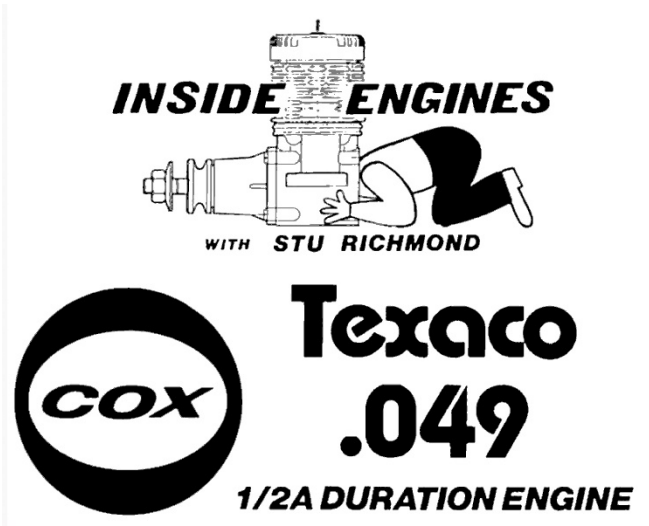


Cox Texaco .049

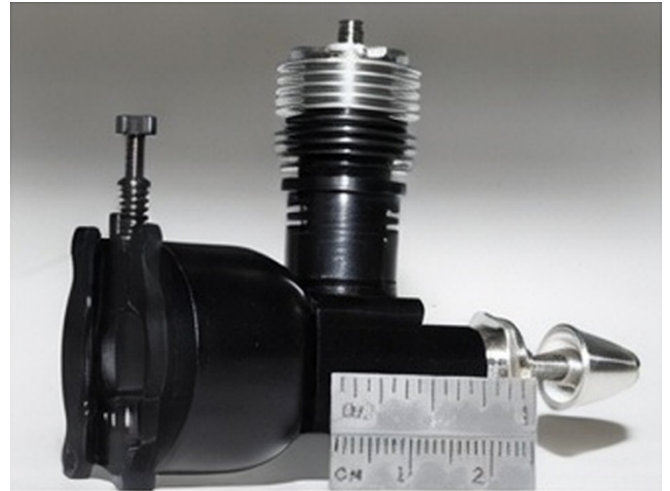


• The Society of Antique Modelers (SAM for short) has grown rapidly as its aim to bring back the nostalgia of old time modeling has reached around the world.

I called upon Joe Beshar, a past SAM president, for comments about the Old Timer movement, the Texaco-sponsored fuel allotment contests of the 1930s, and the introduction by Cox Hobbies of their new "Texaco .049" special duration engine. Excerpts of his reply follow:

"The R/C Texaco event in 1/2A size is, I believe, the best all-around event in the Old Timer movement. It is docile, fun-loving and really is a contest that relates to our free flight heritage. The 1/2A Texaco (fuel allotment event) model, although now glow engine powered, preserves the vintage performance image. The new 'Texaco .049 by Cox acknowledges the low performance of our older vintage engines and simply extends the run duration which is ideal for the 1/2A Texaco flier. I do believe the introduction of this engine will contribute to the event growing. When the flier tries it I am sure it will be well received.

"The first Texaco sponsored model contest was at Roosevelt Field, New York, in 1933 and had no fuel restriction limits. In 1934, 1935 and 1936 the contests allowed 1/4 fluid ounce of Texaco gasoline fuel per pound of model flying weight (7 pound limit) and were held in Akron, St. Louis, and Detroit. In 1937 the fuel allotment was reduced to 1/8 fluid ounce per pound and in 1938



The similarity of the Texaco .049 to the Black Widow and other Cox reed-valve engines is obvious, yet it differs from the others in a number of ways. It's designed for long runs, not brute power.

the last Texaco sponsored event limited engine runs to thirty seconds."

Joe, we thank you for your comments and the history of the Texaco Company's sponsorship of model airplane flying.

Joe included a current set of 1/2A Texaco event rules for R/C Old Timer flying. They allow virtually any pre 1943 design faithfully following the outline of the original model. Scaling is allowed. Wing loading minimum is eight ounces per square foot and the power must be by a Cox reed valve engine, unmodified, with a standard eight cubic centimeter fuel tank capacity. Maximum prop diameter is eight inches. Three attempts are allowed for two official flights a perfect score is two 15 minute flights. Ten bucks mailed to SAM, c/o Bob Dodds, 209 Summer side Place, Encinitas, California 92024, will get you a year's SAM membership and a rulebook.

Let's look at this new engine that Cox has tailored for the 1/2A Texaco event. The simplest way to make a model engine run longer in duration is to use a bigger diameter prop like a seven or eight-inch diameter on a Cox .049 Black Widow. The engine will turn slower (fewer combustion cycles per minute) and the tank of fuel will then tend to last longer.

Cox Texaco .049



On the left is the standard Cox #325 glow head with three cooling fins, as used on the Black Widow. The new Texaco .049's #315 glow head has five cooling fins that provide added cooling.

But these small engines are designed to turn five to six- inch props, and they tend to overheat with bigger props. Also, the rate of airflow past the carburetor will be lower since the rpm decreases with bigger props. The low air flow rate fouls up fuel feed and running becomes inconsistent. By adding more aluminum and two more cooling fins to the #315 glow head the overheating problem with bigger diameter props is solved.

By reducing the airflow diameter to 1/16 inch in the special fuel tank, the air velocity is kept high at lower rpm and the fuel feed stays consistent for smooth engine runs. This is exactly what the large bore Super Tigre 2000, 2500, and 3000 engines use ... lots of head finning for cooling and an under size carb throat for fine fuel draw it works well on big and small engines too! A third special part is the aluminum bushing that fits the hole in the Cox 7 x 3 1/2 prop this engine is designed to use. The bushing centers the prop precisely on the engine's 5-40 prop bolt. All other parts of the Texaco 049 engine appear to be either standard or newly upgraded parts for the rear intake Cox .049 engines.

The Cox pistons are made of leadloy (leaded steel) and are produced on screw machines. They are copper plated overall to promote even heating/cooling and the walls are then centerless ground to finished size.

It's a simply brilliant process, as is the piston's shine!



This view shows the special tank and new lightweight back plate. Top hat style retainer for the reed valve replaces the old spring retainer.

The finished piston/rod assembly weighs a scant three grams. The piston diameter measures .4056 inches and it is .4025 inches high just high enough so there is no sub-piston induction like the Black Widow has. Sub-piston induction allows extra intake of combustion air for more power, but it can also allow fuel to escape, which would reduce the run duration for the 8cc of fuel this engine carries.

The crankshaft is a marvel of precision. The journal's rear bearing is ground to .2173 inch diameter the front to .2172 inch diameter. The section of the journal between the two bearing surfaces is relieved to .2000 inch diameter. This relief minimizes rotational drag as the shaft spins on a blanket of oil/fuel mix in the crankcase.

As you look into the rear of the all black crankcase and sight down the shaft's bearing surfaces you'll see a clever lubrication slot at the five o'clock position. The shaft to bearing surface fits are so precise you'd swear the crankshaft was supported by two precision miniature ball bearings' It's al-most like the crankcase was Teflon coated, like a frying pan. The black surface is only anodizing, but it feels super slippery. Run your fingers over this black surface next time you visit your local hobby shop ... slippery/smooth compared to other metal surfaces.

The cylinder is totally standard, and internal threads hold the glow head. A pair of #21530 wrenches fit "flats" on the top of the cylinder and the top of the glow head for

Cox Texaco .049



These three parts are specially designed to allow bigger props to turn at slower speeds for longer duration on only 8cc of fuel. The center piece fits the Cox 7 x 3 ½ prop originally made for .09 engines.

tightening changing loosening. The wrenches are used in unison, as the photo shows. The new glow head is .1100 inches taller than Black Widow and Tee Dee plugs and provides two more cooling fins. Seven and eight-inch props would cause the normal Black Widow to overheat, and that advances the ignition timing to cause detonation which is damaging to all engines. The additional cooling seems to work well. In an emergency a #1702 plug could be used but listen for the "crackling" sound of detonation avoid a lean setting.

The holding frame for the Mylar reed intake valve has been cleverly re-engineered these newer engines have a black plastic "top hat" shaped piece that holds the .0045 inch reed in place against its seal. About the only thing that makes these reed intake Cox engines run erratically is when a speck of dirt gets behind the reed and won't allow it to seal against the back plate on the piston's down stroke. Another sign of dirt behind the reed is when the engine will only run when primed and refuses to draw fuel. The new design makes it easier than ever to clean the area behind the reed. And I'd suggest you don't do anything dumb like removing the screen over the air intake in the hope of hopping up this engine. The screen is there for dirt protection and does not restrict the airflow past the reed ... trust me!

The prop driver has a machined hex to engage an optional nylon ratchet and starter spring. The last engine finger started beautifully but you may like the spring starter, which is part #51350105 (silver



The success of Cox engines is largely due to the precise machining of their pistons and cylinders. The whole piston is copper plated, then the O.D. is ground to finish. Cylinder has slight taper piston fits tightest at TDC.

plastic) and #20335 for the matching spring for \$1.20 total. The Texaco .049 will also run in reverse, and other part numbers will give you a "backwards" spring starter.

The engine's cylinder is also machined from leadloy. The top of the bore measured .4054 inches and the bottom measured .4060 inches. The cylinder taper is sufficient that the test engine, when cold, held compression for a second or two before leaking out.

And now for performance. Break-in was with a pint of Cox #551 Super Power Fuel that contains a generous percentage of castor oil. With a full tank and a tiny prime and the needle opened 2 ½ turns the engine started with a few flips and ran varying from 8.000 to 8.500 rpm on the 7 x 3 ½ prop. After about 30 seconds it seemed to level out at 8.600 to 8.700 rpm and ran a bit rich for that first tank of fuel. The second tankful was 7.8cc (as were all other refills) and the second start, after a tiny prime, was on the first flip! I was impressed! The second tank ran out with a surprising burst of rpm at two minutes and twenty seconds (2:20). The third tankful was a repeat. The engine was allowed to cool fully between runs. Around the fifth tankful I leaned the needle valve down to two turns open from closed and measured 10.100 to 10.300 rpm and the run was 2:55.

The instructions say the Texaco .049 will turn the 7 x 3 ½ prop at 9.100 to 9.600 rpm. I was already exceeding that as measured by two tachometers.

Cox Texaco .049



Here's the correct way to tighten the Cox glow plug with the two provided wrenches. Don't attempt to loosen a hot glow plug: cool it first to get maximum contraction in the steel cylinder.

With more running and cooling the engine really came alive. After about a dozen runs with cooling I was now recording 10.500 to 10.700 and a tweak of the needle could get 10.900... a full 1.300 rpm above specs, which is a lot of power, but it wouldn't hold that speed as the tank level ran down. When set for 10,500 after starting, the engine ran beautifully as the tank ran its level down and runs averaged about four minutes; the tachs measured 10.900 as the tank ran dry. My test engine was running far above quoted rpm, but for a somewhat shorter duration of run. It was simply converting 7.8cc of fuel to power at a rate somewhat faster than quoted. Starting was best with the needle opened one half turn from the 10.500 run position, and then turned to the 10.500 setting where it happily churned out four to four and a quarter minutes of high climbing power.

I was curious to see if changing fuels would yield runs approaching the quoted five to six minutes duration. Three different fuels that contained 15% nitro and castor synthetic oil blends were tested. In each batch of tests the rpm was adjusted to 10.500 after starting and the tests showed no gain, as follows:

Power master Plus had runs averaging 3:46; Red Max had runs averaging 3:57; Byron's Sport had runs averaging 3:54.



The turned aluminum Insert tits into props made for larger engines and provides precise centering. The combustion chamber of the #315 glow plug matches that for the high performance Cox Tee Dee .049 engine.

Cox's #551 Super Power Fuel has more nitro than these three fuels and also contains more castor oil. The castor provides ultimate lubrication to the ball-and-socket joint between the connecting rod and the piston. Also the #551 fuel, with all castor, may seal the intake reed better and account for the longer recorded run times. I recognize the three non-Cox fuels may cost a bit less, and they may also allow leaner settings and consequent longer runs than recorded above. But the name of the game is fun, and consistency also helps, and when you divide 7.8cc into a sixteen ounce can of Cox Super Fuel you're only dealing with pennies. I'd stay with the Cox #551 fuel for ultimate engine protection in this case.

All through the testing, I had mostly one-flip and two-flip starts. Nothing came loose, nothing failed. The glow plug looked shiny-new with no sign of losing its coil's brightness. In efforts to get longer engine runs I even tested a Master Airscrew 8x4 (7.100 rpm) and a Rev-Up 8 x 3 (8.700 rpm) but neither ran longer than the Cox 7 x 3 1/2 prop. And frankly, in the case of this engine, I'm delighted with getting more rpm for a slightly shorter run time. It's a sure way to get higher... and that's where the thermals and fun are.

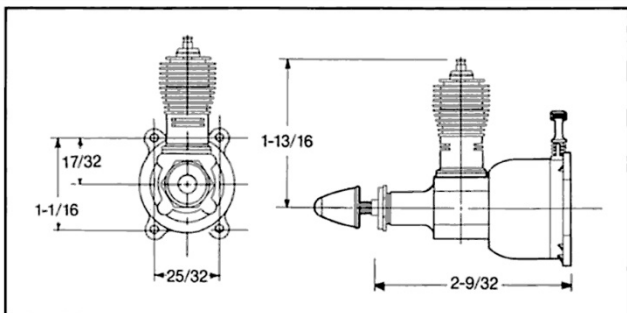
Cox Texaco .049



Looking Into the back of the crankcase we see the narrow channel that provides lubrication for the shaft. Simple and effective.

After your day's flying with Cox #551 fuel. I'd suggest you give the fuel tank a squirt of WD-40 via the red tube, then a short prime of WD-40 too. Stan the engine and run out the WD-40. That will flush out the castor of the Cox fuel so it won't tend to gum up if left for a long period. It will also thoroughly protect your Texaco .049 with a light internal coating of kerosene that prevents rust and corrosion and makes later starting easier.

The Cox Texaco .049, engine number 4506, is in your local hobby shops as you read this and sells for about \$25.00. It is made in the United States by Cox Hobbies, 1525 E. Warner Ave., Santa Ana, California 92705. They even have a toll free courtesy line, (800)451-0339, to answer questions and take orders for parts not stocked by your local hobby dealer.



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