



# VENOM .049

The Venom is Cox's answer to the demanding requirements of 1/2A racing. Designed to meet the needs of the Mouse Racing event, the Venom has all the modifications used by top fliers and a few they can't duplicate.

Starting at the front, the features are a zero drag starter spring system, a stronger crankshaft that is fitted to the crankcase with the correct racing clearance. The piston is light-weight, and the cylinder has extra boost ports and an open exhaust with sub-piston induction; both are taper fitted for maximum performance. To top it all off, there is the high compression head with extra gaskets to allow tuning the engine for weather and nitromethane content.

The other engine features are a large metal fuel tank with inverted flight capability for stunt or combat flying, sturdy radial mounting, and rear needle valve location for safe, easy adjustment.

### Notes:

A. Due to the unusual level of performance achieved with the Venom engines, cleanliness is of the utmost importance. Dirt on or around the engine or its intake will surely degrade the performance in JUST ONE RUN! Similarly, lean running will distort the fit enough to degrade performance very rapidly. Keep your Venom clean and never over-lean, and the engine will run great for many hours.

B. The fuel pick-up tube inside the tank is positioned (at factory) for control-line flying. For free-flight or radio control use, the tank must be removed from the engine and the end of the pick-up tube repositioned at the bottom of the tank. If this tube is located in the wrong position, all the fuel will not be used up and the engine runs will be too short.

C. As with any small engine, the fuel should be filtered as it is put in the tank.

D. Using fuel with less than 10% Castor oil, and less than 20% total oil content will void warranty. For safety sake, use Cox Super Power fuel for break-in, and Racing Fuel for competition. Both fuels use a pure 20% Castor oil mix. Note that for any engine, you can always increase the nitromethane content of the fuel used, but the engine will not run well if you go back to lower nitro content later.

E. Every engine has structural limitations. It is recommended that the prop selection for the Venom engine be limited to a maximum of 22,000 RPM on the ground to achieve acceptable life.

F. Cox engines are fitted so that minimum time is required for break-in, but it is still necessary for maximum performance and life. Lapping procedures are not the same as breaking-in, and use of any abrasives or other modifications will void the warranty for your engine. There is NO substitute for correct break-in running.

### Preparation for Running:

1. Mount the engine in a model or on a solid board. #2x1/2" self-tap screws into at least 3/16" thick aircraft grade plywood are recommended. Never hold the engine in your hand or a vice.
2. Obtain a 1-1/2 volt Cox dry cell battery or equivalent. Never use a higher voltage battery or the glow head may burn out. Connect the glow head clip wires as shown in figure 1A

TROUBLE SHOOTING CHART	
TROUBLE	REMEDY
Poor battery connection	Check connections of wires to battery and check to be sure clip is firmly and correctly attached to glow head.
Weak or dead battery	A good battery should test 1-1/2 volts. Connect battery to a good glow head or flashlight bulb. If glow head coil or bulb does not glow bright - replace battery.
WILL NOT START- ACTS LIKE BATTERY WASN'T ATTACHED TO GLOW HEAD	Remove glow head. Attach glow head to a good 1-1/2 volt battery. If glow head filament does not glow bright orange - replace glow head.
Glow head loose	Tighten glow head with wrench
Engine wasn't primed	Squirt a few drops of fuel through exhaust ports and onto side of piston then continue with starting procedure.
Dirt under reed valve	Remove tank. Wash reed and retainer in solvent or fuel.
Engine flooded, too much fuel in cylinder. Makes a sizzling sound.	Close needle valve 1 full turn and start again (without priming). 4 or 5 starts may be required to clear engine.
Loose propeller screw	Tighten propeller screw
Dirt under reed valve	Remove tank. Wash reed and retainer in solvent or fuel.
ENGINE STOPS- ENGINE FLIPS, TURNS HARD OR WIGGLES	Close needle completely. Leave battery attached and flip propeller (without priming) until short starting burst occurs. Then open reed valve 3-1/2 turns, and start again.
ENGINE STARTS THEN SLOWS DOWN AND STOPS	Close needle valve. Flip propeller until engine starts and burns out excess fuel. Open needle and restart. See instructions
SHORT RUNNING- BURST (BRIEF START, THEN STOP)	Check tank fuel level - refill if necessary; or, open needle valve another 1/2 turn, prime and start again. It may be necessary to repeat this procedure 3 or 4 times, opening the needle valve 1/2 turn each time.
ROUGH SOUNDING ENGINE, SLUGGISH WHEE POWER	Tighten glow head with wrench Readjust needle valve

Use only Cox model fuel - NEVER USE GASOLINE! Gasoline can explode and burn, causing serious injury to YOU AND OTHERS.

Cox model fuel works only because it is FLAMMABLE - it burns with an almost invisible flame, it can burn you if not used with common sense - be careful and follow these rules:

- NEVER FUEL OR PRIME WITH BATTERY CONNECTED TO ENGINE.
- WIPE EXCESS FUEL FROM MODEL WITH CLOTH AFTER EACH FUELING OR PRIMING.
- DO NOT OPERATE ENGINE INDOORS.
- DO NOT SMOKE WHEN FUELING OR OPERATING MODEL.

FOR QUESTIONS REGARDING YOUR COX PRODUCTS CALL THE COX COURTESY LINE TOLL FREE 800/451-0339  
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PART NO. 14000001-200



Cox Customer Service Department  
475 North Sheridan Street  
Corona, CA 91720-2004  
Open 8:00 AM until 4:30 PM Pacific Time  
Monday through Friday  
800/451-0339

### Preparation for Running (cont):

3. Select and install a well balanced propeller on the crankshaft for break-in. Tighten the propeller screw securely. For break-in running of the Venom, a Cox competition 5" dia x 3" pitch prop is recommended.

### Caution:

Never use a propeller which has been damaged with nicks, chips, cracks, or one which has been altered in any way except careful balancing. Unsafe propellers can break apart during operation of the engine and cause serious injury to you or others!

- Inspect propeller before each use, especially after a hard landing.
- Do not alter, modify, or customize your propeller.
- Only use propellers approved for use with your engine. Undersize propellers for smaller engines are not stress designed for the power output of the Venom. Oversize props will not seat right on the prop screw, and will over-stress the crankshaft.
- Do use a good quality commercial prop balancer, and follow it's directions to assure you have minimum vibration. Vibration will eventually destroy both your engine and your model. At the high RPM achieved by the Venom, vibration can be a serious problem.

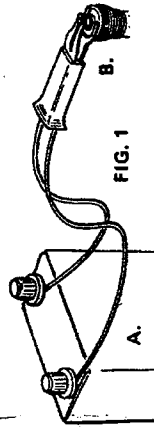


FIG. 1

### Starting Engine:

1. Close the needle valve by rotating it clockwise viewed from the top. It should be just snugly stopped. Do not twist hard.
2. Fill the fuel tank with Cox Super Power fuel.
3. Open the needle valve 3 turns.
4. Rotate the prop until the exhaust ports are just closed, and squirt a few drops of fuel on the outside of the piston. Rotate the prop through a couple of full turns to work the fuel into the engine.
5. Connect the glow clip to the glow head as shown in figure 1B.
6. Engage the starter spring and wind the prop backwards clockwise, viewed from the front) 1 full turn. Over winding the spring will distort it, and shorten its life. Release the prop, and the engine should fire. If it does not, try the start three or four times. If there is still no firing, repeat steps 4 and 6.

7. If engine fires, but only runs a short burst, it has probably not yet drawn fuel through the fuel hose. Repeat the starting procedure several times.
8. If engine still refuses to run more than a short burst, open the needle valve 1/2 turn. Further hints for starting may be found in the troubleshooting section.
9. When the engine starts it should be running rich (this is called four-cycle running). Let it run at this setting for 1 minute with the glow head battery attached. After the first minute of run, begin to screw the needle valve in until the engine starts to break into a faster run cycle (called two cycling), set the needle so that the engine is only "two cycling" part of the time, and remove the glow clip. Allow the engine to run out the rest of the tank this way.
10. During break-in allow the engine to cool down between runs, and slowly increasing the speed of running until the engine will hold peak RPM through a complete tank. This should occur after about 10 minutes of run. At that point, switch to the intended setup for the engine (see the section on tuning), and the intended prop and fuel for long term use. Run at least 5 more minutes, again starting somewhat rich and working up to peak RPM.

**Engine Tuning:**

The Venom is set up at the factory with a high compression head and four head gaskets. The extra gaskets let you tune your Venom to work with larger or small props, and high or low nitro content fuels.

Basically, for small props in the 5" x 3" or smaller region, use only one or two head gaskets depending on the nitro content and weather. For 6" x 3" or larger props, use two or more head gaskets.

The compression ratio of the engine is set by the use of the head gaskets. In general, high nitro and/or hot days require low compression, low nitro and cold days need higher compression. It is better to err on the side of low compression to avoid overheating, hard starting, and potential damage to the engine.

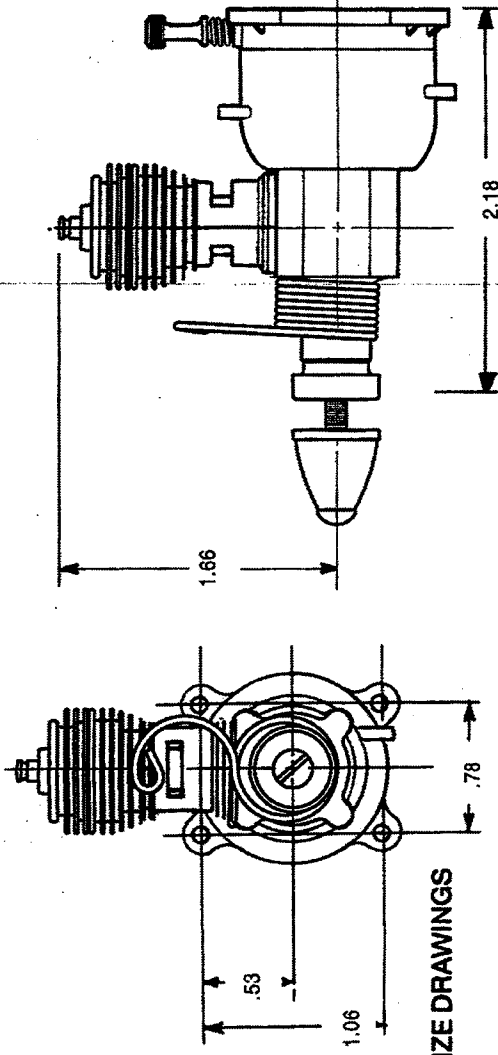
Ultimately, the only way to set the optimum performance of any engine is to compare different set-ups while measuring the RPM with a tachometer. The human ear can only detect large differences in RPM. Set up the engine as needed for your application, and then, starting with too many head gaskets, run the engine and compare RPM as you remove gaskets. When you find the maximum setup, add one gasket back as insurance.

**Operating Tips:**

Never put the engine away with fuel in it or the tank. Run it dry, wipe it clean, and oil lightly with a good quality light oil (3-in-1, Marvel Mystery, WD-40, etc.)

If the engine gets dirty, completely disassemble the backplate, cylinder, and piston from the engine. Use a toothbrush and Q-tips to clean the parts in fresh model fuel, Alcohol or Kerosene. Dry thoroughly and reassemble with one of the light weight oils.

If the engine has been running well but gets tight, it is not "frozen up". Do not send it to the factory. A new engine will sometimes tighten up a few times due to accumulation of a "varnish" deposit inside the cylinder wall. Do not run it tight. Disassemble the head and cylinder from the engine. Look at the bore and see if there is a dark brown deposit inside. Scour the deposit away with very fine (000 grade) steel wool, then wash, oil and reassemble the engine.



**FULL SIZE DRAWINGS**

**Operating Tips (cont):**

The engine should again turn over freely and run properly. Never use sandpaper, emery cloth, or abrasives of any kind, or scrapers. Such methods will ruin the cylinder and void your warranty.

Humid, hot weather and over large props will tend to make an engine varnish more frequently. A light, new engine will also varnish more readily than a well run-in one.

Do not tighten the head too firmly. Set it up just snug. Before removing the head allow it to cool so it will loosen more easily.

Use both wrenches when removing the glow head. Use of pliers will distort the cylinder. To remove the glow head from a hot engine, slowly pour a bit of fuel on the head to chill it. The temperature difference between the head and cylinder should loosen it up easily.

**WARNING**

USE OF THE FOLLOWING EQUIPMENT CAN DAMAGE YOUR ENGINE AND WILL VOID YOUR WARRANTY!

- DIESEL CONVERSION KITS
- SHAVED OR EXTREMELY HIGH COMPRESSION HEADS
- FUELS CONTAINING 100% SYNTHETIC OILS
- FUELS WITH NITROMETHANE CONTENT IN EXCESS OF 50%

**WARRANTY**  
Your Cox engine is fully warranted against factory defect for 90 days from the date of purchase. GLOW HEADS are NOT WARRANTED since they normally require periodic replacement. Should your engine require warranty service, you may contact Cox at the address given below.

**FACTORY REPAIR SERVICE**

Minor repair, examination, or adjustments - \$5.00 plus parts. Complete overhaul, new engine performance guaranteed: \$18.85 This price includes parts.

**CUSTOMER SERVICE**

For any questions or service regarding any Cox products please contact our Customer Service Department at 475 North Sheridan Street, Corona, CA 91720 1-800-451-0339. Customer Service hours are from 8:00 AM to 4:30 PM Pacific Time, Monday through Friday. Prices and Design Subject To Change Without Notice.

**REPLACEMENT PARTS**

We have listed those items which are most likely to require replacement during the life of this product.

Ordering instruction: You may order parts from Cox by telephone or mail. Orders may be charged to your Visa or Mastercard. For credit card order give the following information: name, card number and expiration date. For other orders please send a check or money order made payable to Cox Products for the full amount including the following postage and handling charges:

TOTAL PARTS COST	POSTAGE & HANDLING
Orders from \$0.01 to \$5.00	\$1.25
5.01 to 10.00	3.00
10.01 to 20.00	4.00
20.01 to 30.00	5.50
30.01 to 40.00	6.50
40.01 up	7.50

All international orders \$5.00 additional. CA residents only add state sales tax. No C.O.D. orders accepted. Telephone orders by Visa or Mastercard only.

CAT. NO.	DESCRIPTION	PRICE
303	Needle Valve & Spring	2.10
1702	Glow Head & Gasket	4.25
20339	Starter Spring	1.25
1479	Crankcase, Crankshaft, Thrust Washer & Drive Plate Assembly	6.75
1589	Tank Front & Back, Tube, Spring & Venturi Gasket	12.75
1300	Overhaul Kit (Reed, Retainer Gasket, Screw Set, Spinner, Prop Screw & Venturi Gasket)	3.15
12028	Tank Back, Tube & Spring	4.60
1745	Cylinder, Piston & Rod	15.00
<b>RECOMMENDED PROPELLERS</b>		
858	5" x 3P (127 x 76mm)	1.65
242	5" x 3P (127 x 76mm)	1.65
244	6" x 3P (152 x 76 mm)	1.65
APC	5.6" x 2P (140 x 51mm) (not available from COX)	
<b>ACCESSORIES</b>		
1718	Propeller Spinner & Screw	1.40
1530	Wrench	1.20
1786	Piston/Rod Reset Tool & Holder	3.50

Prices subject to change without notice.