

## Important Notice

Because the *NOVA* series markers are totally pneumatic, 0-rings and 0-ring maintenance are very important. Dirt, sand, weather, lack of lubrication, friction, ozone and other contributing factors ensure eventual wear not only on 0-rings but parts as well. Although operation and maintenance require minimal attention, **no attention** will eventually cause failure. Take care of your marker and it will take care of you. We will address the most common troubles and yet easy to fix in this section.

WHENEVER DOING MAINTENANCE WORK ON MARKERS-NEVER USE BALLS OR HAVE A LOADER ON THE UNIT. **IMPORTANT**: there are times when air is necessary in the middle of some maintenance operations. Other times it can be dangerous. We will be very specific on when, where and why air **should or should not** be applied. Be very specific where you have a problem or leak. A squirt bottle with a small amount of soap in it will help locate and isolate problem areas.

## My Marker Won't Shoot

**Notice: First things first. Check to make sure your bottle has air.**

### **-Barrel Won't Move**

**Barrel won't move.** The velocity is set at the factory between 250-280 fps. The velocity screw is always loose and wobbly when not under pressure. Under pressure it will become solid.

**A.** If the pressure is too low the barrel will not move to the closed position.....Adjust velocity screw clockwise (increase) until barrel moves to the closed position. Adjusting the velocity screw too far will cause the marker to overpressurize and start relieving.

**B.** The brass ring on the exposed portion of the barrel that holds the center 0-ring has moved. It is 1" from the end of the barrel to the beginning of the brass piece. Send the barrel to AirStar for replacement.

**C.** The barrel spring retainer on the barrel assembly has slipped off.  
This is an easy fix-see **BARRELS**.

### **-Trigger Is Sloppy Or Frozen Or Both.**

**Trigger is sloppy or frozen or both.**

**A.** The set screw **in** the trigger has come loose. The trigger is attached to the trigger rod which moves back to actuate the cartridge valve. When the set screw becomes loose the trigger can't move the rod to actuate the valve. Tighten set screw and read **TRIGGER HOUSING** for proper adjustments.

**B.** The brass sleeve in the trigger housing has become loose and moved forward. **Degas marker and remove air source for the following adjustment.** The brass sleeve is located in the trigger hole slot directly behind the trigger (same hole as trigger). In most cases you will only see a small portion of it sticking out. (1/32" to 1/16") Behind the trigger is a set screw. This is a double set screw. Remove the top one and loosen the second one. Then with a jewelers screwdriver push the brass spacer back into the trigger housing and tighten the set screw. **If you push the brass spacer too far into the trigger housing your safety may not work. Always test your safety after making the spacer adjustments.** If the safety doesn't work you have moved the brass spacer too far into the trigger housing. Loosen screws again and move spacer forward 1/32" or until the safety works....Tighten screws.

See: **TRIGGER HOUSING** for proper adjustment.

## Barrels

### **-Disassembly Of The Articulated Barrel Assembly (ABS)**

Pull back the foam on the foregrip where it meets the barrel assembly. There are 3 screws --remove and pull the whole foregrip off. Loosen-don't remove the set screws on the barrel spring retainer (small black ring that holds the spring in place)..... remove the

spring and barrel retainer. Don't forget to clean and lube the 0-ring inside the barrel retainer.

**==IMPORTANT==IMPORTANT == Reattaching the barrel spring retainer.  
==POSSIBLE BARREL DAMAGE==**

It takes very little pressure from the set screws on the barrel spring retainer to hold the ring and spring in place. It takes very little pressure to put a big dent on the inside of your barrel if you're not careful. Tighten one at a time in small (baby) increments. Work the circle and go around again....small increments.

## -Barrel Lubrication

The importance of keeping the 0-rings lubricated is vital to the timing and firing sequence. The barrel must be able to move easily at all times. Lubricating and keeping clean the 0-ring inside the barrel spring retainer is critical. Pull back the barrel and drop some oil on the barrel to lube this internal ring. Small paint skins from ball breaks can get into the barrel spring retainer and prevent free-flow of the barrel. Taking off the foregrip and rinsing any debris can help.

## -Whacky Ball Pattern

It is very important to keep your barrel as clean and dry as possible. AirStar uses lubricants during assembly which end up in the barrel after the marker is gassed up. When you first get your marker you may encounter this situation. Most of this is attributed to oil from assembly and must be removed several times before it disappears.

## -Jumping Barrel Assembly

Possible over lubrication of the large (222) 0-ring on the barrel retainer **or** a small piece of solder buildup where the brass ring is attached 1" from the end of the barrel. With a small file work the solder down until smooth with the ring. Some barrels are soldered on both sides of the ring.

## -Chopping Balls

Free movement of the barrel is critical in the timing and firing sequence. Keep the 0-rings on the barrel lubricated well. Chopping can be caused from a variety of sources:

1. Bad paint
2. Paint skins in the barrel retainer
3. Holding back on the trigger too long between shots. (Here is the rational )

The *NOVA* markers can out cycle the gravity drop of the balls....holding back on the trigger of course keeps the barrel open allowing one ball to drop and the second ball trying to drop and getting caught in the middle. That causes the chopping...**crisp up your trigger pull!**

## Recognizing Regulator Problems

The regulator is located in the back of the body housing. The velocity screw is a part of the regulator assembly. It is held in by two screws..The site rail screw and a screw under the relief spring located in the trigger housing. Removing the reg. accesses the entire body components of the unit. You do not have to remove the regulator from the body to test.

### **Recognizing regulator problems:**

1. A hot shot (loud) on your first shot
2. You shoot and then gas starts relieving from the back slot of the two slots located between the trigger housing and the body housing. If you shoot-the escaping air stops and comes back again when you stop shooting

### **Solution:**

1. Turn down your velocity...You may be over pressurizing the marker. There is nothing wrong with the regulator.
2. The brass regulator seat in the regulator has loosened.

**We highly recommend wearing safety glasses while working on the regulator. The directions are very specific on when to degas or apply gas. Not following exact direction can cause regulator parts to become projectiles that can cause serious injury.**

## Regulator

### -Read This First

**\*\*\*\*\*We highly recommend wearing safety glasses while working on the regulator. The directions are very specific on when to degas or apply gas. Not following exact direction can cause regulator parts to become projectiles that can cause serious injury.**

### -Test For A Faulty Regulator

**The Test For A Faulty Regulator: Degas marker--no air**

1. Remove snap ring--get snap ring pliers if you don't have any-you'll definitely need them.
2. Remove velocity screw and cap (they are together), washer, spring, piston and the pin which is located in the center hole of the brass reg. seat. **Do not** remove the brass seat at this time.
3. **Gas up marker:** Don't worry-nothing will happen. You don't need to have the barrel on. If you do not hear air leaking the regulator is fine...**degas marker, remove air source** and reassemble...
4. If you hear air escaping, the brass seat has backed out. With a 1/2 inch long socket (do not use a screwdriver) tighten brass seat snug---clockwise
5. (memory aid--lefty loosy---righty tighty)  
Do not overtighten...

If air continues to escape: **Degas marker and remove air source..** With a 1/2" long socket-remove the brass seat. Beneath the brass seat is a poppit and under that is the poppit spring. Examine the poppit for damage--This is a possible cause for regulator failure Replace the 0-ring on the brass seat (size 009) and put a small (very small) drop of loctite on the threads (no teflon tape). Tighten...let loctite set for one hour.

**DO NOT REASSEMBLE ENTIRE REGULATOR-Gas up** after 1 hour and test for leak

### -Assembling The Regulator

**To Assemble Regulator: Degas And Remove Air Source**

**ASSEMBLY ORDER FROM BOTTOM UP:**

Poppit spring, poppit, brass reg. seat, pin (goes in center hole of brass seat, piston (cup up), spring (fits in piston cup), washer, velocity screw and cap, snap ring.....

**The snap ring fits into a small slot near the top of the regulator....Make certain it is firmly engaged in the slot. Whenever replacing or removing the snap ring....point that portion of the marker in a safe direction to ensure proper engagement of the snap ring into the slot when gassing up.**

## Body Housing

### -Drop Tube

The ball drop tube is threaded into the body housing. The two small holes in the drop tube allow you to put a rod through it for removal. There are very few reasons to remove the drop tube. The drop tube is loctited at the factory but the torque from the loader can cause it to become loose-so watch it and keep it tight. If you remove it, be very, very careful not to strip the threads when replacing. The drop tube should have no thread resistance when replacing.

### -Breach

Located in the front of the marker, it is the first visible part when the barrel assembly is removed. The breach is held into the body housing by the drop tube and a screw located in the front of the trigger housing that connects the trigger housing to the body housing (and the breach). Keep the breach clean of dirt and debris as this is where the barrel slides. A small drop of oil on your finger and then rubbed around the breach surface before playing will promote free barrel movement. A small scratch in the breach can cause a leak. (see leaks) If you feel a small scratch in the large bore of the breach, use emory paper or a fine steel wool to remove. As you look into the breach-the center circle in the back is the spool.

### -Brass Spacer

This brass ring is used as an accumulator area for air in the firing and shooting sequence.

### -Spool, Spool Cap, And Spool Housing

The heart and brains of the *NOVA* markers. Spools have been used in industrial and commercial applications for a hundred years. Proven reliable because they are symmetrical, centerline and move large volumes of air or liquid with small movements via differential air pressure. In the maintenance of your unit the spool and spool cap will be removed. The spool housing which holds the spool and cap should not be removed. **If** the spool housing is removed be certain of two things:

1. Align the holes that are drill in the spool housing with the holes on the flat section of the body housing.
2. There is a large O-ring (222) that must be seated completely around the top of the spool housing.

## Trigger Housing

The trigger housing contains the relief spring, relief (brass piece with O-ring), cartridge valve, brass sleeve for the trigger rod, trigger rod and trigger. This is also the loading order. All the parts are loaded from the large hole located behind the trigger guard. When removing the components in the trigger housing always use a piece of fine steel wool to remove burrs from the brass sleeve and trigger rod. Clean and lubricate all O-rings.

### -Tear Down

Remove the trigger guard. Behind the trigger guard is the safety spring and then the ball bearing. If the ball bearing won't come out, lightly tap the unit until it does. It is not necessary to remove the safety. **In** the trigger is a set screw that holds the trigger onto the trigger rod--loosen. Wiggle the trigger or in many cases you will have to pick the trigger rod out. Remove the trigger. **IMPORTANT** This is a great time to see how the trigger fits onto the trigger rod. With the trigger and trigger rod out of the marker put them together and notice the steps on the rod. The trigger should always fit snugly on the last (biggest) step. When reassembling you should always put pressure on the trigger rod in one direction and pressure on the trigger the opposite direction when tightening. Behind the trigger is a set screw. This is a double set screw. Remove the top one and loosen the next one. This set screw holds the brass sleeve in position. In most cases the brass sleeve should extend out of the trigger housins approximately 1/32" to 1/16". To move the brass spacer forward it maybe necessary to force the spacer out. To do this, continue back along the trigger housing to the **relief spring hole**. With a jewelers screwdriver, get behind the spring and move it forward to force the sleeve to move forward. Do not damage the brass relief valve that the spring fits into. This is not the same piece you are trying to move. They are separate. Sometimes it is necessary to "pick" the spring out. When picking the spring-use caution not to bend the spring or damage the brass relief as they play an important part in allowing the marker not to over pressurize. There are two screws that hold the trigger housing on the body housing. Beneath the relief spring is one. The other screw is located at the front of the trigger housing. There are three small O-rings located on the top of the trigger housing where it attaches to the body housing.

## -“My Gun Won’t Shoot - The Trigger Is Frozen - The Trigger Is Sloppy”

Three reasons: The set screw in the trigger came loose. The brass sleeve moved forward so the trigger rod can not move back to actuate the cartridge valve or a combination of both. ALL SIMPLE FIXES.

## Leaks

### -Identifying

Accurately identify any leaks you may have. A small spray bottle with soap will help you identify and detect where the leak is coming from.

Your NOVA series marker is present at the factory between 250-280 fps. The velocity screw will feel loose and wobbly when not under pressure and firm up when an air source is applied. The velocity screw should be approximately 3/8" from the end of the velocity screw cap cover. Turning the velocity screw in all the way will cause your marker to overpressurize and leak from the back slot located between the trigger housing and body housing.

### -Gassing Up Correctly

**For best results when gassing up marker:**

Safety off---screw in bottle 2-3 turns-- then point neck of air bottle up and screw in the rest of the way.

### -Out Of Sight Rail

Remove air source and degas. Remove sight rail. Gas up and cycle until leak stops. While under pressure attach sight rail with screw to snug position.

### -Out Of Barrel

1. Spool has become stuck in spool housing---the fix is as follows: remove air source---put marker on safety---remove barrel---as you look into the marker the furthest small center circle is the spool. Have a pencil, pen or long screwdriver available. Attach air source and with pencil push on the spool until leak stops---do not push too hard (it doesn't take too much pressure)-- attach barrel, move safety to fire position and cycle several times. If you do this while the marker is not under pressure you may push the spool cap out of the spool housing.

2. 0-ring on the end of the spool has come off--Recognizing---air leaks when the barrel is in the closed position. When you pull and hold the trigger the leak stops. Replace with 108-70 poly 0-ring.

### -Ball Drop Tube (Inside)

**Ball Drop Tube-Inside-when the barrel is in closed position: three reasons:**

(Make sure velocity screw is in far enough to allow barrel to pressurize)

1. Worn 0-rings or debris on barrel 0-rings. Fix--Clean or replace 0-rings and/or rotate barrel assembly 1/3 turn.

2. Small scratch in the breach. Rub your finger in the large diameter hole where the barrel retainer normally fits. If you feel a scratch use fine steel wool to remove scratch.

**Breach movement:** Because there is always torque being applied to the drop tube from taking on and off the loader, the drop tube may have gotten screwed in too tight thus moving the breach. Fast fix--loosen drop tube 1-2 turns and cycle until leak stops. The two holes in the drop tube will allow you to put a small rod through for removal. Then snug up drop tube. The breach is held in place by the drop tube and a screw located in the trigger housing that attaches the trigger housing to the body housing and thus the breach. If all other attempts have failed, remove the breach and clean or replace the 0-rings (222-70 Buna) and reinstall. Caution: The threads on the drop tube are very fine. There should be no or very little resistance when screwing in the drop tube.....Make adjustments by moving the breach slightly to allow the drop tube to screw in easily.

## -Ball Drop Tube (Outside)

See #3 of [Ball Drop Tube Inside](#)

## -Trigger (Relaxed Position)

Brass sleeve located in the trigger hole has moved forward. Degas marker and remove air source. Behind the trigger hole is a set screw. This is a double set screw. Remove top one and loosen second one. Push brass sleeve back into trigger housing and tighten. Gas marker--check for leaks and check safety--if safety does not work you have pushed the brass sleeve in too far...Degas and move sleeve forward slightly.

## -Trigger (Pulled Back)

O-ring on cartridge valve has debris on it or it is cut. Cartridge valve is located behind the brass sleeve in the trigger housing. Replace with 010-90 Buna O-ring.

## -Relief Hole In Trigger Housing

This is the hole at the end of the trigger housing where you can see the relief spring. There is debris on the relief valve O-ring or it is cut. 95% of the time it is debris. Remove and clean.

## -Between The Trigger Housing And The Body Housing

### **Between the Trigger Housing and Body Housing:**

There are two slots between the trigger housing and body housing--locate where the leak is coming from.

### -Front Slot

O-rings on spool are wearing. If the leak is small and it does not affect shooting performance or gas efficiency-don't worry about it...but get it fixed. Small leaks on the NOVA's are not as critical because they are operating at 95 PSI.

### -Back Slot

1. The marker is overpressurized--turn down velocity. It is not uncommon that occasionally after rapid firing or changes in weather conditions (getting hotter) that the marker will overpressurize and relieve.

2. Regulator is malfunctioning--See [Regulator Test](#)