. Allows for variety of loads.
- The magnum has a recoil pad and 2 (as opposed to 1) black screw holes filled on the stock.
- A classic gun is a variation of a mountain rifle.

- A mountain rifle is a light weight, shorter BBL that is smaller contour. The stock is always the same, no monte carlo stock, no cheekpiece, no black fore end.
- The mountain rifle is offered in detachable magazine. The custom shop has other versions.
- Long Action/Long Action Magnum-receiver plug screws are the same distance. Can use the same 1 piece base for both.

## Model 700 ML:

In 1996 we introduced our bolt-action muzzle loader which is still in production at the current time.

No one actually uses black powder any more. Too volatile.

Three types of product used with muzzle loaders are:

Pyrodex

Go Ex

Clean Shot

These don't have nitro content of black powder. Different derivatives.

Model 700 one of the most popular bolt action rifles.

What makes 700 or centerfire so strong is the **3 rings of steel**.

Receiver

Barrel

Breach plug

The Barrel Lug (also called the recoil lug) hooks around the barrel. This stabilizes the barreled action in stock. It absorbs a large amount of energy. This is put on when the barrel is made.

Most of the pressure in any gun is in the Breech Plug. 700's have the strongest receiver in the market. (ours is the strongest in the market)

Barrel Action consists of the barrel action, receiver, everything but stock.

Barrel

Action

Bolt

Firing Pin- In bolt (called striker in muzzleloader)

Bolt

Trigger Assembly (holds safety)

Trigger Guard

Ram Rod

Barrels are restricted. These are not sold to customers.

Smokeless powder is **measured in grains of weight NOT volume**.

A couple of years ago someone made smokeless powder for muzzleloaders. **THIS IS NOT GOOD-DON'T USE THIS!!!!!!** Some people used this in our guns and others in the market. The guns blew up-no one died w/ ours. The receiver held up.

Bullets and powder volume make accuracy. Experimentation using parameters is advised.

We make several different types of projectiles.

**Lead conical-chunks of lead**

**Balls**

**Sabots**

Our guns were specifically designed for sabots. They have different weights but ours in general work best w/ around a 300 grain bullet (projectile) and 90 to 120 grains of powder. The customer will need to experiment to find out how much is best using these parameters.

Some states ban sabots (lead with copper around it) Every state has different regulations. If they can't use sabots they can use conicals, gamemaster, or bullets.

The types of projectile used for muzzleloaders are:

Lead Round Balls (target small game) used very little for small game

Pieces of lead shaped like bullets.

Sabot projectile in plastic sleeve. The jacket protects the bullet from the rifling. 20 or 30ft after fire the jacket falls off and bullet keeps going.

There are two types of muzzleloaders

Inline (All of our current models are inline)

Sidlock (has big hammer that moves back)

#### **To Load a Muzzleloader**

Put powder in (measure the grains by **volume not weight**). Must use between 90 grains to 150 grains. Most of the time between 90 to 120.

Pour this into muzzle end of gun.

Put projectile in barrel.

Put jag on ram rod to press projectile down in gun.

Next need something to ignite powder.

With inline, the breech end is open and you have a breech plug that screws into breech.

Powder sits right up against hole in breech plug.

Nipple screws into breech plug. On top of nipple you place percussion cap. (this is piece that makes spark to ignite powder-it has explosive paste inside).

This sets on end of nipple and striker hits this. Fire goes down through nipple and ignites powder.

**Standard muzzleloader has 24 in barrel. 700 mag has 26 inch barrel.**

Pyrodex has 50 & 30 grain pellets to make it easier to load. Magnum is made for 120 to 150 grain powder but 90 will do fine. For accuracy, we recommend 90-120 gr.

The **Bedding Block** is in the action.

The **objective** is the front part of the scope.

For scope the screws are called **receiver plug screws**.

We have 700 synthetic & 700 camo stock.

50 & 45 the 45 is new for this year. (50 caliber means that the bore size-inside barrel is .50).

**SAMMI-Shooting Arms Ammunition Manufacturers Institute.** This is our governing regulator-not the federal government. Federal government has no say in anything. We issue recalls-not the government. SAMMI makes regulations for this-not the federal government.

Shooting a muzzleloader is not like other guns. It is very dirty. When sighting and trying to find the right combination of powder, etc. you have to clean the gun (bore).

The way to **clean the bore** is to use **Wonder Lube** patches. Take ram rod & cleaning jag (the little brass thing in the box with 3 ridges on it). This gets the patch down and back. Do this once between every shot.

**Wonder Lube** is a cleaning product for Muzzleloaders. A cleaning product for Muzzleloaders can't be petroleum based. Wonder Lube is **vegetable based**. Petroleum based burns and leaves residue, gumming up gun.

**It's very important to clean after every shot!**

You get blowback that goes into bolt assembly. **EXTREMELY IMPORTANT** that after shooting and end of season clean bolt assembly put bolt disassembly tool on end of bolt, turn  $\frac{1}{4}$  turn and rock back & get firing pin assembly and bolt body-very important to clean each time w/ all powder natural cleaner, all natural bore cleaner, or Vortex Bore Cleaner.

You can soak parts in bore cleaner & scrub w/ nylon brush. Do this outside. When putting gun up for storage can use Rem Oil but before using **VERY IMPORTANT** to clean before using. Clean inside of bolt, outside of bolt - everything completely dry off-Dirt and debris will stick to it and gum it up. Coat very well w/ wonder lube-all metal except trigger assembly for storage and leave it on.

The tool for breech plug assembly (breech plug nipple wrench goes up into bolt assembly. Turn to get nipple and breech plug out.

To install breech plug **VERY IMPORTANT** to take wonder lube and put it on the nipple and breech plug threads before installing or they will **NEVER** get it out. **VERY IMPORTANT!** Some people make breech plug grease that people can get.

To clean bore (every time that you shoot) take stock off-get bucket of hot water, put in all natural bore cleaner (ours is a 10 to one solution). Don't do cleaning in the bathtub. Stick whole receiver (breech) end of gun down into water. Take clean cotton cloth with ram rod and cleaning jag and put down barrel. Keep pulling and pushing back and forth with the ram rod until gun is clean. Take out of the water and dry well (**VERY IMPORTANT**) See two pieces of metal (sear and trigger control) in hole. **EXTREMELY IMPORTANT** to get all black powder out. This is mechanism. All triggers for muzzleloaders are stainless but they will rust. Spray only here in gun very lightly with Rem Oil & wipe off.

The bolt itself is held in w/ cam screw that goes down cut out in the bolt. Get all powder off here also.

To clean with Vortex (a hydrogen peroxide cleaner) comes with a little toothpick thing. Pour Vortex down barrel until 1 inch from the top. Let sit from 5 to 10 minutes. Pour Vortex back into bottle. Bore will be completely spotless. You still have to clean the breech plug. Dry everything-clean trigger assembly. Lube everything with wonder lube-coat bore with Wonder Lube. Trigger mechanism can actually be cleaned with Rim Action Cleaner (it's alcohol spray)

VERY VERY IMPORTANT- NEVER NEVER run a dry patch down barrel of muzzleloader except to dry gun. Always use cotton patch. Lick patch if necessary. Static can cause powder to ignite!!

DENNIS SANITA (3352 EXT.452) GETS ALL PERSONAL INJURY, PROPERTY DAMAGE CALLS.  
IF YOU CAN'T GET HIM THEN CALL FRED SUPRY (3606 EXT. 444)

#### COMMON QUESTIONS:

I had to bolt my gun twice-it didn't go off, why?

Usually you have to replace the nipple (this part should be changed once a year).

Make sure firing pin assembly has been taken apart & cleaned. Could be gummed up, dirty, etc.

There are two types of ignition systems for muzzleloaders:

Musket Cap (uses musket caps ((top hat caps)) instead of percussion caps.

Musket caps are more reliable in rain than percussion caps. Percussion caps won't work w/ moisture.

New this year is the 209 conversion kit-uses 209 shotgun primer-same primer as in the back of shotgun shells (waterproof). The kit has different nipple and firing pin assembly w/ nodule that sticks up. The kit is approximately \$40.00. Primers are sold anywhere. This kit makes for completely reliable ignition every time

### **700 ML Parts:**

Trigger: The trigger on the Model 700 ML is the same as the trigger on the Model 700.

Trigger Guard Screws: The front and rear trigger guard screws can be removed with a 5/32 Allen head hex key. The center screw is 3/32.

Trigger Assembly: Use Rem Action Cleaner to clean the trigger assembly. You can put one drop of oil on the trigger pin.

Receiver: The receiver on the Model 700 ML is basically cut the same as the Model 700; the difference is the ML has a breech plug and nipple.

Loading the ML: You load the muzzle loader by putting the ammo and powder in at the muzzle.

Cleaning the ML: The bolt needs to be taken apart and cleaned every time the firearm is cleaned. You can use the bolt disassembly tool or follow instructions in the owner's manual. When you fire the ML you get what is called "Blow Back" which is the powder that is blown back on the face of the bolt. Black powder is very corrosive. Do not use petroleum based products on the ML except for one drop of Rem oil on the trigger.

Bolt Stop Screw: This screw can be removed with a 5/32 hex key.

Bolt: There is no head spacing, so the bolt body can be purchased by a consumer

Misfires: Misfires can be caused by a dirty bolt, bad caps, wet caps or powder, and a flattened nipple (if the nipple is flattened the consumer will need to purchase a new one).

Ram Rod: The ram rod is made out of aluminum because it is softer than steel and it will not hurt the bore. Only use the ram rod for loading the ML not cleaning it (need to use a brass rod to clean the gun). If the ram rod won't stay in the stock, take the stock off and bend the piece of steel back down. Many hunters mark/notch the ramrod so they know if the load is in.

Weather shroud: The weather shroud goes on the front of the bolt to protect it from bad weather; the only time the shroud should be used is in bad weather conditions.

Scope Base: The Model 700 Short action scope base works on the Model 700 ML.

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We haven't made a side lock in more than 100 years EXCEPT for 1995. This was a kind of anniversary edition. It had approximately a 35 inch barrel. It was the Elphialat Anniversary Special. It was a flint lock custom shop gun.

Flint lock-the hammer hits a piece of flint for ignition.

We started producing the line that we have now in 1996. It is based on the Model 700-same receiver-short action.

For scope mounts they would use the same ones as the regular short action 700 would use.

Muzzle loaders use black powder or a black powder substitute. We use a substitute. Black powder is a nitro based solid. It is very volatile and unstable. It is also very dirty and corrosive. Not many people use actual black powder.

We make no powder. There are only three manufacturers in the country: DuPont, the US government, and one more company. The laws governing this manufacturing are very tight.

We have tested black powder and pyrodx. Pyrodx is the biggest seller. Some other brands are go-ex and clean shot.

We have always used pyrodx in testing for accuracy.

MEASURE POWDER OUT BY VOLUMN NOT WEIGHT

MUST USE POWDER SUBSTITUTE LABELED RS (rifle or shotgun) OR FFG EQUIVILANT (burn rate).

TJERE IS ALSO SPECIFICALLY MADE FOR PISTOLS-DON'T USE THIS IN RIFLES!

Pyrodx Select is great. Better control (consistency) in size of granules. Consistency leads to accuracy.

Projectiles we make and use are:

1.Round ball (originally used)

Coated with brass (ours are golden balls-the golden color is brass powder)

2.Lead Conical (used in Civil War)-chunky lead shaped like a bullet. These come pre- lubricated with wonder lube.

3.Sabots (the green plastic is the sabot)-this protects the metal part-it prevents rifle lines on the brass. For accuracy we use core-lokt bullets in ours. (In class we saw a .50 caliber sabot with a .45 bullet in it).



We make a solid copper sabot for one of ours because it keeps it's weight better. They keep 100% of their weight where lead bullets keep about 75% of theirs.

The only problem with solid copper is that some states don't allow them. Some don't even allow copper jackets-it must be lead.

HAVE CONSUMER CHECK THEIR STATE AND LOCAL REGULATIONS

## TO LOAD:

Check the bore (make sure that nothing is already loaded there)-to do this take the ram rod put down barrel until it stops. Make a mark on the ramrod. You can use this to measure. When you first do it to make the mark to measure from you MUST have gun empty.

The best way to unload is to shoot the firearm-otherwise you have to take the bolt off take the nipple off and do many more steps to unload.

This gun is made to hold up to 150 grains. We recommend between 90 and 120 grains for best accuracy. These specs are to be used with sabots for the best accuracy.

Pour powder in gun-tap sides of barrel to get any powder stuck there off. To measure powder you DO need some kind of measuring tool.

Put projectile in (if using round balls you must use shooting patch (a patch with wonder lube-this creates a seal). With a sabot or a conical just push down into the gun. To do this use a jag head on the ram rod. Just push smoothly down into the gun don't slam the ram rod down (this ruins the point on the bullet).

Remember to take ram rod out

WHILE DOING THESE STEPS IT IS CRUCIAL THAT YOU HAVE THE BOLT OPEN AND NEVER, NEVER, NEVER HAVE THE PERCUSSION CAP ON! (The percussion cap is a little piece of copper with primer gel in the bottom-a lot of people, before shooting the gun will shoot a couple primers just to clean the flash hole and this is OK.)

NOW put the primer (percussion cap) in the end of the nipple. (The bolt has a striker instead of the firing pin.)

Pyrodex came out 4 years ago with Pyro Pellets. They came in 30 gr. and 50 gr. Pellets.

The best accuracy comes with powder not pellets.

Normally anything more than 120 grains leaves powder that won't burn leaving the gun dirty.

Usually a 300 gr. wt. sabot bullet works best in our guns and 90 to 120 grain wt. powder.

The more powder used the bigger bullet you should use.

Every gun is different. EXPERIMENT.

Start with 90 gr. powder and 300 gr. wt. either copper jacketed or core loki sabot. If this works stick with it if not change up.

Wonder Lube is an all natural vegetable oil based lubricant.

ALL PRODUCTS USED IN AND AROUND MUZZLE LOADERS HAVE TO BE NATURAL PRODUCTS. PETROLEUM BASED WILL RUIN THE GUN AND NEUTRALIZE THE POWDER.

## Troubleshooting Tips:

The #1 reason that the gun won't fire is a dirty bolt. You get a lot of blow back so it's very important to clean bolt and firing pin assembly. Use a penny or a bolt assembly tool to do this.

If the gun fires twice to shoot once the nipple could be oversized and 1<sup>st</sup> strike seats the percussion cap. Second strike makes gun go off.

Won't fire at all, or just sometimes, may be bad percussion caps or nipples.

If the ram rod keeps falling out take the stock off and bend screw. (This is the ram rod spring screw.)

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With the 209 primer these guns are just as reliable as centerfire rifles. This makes gun use shotgun primers.

The trigger assembly is a model 700 trigger assembly. It's all stainless steel except trigger pivot pin (holds the trigger in)

The action, receiver, barrel, and trigger assembly are all factory restricted.

The bolt is sold as the bolt body and firing pin assembly. You have to buy both to get both.

The cam follower screw holds the bolt in. Remove screw to remove bolt.

The ram rod is held in place by a ram rod spring.

The warning on the barrel says pyrodex or black powder only. No smokeless powder.

It is EXTREMELY important to put all natural lubricant (wonder lube) on the threads of the breech plug or it can electro statically fuse to the gun and it may never come out.

Never use grease or gun oil on muzzle loaders. They aren't natural. Don't get paste on any other parts just in the threads.

Only place to use Rem Oil on this gun is 1 drop in the trigger assembly hole.

When storing bolt assembly, spray down w/rem oil. Make sure that you clean it back off before shooting. To get the bore ready for storage put a patch with a lot of wonder lube on it and run it down in the barrel.

We supply the breech plug nipple wrench with the gun.

Use 7/16 in. deep socket wrench to take musket cap nipple off and put new one back on. The nipple is sold in the accessories division.

Musket cap (or English style cap) looks like a top hat. It's a little more reliable than a percussion cap.

The guns come in a 24 inch barrel and was 50 caliber and.....

The only other version that we make of this gun is 26 inch barrel magnum 45 and 50 caliber. The longer barrel (2 inches longer) allows more powder to burn leaving less excess in the barrel.

Measure the barrel from the ejection port to end for barrel length. Muzzle loaders won't say magnum on the barrel.

Our magnum muzzle loaders come with a percussion cap nipple conversion and a musket cap nipple. The standard gun only comes with a percussion nipple.

All we offer is a 45 caliber and a 50 caliber. The 45 caliber is new for this year. We used to make a 54 caliber but we don't any more. We couldn't get good accuracy out of the 54 caliber. Our guns come with a choice of stainless and blued. The stainless has a camo stock. We make these stocks not HS Precision.

We used to have a Model 700 muzzle loader custom gun. It had a thumb hole in the stock.

## Cleaning

To clean the breech plug and nipple use all natural bore cleaner (let soak) use hot water to mix (this evaporates and cleans better).

Take a 3 gallon bucket and put bore cleaner in. Take the action off the gun and soak it. Take jag and a cotton patch. Put jag on the ram rod (don't push into threads) and pull back up. When you pull up thru the barrel this pulls water back up to clean barrel out.

Dry barrel with a clean cotton patch and the ram rod-then go from the breech plug side with patch and a finger-clean threads and wipe.

Take Rem Action Cleaner and spray down good to clean trigger assembly. Put one drop of oil in the scar hole and one drop in the trigger hole.

You can also put one drop on the safety pivot pin.

Get wonder lube grease and run a patch with it on it and go back down the bore. Get a stiff brush and clean nipple and breech. Grease threads on the nipple and breech brush and put back.

It is important to change the nipple every year.

Make sure that the top of the trigger assembly scar are cleaned good. Take bolt in first phase and let soak also. You can scrub these with a caliber specific brush and clean bolt body. Clean firing pin assembly with bore cleaner and a toothbrush. For storage coat the gun with wonder lube or Rem Oil. Make sure to clean either of those cleaners before using.

Vortex is the simplest way of cleaning. Plug up the end of the barrel, pour vortex in and let soak. Vortex also works for the nipple and the breech plug and the bolt just soak them.

When shooting the firearm, everytime you take a shot clean the bore with pre lubricated patches (bigger than cleaning patches).

Never put a dry patch against the bore. Can make a charge and ignite left over powder. NEVER USE NYLON!

ALWAYS USE LUBRICATED COTTON PATCHES.

The Ram rod is made out of aluminum and it is threaded. This can get stripped out or broken. You can send a new one for free.

There is an extension and the extension handle are made for cleaning.

Pieces that come with the gun are:

Jag (caliber specific/has it written on it)

Breech plug nipple wrench

Hex key or allen wrench (fits 2 trigger guard screws and cam follower screw-cam follower screw is used to take bolt off)

Ram rod extension

(there is also a 5/32 hex head screw on top of trigger that is not included)

The ram rod extension handle and cleaning tube (goes through the back of the receiver with the bolt out and screws down into the breech plug threads).

Can buy bronze bristle brush.

The ram rod bracket is the bracket around the barrel that holds the ram rod.

If the ram rod keeps falling out, take the stock off and bend screw (this is the

### Model 700 Bolt Action Rifle:

The Model 700 was introduced in 1962 and is still in production at the present time. This rifle has the reputation of being the most accurate out of the box rifles on the market. The Model 700 is a bolt action push fed rifle.

The model 700 was conceived in the late 50's and was on the market on '62. It quickly became the standard for production firearms. We were the first to do production guns in an assembly line. Before this guns were done one at a time by hand.

Prior to the 700 we had several bolt action guns. The 600, 660, and 625 were the predecessors. These were very reliable, accurate, but 700 was designed to be better, faster, and easier to make.

The only difference between rimfire and centerfire is the primer. Rimfire has the paste around the outer edge centerfire has the primer in the center. This makes it reloadable. The self contained cartridge was a huge breakthrough in the late 1800's.

One of the key selling features is the locktime. Locktime is the time it takes from the trigger pull to the bang. The 700 has a 3 millisecond locktime. This is due to the way that the bolt assembly marries in with the sear.

The main differences in the BDL and the ADL are that the BDL has a detachable magazine or a hinged floor plate. (The BDL also has the great finish walnut stock, white spacers black fore end tip)

There is a new type of fore end tip now. The part is available to buy. They can put them on (or back on if just came off) with any two part epoxy.

If a gun is magnum then it gets a recoil pad. Standard Long action or short actions get butt plate. Pads have to be fitted. They can buy them but they do have to be fitted to the gun. Caution is advised because they can mess up their stocks doing this. Both butt plates and recoil pads need to be fitted to the individual gun.

Recoil pads are not fitted they are flat. Butt plate is fitted. Recoil pad has to be cut to fit stock. We don't recommend that they do this work themselves. (Also putting the recoil pad on voids the warranty but don't make a big deal out of this).

Trigger guard assembly in BDL can be hinged or detachable.

### 700 Parts & Misc Training:

The main parts of the 700 are:

- Stock
- Trigger
- Bolt assembly
- Receiver
- Barrel

Receiver: Long action receivers are physically longer to accommodate longer cartridges. The recoil lug is listed as the barrel bracket on the parts list.

3 Rings of Steel: The Model 700 was the first rifle to have the 3-rings of steel, this is the portion of the firearm that the receiver, barrel, and bolt are all lined up to form 3 rings of steel. This is for strength. Most of the pressure is in this portion of the rifle.

Barrel: Hammer forged barrel on standard production rifles. Button rifled on Custom Shop rifles. Barrels are threaded into receiver & held in with lock tight.

A heavy barrel disperses heat much better, (heat is the enemy of accuracy), and helps with rigidity.

Sendero SF and VSSF has fluting. This gives more surface area. It cools better and makes it more rigid.

Barrel rate of twist: Faster rate of twist is for heavier bullets. Our rates of twist are made to stabilize any bullet in that caliber load-this is not necessarily true for reloads.

All 700 guns w/ standard barrels(not heavy) just blued we put front and rear sites on it. There are none on the stainless steel barrels.

Magazine: Double stack magazine.

We just started making the detachable magazine models in 1993.

We do not make detachable magazine ultra mags because our current magazines won't fit.

Except

The new custom shop African Game Rifle. It is detachable but it is completely different system. It is a single stack magazine.

ADL & BDL: ADL doesn't have a hinged floorplate or detachable magazine. It has a blind box magazine which means it has to be loaded and unloaded from the top. BDL has either Hinged Floor Plate or Detachable Mag. Cannot change an ADL or a BDL (hinged floorplate) to a BDL DM, the receiver is cut different. Can change from an ADL to a BDL w/ hinged floorplate fill in parts.

VS vs. Sendero- VS is in short action only, Sendero is in long action only.

Extractor & Ejector: The extractor and ejector are located in the bolt, the extractor looks like a metal lip inside the bolt near the ejector which looks like a button. Inside Hinged Floor Spring is magazine spring (doesn't come with a hinged floorplate and trigger guard assembly when you order them).

On top of the magazine spring is the magazine spring follower. These are specific to caliber, long action, short action, and mag. Extracting and ejecting is done on the bolt face. The inside of the bolt on the opposite side of the lug is the extractor. This pulls the case out. The ejector is the shiny circular pin on the bolt face. When gun is fired this pin is pushed in and that ejects the shell. Consumers can buy and replace these.

The ejector parts are:  
Ejector Spring  
Ejector plunger

A possible problem that people may have is:

Gun is hard to cam bolt handle down. Usually will drill hole to fit ejector in place there is a tiny burr left and it catches. Can fix with a grinder.

Another cause may be that the extractor is not installed properly. We should let them know that if they try to fix this themselves that they are easy to break.

Ask if consumer has a scope on the gun. Sometimes if the screw on the scope base is too far in and that catches.

(Never forget that there is the possibility that it is the manufacturers fault. Always kindly serve the customer).

The Magazine follower spacer is only for 222 rem and 17rem calibers only. These two particular caliber bullets are really short and the spacer goes into the back of the follower to take up space and make it feed correctly.

Bolt face parts, ejector and spring are for sale.

We use rivetless extractors for long action and short action calibers. Magnum caliber extractors use riveted extractors. This is an extractor that has a rivet that goes down through the bolt face. This helps with the extra force of the magnum loads.

Normally we suggest that they get a gunsmith to put extractors on or they will break for them (unless it's something that they are familiar with doing).

The magnum needs to be done by a gunsmith because of the tooling that has to be done to rivet it.

Guns with riveted extractors in small non magnum calibers are old. Consumers can get parts from Jack First (he not only sells and makes obsolete parts, he is a great gunsmith).

They could just change from riveted to non riveted by buying a total bolt assembly. This would modernize the firearm.

#### Extractor Types:

Extractor Heavy (thicker) Rivetless: Current short & long actions calibers are rivetless. Approx. 15 years ago they had a rivet; they no longer have a riveted extractor. Jack 1<sup>st</sup> makes them. If the consumer needs a riveted extractor they can either contact Jack 1<sup>st</sup> or send in their gun and we will fit rivetless bolt to it.

Extractor Rivetless LA: works on all long action 700's and 7400's.

Extractor Riveted: Magnum calibers still use a riveted extractor.

Bolt: ~~Bolt body~~ cannot be ordered because the factory has to check the head spacing.

~~Firing pin assembly~~-Can be ordered.

~~Bolt handle~~ is brazed onto the bolt. (you braze/weld something by taking a brazing material and putting it in between two pieces of metal and heating it together).

~~Jeweling~~ (design on bolt body) used to be polished on, now it's lasered on.

Serial number: The last 4 numbers of the serial number are stamped onto the bolt.

#### The bolt assembly consists of:

Bolt head (contains back side of firing pin-firing pin is connected to the bolt head. A lot of people call this the bolt plug.

Firing Pin

Firing Pin Spring (or main spring)

(the plug is held in by a little pin. The spring wraps around the pin.  
When you cock the gun you are actually pulling the spring back. This is held back by trigger assembly. The sear makes contact w/ bolt at sear lines-when the sear drops down it (bolt goes forward and bang.  
Trigger Assembly-is held on by couple of screws to bottom of receiver  
The safety assembly is on the trigger itself.  
All that our safety does is to block the sear.  
Trigger Adjustment Screws-2 in front and one in the back

The bolt spring is available for consumers to buy but they should never be a reason for them to need to buy it. It can be dangerous to work with. Normally don't recommend that they work with it.

On Model 700 they can't get any part of bolt or firing pin assembly. They can get the spring only. This is factory restricted due to the Iss system.

The firing pin itself isn't restricted.

The bolt handle is not restricted on the parts list. Mark it as restricted on the parts list. People don't need to buy it.

The bolt plug listed on the parts list (blue and SS) are probably before ISS. The bolt plug manufactured after this time is restricted.

Safety: Our safety is called a positive click safety. We will never make it quieter.

Trigger Assembly: All of the parts in the trigger assembly are restricted. We do not recommend any adjustments to the trigger screws. This will void the warranty on the trigger and can put the firearm in an unsafe condition.

Trigger guard screws: The ADL version has front, rear, and center guard screw; all other 700's have only a front and rear trigger guard screw. Trigger guard screws on synthetic and wood are tightened to a hand tight fit. VS & Sendero trigger guard screws are tightened no more than 45 in lbs. Police trigger guard screws are tightened no more than 65 in lbs. Too much can crack the stock!!

Reinforcement screws: This screw helps with the strength of the stock, it keeps it from splitting. Long action & long action Mag have 2, short action has 1. Looks like a black dot on stock.

Recoil Lug: The recoil lug helps to direct the recoil into the stock, which lessens the amount of felt recoil. The lug is located in the barreled action.

Stock: Stocks come with a butt plate or recoil pad on magnums and grip cap. Some of them also come with swivel studs. Fore end tip is epoxyed on. HS Precision makes our Custom synthetic, Police, Varmint, and Sendero stocks. Our free floated stocks do not have pressure points. They have an aluminum bedding block which holds the action in place. Trigger guard screws on synthetic and wood are tightened to a hand tight fit. VS & Sendero trigger guard screws are tightened no more than 45 in lbs. Police trigger guard screws are tightened no more than 65 in lbs. Too much can crack the stock!!

700 Mtn stock will interchange with 700 Titanium



Check pieces on stocks:

Cheekpieces:

ADL (wood and synthetic)  
BDL (wood and synthetic)  
Mountain  
LSS

No cheekpiece:

Classic  
Sendero  
Varmint  
Police  
Etronx  
Model Seven SS

There are two different kinds of varmint stocks:

Synthetic-aramid fiber

Laminate wood –satin finish.

Laminate wood is the strongest stock that we make and it is impervious to weather.

We used to make a walnut varmint stock but it was discontinued.

The pressure point (located inside the fore end of the stock) is a design feature. People shouldn't sand them down. They can ruin the accuracy of the firearm.

There is no pressure point on a laminated stock-it's just not necessary.

A huge selling feature is the aluminum bedding block which can be found on the synthetic varmint and Sendero.

(You can't put aluminum bedding block in wood it just won't work).

The synthetic stock has an aluminum bedding block. This stabilizes the barrel.

People can bed their own guns with fiberglass or some other material. They do it a lot.  
(Voids the warranty on the stock).

Synthetic stocks are BDL style (hinged floor plate).

Wooden stocks should be tightened hand tight. If consumer is adamant about using torque pounds then they should never use more than 35 inch (not foot) pounds but try to push hand tight.

The synthetic varmint and Sendero can go to 45 inch lbs. Hand tight is fine also.

Recoil pads on varmint and Senderos are glued on. Consumers must take to a gunsmith to remove and replace. We won't do it.

Even older stocks, 30 to 40 years old even, you may notice that the recoil pad may look slightly smaller than the stock. This is where the wood has swollen, this is perfectly normal.

All custom shop wooden stocks are glass bedded by hand. They are truly free floated.

Synthetic guns are glass (fiberglass) bedded too.

Synthetic 40x's are aluminum bedded.

A big thick fore end is referred to as a beaver tail fore end.

Swivel Studs: We make the swivel studs for our synthetic stock. If someone needs a swivels stud for a stock that was made by HS Precision, they need to contact HS.

Butt Plates & Recoil Pads: All must be sanded to fit. Recoil pads are flat, butt plates are concave. In order to interchange, the stock has to be altered. If there are 4 screws in the butt plate and the consumer wants another one like it they can contact an obsolete parts dealer, the new butt plates will work on the old models. Sendero and Varmint butt plates are glued on.

Sights: The front sight including screws has 4 pieces; base, front sight, & 2 screws. The front sight is dovetailed in. This must be tapped out to the side to remove. Sometimes it will have a 5<sup>th</sup> piece, which is the hood. The back sight has 5 pieces; base, slide, aperture, & 2 screws (windage and elevation). We do not sell stainless sights. On the parts list if says bright besides the sight listing it is unfinished. The sight would have to be brazed on and then finished (the brazing process can hurt the finish on the sight).

### Model Seven Bolt Action Rifle

The Model Seven was introduced in 1981 and is still in production at the current time.

The Model Seven has the same receiver design as the Model 700 but it is physically smaller. The parts are not interchangeable. The parts on the Model Seven are just as strong as the Model 700, have the 3 rings of steel but have a shorter barrel.

Only offered in short action and short action magnum calibers and with hinged floorplate.

This is the other major centerfire that Ilion produces.

Came out in 1987.

It is a small compact light weight centerfire rifle.

Model seven was our first light weight rifle that we had.

It was based on the 700 but it wasn't the 700.

The main difference in the 700 and the seven is the shorter action in the model seven. It has always been short action-it will never be long action. There is no left hand seven and we are pretty sure that there will never be one.

Model seven works just like the 700 bolt action hinged floor plate that is held in by front and rear screws (tightened to 10-15 inch lbs or hand tight fit). The trigger works the same but they are **NOT** interchangeable.

The model seven has a bolt release just like the 700, a firing pin assembly, pushing the bolt handle down cocks the gun. When you cock the gun the firing pin doesn't turn-only the bolt body does, and it turns into the cut onto the firing pin.

The model seven fore end is slimmed down.

We make a youth model of this firearm.

We don't make a walnut stock model seven anymore.

We offer synthetic and laminated models.

The Model Seven is always short action, right hand only. It is offered in 5 or 6 calibers. It is great for kids or small statured people.

This firearm has been said to be "the ultimate white tail deer gun."

Scope Base Holes: There used to be 3 base holes (2 in front, one in back) but we changed these in 1998 to 4 base holes.

Checkering & Engraving: The wood checkering is done by a machine and the engraving is done with a laser.

Swivel Studs: The swivel studs are removable, they are threaded in.

Barrels: 20" barrels. Used to be 18" barrels. New Short Action Ultra Mags have 22" barrels.

In 2000 we changed to a 20 inch standard barrel on this gun. Before this back to 1998 we had a standard 18 1/2 barrel. The reason for this change was mainly to gain accuracy on the 260 caliber model. It gained some accuracy in all calibers.

The model seven magnum has a bigger diameter (but not as heavy as a bull) barrel.

The custom shop has a model seven model

The model seven Mannliker . The stock goes all the way to the very end of the barrel on this firearm.

Model 7 receiver is shorter than the Model 700 Short Action receiver. These are not the same action.

### Model 710 Free Floated Bolt Action Rifle:

The Model 710 was introduced in 2001. Designed by Mike Keeney as an introductory affordable rifle for beginners or occasional hunters. Manufactured in Mayfield, KY plant. New technology-bolt locks into barrel rather than receiver.

Only gun that we sell that comes with a (Bushnell) scope.

NEVER USE GUNSCRUBBER ON YOUR FIREARM! It will disintegrate non metal parts almost instantly!

This firearm was designed specifically to keep cost down. It was the reason that the Mayfield plant was built.

The idea was also to build a completely different gun, be innovative, and make alot of them at a low cost.

The biggest key feature of this firearm is the way that the barrel and the receiver marry up. They are hydraulically pressed in, this is permanent, there is no changing the barrel. Since we did this we could lock the locking lugs right into the barrel. They are right behind the chamber. We completely by passed the chamber as far as head space goes.

The 710 has 3 locking lugs on the bolt instead of 2.  
The 710 still has the 3 rings of steel.

#### Receiver:

Has the 3 rings of steel like the Model 700.

Receiver Insert: The receiver insert is made out of a synthetic material (injection molded piece of plastic). We put two inserts in with the receiver insert to keep the bolt from binding & flexing.

Receiver Take Down Screw: The take down screw can be removed with a 3/32 Allen head hex key. This does not have to be removed every time you clean the gun. This model has the 3 rings of steel.

There are two receiver backers. A left and a right. Every gun uses both. The larger goes on the left side and the small goes on the bottom.

Trigger: The trigger is part of the receiver insert. The Model 710 trigger is based on the Model 700 trigger. Individual parts for the Model 710 trigger are not for sale. The trigger does have adjustment screws. We do not recommend any alterations to the trigger assembly.

#### TRIGGER ASSEMBLY

The big difference in this and the 700 is that when you take out the trigger bracket retaining screw the trigger is connected to the receiver insert. You have to replace one to replace the other. The receiver insert is nylon and the consumer can buy it.

Trigger Guard: The trigger guard is molded into the stock; if it breaks, the consumer will have to get a new stock.

Safety: The Model 710 safety is a sear blocking safety like the Model 700. The safety is called a positive click safety; we will not change the safety so that it does not make a clicking noise.

Magazine: This model has a single stack clip (this is more reliable). The magazine holds 5 cartridges.

Magazine Latch: The latch is in the stock, it holds the magazine in place. If this breaks, only a Premier RARC can fix this or the whole stock needs to be replaced.

Bolt:

Bolt has a 60° bolt throw, as opposed to the Model 700 which has a 90° bolt throw. This is a totally different feel than the Model 700 design. The bolt has 3 locking lugs that lock into the barrel whereas the Model 700 has 2 locking lugs which lock into the receiver.

Bolt disassembly: To remove the bolt the bolt release switch needs to be in the vertical position (the release is located on the left side of the receiver). To take apart the bolt assembly you have to turn the bolt head to the right and pull. To remove the bolt face, pull the bolt pin out.

The bolt stop on the 710 is on the barrel. If customer's breaks they can buy this piece.

The only part that the consumer can't buy on this gun is the barrel assembly.

Barrel: The barrel is hydraulically pressed into the receiver. This barrel cannot be customized because you can not remove the barrel. Free floated barrel but no aluminum bedding block.

The barrel is button rifled.

Stock: The Model 710 and 700 use the same recoil pad.

If the magazine release breaks they need the total stock. Same with the trigger housing. They are all made into the stock. Gun Scrubber can cause this to break. Please advise customer not to use this product on this model.

Take Down Screws: The middle and front screw can be removed with a 5/32 Allen head hex key and the rear screw can be removed with a 3/32 hex key. They are called take down screws instead of trigger guard screws because there is not an actual trigger guard.

Do not have to worry about the torque, just hand tighten the screws. If the consumer tightens the screws too much every time eventually this will cause the stock to bind.

Recoil Lug: The lug is silicon inserted into the stock and sticks up in a groove in the barrel. The lug helps reduce recoil.

Scope Mounts: Bushnell is the only company that makes scope mounts for the Model 710 at this time. If the scope does not work it needs to be sent back to our office.

### Model 7400 Gas Operated Semi-auto Rifle:

The Model 7400 was introduced in 1980 and is still in production at the current time. Lightweight hunting rifle. This model is based off of the Model 742 & 740. 6-7 years ago we called these a Buckmaster. Offered the Model Four in 1980's as a more economical version of the 7400. Parts are interchangeable from the Model Four to the Model 7400.

The clip and butt stock can interchange with the Model 7400 and Model 742, however, these are the only parts that can be interchanged. Magazine latch may need some modification in order for magazine to fit. Rear stock from 870 20 ga will interchange.

### 742 Exchange program:

Gas Operating System: The Model 7400 is very similar to the Model 11-87 and 1100 because of the way the gas operating system works. The 7400 has a gas orifice hole that allows some of the gases to bleed through onto the piston (in the fore end) forcing the action to cycle. Do not over lubricate or over oil, will cause it to jam. This does not get as dirty as a shotgun but it would be best to take to a RARC or gunsmith for professional cleaning.

You lose a little bit of velocity with a gas system but will not be able to tell at most hunting ranges. The loss would be more significant at several hundred yards.

Magazine: We offer a 4 & 2 shot clip in .30-06, .270, & .35 Whelan. We do not offer 10 round clips, may be available aftermarket. If the magazine will not stay in the firearm the consumer will need to purchase a new magazine latch and have a gunsmith install it. Magazine latch has a number stamped on it indicating which one.

Stock & finish: The synthetic stock 7400 has a matte finish & the wood stock 7400 has a bright blue finish. All of the newer models have cut checkering; at one time they had press checkering with floral design (fleur de l'ois)-stopped about 15 years ago. The 870 20 Ga. stock will work on this model but the wood probably not match. Customers use this if they do not like the Monte Carlo style stock that comes on the rifle. We put MC style stock because most hunters put a scope on the rifle.

Butt Plate: The Model 7400 comes equipped with a butt plate, the consumer may put a recoil pad on, however, the gun may not work because it needs the energy from the recoil.

Fore end: If you remove the fore end tip, tip spacer, and screw then the fore end will come off. There is a metal sleeve on the fore end that protects it from gases. Clean the remaining parts with Rem Action cleaner.

Sling strap: You can not drill into the fore end to install a swivel stud because of the metal sleeve. The consumer can purchase a barrel sling assembly (Made by Uncle Mike's) at their local dealer or they may put a swivel in place of the fore end screw. Or they can purchase a barrel band through our parts department. This is a metal clamp that clamps onto the barrel.

Grip Cap: The old grip caps have a white line spacer.

Bolt assembly: We do not recommend taking out the bolt assembly. See a RARC or gunsmith for assistance with cleaning. (Old 742 manual had more in depth take down instructions) Bolt has 6 locking lugs on bolt head (3 pairs of 2). Model 700 has 2.

3 rings of steel: Barrel, bolt, & lugs make up the 3 rings of steel.

Port Cover: The port cover protects the bolt assembly from dirt and twigs. The bolt cover is made out of a synthetic material (plastic).

Disconnecter: The disconnecter holds the bolt into place until after the gun has been fired. The disconnecter is attached to the trigger assembly.

Extractor: The Model 7400 and 700 have the same extractor, some old 7400's have a riveted extractor. Difficult to install. See a RARC or gunsmith for assistance.

Feeding Problems: The 7400 will jam if it is not held properly; it needs the energy from the recoil to cycle the action. Not cleaning the firearm properly may cause a round to jam (it will expand and get stuck in the chamber). Clean with chamber brush.

Cleaning Instructions: Clean from the muzzle end to the receiver with bore cleaner. If the chamber area is not cleaned properly it may rust. Use chamber brush that comes with the firearm to keep chamber clean. We do not recommend removing the barrel or bolt for cleaning. See a RARC or gunsmith for professional cleaning. Do not over lubricate or over oil, it will cause it to jam.

Ammunition: Do not use military surplus, high powered or light magnum ammo; this model was made for normal pressure hunting rounds. The high-powered rounds slam the bolt back to fast and this will cause it to wear out the gun quick (1/2 life). These rounds will also wear the chamber out. This firearm was not designed for rapid fire.

Sights: The Model 7400 sights are the same as the Model 700 sights. We offer a high front sight that will make it easier for the consumer to line up. The receiver plug screws do not fit in the sight holes. The Model 700 receiver plug screws will plug the holes.

Barrels: All of the Model 7400 barrels are 22 inches, except for the carbine, which is 18 inches long. We do not recommend removing the barrel.

Trigger Assembly: The trigger assembly is similar in design to the Models 1100, 11-87, and the 597 (the trigger, hammer, sear, and sear spring are the same). We do offer a left-hand trigger assembly for the 7400. Only put a small drop of oil on the trigger. Cross lock safety.

Trigger Plate Pins: You have to knock the trigger plate pins out in order to remove the trigger assembly (no trigger guard screws). If these will not stay in place the front or rear detent spring may be broken or missing (if this is the case sell them another one).

Trigger Guard: The trigger guard is made out of a synthetic material (plastic) (the only ones that we still make out of powdered metal are the police models).



### Model 7600 Pump Action Rifle:

Similar to 7400 but pump action. The Model 7600 was introduced in 1980 and is still in production at this time. Based off of the Model 760. Offered the Model Six in the 1980's as an economical version of the 7600. Parts are interchangeable with the 7600. This model is somewhat similar to the Model 870. Few problems, reliable. The Model 7600 and 760 can not interchange parts except for the magazine (may need slight adjustment to magazine latch) and rear stock. 870 20 ga stock will interchange.

Fore-end: All of our pump action firearms will open up after shooting if you do not put forward pressure on the fore-end. This is designed this way for a quick follow-up shot.

Bolt: The bolt has 6 locking lugs. The Model 7600 bolt is a little longer the Model 7400 bolt. The bolt slides on the action bars.

Magazine: We offer a 4 shot clip in .30-06, 270, & .35 Whelan. We do not offer 10 round clips, may be available aftermarket. If the magazine will not stay in the firearm the consumer will need to purchase a new magazine latch and have a gunsmith install it. Magazine latch has a number stamped on it indicating which one.

Receiver Screw: The receiver screws do not fit in the holes from the sights, must use the Model 700 screws.

Disconnecter: The disconnecter pushes against the left side of the action bars this allows you to pump the action. The disconnecter is located above the trigger.

Sling strap: You can not drill into the fore end to install a swivel stud because of the metal sleeve. The consumer can purchase a barrel sling assembly (Made by Uncle Mike's) at their local dealer or they may put a swivel in place of the fore end screw. Or they can purchase a barrel band through our parts department. This is a metal clamp that clamps onto the barrel.

Stock & finish: The synthetic stock 7400 has a matte finish & the wood stock 7400 has a bright blue finish. All of the newer models have cut checkering; at one time they had press checkering with floral design-stepped about 15 years ago. The 870 20 Ga. stock will work on this model but the wood probably not match. Customers use this if they do not like the Monte Carlo style stock that comes on the rifle. We put MC style stock because most hunters put a scope on the rifle.

Butt Plate: The Model 7400 comes equipped with a butt plate, the consumer may put a recoil pad on.

Sights: The Model 7400 sights are the same as the Model 700 sights. We offer a high front sight that will make it easier for the consumer to line up. The receiver plug screws do not fit in the sight holes. The Model 700 receiver plug screws will plug the holes.

Bolt assembly: We do not recommend taking out the bolt assembly. See a RARC or gunsmith for assistance with cleaning. (Old 742 manual had more in depth take down instructions) Bolt has 6 locking lugs.

Port Cover: The port cover protects the bolt assembly from dirt and twigs. The bolt cover is made out of a synthetic material (plastic).

Extractor: The Model 7400 and 700 have the same extractor, some old 7400's have a riveted extractor. Difficult to install. See a RARC or gunsmith for assistance.

Cleaning Instructions: Clean from the muzzle end to the receiver with bore cleaner. If the chamber area is not cleaned properly it may rust. Use chamber brush that comes with the firearm to keep chamber clean. We do not recommend removing the barrel or bolt for cleaning. See a RARC or gunsmith for professional cleaning.

Sights: The Model 7400 sights are the same as the Model 700 sights. We offer a high front sight that will make it easier for the consumer to line up. The receiver plug screws do not fit in the sight holes. The Model 700 receiver plug screws will plug the holes.

Barrels: All of the Model 7400 barrels are 22 inches, except for the carbine, which is 18 inches long. We do not recommend removing the barrel.

Trigger Assembly: The trigger assembly is similar in design to the Models 1100, 11-87, and the 597 (the trigger, hammer, sear, and sear spring are the same). We do offer a left-hand trigger assembly for the 7400. Only put a small drop of oil on the trigger. Cross lock safety.

Trigger Plate Pins: You have to knock the trigger plate pins out in order to remove the trigger assembly (no trigger guard screws). If these will not stay in place the front or rear detent spring may be broken or missing (if this is the case sell them another one).

Trigger Guard: The trigger guard is made out of a synthetic material (plastic) (the only ones that we still make out of powdered metal are the police models).