

# OPERATION AND SAFETY MANUAL

## jetZILLA Model SPO-100 Sport Throttle



( NOTE: Parts may vary slightly from this illustration)

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## **--- READ THIS NOTICE ---**

**BY PURCHASING THIS PRODUCT, YOU ARE ACKNOWLEDGING THAT YOU UNDERSTAND THAT JET ENGINE EXPERIMENTATION IS INHERENTLY DANGEROUS TO LIFE, HEALTH AND PROPERTY - ALWAYS OBSERVE THESE PRECAUTIONS:**

- 1. HEARING PROTECTION MUST BE IN PLACE** for yourself and all persons in the immediate area; **NEVER** try to work without hearing protection, even for brief test runs
- 2. NEVER TRY TO START OR RUN** an engine in close proximity to pets or other animals
- 3. FIRMLY SECURE YOUR ENGINE** to a heavy base or nonflammable structure before running
- 4. HOT METALLIC SPARKS** can be occasionally thrown from the tailpipe or intake of ANY hobby jet engine - **NEVER** run with dry grass, brush or flammable materials or structures downwind
- 5. NEVER LOOK** directly into the exhaust or intake pipes of a running jet engine without eye (or, preferably, full face) protection
- 6. NEVER RUN YOUR ENGINE INDOORS** in enclosed spaces or in any space of flammable construction or containing flammable materials
- 7. NEVER TRY TO START OR RUN** a hobby jet engine under gusty or windy conditions - in the case of **LIGHT** wind, set up the engine so it will be firing downwind
- 8. KEEP FUEL HOSES AWAY** from hot engine surfaces - at least 8 inches from small engines and at least 16 inches from larger ones; use metal tubing as fuel pipe extensions if necessary to adequately isolate fuel hose from red hot metal surfaces
- 9. SHUT OFF FUEL FLOW IMMEDIATELY** if there is any emergency **OR** if you sense a dangerous situation developing around your engine
- 10. DO NOT TOUCH YOUR ENGINE** during a run or too soon after running - even a small pulsejet can take several minutes to cool down sufficiently to allow safe handling
- 11. USING NON-OPD EQUIPPED CYLINDERS:** On all but the smallest engines, you will need to use a fuel cylinder that is **NOT** equipped with an OPD (Overfill Protection Device) - this type of cylinder must be refilled **ONLY** by qualified personnel using equipment that weighs the cylinder as it is being filled. **DANGER:** An overfilled cylinder can explode with **DEADLY** force after it warms just a few degrees after filling!

**FAILURE TO OBSERVE THESE PRECAUTIONS CONSTITUTES CIRCUMSTANCES BEYOND OUR CONTROL. BY PURCHASING AND USING THIS PRODUCT, YOU ARE ACCEPTING ALL RISK AND YOU ARE AGREEING TO HOLD THE DESIGNER AND COTTRILL CYCLODYNE CORPORATION COMPLETELY HARMLESS IN REGARD TO ANY DAMAGES YOU INCUR, WITHOUT LIMITATION.**

## jetZILLA SPORT THROTTLE PRODUCT DESCRIPTION

- The jetZILLA Sport Throttle is designed especially for throttle control of vapor fueled hobby jet engines. It basically consists of a brass body ball valve containing a polished stainless steel ball connected to an aircraft style throttle knob and lever for smooth, easy adjustment
- Internal construction of the Sport Throttle assures that it will stay at the exact setting where you position it - NO throttle creep, ever!
- US standard 1/2-inch female NPT outlet makes it easy to add any fittings you need to connect hose or tubing for fuel delivery to your engine
- Long throttle lever and comfortable vinyl palm grip for easy, precise flow setting
- Throttle lever has 90 degree maximum rotation - OFF position provides for INSTANT fuel shutoff in case of emergency
- Standard left hand thread fuel barb fits standard propane (and other) fuel valves
- 3/8 inch bore and absence of filters or other restrictions provide maximum fuel flow in the fully open position

## PRODUCT LIMITATIONS

- The Sport Throttle contains a stainless ball running against plastic seals - it should be protected from high heat (especially the heat of your pulsejet!).
- The valve action is non-linear - it will be highly sensitive when slightly opened and much less sensitive when over halfway open. While this takes some getting used to, it is not a defect - it is simply a physical property of this type of valve.
- The Sport Throttle is designed for ordinary vapor fuels only (e.g. propane, butane, natural gas). DO NOT use for high-energy gases such as acetylene. DO NOT use for liquid fuels.
- Because the Sport Throttle is adequately sized for fairly large hobby pulsejet engines, it can be touchy to adjust when running very small engines. This difficulty can be alleviated by (a) using restricting fittings and a small ID fuel hose from the valve to the engine; and/or (b) limiting how far the cylinder valve itself is opened.
- All propane cylinders drop in temperature and vapor pressure (and therefore, gas flow) during use. The Sport Throttle is not a pressure regulator, and cannot automatically compensate for this normal physical property.

## BASIC SETUP

**NOTE:** The fuel barb nut is US standard for fuel gases - i.e. a LEFT HAND thread.

- Make sure the Sport Throttle lever is in the full OFF position
- Insert the fuel barb into the threaded socket of the fuel cylinder valve until the rounded end of the barb rests against the conical seat
- Thread the barb nut into the fuel cylinder valve as far as it will go - it will spin EASILY all the way when the barb is held correctly centered. Remember, this is a LEFT HAND thread.
- Hold the Sport Throttle with the throttle lever toward the top as you tighten the barb nut securely, using a cylinder wrench or a large adjustable wrench
- Make sure the connection is tight - the Sport Throttle valve body should be absolutely rigid in relation to the cylinder valve!
- Once again, make sure the throttle lever is in the full OFF position - i.e. positioned fully toward the cylinder valve

## **FINAL SETUP FOR SMALL PULSEJET ENGINES**

- Add the necessary fittings to the output side of your Sport Throttle to fit the fuel hose you're using (the output side of the throttle valve body is 1/2-inch female pipe thread) - for a small hobby engine, I suggest stepping down to 1/8-inch fittings at the Sport Throttle outlet to provide restriction, even if the fuel hose/tubing is somewhat larger
- Attach your fuel delivery hose or tubing (1/4 inch or smaller suggested) and double check that all fittings from cylinder valve to engine are securely tightened
- Make sure the Sport Throttle lever remains in the full OFF position while you set up your ignition system, starting air, etc.

## **FIRST RUN FOR SMALL PULSEJET ENGINES**

- With the cylinder valve still closed, open the Sport Throttle to about its halfway point
- GET YOUR HEARING PROTECTION FIRMLY IN PLACE!
- Start your ignition system
- Use your starting air while GRADUALLY opening the cylinder valve
- Once your engine is running, shut off the ignition system
- Slowly open the cylinder valve for maximum power (or to engine flameout)
- Use your Sport Throttle to immediately shut OFF fuel flow
- Now, slowly close the cylinder valve, NOTING the exact number of turns (or fraction of a turn) that it was opened
- In future runs, leave the Sport Throttle OFF and open the cylinder valve TO THE EXACT SETTING NOTED, then slowly open the Sport Throttle to start and operate your engine; as the cylinder pressure drops off, you can gradually open the cylinder valve further to compensate and maintain power

## **FINAL SETUP FOR LARGER PULSEJET ENGINES**

- Add the necessary fittings to the output side of your Sport Throttle to fit the fuel hose you're using (the output side of the throttle valve body is 1/2-inch female pipe thread)
- Attach your fuel delivery hose or tubing (3/8 or 1/2 inch or suggested) and double check that all fittings from cylinder valve to engine are securely tightened
- Make sure the Sport Throttle lever remains in the full OFF position while you set up your ignition system, starting air, etc.

## **RUNNING LARGER PULSEJET ENGINES**

- With the Sport Throttle valve still closed, FULLY open the cylinder valve
- GET YOUR HEARING PROTECTION FIRMLY IN PLACE!
- Start your ignition system
- Use your starting air while GRADUALLY opening the Sport Throttle
- Once your engine is running, shut off the ignition system
- Slowly open the Sport Throttle for maximum power (or to flameout), NOTING the throttle lever position
- Use your Sport Throttle to immediately shut OFF fuel flow
- Start again and slowly open the Sport Throttle to start and operate your engine; the noted position will be the upper limit at first, but as the cylinder pressure drops off, you can gradually open the Sport Throttle further to compensate and maintain power

Record your date of purchase here: \_\_\_\_\_

## **LIMITED WARRANTY**

**COTTRILL CYCLODYNE CORPORATION** will, at its discretion, repair or replace this product if found to be defective in materials or workmanship within **ONE YEAR** from the date of purchase. This warranty specifically excludes plastic parts which, **IN OUR OPINION**, have been damaged by exposure to flame or excessive heat. **THERE IS NO OTHER EXPRESS OR IMPLIED WARRANTY**, including fitness for any particular purpose.

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