

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	Remove glow head. Attach glow head to a good 1½ volt battery. If filament does not glow bright orange, 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 flooded, too much fuel in cylinder	Close needle valve 1 full turn and start again (without priming). 4 or 5 starts may be required to clear engine.
ENGINE POPS AND/OR "KICKS" — WON'T START	Loose propeller screw	Tighten propeller screw.
	Dirt under reed	Carefully unsnap reed retainer and remove reed. Wash reed and retainer in solvent or fuel. Replace reed. Be sure reed turns freely under retainer wire.
ENGINE STIFF, PROPELLER TURNS HARD OR "KICKS".	Engine flooded, too much fuel in cylinder	Close needle valve completely. Leave battery attached and flip propeller (without priming) until short starting "burst" occurs. Then open needle valve 2½ turns, and start again.
	Excess fuel at ports	Close needle valve. Flip propeller until engine starts and burns out excess fuel. Open needle valve and restart.
ENGINE STARTS THEN SLOWS DOWN AND STOPS.	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.
	Loose glow head	Tighten glow head with wrench.

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

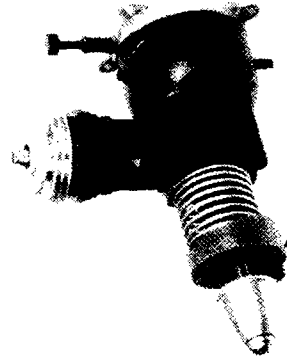
Cox model fuel works only because it is FLAMMABLE — it burns with an almost invisible flame. It can burn you if not used with common sense — be careful and follow these rules:

- 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.

COX HOBBIES INC., CUSTOMER SERVICE
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BLACK WIDOW CARE AND OPERATION



The Black Widow is the most powerful reed valve .049 engine that is available today. It will deliver more power and has a larger fuel tank than the famous Cox Babe Bee .049. These additional features make it an outstanding value:

- Snap starter system — engine will not run backwards!
- Metal fuel tank with special venting for control line stunt and combat flying.
- Sturdy radial mounting.
- Needle valve located at rear of tank.
- Redesigned cylinder porting for maximum power.

NOTES:

- The fuel pick-up tube inside the tank is positioned (at factory) for control line flying. For free flight flying, tank must be removed from engine and end of pick-up tube repositioned to bottom of tank. If this tube is located in wrong position, all the fuel will not be used and engine will stop prematurely.
- When adjusting engine speed, allow for a short delay between movement of needle valve and change in engine speed.
- 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.

PREPARATION FOR RUNNING

- Mount engine in plane or on board. Never hold engine in hand or vise.
- Obtain a 1½ volt Cox dry cell battery or equivalent. Never use a more powerful battery or glow head may burn out.
Connect Cox glow head clip wires to battery as shown in Figure 1A.

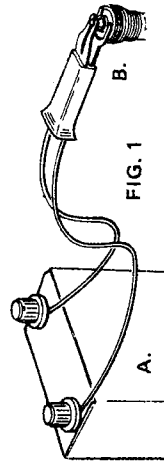


FIG. 1

- A propeller which has been damaged with nicks, chips or cracks, or one which has been altered in any way can break apart during operation of the engine and cause serious injury to you and others.
 - Inspect propeller before each use.
 - Do not alter, modify or customize your propeller.
 - Discard and replace nicked, chipped, cracked or altered propellers.
 - Use only propellers approved for use with your engine.

- Install propeller on engine shaft. Flat side of propeller should face engine. Tighten propeller screw securely.

STARTING ENGINE

(A short break-in period is recommended for new engines to ensure top performance and extend engine life.)

- Close needle valve (turn clockwise). Do not force or overtighten valve. After closing, open valve (turn counterclockwise) 3 turns.
- Fill fuel tank. Fuel will flow from overflow on top of tank when tank is full. Wipe any excess fuel from engine and tank.
- Prime engine. Close exhaust ports by rotating crankshaft until piston blocks ports. Squirt several drops of fuel into exhaust ports. Flip propeller over 3 or 4 times to work fuel into engine.
- Connect glow head clip to glow head. Bottom clip should rest on top of glow head. See Figure 1B.
- Start engine. Wind propeller backwards (clockwise) until spring hook catches on notch in snap starter cam. After cam is engaged, wind propeller backwards one full turn. (To prevent damage to starter spring, never wind propeller more than one turn.) Release propeller, engine should start.

NOTE: If engine does not start, open needle valve another ½ turn, reprime, and repeat starting procedure.

- Break-in new engine. Slowly tighten 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, loosen 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.

Restart and repeat procedure until engine has burned a minimum of 3 tanks of fuel.

- Restart engine. Tighten needle valve until engine is running at top speed. Remove glow head clip. If engine holds top RPM, it is broken in.

- If engine is mounted in place, tip nose of plane up to 45 degree angle. If engine speed changes readjust needle valve.

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. Hot glow head will stick, and forced removal may damage cylinder. To cool glow head, pour fuel over head. Never pour fuel over cylinder.

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.

Never force threads when installing glow head. Glow head should only be tightened until snug.

Storage. Before storing, run engine until fuel tank is dry. Lubricant in fuel thickens upon exposure to air and may clog parts if allowed to remain in tank.

Oil engine with light oil such as SAE 10, 3-IN-ONE oil, or sewing machine oil, then wrap in plastic bag or clean cloth to protect it from dust and dirt.

WARNING

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

- ELECTRICAL STARTERS
- DIESEL CONVERSION KITS
- SHAVED OR EXTREMELY HIGH COMPRESSION HEADS

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

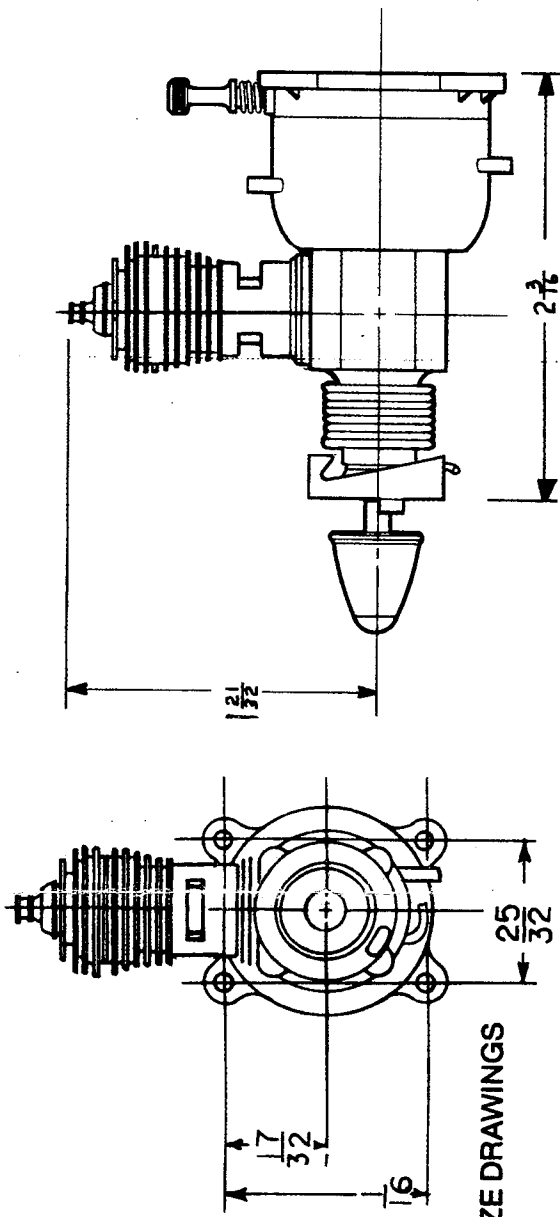
Minor repairs and complete engine overhauls are available at the factory. Send the entire engine to the factory for evaluation. Give complete explanation of problem(s). Please tag the engine with your complete name and address. After factory examination you will be contacted as to repairs required and charges.

REPLACEMENTS PARTS

To save time, we suggest that you contact your nearest hobby dealer if you need assistance or repair parts. If not available, order direct from factory. Add \$2.00 for postage and handling. (Foreign countries add \$5.00 for postage and handling.) Insured packages \$1.00 extra. California residents add 6% sales tax. Please enclose check or money order only. No C.O.D.'s accepted.

We have listed those parts which are most likely to require replacement during the life of your engine in the chart.

PRICE AND DESIGN OF PARTS SUBJECT TO CHANGE WITHOUT NOTICE.



FULL SIZE DRAWINGS

CAT. NO.	DESCRIPTION	PRICE
309	Needle valve & spring	1.35
325	Glow head & gasket	3.00
333	Snap starter, P. H.	1.10
1579	Crankcase, crankshaft & drive plate assembly	4.45
1598	Tank front & back, tube, spring & venturi gasket	8.90
1299	Overhaul kit (reed, retainer, gasket, screw set, spinner, prop screw & venturi gasket)	1.65
375	Cylinder, piston & rod	6.00

ACCESSORIES

1530	Wrench	1.10
1796	Piston/rod reset tool & holder	7.50

NOTE

The inside fuel pickup tube location is shown for control line flying. The end of this tube must be relocated to the bottom of the tank for free flight flying.

