

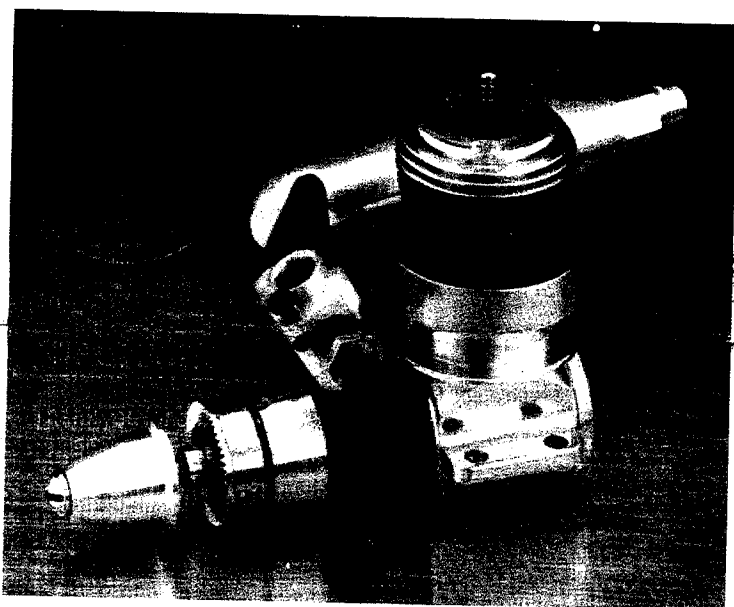


CARE AND OPERATION OF YOUR **TEE DEE R/C**

09 ENGINE WITH THROTTLE & MUFFLER

INTRODUCTION:

Thank you for purchasing one of the new Tee Dee R/C engines. Used carefully and kept clean, this engine can provide years of high performance power for your flying enjoyment. Cox engines are produced from solid bar stock material for the greatest possible quality control. Precision grinding, lapping and honing equipment allow tolerance control to within 10/1,000,000 of an inch. Small engines must run with closer fits than large ones, so to maintain your engine's quality and performance remember the three keys to long engine life: Cleanliness, Proper Lubrication, and Never Run Too Lean!



TEE DEE R/C 09

SPECIFICATIONS

- Displacement: .091 cu. in. (1.49 cc)
- Weight, including Muffler: 3.8 oz (107.7 g)
- Height: 2.44 in. (62 mm)
- Length with Prop and Spinner: 2.98 in. (75 mm)
- Bore: .497 in. (12.6 mm)
- Stroke: .471 in. (12 mm)
- Recommended Propeller: 7 in. x 3.5P and 6 in. x 4P Comp. (18 x 9 and 15 x 10 cm)
- Recommended RPM range: 19,000 Maximum Continuous
- Typical Static: 15,500
- Idle: 5,500

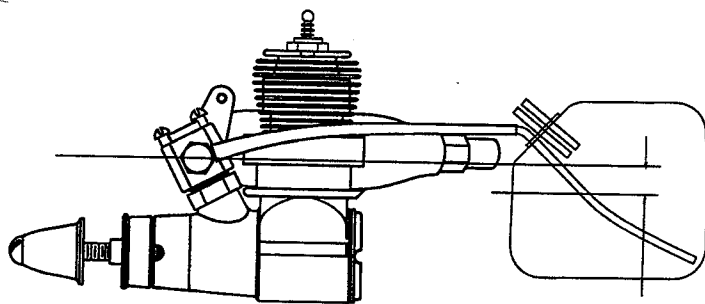
SETUP:

Although Cox engines require little break-in to run well, it is desirable to set up the Tee Dee R/C engine on a good test stand in order to get familiar with it, break it in, and set the carburetor idle adjustment. Never clamp the engine in a vice, the distortion will completely ruin the fit of the engine parts even if no visible damage occurs. The test running must be done away from any dust or dirt. The engine may be broken-in and set up on an airplane, but keep it off the ground.

Throttled engines will not idle correctly until they are running freely. The Tee Dee R/C engines can be set for an adequate idle after about 15 minutes of running, but the idle and peak rpm will both improve measurably after about an hour of running. Break-in is a thermal stabilization process, not a fitting or polishing process.

PLEASE NOTE: 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.

Set up a fuel tank with the centerline of the tank 1/4" to 1/2" (6 to 13 mm) below the needle valve of the engine as shown. Rig a wire to allow control of the throttle arm from behind the engine. Some sort of friction or stop should be used to lock the throttle control wire.



.25 to .50 in.
(6 to 13 mm)

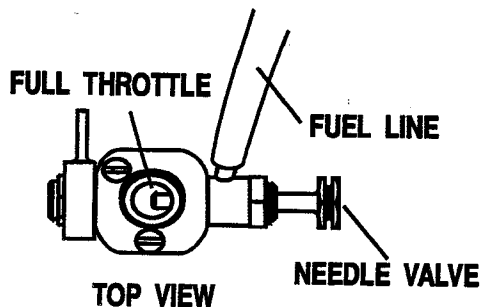
Select a new, 7 in. x 3.5P (18 x 9 cm) propeller for break-in and balance it. Sand off any bead of plastic along the edges of the blades. Prop balancers of outstanding quality are available from several manufacturers; use one and follow its directions.

Insert the prop screw through the spinner and propeller with the flat side of the blades toward the engine. Install on the engine so that the blades are horizontal just as the engine begins its compression stroke in a counter-clockwise direction as viewed from the front.

Propeller Selection	Tee Dee R/C .09
Break In	7 in. x 3.5P (18 x 9 cm)
Sport	7 in. x 2P, to 7 in. x 4P (18 x 5 and 18 x 10 cm)
Racing	6 in. x 4P, 6 in. x 5P (15 x 10 and 15 x 13 cm)
Old Timer	8 in. x 3P, 8 in. x 4P (20 x 7.5 and 20 x 10 cm)

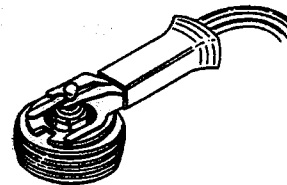
STARTING AND BREAK-IN:

No matter how expert you are with small engines you will have better luck with these engines if you follow directions exactly as listed, and do each operation in the order given. Use of Cox fuels is recommended because we know that they contain the finest ingredients in the correct mix for Cox engines. A good, fresh 1-1/2 volt starting battery and glow clips in good condition are required. The glow plug should heat up to a medium orange. Small engines need a plug that is glowing strongly to start well.



1. Close the carburetor needle valve, by turning it clockwise until it stops. Do not force it. The carburetor throttle should be set fully open.
2. Fill the tank with Cox Super Power or Racing fuel. If other brands are used, they MUST contain Castor oil in at least a 20% oil mix, and Nitromethane content between 15% and 30%. The lower Nitro mix runs cooler and longer, high Nitro gives lower idle speed and higher top RPM but less fuel economy. An extra head gasket may be needed with high Nitro fuel in hot weather to achieve the ideal compression ratio.
3. Open the needle valve 2 turns.

4. Put your finger over the air intake of the engine and pull the prop through compression until fuel just reaches the carburetor. Use of a clear fuel line helps check this visually.
5. Squirt a couple of drops of fuel into the venturi of the engine and immediately flip the prop over counter-clockwise rapidly several times.
6. Connect the glow plug to the battery, then repeat step 5. The faster you can flip the prop through compression, the more easily the engine will start.

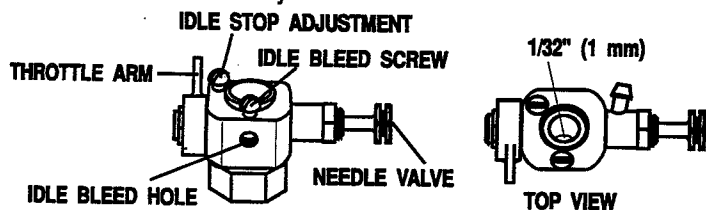


Use of an electric starter will make starting much easier. Be sure to pull the prop through compression by hand before using an electric starter to check for flooding that could cause hydraulic lock of the cylinder. To correctly use the starter, run it up to speed and then gently touch the prop in very short "bursts"; do not hold it on the prop and "grind".

7. When the engine starts it will be running very rich and slow. This should be allowed to continue for approximately one minute. After the minute is up, screw in the needle valve (clockwise rotation) until the engine is running smoothly, but still in its "4-cycle" or slow mode. Remove the glow-plug/battery connection.
8. Allow the engine to run for 5 minutes, stop it and let it cool down completely. Restart the engine, tune it for a smooth, but rich "2-cycle" or fast mode of running. Again run the engine for 5 minutes and then let it cool completely. A third tank should be run with the engine set with the needle backed out 1/4 turn from the peak RPM setting. This completes basic break-in.

SETTING THE IDLE ADJUSTMENT:

1. Set the idle stop screw so that the carburetor will close to allow only 1/32" (1 mm) of opening remaining. The idle bleed screw should be set so that it closes the idle bleed hole about half way.



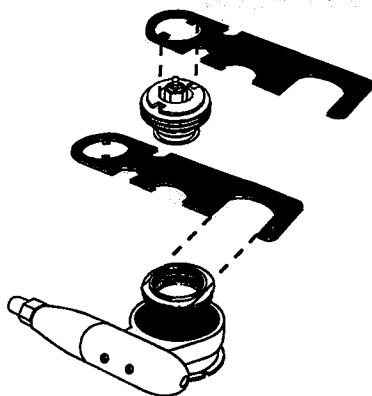
2. Start the engine, peak it out, but not over leaned. Close the throttle. The engine should reach a high idle. After a few moments of idling, pinch the fuel hose completely shut. The engine should do one of the three things per the chart to the right. Stop the engine and adjust it as shown.

3. Back the idle stop screw out 1/4 turn, and retest and set the idle bleed as above. Repeat this procedure until you have a really low, smooth idle with good transition. Final adjustments may require 1/8 or less turn on the screws to get the ideal adjustments. The 09 should eventually idle smoothly at 5500 RPM's. On small engines, this idle speed is more than adequate for smooth landings and taxiing.

SYMPTOM	CONDITION	CORRECT ACTION
Engine dies immediately.	Too Lean	Turn the bleed screw in 1/4 turn.
Engine speeds up slightly, then slows and dies.	Just Right	Don't touch setting.
Engine speeds up a lot. Runs a long time before slowing.	Too Rich	Turn the bleed screw out 1/4 turn.

INSTALLATION:

The engine should be installed in your model on a good quality mount, or on maple or similar hardwood bearers. The mounting beams must be flat and parallel to avoid distortion of the engine case. In most cases, the muffler must be removed to reach the screws that go through the right side mounting lugs. Use the wrench as shown below to unscrew the cylinder from the engine and remove muffler. Then temporarily reinstall the cylinder to prevent dust and dirt from getting into the engine.



Mount the crankcase, then reassemble the muffler to the engine and snug the cylinder back firmly.

Pay attention to the tank height, sufficient vibration cushioning of the tank to prevent foaming, and proper position of vent, pickup and over-flow lines.

The throttle arm may be removed by sliding the circlip off, then pulling the arm straight out from the engine. The splined mating surfaces will allow adjustment of the arm position to suit any model. Be sure to reinstall the circlip to retain the arm.

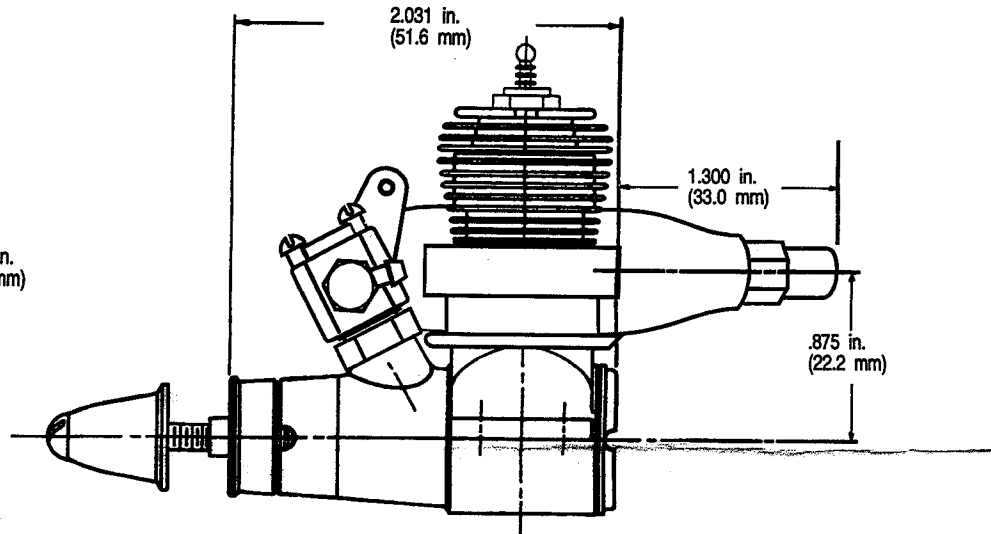
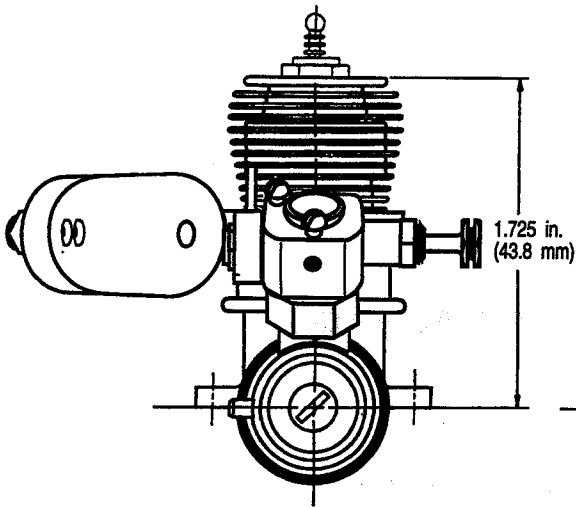
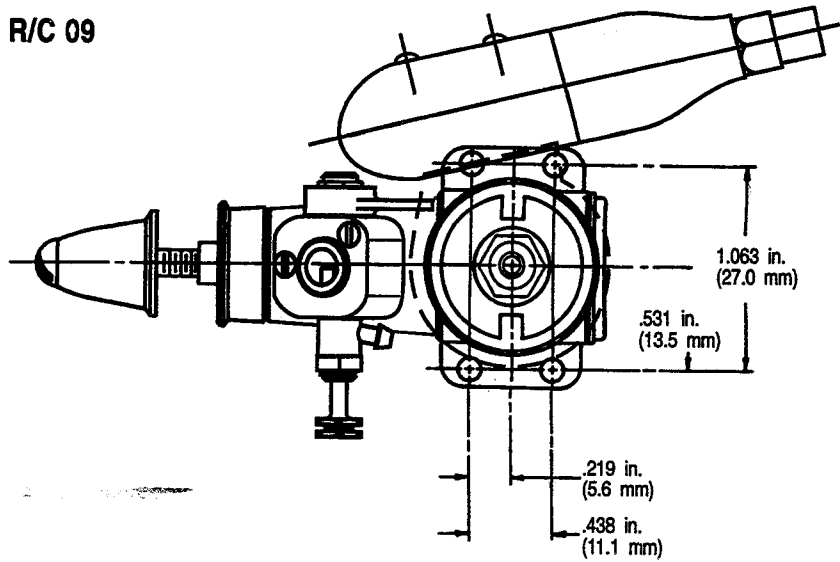
The retainer nut for the fuel nipple may be loosened, and the nipple positioned wherever it is needed. Retighten the nipple nut.

For tight cowl situations, the end of the needle valve mates perfectly with a 1/4" (6 mm) nut-driver for safe, remote adjustments.

FULL SCALE VIEWS OF THE TEE DEE R/C 09

For installation information

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TROUBLE SHOOTING AND ENGINE CARE:

- 1. If the engine coughs and spits** a bit of fuel spray from the exhaust, it is too rich. Close the needle valve and continue cranking the prop until the engine starts briefly. Open the needle valve again and crank it over. It should start immediately or with only the slightest prime.
- 2. If the engine starts up with lots of power and dies immediately**, it is too lean. Open the needle valve half a turn, re-prime, and crank it over again. If the engine is used and hasn't been run in some time, it is possible that the castor oil in the fuel has thickened and clogged the needle valve jet. Close the needle valve completely to squeeze the clog, then open the needle to 4 turns and choke the engine to pull fuel through. Reset the needle. At worst, the jet may need to be cleaned with .020" (.5 mm) diameter or finer COPPER wire.
- 3. If the engine refuses to fire** at all, screw the plug out and connect it to the clip to check the level of glow. If the little coil does not get orange hot, it may be burned out, the battery may be bad, or the connecting leads are bad. Try different combinations to eliminate the trouble. If the coil is filled with fuel, the engine is flooded, clear out as in step 1.
- 4. After the final run for the day**, run all the fuel out of the engine, add a couple of drops of light (SAE 10) oil down the venturi and flip the prop smartly to work it into the engine. Cover the engine with porous cloth or paper towel to keep dust and dirt out. Plastic may trap moisture and rust your engine.
- 5. After a hard landing** where the engine has been coated with dust or dirt, do NOT run the engine until it has been thoroughly cleaned! Generally, external cleaning followed by disassembly and cleaning of the carburetor are all that is required. In some cases, a complete tear-down may be necessary to adequately remove the dirt.
- 6. If the engine gets tight it is not frozen up.** Do not send it to the factory. A new engine will sometimes tighten up due to varnish accumulation on the cylinder walls. This is more likely to happen on a tightly fitted new engine. Certain kinds of weather such as hot humid conditions will increase the rate of varnish formation. After a few cleanings it should stop happening. Do not run it tight! To clean off the deposit, remove the Cylinder Head and Gasket(s), set aside. Remove the Cylinder from the engine. Scour the upper cylinder wall with very fine steel wool. Thoroughly wash, dry, and oil the cylinder, then reassemble the engine. The engine should turn over freely, and run properly. NEVER use sandpaper, emery cloth, scrapers, or abrasives of any kind. Such methods will ruin the cylinder, while steel wool is softer than the steel of the cylinder wall and won't hurt it.
- 7. Do not tighten the head too firmly.** Always tighten it when the engine is cool. Also, the head will be easier to remove when the engine has cooled down. If it is necessary to remove the head from a hot engine, pour a little fuel over the head to reduce the temperature and shrink it compared to the cylinder. A hot head will stick and forced removal may damage the cylinder.
- 8. After several hours of running**, the ball socket between the piston and connecting rod may become slightly loose. This socket may be tightened by using the Cox Piston/Rod Reset Tool appropriate to your size engine (see the parts list); follow directions provided with the tool. Generally, after the rod has been tightened once, it will never need it again, unless the engine is used in racing conditions.

PRESSURIZING:

The only practical pressurization process useable on an R/C engine is Muffler Pressure delivered to the tank overflow. This technique gives improved fuel delivery without the danger of flooding the engine in starting or at idle position. Engine mixture setting variation throughout the run will be minimized, and the run will be more steady in climbs or dives.

Several manufacturers make aftermarket muffler pressure taps, and any small one should work if installed per manufacturer's instructions. The tap should be installed just to the rear of the muffler screw joint.

It will be necessary to completely reset the idle bleed adjustment when using muffler pressure.

REPLACEMENT PARTS

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 Products for the full amount including postage and handling charges:

TELEPHONE ORDERS

Call the Cox Customer Service Department
Open 8:00 AM until 4:30 PM Pacific Time
Monday thru Friday
800/451-0339
Visa or Mastercard only.

MAIL ORDERS

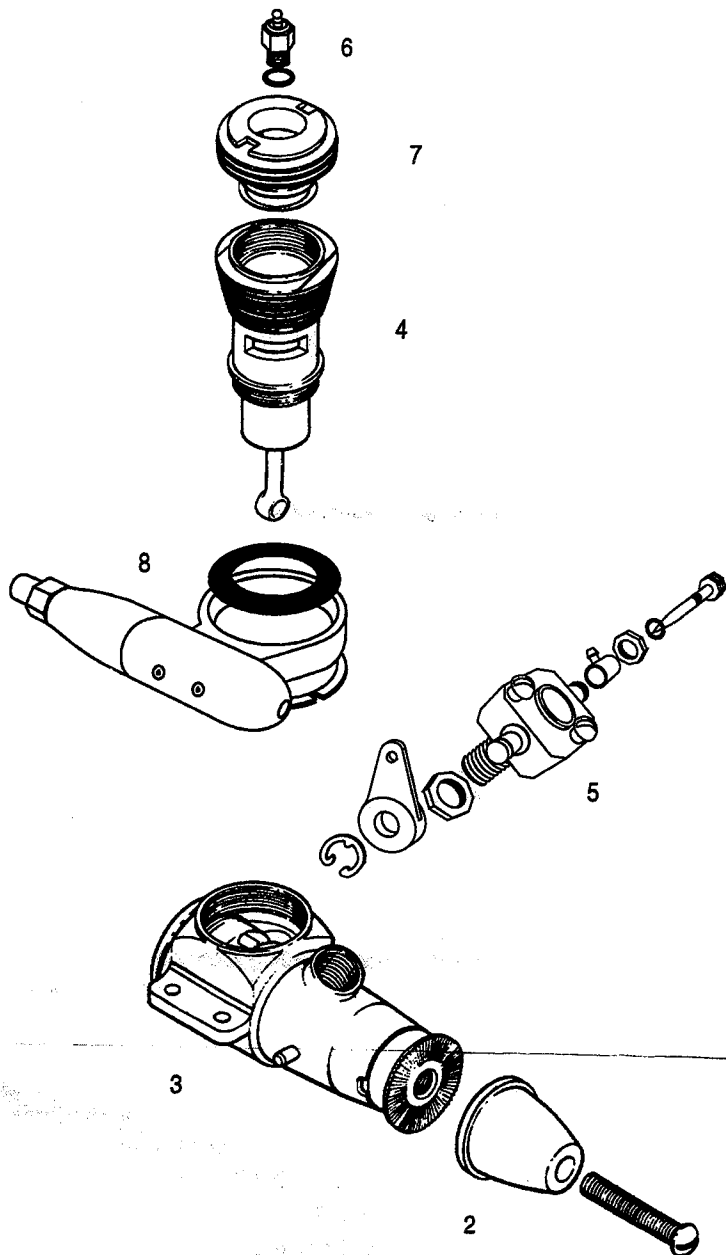
Send check, money order, Visa or Mastercard number to:
Cox Customer Service Department
350 West Rincon Street
Corona, CA 91720

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.
CA residents only add state sales tax.
No C.O.D. orders accepted. Telephone orders by Visa or Mastercard

FACTORY REPAIR SERVICE: Minor repair, examinations, or adjustments - \$5.00 plus parts. Complete overhaul, new engine performance guaranteed: \$46.60 (This price includes parts.)

EXPLODED VIEW



CUSTOMER SERVICE: For any questions or service regarding any Cox Product please contact our Customer Service Department at 1-800-451-0339. Customer Service hours are from 8:00 A.M. to 4:30 P.M. Pacific Time, Monday through Friday.

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.

REF	PART NO.	DESCRIPTION	PRICE
1	222124	Carburetor Body	3.00
2	2119	Spinner & Screw	1.55
3	3179	C-Case, C-Shaft, Carb. Body, Ret. Nut & Dr. Plate, Thrust Washer and C-Case Cover	25.00
4	21145	Cylinder, Piston & Rod	15.10
5	21152	Replacement Carburetor	30.00
6	3702	Glow Plug & Washer	4.00
7	3703	Cylinder Head & Gasket	3.50
8	211130	Muffer Assembly	12.00
-	21109	Needle Valve and O-ring	2.00
-	21110	Fuel Nipple, Nuts & Clip, Throttle Arm, & Air & Idle Stop Screws	5.00
-	2196	Piston/Rod Reset Tool	3.50
-	22131	Wrench (1)	2.45

Prices and Design Subject To Change Without Notice.

COX PRODUCTS, INC. FULL 90 DAY WARRANTY

COX PRODUCTS WILL REPAIR OR REPLACE FACTORY DEFECTS FOR 90 DAYS FROM DATE OF PURCHASE. GLOW HEADS ON FUEL POWERED MODELS ARE NOT WARRANTED SINCE THEY NORMALLY REQUIRE PERIODIC REPLACEMENT. THIS WARRANTY SPECIFICALLY DOES NOT COVER CRASH DAMAGE OR ABUSE!

If you have a warranty claim or need replacement parts, please contact Cox Customer Service Department, 350 West Rincon St., Corona, CA 91720, (800)451-0339.

THIS WARRANTY APPLIES ONLY IF THE PRODUCT IS OPERATED IN COMPLIANCE WITH ASSEMBLY AND OPERATING INSTRUCTIONS PROVIDED WITH EACH MODEL. COX ASSUMES NO LIABILITY EXCEPT FOR THE EXCLUSIVE REMEDY OF REPAIR OR REPLACEMENT OF PARTS AS SPECIFIED ABOVE. COX SHALL NOT BE LIABLE FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES. Some states do not allow the exclusion of incidental or consequential damages so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

READ THE ALL INSTRUCTIONS AND SAFETY INFORMATION BEFORE USING THIS PRODUCT.



Cox Customer Service Department
350 West Rincon Street
Corona, CA 91720-2004
Open 8:00 AM until 4:30 PM Pacific Time
Monday thru Friday
909/278-1282 or toll free 800/451-0339