

# X-Valve Level 10 Installation and First Time Set-up

Please refer to the LVL 10 parts diagram below.

Thank you for your purchase of Airgun Designs LEVEL 10 Bolt System. The Level 10 is specifically designed to work with your AGD branded valves to help eliminate and control ball breakage from breach pinched paintballs. The patented designs work exclusively with your AGD valve to slow and stop the bolt in the event of breach block or pinched ball. The system will not eliminate ball breakage in your breach but should significantly decrease if not eliminate all breakage if adjusted properly and quality paintballs are being used. No device can prevent ball breakage if you choose to use inferior paintballs or the device is installed improperly. AGD makes no guarantee that this modification will work better or worse with any specific brand, quality or price of paintball.

These instructions will familiarize you with the level 10 bolt set-up and allow you to set it up on any variation of the Automag valve. Including the RT Classic valve, Emag Valve, RT pro's valves and Classic Valves.

NOTE: Make sure your current gun configuration is shooting with the Level 7 bolt. You should not use an upgrade to "fix" your gun. Make sure the gun is functioning properly prior to installing this upgrade. The level 10 upgrade may create more issues if your gun is not firing properly prior to installation.

## Terms you need to be familiar with:

**Powertube:** This is the stainless-steel shaft that the bolt slides along with the brass tip.

**Powertube Tip:** (part #2012 – Diagram #7) This is the brass tip on the end of the powertube. It is threaded on. Level 7's can be removed with a coin or the edge of the spring. On a level 10 powertube the tip is fitted for a 3/8 wrench to loosen and tighten. The powertube tip is fitted with a urethane oring (part #781 – Diagram #6) to make sure it stays tight. Use of the wrong size oring or material can cause the tip to loosen while shooting and cause serious damage. Use of any other oring or material is not recommended.

**Level 10 Shims:** (part #1695 – Diagram #5) Small thin stainless washers used to shim the powertube tip. These measure .010 and should not be confused with ULT shims.

**Carriers:** (Carriers have a different part# for each size - Diagram #4) Carriers are circular brass rings that hold the **LVL 10 Powertube**

**Orings:** (part #844 – Diagram #2). Powertube Orings seal the bolt stem when the gun is aired up and at rest. Carriers have a thin oring

**Carrier OD Oring** (part #2000 - Diagram #3) around them to help seal and hold them in the powertube.

**Backing Washer:** (part# 1694 – Diagram #1) This drops in the bottom of the powertube and keeps the carrier oring from falling into the air chamber.

**Bolt:** (part #2011 – Diagram #8) Core component of the system, the main firing bolt. Chambers paintball and carries the air charge to the ball. The special bolt stem core is critical to the level 10 bolt operation.

**Bolt Spring:** (part #798 Gold, #2005 Red) Controls the return of the bolt and a significant factor in bolt speed and controlling ball breakage.

**1. Remove the level 7 bolt, spring, powertube tip, spacer and oring** from the current powertube configuration. You can continue to use your existing bumper. You are basically gutting all the old parts. Keep them together in a safe place to use for testing in the future. The level 7 can be re-installed later to test if your level 10 parts are causing an issue on your gun.

**2. Install backing washer** - First place the white disc backing washer (1) into the bottom of the power tube. Make sure it's sitting flat on the bottom. It's made from delrin and should go in a little tight and stay there. This washer prevents the new smaller o-ring from getting pushed into the air chamber.

**3. O-ring inside carrier** - Pickup one of the brass o-ring carriers (4) and push a power tube o-ring (2) into the end that does not have a tapered hole. It should not go in one side and either slide in or press into the correct side. There are 6 carriers supplied with your kit, each one is a little bigger than the next. They each have a special oriented set of dots and small grooves on the outside to help you tell them apart. We have a diagram to help you determine the size. Without the diagram it will be evident as to which carrier is smaller or bigger by how tight it fits onto the bolt stem with the oring installed.

### **4. Tune the carrier to the bolt and o-ring**

Each batch of orings is different. Over the years we've created 11 carrier sizes to compensate for the difference that occurs in one oring. In order to compensate for this difference, we need to find the proper size carrier. The idea is to get a good seal with as little friction as possible. Take the carrier with the o-ring installed and push it o-ring first onto the bolt stem sticking out of the bottom of the bolt. If it pushes on too hard then go to a larger carrier, if it slides freely then use a smaller carrier. The proper fit should be just snug. A simple test is that the oring tightness should support the weight of the valve. Once you have the carrier installed and the tip back on, simply slide the bolt back onto the valve assembly and hold the entire assembly by the bolt. The friction should hold the valve assembly from sliding off the bolt. If the bolt just falls right off the powertube you'll probably need a tighter carrier. NOTE: Finding the proper size is about changing the carrier NOT THE ORING! This is a common mistake. Customers keep changing the oring at the same time they change the carrier, thus defeating the entire purpose of sizing the oring to the proper carrier. If you reach the smallest carrier and cannot get a seal on your bolt, then it is time to use another oring and throw that one out.

### **5. Install the o-ring carrier**

Lightly lubricate the black o-ring (3) on the outside of the carrier. Push the carrier, o-ring first, into the power tube. Use the blunt end of a plastic pen or a small wooden dowel to fully seat the carrier into the bottom of the power tube. When looking down into the power tube you should NOT see the white power tube oring (2). Use of metal tools like a screwdriver to do this job will certainly cause damage to your parts. Please use wood or plastic tools for this job.

### **6. Install the power tube tip**

Next install the new power tube tip (7) it should already have the power tube tip o-ring installed from the factory (6). These new tips have wrench flats to tighten the tips. DO NOT OVERTIGHTEN!! Notice that we did NOT put in the shims (5) at this time.

## 7. Test the o-ring carrier

Now slide on your new LVL 10 bolt with a new GOLD spring then reassemble the valve into the marker. Gas the marker up as see if it leaks down the barrel. If it does leak use your finger or a squeegee to push the front face of the bolt around while its leaking. If the leak changes tone then it's most likely the wrong oring carrier (4). You'll have to install the next smaller carrier size and try again. If the marker is not leaking then you have the right carrier and can proceed to the next step.

## 8. Shim adjustments

NOTE: Testing for this is done with a plastic squeegee or a wooden dowel. Be careful to hold these items tightly when testing so they do not shoot out of your gun and hurt yourself or someone else in the room.

Put a squeegee right in front of the bolt and pull the trigger. With very little clearance between the bolt and squeegee you will notice that the bolt comes forward and just stops on the squeegee. Then nothing else happens. Pulling the trigger does nothing to reset the bolt. In order to get the bolt to reset when it pinches a ball, we have to let the air out of the air chamber. The shims (5) control where in the forward stroke the air chamber starts venting. Its works a lot like the spacers in the original Mags. We left them out before so you could tell the difference between a carrier leak and a shim leak. Remove the power tube tip (7) and drop in two shims (5). Make SURE they are sitting flat in the bottom of the power tube before you screw the power tube tip on otherwise you will bend them up. Bent shims are useless and you will have to buy more. Reassemble the valve system as before. Now when you air up the marker it should not leak but when you do the squeegee test you will notice that the air starts venting when the bolt moves forward. If you keep adding shims eventually the bolt will just leak all the time. For most people two shims work just fine. If you find that occasionally the gun will "bolt stick" (not move anymore and has to be reset manually) randomly or when you pinch a ball the marker locks up and does not reset then add another shim. An additional shim should fix a "bolt stick" issue.

## 9. Main spring tuning

There are two schools of thought when choosing which spring to use. Some people (old school) prefer to Max out the guns level 10 potential and use the heavy red spring while the more common school of thought is to remain more efficient and use the GOLD spring at the expense of some potential breakage. The Gold spring will move the bolt forward with less force than usual but it may still have enough force to chop a ball depending on the paint, weather and other factors. The pin in the middle of the bolt is called the Power Piston, it acts like a cork to seal the air chamber. Just like a cork, it's being pushed out by the air pressure but the sear holds it back. When you fire the marker, the bolt is getting pushed out by the air chamber pressure but the mainspring is pushing BACK against the bolt at the same time. The level 10 modification reduces the size of the "cork" so the main spring has an easier time holding it back. If you put a big enough main spring on the bolt, it will not fire at all. The Gold spring typically provides enough ball breakage protection with today's paintballs. The Gold spring will also require much less air consumption and work with lower velocities versus a heavier spring. In most set-ups and situations, we recommend using the Gold spring. Using the heavier Red spring will slow the bolt down and create a stronger "Anti- chop" effect. This is at the expense of having to turn the gun up higher and use more air to combat the heavier spring strength. You may have to completely re-adjust your level 10 assembly to use the Red spring. In some instances, you may not be able to turn the gun up enough to use the Red spring. Your gun may vent before it is capable of firing. In this case just use the Gold spring.

## 10. Fine tuning

For most people the basic setup outlined above will make every paintball day a great experience. For those looking to get maximum anti chop with fragile tourney paint we offer the following suggestions. The o-ring friction can be used to additionally slow the bolt down. By going to the next smaller carrier, you add an additional layer of protection at the expense of risking bolt stick. You must keep your powertube oiled daily to keep it working reliably. The best performance comes when the marker just starts firing at 270 fps and works reliably at 290 fps. The penalty for over tuning is the fact that the marker may occasionally refuse to fire. This is because the main spring combined with the power tube oring has too much friction and grab to let the bolt go forward. Try at your own risk.

That's it! Your new Level 10 marker is ready to go!!



## AGD Level 10 Parts

### Parts List

1. Backing washer #001694
2. Power tube o-ring#000844
3. Carrier o-ring #002000
4. Carrier Various
5. Shims#001695
6. Power tube o-ring#00781
7. Power tube tip #002012
- 8 Superbolt #002011
9. Main spring #000796, #002005

