The **TORNADO®** (Pat. 5791328) SPYDER

Replacement Valve

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WE RECOMMEND THAT YOU CONSULT A QUALIFIED AIRSMITH FOR INSTALLATION.

THANK YOU for purchasing the most gas-efficient low pressure valve currently available for the Spyder!

History: (See our web page for history on the Tornado (Pat # 5791328) (TM) valve, and versions for other paintball markers.)

INSTALLATION INSTRUCTIONS V1.3, OCT 99. SUPERSEDES ALL PREVIOUS INSTRUCTIONS.

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 which 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. Install the new valve body in the Spyder body. Install the new set screw that came with the Tornado (Pat # 5791328) (TM) 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 (Pat # 5791328) (TM) valve doesn't need it.

5. Install the stem, cupseal and spring into the Reservoir plug or the AKALMP Spyder Mitey-max (TM). Re-install the grip frame now. Recock the hammer into the firing position. Screw the Reservoir Plug or Spyder Mitey-max (TM) 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 won't 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. The Spyder Tornado (Pat #5791328)(TM) is based off of the Autococker Tornado (Pat # 5791328) (TM) valve which is a hybrid of two valve ideas, one is a spring controlled valve and the other is a pressure controlled valve. If you haven't 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.

Recommendations: If you play outside and the field velocity is 280 and up, go ahead and set the pressure regulator to 300 psi. Then, with the velocity adjuster backed all the way out, see what your marker chronos at. Then adjust the velocity screw in to raise the velocity.

AIR PRESSURE SETTINGS ARE BASED ON YOUR AIR SYSTEM SET-UP - FOR LOW PRESSURE.

A. Double regulated air system (ie., Using two regulators, the tank regulator and a second regulator on the marker.)

*** OLDER NITROGEN SYSTEMS SHOULD BE DOUBLE REGULATED, though it is a good idea to double regulate the new systems, also.***

Set your main tank regulator output at about 800 to 900 psi. to mimic the output pressure of a CO_2 tank. Then, set your second regulator at 250 psi and adjust the velocity by adjusting your second regulator into the marker.

B. Single regulated air system (i.e., straight from the nitrogen tank regulator or a regulator on the marker with air supplied by a CO_2 tank.)

OLDER NITROGEN SYSTEMS SHOULD BE DOUBLE REGULATED, though it is a good idea to double regulate the new systems, also.

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.)

C. CO_2 users (best gas to use on the Spyder)
If you are using CO_2 and a regulator, follow the double regulated air system since you already have your main tank pressure preset for you. CO_2 will work just as well as nitrogen if set up correctly. My personal setup starts with a 20 oz anti-siphon tank that runs into a bottomline stabilizer and then runs into a Bud Orr In-line Reg with the AKALMP external adjuster cap. With this setup you shouldn't experience any freezing of the marker or velocity drop off. If you can't, or don't want to, invest in nitrogen, this method is a good way to go.

D. Unregulated CO_2 users - USE A REGULATOR PLEASE! This valve was not designed to be used at pressures above 400 psi. Running pressures above 400 psi will damage the cupseal and void your warrantee. See the list of best reported setups for regulator information.

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. This method puts a low pressure push on the ball which creates less distortion on the paintball & gives better range & accuracy. Now, with the velocity set at 280 fps by adjusting the air pressure, use the velocity adjuster to fine-tune the velocity up to 295 fps. Another way 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 you will have to put a large bore barrel on the marker to get the velocity to drop lower than 250 fps.

YOU NEED TO SHOOT PAINTBALLS, NOT DRY-FIRE THE MARKER, TO GET THE CORRECT EFFICIENCY READING. The velocity should vary approximately +/-10 fps during use when first installed and then settle in closer as you use the valve and also depending on what type of regulator you are using.

BEST REPORTED SETUPS:
In order of performance preference
/=all in one category
,=next category

Nitrogen/Air - Use CO_2 or Nitrogen/Compressed air (CO_2 works best on the Spyder.)

Secondary regs - Vigilante by Air America, Palmer Stabilizer/Bud Orr In-line Reg with AKALMP External Adjuster Cap, Uniregs

Bolts - AKALMP Lightning (TM) bolt. If you want to use the AKALMP Beavertail/Cocking Rod, make sure the back of the bolt is tapped to 10-32.

Barrel - Javelin(TM)/Lapco or a 14" with a .687 bore or smaller.

AKALMP Mitey-Max(Pat pend)(TM) Air Reservoir - Best used on all Spyders, also available for the compact Spyders and TL's

Springs - Stock Springs from the Spyder, do not cut them.

Inlet pressures into the marker - will range depending on velocity but at 300 fps the psi range should be about 280 psi to 300 psi. This also depends on marker setup, what type regulator you are using, and the paint used - 300 psi for a standard Sypder with the Mitey-max and valve; 350 psi for a Spyder compact with the Mitey-max compact and the valve.

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 in it to .187 to .203 for more air flow. This procedure is best done on a lathe. The best verticals to use are the Benchmark or the Lapco.

TROUBLE SHOOTING:
If the marker wants to sputter when fired, and the bolt won't recock all the way, check to see if the o-rings on the bolt are too tight to the bore. The bolt should be able to fall through the marker by itself. If it doesn't, change the o-rings. The pressure settings may be wrong, also.

THESE MAY PREVENT ATTAINING MAXIMUM EFFICIENCY AND CAUSE LARGE VELOCITY FLUCTUATIONS:

Micro airline
Regulators that don't have high enough air flow capacity
Some venturi bolts
Pro-Connect & others like it
Large bore barrels
Low air flow vertical mounts

FACTORY AUTHORIZED AIRSMITHS: SEE OUR WEB PAGE AT AKALMP.COM