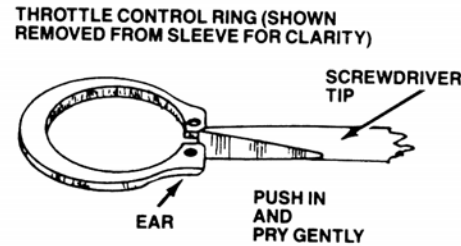


OPERATING TIPS

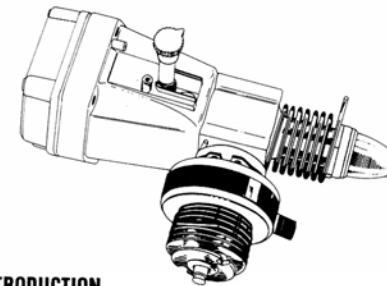
If it should be necessary to adjust the throttle control ring, in order to make the throttle operate correctly, it can be easily moved by slipping the end of a screwdriver in between the ears of the control ring and then turning the sleeve as required. Do not use force to turn the ring. If the sleeve does not move easily, spread the ears on the control ring slightly by prying with the screwdriver. Take care not to bend the control ring.



TROUBLE SHOOTING CHART

TROUBLE	PROBABLE CAUSE	REMEDY
WILL NOT START – ACTS LIKE BATTERY WASN'T ATTACHED TO GLOW HEAD.	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 1½ volts or connect battery to a glow head that is known to be good. If glow head filament does not glow bright orange – replace battery.
	Burned out glow head	With a battery that tests 1½ volts connected to glow head, check for bright orange reflection on top of piston seen through exhaust port. If no glow appears, replace glow head.
	Engine wasn't primed	Squirt a few drops of fuel through exhaust port and onto side of piston then continue with starting procedure.
ENGINE POPS AND/OR "KICKS" – WON'T START.	Loose propeller screw	Tighten propeller screw.
ENGINE STIFF, PROPELLER TURNS HARD OR "KICKS"	Engine flooded, too much fuel in cylinder	Close needle valve completely. Leave battery attached and turn propeller (without priming) until short starting "burst" occurs. Then open needle valve 3 turns, and start again.
SHORT RUNNING "BURST" (BRIEF START, THEN STOP)	Engine not getting enough fuel (mixture too lean or tank empty)	Check tank fuel level -- refill if necessary; or, open needle valve another ½ turn, prime and start again. It may be necessary to repeat this procedure 3 or 4 times, opening the needle valve ½ turn each time.
	Clunk jammed forward from hard landing	Point nose straight up and tap side of engine. If "clunk" is still jammed, disassemble engine tank and free it.
ROUGH SOUNDING ENGINE, SLUGGISH, WEAK POWER	Loose Glow Head	Tighten Glow Head with wrench supplied.

CARE AND OPERATION OF YOUR CAT. NO. 4505 .049 DRAGONFLY ENGINE



INTRODUCTION

Your Cox .049 DRAGONFLY engine incorporates many of the features most wanted by serious modelers like yourself. The fuel tank is extra-large and includes a 'clunk' fuel pickup for extended flying time and easy inverted flight. The mylar reed fuel induction system assures easy starting while the new Snap Starter eliminates the problem of having the engine start backwards.

FUEL TANK INFORMATION

NOTES

A. Installing fuel line onto the fuel inlet is delicate, and can be difficult. We recommend the following method: Attach weighted fuel pickup "clunk" onto one end of fuel line. Straighten a small paper clip and insert through "clunk". Push paper clip all the way through fuel line and insert paper clip into engine fuel inlet hole. Push "clunk" to install fuel line onto engine fuel inlet. When fuel line is secure, remove paper clip.

B. To prevent fuel leakage from the rear of the tank, the engine must always be mounted so that the tank back is pressed firmly against the firewall or mounting support.

C. A "clunking" sound in your fuel tank is normal and is caused by the weighted pickup on the fuel intake hose.

D. Using fuel with less than 5% castor oil will void warranty. Always use Cox Super Power Fuel or other high quality fuel.

You will need a 1½ volt battery, a glow head clip, Cox Super Power fuel, and a filler hose to start your engine. These items are all available in the COX 400 or 990 Accessory kits.

E. For starting, and during break-in, leave the throttle in the 'fast' or 'high' position.

F. To simplify priming and help the engine run cooler, remove the muffler spring during break-in.

BREAK-IN

As with any precision-built product, a little care and preparation will help your .049 DRAGONFLY to give you top performance. While most .049 DRAGONFLY engines can be flown without break-in, a little time spent breaking the engine in properly will pay many dividends in good flying later.

1. Mount the engine in a break-in/test mount or in the model. The tank back is sealed against the tank front by bolting the tank to the test mount or firewall. Make sure the gasket between the tank back and tank front is in place. Do not hold the engine in your hand or directly in the jaws of a vise. The mounting hole location of the .049 DRAGONFLY is the same as for Cox's other reed-valve engines.

2. Install a Cox 6" Dia. x 3" Pitch propeller (Cat. no. 862). The flat side of the propeller goes toward the engine. Tighten the propeller screw securely, remove the muffler spring from the throttle sleeve and lay aside.

3. Start the engine as described in the "Starting the Engine" section. When the engine is running, slowly close needle valve (clockwise) until engine is running at top speed. At top speed, engine should produce a shrill whine. After engine has reached top speed, open needle valve approximately ½ turn, or until engine runs with a "crackling," or "bubbling," sound. Remove glow head clip and let engine run until fuel tank runs dry.

4. Refill the tank and restart the engine. Repeat step 3 until 2 tanks of fuel have been burned.

5. The engine is now ready to fly. When the engine is mounted on the model, refill and restart the engine. Adjust the needle valve until the engine reaches top speed (a shrill, high-pitched whine), then open the needle valve an additional ½ turn. Remove the glow head clip and tip the nose of the model so that it is pointed upward at an angle of about 45°. Readjust the needle valve if necessary.

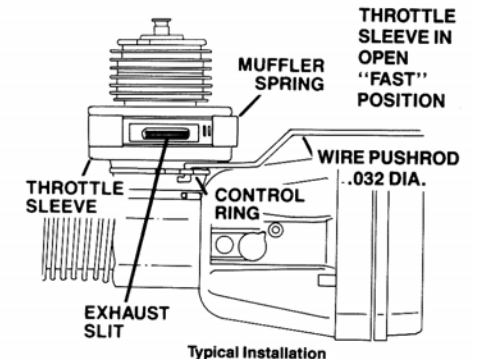
6. For the first few flights it is recommended that the muffler spring be left off. This will allow the engine to run at a cooler temperature while completing its break-in. After a total of 10 to 12 tanks of fuel have been burned (break-in and flight combined) the muffler spring may be reinstalled.

STARTING THE ENGINE

We recommend the use of a Cox 6" Dia. x 3" Pitch Propeller. If you prefer to use a wooden propeller, it should be balanced to assure good performance with little vibration.

1. Connect the glow head clip to a 1½ volt battery. Attach the fuel filler hose to a can of Cox Super Power fuel.

2. Pull the muffler spring away from the rim of the throttle sleeve far enough to verify that the throttle is in the 'fast' or 'high' position.



3. Close the needle valve (clockwise) but DO NOT FORCE or overtighten. Open the needle valve 6 turns.

FOR QUESTIONS REGARDING YOUR COX PRODUCTS CALL THE COX COURTESY LINE TOLL FREE 800/451-0339

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Cox Customer Service Department
350 West Rincon Street
Corona, CA 91720
Open 8:00 AM until 4:30 PM Pacific Time
Monday thru Friday
800/451-0339

24535

4. Push the end of the fuel filler hose onto the fuel tank filler tube. Fill the tank slowly to avoid flooding the engine. Fill until fuel spurts out of the overflow. Remove the fuel filler hose. Wipe any excess fuel off the engine and tank.

5. Prime the engine by rotating the muffler spring to uncover the opening on the muffler housing, and squirt several drops of fuel into the engine exhaust slits. Be careful not to place too much fuel at this point as it will flood the engine. Flip propeller several times to work fuel into the engine.

6. Connect the glow head clip to the glow head. Turn the propeller ONE full turn backwards (clockwise) after the starter cam engages. Release the prop by sliding your finger off the end of the blade and away so your finger is out of range of the spinning propeller. MORE THAN ONE TURN WILL DAMAGE THE STARTER SPRING!

7. If the engine does not start, repeat step 6 three more times. If the engine will still not start and run, remove the glow head clip and repeat steps 5 and 6.

8. If engine refuses to start, open the needle valve 1/2 turn and repeat steps 5 through 7. If engine still will not start, refer to the troubleshooting section.

9. When the engine starts, adjust the needle valve for the desired speed (either for break-in or for flight), and remove the glow head clip. When adjusting the needle valve, allow a short amount of time between valve adjustment and engine response to avoid "overshooting" the desired setting. This engine has been especially designed to be less critical in adjustment than most engines of this size. For this reason there is a short delay between a movement of the needle valve and a change in the engine speed.

ENGINE CARE

Cleaning. Engine may be taken apart for cleaning or replacement of parts. Refer to diagram with "Parts List" for position of engine parts.

Disassemble and clean engine whenever it is dirty. Wash and oil parts before reassembly. Always disassemble and clean engine after crash or whenever you suspect that dirt may have gotten into parts. Dirt in engine will drastically shorten engine life.

Glow Head. Replace burned out glow head.

Never attempt to remove hot glow head. A hot glow head will stick, and forced removal may damage cylinder. To cool glow head, pour fuel over head.

Use both wrenches when removing glow head. The top fin on the cylinder has two flats. Insert one wrench over these flats and hold in place while using other wrench to remove the glow head.

When installing glow head make sure it is tight!

THE FUEL PICKUP

Tubing used inside the tank is a super-flexible silicone-based material that will stay flexible through long immersion in fuel. If for some reason the tubing should have to be replaced, you may obtain a new one from Cox. See the parts list for directions on how to obtain the tubing. The weight and the inlet tube to the engine have openings of only .062 inch diameter. Dirt in the fuel may cause these openings to become plugged. If this happens, they may be cleaned by blowing the dirt out or by inserting a thin piece of wire into the openings.

Access to the inside of the tank can be gained by unbolting the engine from the firewall and removing the tank back.

STORAGE

Never put the engine away with fuel in the tank, but instead run the engine until the tank is dry. The lubricant in the fuel will thicken after exposure to air and may clog the fuel intake. If the intake does become plugged, disassemble the engine and wash all parts in alcohol or fresh fuel.

When storing the engine, oil it lightly with a good quality light oil (3-in-1, sewing machine oil, etc.) and wrap in a plastic bag or a clean cloth. In cold weather, or for more power, you may wish to substitute Cox Racing Fuel.

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 PERCENT SYNTHETIC OIL FOR LUBRICATION

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 on back page.

FACTORY REPAIR SERVICE

Minor repair, examination, or adjustments - \$4.00 plus parts. Complete overhaul, new engine performance guaranteed: \$18.75 These prices include parts.

CUSTOMER SERVICE

For any questions or service regarding any Cox products please contact our Customer Service Department at 1-800-451-0339. Customer Service hours are from 8:00 AM to 4:30 PM Pacific Time, Monday through Friday.

REPLACEMENT PARTS

Dear Customer:

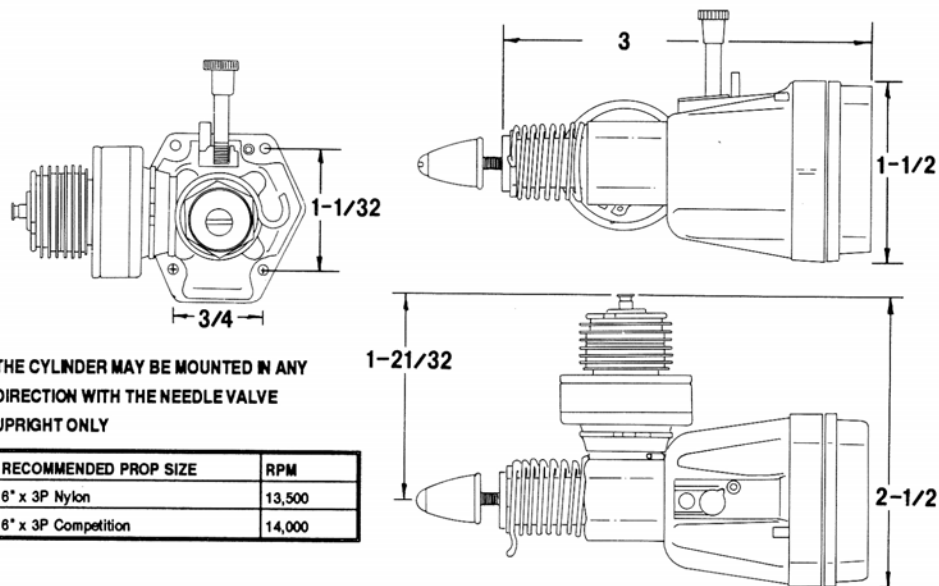
We have listed those items which are most likely to require replacement during the life of this product. We have also included an exploded assembly drawing which identifies all replacement items available.

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

TOTAL PARTS COST	POSTAGE & HANDLING
Orders from \$0.01 to \$5.00	\$1.00
5.01 to 10.00	2.50
10.01 to 20.00	3.50
20.01 to 30.00	5.00
30.01 to 40.00	6.00
40.01 up	7.00

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

VIEWS OF THE DRAGONFLY .049 FOR INSTALLATION INFORMATION NOT ACTUAL SIZE



RECOMMENDED PROP SIZE	RPM
6" x 3P Nylon	13,500
6" x 3P Competition	14,000

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	PRICE
1	380	Crankcase and Crankshaft Assembly	5.50
2	325	Glow Head and Gasket	3.35
3	1718	Prop Spinner and Screw	1.30
4	20467	Throttle/Muffler Assembly	7.00

REF. NO.	PART NO.	DESCRIPTION	PRICE
5	333	Snap Starter Assembly	1.35
6	20468	Piston/Cylinder Assembly	10.50
7	20466	Fuel Intake Tube and Weight	3.00
8	1968	Needle Valve and Spring	1.75
9	20464	Tank Front Assembly, Back, Reed Retainer, Screws (4), Gaskets (Tank Backs, and Crankcase), Reed, Fuel Intake Tube, and Weight	13.75
-	20465	Reed, Gaskets (Tank Back, and Crankcase) and Screws (4)	1.75
-	1530	Wrench	1.10
-	1796	Piston/Rod Reset Tool	2.80
-	862	6"x3P Nylon Prop	1.35
-	244	6"x3P Competition	1.35

PRICE AND DESIGN OF PARTS SUBJECT TO CHANGE WITHOUT NOTICE.

