

## SPYDER TORNADO® ( Pat 5791328) Replacement Valve

Installations instructions V 1.4, Aug 2006, Supersedes all previous instructions.

**WARNING:** The Tornado valve was designed for the early full-sized Classic Spydres. If you have a newer “compact” Spyder with a straight-through bore there is probably not enough standing air capacity to re-cock the valve resulting in sputtering or lack of velocity.

1. Remove all air sources connected to the marker. Remove all paint.
2. Disassemble the marker until you can take out the valve. If you are not familiar with disassembling the Spyder, please allow an airsmith to do the work. While the Spyder is apart, remove all air filters that are located in the air hoses and the vertical mounts. If you have an aftermarket vertical mount, please read the vertical mount information in these instructions.
3. Remove the old valve. Lightly oil o-rings and install the new valve body in the Spyder body. Install the new setscrew that came with the Tornado valve, replacing the brass screw. Gently tighten the screw but don't over tighten.
4. Take the original valve spring off of the old stem and cupseal. Do not remove the cupseal guide. **DO NOT CLIP THE VALVE OR HAMMER SPRING.** Install the spring onto the new stem. Do not install the cupseal guide. The Tornado valve does not need it.
5. Install the stem, cupseal and spring into the Reservoir plug or the AKA Spyder Mitey-Max®. Re-install the grip frame now. Recock the hammer into the firing position. Screw the Reservoir Plug or Spyder Mitey-Max® into the front of the Spyder. When using the stock reservoir plug, screw it in until the plug is flush with the Spyder body.
6. Attach your regulator to the ASA, vertical mount or air hose. With the stock velocity adjuster, either take the velocity screw out of the adjuster or turn the adjuster screw out until it does not put any tension on the hammer spring. For indoor play, where velocities are lower than 260 fps, remove the adjuster screw until needed for outdoor play.
7. Set the pressure regulator at 250 psi. Connect air to the Spyder. If you have not already done so, adjust the stock velocity adjuster screw so the head is flush with the back of the adjuster endcap or backed all the way out. To adjust the velocity first check the air pressure settings

based on what type of air system you have. Then, follow velocity adjustment instructions.

8. **RECOMMENDATIONS:** If you play outside and the field velocity is 280 and up, set the pressure regulator to 300 psi. Then, with the velocity adjuster backed all the way out check your marker over a chrono. Then adjust the velocity screw in to raise the velocity.

#### SETTING YOUR AIR PRESSURE:

1. Double regulated air systems –(Using two regulators, the tank regulator and a second regulator on the marker.)

Set your main tank regulator output at about 800-900 psi to mimic the output pressure of a CO2 tank. Then, set your second regulator at 250 psi and adjust the velocity by adjusting your second regulator into the marker.

2. Single regulated air systems – (Using only the nitrogen tank regulator or a regulator on the marker with air supplied by a CO2 tank.)

Set the regulator at 250 psi output and adjust the regulator output to adjust velocity. If your regulator has a slow response time, you may want to install an expansion chamber or a gas through grip to store up a greater volume of regulated gas.

3. CO2 users (Best gas to use on Spydors.)

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. Use a 20 oz anti-siphon tank that runs into a bottomline Stabilizer and then runs into a vertical regulator. With this setup you shouldn't experience any freezing of the marker or velocity drop off.

4. Unregulated CO2 users - **USE A REGULATOR PLEASE!** This valve was designed to be used at pressures lower than 400 psi. Running pressures above 400 psi will damage the cupseal and void your warranty.

## VELOCITY ADJUSTMENT:

With the pressure regulator adjustment screw backed out or set at 250 psi, slowly start raising the pressure into the marker until the velocity raises to 280 fps. Then, to lower the velocity, turn down the pressure so there is less pressure pushing the paintball. Now, with the velocity set at 280 fps, use the velocity adjuster to fine-tune the velocity up to 295 fps.

Another method is to have the velocity adjuster screw-head flush with the stock adjuster and then adjust the incoming air pressure up to the desired velocity. When playing where velocity is lower than 250 fps, you will need to use a large bore barrel on the marker to get the velocity to drop lower than 250 fps.

## EFFICIENCY:

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

## VERTICAL MOUNTS:

If you have had the air hose replaced with a vertical mount, it is a good idea to have an airsmith drill out the air passage hole to .187-.203 for more air flow.

## VELOCITY FLUCTUATIONS:

May be caused by:

Micro airline

Regulators that do not have a high enough air flow capacity

Some venture bolts

Pro-Connect & others like it

Large bore barrels

Low airflow vertical mounts