**Ultimate Nova Guide**

**IMPOTANT:**

When working on the nova always air the marker up with the regulator fully installed with the c-clip and both frame and sight rails installed. It will prevent possible malfunction and injury. If using a nova with an external regulator or aftermarket regulator be sure to zero the regulator before airing up the marker to prevent over pressurizing the marker. It only requires 95 psi to fully cycle. Always check that the barrel is clear of paintballs before airing the marker up. The gun fires from a closed breach position and you cannot check after it has been aired up.

**Trouble Shooting:**

**Marker will not shoot:**

Barrel won’t move.

1. Likely cause is that the pressure is to low ( the reg cap should be loose and wobbly when not aired up). Increase the velocity screw clockwise until the barrel moves to the closed position. Proceed to chrono, if the screw is into far the gun will be over pressurized and will likely leak between the body and trigger housing at the relief hole.
2. The brass ring on the rear of the barrel(exposed portion) that holds the center of the 3 orings has broken free. It should be 1” from the end of the barrel. The barrel will need to be repaired.
3. The barrel spring retainer inside the barrel assembly has loosened. It will need to be reset in the proper location. look in the Barrels section

Sloppy or frozen trigger

1. The set screw in the trigger has come loose. The trigger screw should be tight against the rod. If it is loose it cannot push the valve. Push the rod to the rear of the gun and tighten the screw onto the trigger rod.
2. The brass sleeve in the trigger housing has come loose and moved forward. Degas the marker and set the sleeve distance per the Trigger housing adjustment section.

**Barrels:**

Disassembly

1. Pull the foam on the barrel forward from the rear of the barrel to expose the 3 screws. Remove the screw to remove the shroud.
2. Loosen the set screws on the spring retainer so that the black ring slides forward. ( on aluminum barrel it uses a c-clip to hold the spring on instead)
3. The large barrel housing will slide off the front of the barrel over the bump for the retaining ring.

Reassembly

1. Inspect and replace worn orings. Lube the orings and install.
2. Slide the barrel housing over the front of the barrel with the barrel locking pins at the rear of the barrel
3. Slide the spring over and slide the spring retaining ring on from the front.

**POSSIBLE BARREL DAMAGE:**

**Be very careful when installing the spring retainer ring on the barrel. Use very small turns of the screw to avoid denting the soft brass barrel.**

Barrel lubrication

Keep the orings clean and well lubricated with oil. To lubricate the inner oring of the barrel pull the barrel back as if in the closed breach position and add a couple drops of oil just in front of the 3 rear most orings.

Poor Ball Pattern

 Make sure that the inside of the barrel is clean and free of debris.

Jumping Barrel Assembly

Possible over lubrication of the 222 oring on the outside of the barrel housing. Possible build-up of solder on the brass piece that holds the center oring on the rear of the barrel. Some barrels are soldered on both sides check for excess solder.

Chopping

Free movement of the barrel is critical in the timing and firing process. Keep the orings on the barrel clean of debris and well lubed with oil. Chopping can be caused be several sources:

Bad paint

Paint larger than the barrel

 Broken paint on barrel or in breach

 Holding the trigger too long between shots

The nova marker can out cycle the gravity drop of the balls. Holding back on the trigger of course keeps the barrel in the open allowing one ball to drop and the second ball trying to drop and gets caught in the middle. That causes chopping… use crisp trigger pulls and a motorized hopper.

**Regulator Problems:**

The regulator is located at the rear of the marker. The velocity screw is a part of the regulator assembly. It is held in by 2 screws. The sight rail screw and a screw under the relief spring, located in the trigger housing. Removing the regulator accesses the entire body components of the marker.

Recognizing Regulator Problems.

Hot Shot (loud on first shot)- you shoot and then gas starts relieving from the back slot of the 2 slots in the trigger housing below the body. It stops briefly when the next shot is taken.

1. Turn down the velocity. You may be over pressurizing the marker. Regulator may be working correctly just set to high.
2. The brass regulator seat in the regulator has loosened.

Regulator

**Read First:** **We highly recommend wearing safety glasses while working on the regulator. The directions are very specific as to when it should and should not be aired up. Not following the procedure can be dangerous and parts can become projectiles.**

Test for faulty Reg.

 **Degas Marker**

1. Remove c- clip with c-clip pliers
2. Remove velocity screw and cap, washer, spring, piston and the pin. Do not remove the brass seat yet.
3. Put the barrel on the marker and face the rear of the marker in a safe direction away from your face. Air the marker up keeping it pointed in a safe direction. If you do not hear air coming directly out of the rear of the marker the regulator is fine. Degas and reassemble.
4. If you hear air escaping from the rear of the regulator the brass seat has backed out. Degas the marker. With a 1/2in long socket snug the seat up spinning clockwise. Brass is soft and should only be snug.
5. Air the marker up again. If air still escapes the rear of the regulator. Degas the marker and remove the brass seat. Replace the urethane cylinder under the regulator seat. Replace the 009 oring on the seat and add 1 drop of Loctite to the brass threads. Reinstall and allow to set for 1 hour before airing the marker back up. To test for the leak again pointed in a safe direction.
6. If no leaks are present the regulator is now fixed.

Assembling Regulator

 **Degas Marker**, assembly order from bottom up

1. Spring, urethane cylinder, brass seat with oring, reg pin, piston, spring , washer, velocity adjuster
2. Adjust the velocity screw outwards to make it easier to put the c-clip on. It goes over the velocity adjuster in the hole. Be sure that it has been seated before airing the marker up. Once it is in the hole I adjust the velocity screw until I hear it seat.
3. Make sure the velocity adjuster wobbles before airing the marker up. It will keep you from over pressurizing it, point it in a safe direction when airing it up to ensure the c-clip has seated and won’t become a projectile.

**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 your remove it be very, very careful not to strip the threads when replacing it. It should have no thread resistance when replacing.

Breach

Located in the front of the marker it is the first visible part when looking in to the body housing. It is held in by the feed tube and the front trigger housing screw. The breach should be kept clear of dirt and debris. Put one drop of oil on your finger and rub the inside of the breach before play. If you find a small scratch in the breach use emory cloth or fine steel wool to remove it.

Brass spacer

 The 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 until the spool and spool cap should not be removed. If the spool housing is removed be certain of two things:

1. Align the holes that are drilled in the spool housing with the holes in the bottom of the body.
2. There is a large 222 oring that must be seated around the top of the spool housing.

**Trigger Housing:**

The trigger housing contains the relief spring, relief( brass piece with oring), 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 wool to remove the burrs from the brass sleeve and trigger rod. Clean and well lubricate all the orings. If there is a leak in rear slot of the trigger housing replace and lube the relief oring.

Trigger Housing Breakdown

1. Remove the trigger guard. Behind the trigger guard is the safety spring and then the ball bearing. If the ball bearing doesn’t come out lightly tap the marker until it does. It is not necessary to remove the safety
2. Inside the trigger is a set screw, loosen it, the trigger rod should come out the large hole that was behind the trigger guard. Tiy may have to wiggle the trigger until it falls out if not you may have to use a pick to pull it out. The trigger will come out of the slot it is in. ( when reassembling the trigger should fit on the last notch of the trigger rod, do this by using something to press the trigger rod towards the rear of the gun while pulling the trigger to the front of the gun, tighten the screw then)
3. Behind where the trigger was there is a set screw this is a double set screw, remove both screws( one on top of the other). This will free the brass sleeve, remove it.
4. To remove the valve, relief assembly and spring. Use a small allen key to push the spring forward until the tip of the valve is visible to remove. Lightly tap the relief assembly and spring out of the front.( when reinstalling be sure that the relief oring is clean and well lubed)

Why the trigger doesn’t work

The set screw in the trigger loosened and the rod won’t push the valve. When reassembling the trigger should fit on the last notch of the trigger rod, do this by using something to press the trigger rod towards the rear of the gun while pulling the trigger to the front of the gun, tighten the screw then

The brass sleeve moved. Set the brass sleeve so that about 1/16th of an inch is showing.

**Identifying Leaks:**

To aid in helping identify leaks use a spray bottle with some soap in it.

The velocity screw will feel loose and wobbly when not under pressure and firm up when under pressure. The velocity screw should be about 3/8”from the end of e the velocity screw cap. Turning the screw all the way in will cause the marker to over pressurize and leak between the body and trigger housing at the rear frame slot.

Gassing up correctly for best results when gassing marker: safety off screw bottle in 2-3 turns then point neck of bottle up and screw in the remainder 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—remove air source, put marker on safety remove barrel as you look into the marker the furthest snall center circle is the spool. Using a pen or pencil push on the spool until leak stops, do not push to hard. Reattach barrel and move safety to off.
2. The oring on the tip of the spool has come off. This can be seen if the trigger is held down and the leak stops. Replace the 109-70 poly oring on the tip.

Ball Drop Tube( inside)

Make sure the velocity screw is in far enough to pressurize. Worn orings or debris on barrel orings, fix clean or rotate barrel 1/3 turn. Small scratch in the breach rub your finger in the large diameter hole. Use emory cloth or fine steel wool to remove scratch.

Ball Drop Tube ( outside)

 Check for scratch in breach.

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 to far. Try loosening 1-2 turns. If it continues to leak replace the 222 orings on the breach. Be careful when reinstalling the feed tube it is easy to strip there should be no resistance when turning.

Trigger (relaxed position)

Brass sleeve located in the trigger housing has moved forward, degas marker and reset the brass sleeve.

Trigger (pulled position)

Oring on the cartridge valve has debris on it or is cut. The valve is located behind the brass sleeve and has 010-90 buna orings.

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 oring or it is cut. 95% of the time it is debris. Remove and clean.

Trigger Housing and Body Housing ( front slot)

 Orings on the spool are wearing.

Trigger Housing and Body Housing (Rear slot)

1. Marker is over pressurized. Turn the velocity down.
2. Regulator is malfunctioning. See regulator test.

**Nova Breakdown:**

1. Remove trigger guard. Remove spring,ball bearing and safety.
2. Loosen set screw located “in the trigger” not behind it. Wiggle trigger until trigger rod falls out the front opening. Remove trigger.
3. Loosen the setscrew located behind the trigger. This is a double setscrew. Remove the top one then loosen the bottom one. Look in the rear frame screw hole and push the relief spring forward so that everything comes out through the front opening in the trigger housing.
4. Remove the screw under the relief spring. Remove the front trigger housing screw.
5. Remove the sight rail screw. The regulator housing is now free and can be removed out the rear of the marker. Use a soft non-marring tool to push the contents of the marker out. Insert it in the breach of the marker with the barrel off and push on the smallest circle until everything comes out of the rear. Go slowly as to not lose the spool spring,
6. Remove the feedneck and push the breach out the front of the marker.
7. Loosen the regulator screw until it wobbles freely, use c-clip pliers to remove the c-clip ring. Remove adjuster, washer( possibly ball and cap), spring or spring stack, piston, reg pin, bass reg seat( use 1/2in deepwell socket not flat head screw driver), seat seal and spring.

**Nova Reassembly:**

1. Assemble regulator housing in reverse order as disassembly.
2. Spool housing should be aligned so that holes in the side of the body face directly downward and align with those in the bottom of the body.
3. Breach should be placed in through the front of the body and carfully aligning the breach hole with the feedneck port and the trigger housing screw in the bottom of the body. **VERY CARFEULLY THREAD THE FEEDNECK IN. IT IS VERY EASY TO CROSS THREAD. IT SHOULD HAVE NO RESISTANCE.**
4. Place the spool cap on the spool so that the oring is closest to the front of the marker. Insert the spool and spool cap into the spool housing and push until you hear a click sound.
5. Stand the body up on end and place the spring in the center most circle( inside the spool cap). Slide the regulator housing in so that the extra hole in the side of the regulator body faces down and the threaded holes align with the body holes. Make sure not to tip the body because the spring will fall over and you will have to start again.
6. Attach the trigger housing following the reverse order of the disassembly.

**Tips and Tricks:**

Sluggish Barrel: when the barrel appears to be sluggish the retaining ring for the barrel spring is set to far away and there is not enough spring pressure. If there is to much spring pressure it will require more pressure to seal. The retaining ring adjustment is also important for adjusting blowback. By using a tissue placed on or in the feedtube it can be seen with the shot whether or not air is escaping out of the feedtube. If this is happening the retaining ring should be adjusted.

Scenario 1:

The tissue will fly out of the feedneck this means that they marker has blowback. Which means the barrel still has pressure in it when it moves forward to let the next ball drop. This happens when there is to much tension on the retaining ring. Move the retaining ring towards the tip of the barrel slightly and try again.

Scenario 2:

 The tissue falls into the breach and because the pressure has been released before the barrel opens.

To properly set it increase the spring tension until blowback begins to occur. Then slowly move it towards the tip of the barrel until blowback no longer occurs.

You can also increase the speed of the barrel slightly by replacing the oring at the back of the barrel with one that is slightly smaller in diameter so it doesn’t rub the breach. It only acts as a bumper. You may need to use 2 orings instead.