AUTOCOCKER TORNADO® (Pat # 5791328) Replacement Valve

INSTALLATION INSTRUCTIONS V2.6, Aug 2006. Supersedes all previous instructions.

1. Remove all air sources. Remove all paint.
2. Dissemble the marker until you can take out the valve.
3. Using a valve removal tool, remove the old valve. Place the new o-ring on the new valve body. It should seat into the small grove on the o-ring seat. Lightly oil the o-ring with Extreme-Lube.
4. Place an AKA valve spring (or yellow Nelson) on the back of the cup seal. DO NOT CLIP THE SPRING.
5. Place the valve in the marker with a valve removal tool with the exhaust port UP and the setscrew chamfer showing in the setscrew hole. Using the new setscrew that came with the valve, place setscrew in the marker body and gently tighten down. Now, alternately tighten the jam nut and set screw until both are tight. Do not over-tighten. This alternating tightening action will help keep the valve body straight inside the bore. Now re-assemble the hammer with an AKA hammer spring (or Yellow Nelson equivalent). DO NOT CLIP THE SPRING ENDS. You may need to re-time the trigger once the marker is re-assembled. The timing for a low-pressure marker should be a little more conservative than most high-pressure markers.
6. Pull back the hammer and put air to the marker. For most markers the valve should seal right away. There may be a few valves where you have to fire the marker with air leaking out of it a little before the valve cup seal will seal. If the valve doesn't seal see TROUBLE SHOOTING.

   After the valve seals, it is time to adjust the velocity. Adjust your spring adjuster all the way out to the lowest spring tension setting possible and leave it. To adjust the velocity, first check the air pressure settings based on what type of air system you have. Then follow velocity adjustment instructions.

7. You need to shoot paintballs, not dry-fire the marker, to get the correct efficiency reading.

SETTING YOUR AIR PRESSURE:

1. <u>Double regulated air systems:</u> (Using two regulators: the tank regulator and a second regulator on the marker)

   (It is a good idea to always double regulate as it helps prevent damaging spikes.)

   Set your main tank regulator output at about 800-900 psi. Then set your second regulator at 100 psi and adjust the velocity by adjusting your second regulator input into the marker as specified in the Velocity Adjustment section of these instructions.

2. Single regulated air system: (straight from the nitrogen tank regulator)

Set the regulator at 100 psi output and adjust the regulator output to adjust velocity. (If your regulator has a slow response time, you may want to install and expansion chamber or a gas-through grip to store up a greater volume of regulated gas.)

3. CO2 users:

If you are using CO2 and a regulator, follow the double regulated air system since you already have your main tank pressure preset for you. CO2 will work just as well as nitrogen, if set up correctly. You should use an anti-siphon tube in the CO2 tank (or run a remote) to keep liquid nitrogen out of the marker.

4. Unregulated CO2: USE A REGULATOR, PLEASE.

The Tornado valve was designed for pressures under 400 psi. Failure to use a regulator will damage the seal and void your warranty.

VELOCITY ADJUSTMENT:

With the pressure regulator adjustment screw backed out or set a 100 psi, slowly start raising the pressure into the marker until the velocity raises to the desired fps. Then, to lower the velocity, turn down the pressure. Input pressure into the marker will range from 150 psi to 300 psi depending on your marker and the type regulator you are using.

AIR EFFICIENCY: With everything set up correctly, you should achieve shot counts similar to these.

1100-1300 from a 68 cu 3000 psi tank
2200-2500 from a 114 cu 3000 psi tank
2000-2200 from a 68 cu 4500 psi tank
2000+ from a 20 oz CO2 tank

TROUBLE SHOOTING:

Valve leaks are rare, but since the cup seal material is so hard and the pressure is so low, you may need to install the valve and then let the marker sit overnight with an unregulated bottle of CO2 on it to seal the cup seal. If your marker sits for more than a month without being used, the groove that was formed in the cup seal may go away. Then the cup seal will have to re-seated again. If this procedure does not stop the leak, call AKA at 317-631-7200 for a replacement valve.

If the valve leaks after successful play for a period of time, you probably have gotten some debris in between the valve sealing surface and the cup seal. This will damage

both surfaces. The valve is warranted for life, so send the entire valve body and stem back to AKA for replacement.

Low velocity can have several causes usually due to differences in manufacturing tolerances on springs and other components. First, turn in the spring velocity adjuster one or two turns and then reset pressures. Second, check o-rings on the bolt for a good seal to the bore of the marker. Third, use a tight bore barrel. Fourth, check the timing of the marker. If problems persist, contact an airsmith.

These items may also affect air efficiency and velocity:

Bad paint
Inline filters
Micro airline
Regulators that don't have high enough air flow capacity
Some venture bolts
Pro-Connect and others like it
Older FX bodies
Large bore barrels