Cox Medallion .09 R/C

Cox Medallion .09

with Cox Throttle Control

ENGINE TEST

By Peter Chinn

The Cox “Medallion” series engines were first introduced in 1962 and comprised three models, the ”.049” (0.817 c.c.), ".09” (1.497 c.c.) and “15“ (2.499 c.c.). Basically these were, and still are. de-tuned versions of the “Tee Dee” series competition engines, a little cheaper than the Tee-Dee type and intended for “Sunday flying”, including control line stunt, sports free flight, scale etc.

Up to this time, Cox had not offered throttle equipped versions of any of their engines but, late m the following year, this situation was remedied with the announcement of the Cox Throttle Control unit. This is a set of conversion parts, applicable solely to the Medallion series, and is made in three sizes to suit the three different displacements. Cox do not offer complete engines ready equipped with the throttle control, but it is a simple matter to fit the parts to the engine and the only item that gets “wasted” in the process is the standard spray-bar. All other conversion parts arc additional to the standard parts of the engine and re-conversion back to the standard engine can be just as easily effected.

As we have already implied, the Medallion .09 is similar in general design to the Tee Dee .09. The latter, when operated on a fuel of high nitromethane content, is just about the most powerful 1.5 c.c. engine on the market at the present time. The standard Medallion .09 is a very much less powerful motor than the Tee Dee .09 and, unless one is unconcerned with power output, the Tee Dee .09, with at least 50 per cent more power than the Medallion, is a much more attractive proposition. However, if throttle control is needed, it has to be the Medallion, obviously, and, for these reasons, we have chosen the Medallion with Cox Throttle Control for this report, rather than the standard Medallion.

Actually, although the two engines look alike and are identical in mounting dimensions, the only parts they share arc the crankcase and back plate, piston, conrod and front retaining ring.

The crankcase is produced from extruded aluminium bar, with an unbushed extension sleeve forming the crankshaft bearing. The top of the sleeve is machined flat, to expose a large rectangular intake port, and is surrounded by a moulded Delrin housing complete with venturi intake which is secured by means of a screw on ring at the front. The crankshaft is of generous dimensions and is similar to that of the Tee Dee .09, except that it uses a smaller, circular, valve port actually about 60 per cent smaller in area than that of the Tee Dee.

The unhardened steel cylinder is typically Cox and looks exactly the same externally as the Tee Dec cylinder. It screws into the crankcase, has integral fins and is topped by a screw in alloy head with integral glow filament. However, it has only one transfer flute instead of two, and the head, instead of the trumpet shape of the Tee Dee, is hemispherical and of larger volume thereby reducing compression ratio. The piston is of the usual Cox pattern, flat crowned and permanently fitted to the hardened steel

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connecting rod by means of a ball and socket joint.

The Cox Throttle Control features a slide type exhaust restrictor coupled to a flattened spray-bar type intake throttle. The exhaust collector housing is pressure die-cast (the only cast part of the engine, incidentally) in two halves which are precisely machined to fit around the cylinder between the base flange and lower cooling fin. The two halves are connected together by two screws and there is a small set-screw which prevents rotation of the complete unit. The housing incorporates a cylindrical section on the left side, through which is installed the sliding bar that controls the exhaust outlet. A glance at the illustration will clarify these details. Fitting the Throttle Control conversion kit lakes only a few minutes.

Whereas the manufacturer's recommended fuel for the standard Medallion is Cox Thimble Drome Glow Fuel a fuel of medium power rating containing approximately 15 per cent nitromethane— he recommendation for the same engines when fitted with the throttle unit is Cox Racing Fuel which contains approximately 30 per cent nitro. We would assume that the reason for selecting this more powerful fuel is to try to restore some of the power lost through the addition of the throttle system. A feature of most Cox engines, the Medallions included, is “sub-piston supplementary air induction”. In this, the piston skirt clears the bottom edge of the exhaust ports at the top of the stroke and, provided that the exhaust ports are exposed to the atmosphere,

Parts of the Cox Throttle Control unit are accurately made and are easily fitted to the engine in a few moments.

the crankcase thereby achieves more complete charging by drawing in extra air. Unfortunately, if the exhaust ports are enclosed within any sort of chamber or duct such as a collector ring, silencer or, as in this case, the housing for the exhaust restrictor valve, the supply of pure air is cut off, burnt gas will be drawn in and the fuel charge diluted and heated, thereby reducing volumetric efficiency and causing a loss of power.

However, the use of a more powerful fuel undoubtedly helps in this particular instance and the torque and power developed by the throttle version of the Medallion .09 was quite good for a 1.5 c.c. R/C engine and particularly so on a power/weight ratio basis.

Practical idling speeds obtained on test included 4500 r.p.m. on a 9x4 Top Flite nylon, 5300 on an 8x4 Top-Flite nylon, 6100 on an 8x3| Top-Flite nylon and 7200 on a 7x4 Power Prop wood. These are not as low as have been obtained with some small R/C engines, but we found the throttle control very reliable. Incidentally, the idling adjustment is by means of one, two or three 10 thou, washers, placed between the rear actuating arm and the exhaust bar. The larger the number of washers fitted, the further forward the bar is allowed to move, thereby closing the throttle to a lower idling speed.

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Three washers are supplied and, after experiment, we used all three. We also tried adding a fourth but with no further improvement. This also involved the addition of a fiber washer behind the prop to prevent the throttle linkage from fouling the rear of the prop blades.

The total cost of the Medallion .09 with Cox Throttle Control is a little high, but the engine has the merit of light weight and a good power output, added to which the beginner will find it easy to start and uncomplicated to adjust.

Power/Weight Ratio (as tested): 0.70 b.h.p./lb.
Specific Output (as tested): 90 b.h.p./litre.

SPECIFICATION

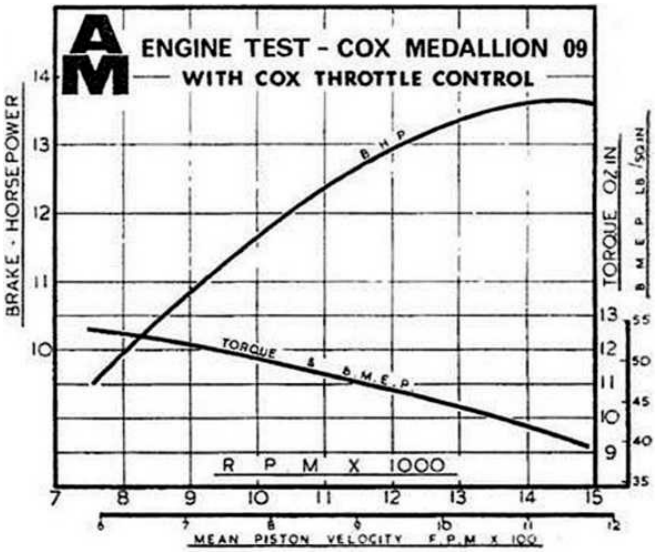
Type: Single cylinder, air cooled, two port two stroke, with opposed exhaust ports and single transfer flute. Shaft rotary valve Induction. Glow plug Ignition. Plain bearings.
Bore: 0.497 in.
Stroke: 0.471 in.
Swept Volume: 0.0914 cu. in = 1.497 c.c.
Stroke/Bore Ratio: 0.943:1
Weight: 3.1 oz. (including throttle unit)

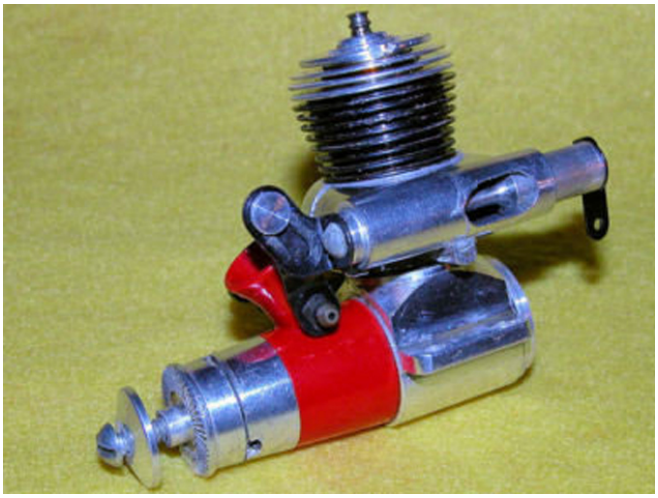
General Structural Data

Crankcase and main bearing (unbushed) machined from extruded aluminium alloy bar. Hardened and ground steel crankshaft with full disc web and crescent counterbalance. 0.375 in. dia. divided main journal. 0 265 in. dia. bore gas passage and 0.156ln. dia. solid crankpin. Shaft end knurled for pressed on machined aluminium alloy prop driver and tapped for prop retaining screw. Unhardened stool cylinder with integral fins and blued finish. Steel piston, hardened on skirt surface only and fitted to ball-ended, hardened steel connecting rod by moans of swaged cup. Screw-in aluminium alloy glow head, seating on soft copper gasket. Moulded Delrin main bearing housing and carburettor Intake with moulded in nipple for optional high-pressure crankcase-pressurised fuel system Pressure die-cast aluminium alloy exhaust collector ring and restrictor valve housing Machined aluminium alloy exhaust restrictor valve linked to flattened spray-bar type Intake throttle valve. Beam mounting lugs.

TEST CONDITIONS

Running time prior to test: 1 hour.
Fuel used: Cox Racing Fuel. (Approx. 30 per cent nitromethane).
Air temperature: 45 deg F.
Barometer: 30.20 in. Hg.
Silencer type: Nil. (Maker does not offer silencer for this model).





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