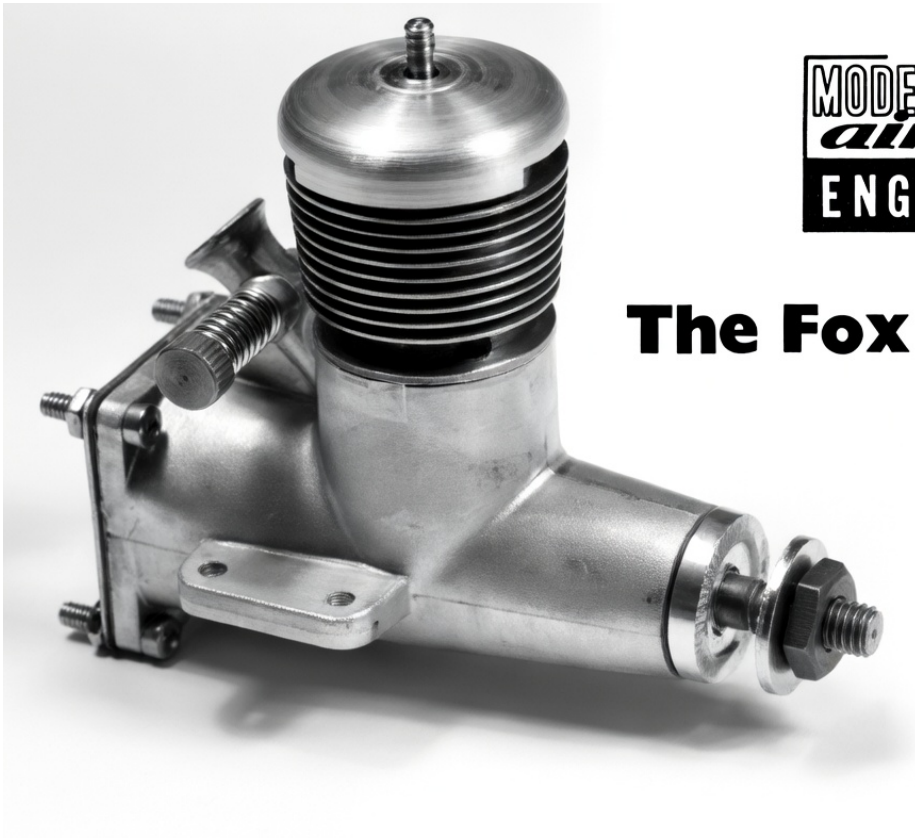
Fox Rocket .09



MODEL aircraft
ENGINE TESTS

The Fox ROCKET 09

1·6 c.c. Glowplug Engine

" . . . excellent starting through a wide variety of props, with no tendency to 'bite.' "

The Fox Rockct-09 is an American glow-plug motor aimed specifically at the beginner market in the U.S., where it costs a modest $4.95 or approximately 35s. 5d. On the British market, it has been advertised at prices ranging, according to supplier, from 45s. 6d. to 60s., but is still one of the cheapest imported engines currently available.

The Rockct-09 is to the popular American 0.099 cu. in. size, actual displacement being 0.0974 cu. in., or just outside the British 1 ½ c.c. group, at 1.596 cubic centimetres.

Compared with most leading 0.09 glow and 1.5 c.c. diesel motors, the Fox is not especially outstanding as regards power output. For the purposes for which it is intended, however, this is unimportant. As we have said, the Rocket-09 is intended primarily for beginners. As such, it does not need ultra-high power. Hot performance is usually more of a hindrance than a help to a beginner: an extra 1,000 r.p.m. with an imperfectly trimmed F/F model can spell disaster. On the other hand, costing, in its country of origin, no more than the average "Half-A" (0.049 cu. in.) motor, the Fox does offer, over these baby motors, the extra power generally desirable for C/L models. In other words, the Rocket-09 rates favourably on the basis of "power-per-dollar" as distinct from power/dis-placement, which, after all, is mainly of interest only to the contest enthusiast.

We have emphasised this approach to assessing the Rocket-09 because we feel that there is often a tendency for modellers to place undue importance on high specific performance figures, irrespective of engine types. This was brought home to us rather forcibly in the case of the Fox, which one experienced and noted modeller dismissed as "disappointing" mainly because its power fell somewhat short of another engine of equal capacity but costing twice as much.

A quality which is of greater importance to the beginner than sheer power is, of course, easy starting, and, in this respect, the Fox excels. Other desirable characteristics, in a beginner's engine, are that the controls should be placed at a safe distance from the prop, that the engine should be as self-contained as possible preferably with an integral fuel tank and that it should be easy to instal in a wide variety of model designs, i.e. with provision for bulk-head or

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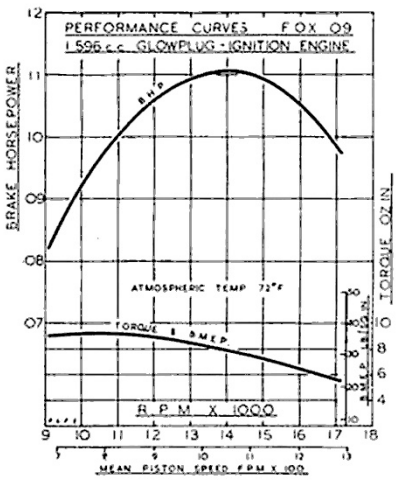
beam type mounting. All these are features of the Fox Rocket-09.

The design of the Rockct-09 is somewhat off the beaten track. With its one-piece crankcase, front housing and fuel tank casting and inclined rear intake, its appearance is quite unlike that of any other engine at present on the market.

The most unexpected feature of the Rocket-09 is in its revival of the 3-port type layout i.e. piston controlled induction instead of the rotary-valve or reed-valve system that has become standard practice nowadays. Instead of the usual single induction port of the old-type 3-port engine, however, Fox has brought things up to date by using twin opposed induction ports, of generous area, fed from an annular chamber, into which mixture is drawn from an inclined rear-positioned carburettor. This has also facilitated the use of an efficient reverse-flow scavenged cylinder, having twin internal transfer flutes and twin opposed exhaust ports. Other modern features include the use of a ball-joint small-end and a built-in glow filament in a hemispherical pattern cylinder head. Standard beam mounting lugs arc disposed symmetrically on the horizontal centre-line of the engine and aft of the cylinder axis. Frontal overhang, however, is kept at a minimum by the short main bearing made possible by the rear carburettor location. Alternative, four- point, radial mounting is provided for by means of a rectangular flange which normally serves to secure the tank back-plate. The engine can be used with or without the integral tank, beam or bulkhead mounted.

Specification

Type: Single-cylinder, air-cooled, reverse-flow-scavenged 3-port 2- stroke cycle.
Bore: 0.527 in.
Stroke: 0.450 in.
Swept Volume: 0.0974 cu. in. 1.596 c.c.
Stroke/Bore Ratio: 0.854 : 1
Weight: 3.1 oz.



General Structural Data

Pressure die-cast aluminium alloy crankcase and unbushed main bearing unit with integral fuel tank. Tank section separated from crank chamber by screw-in back-plate. Rear of tank scaled by stamped aluminium plate, with cork insertion gasket, retained by four screws and nuts. Counter balanced, hardened crankshaft with ¼ in. dia. journal and 1/8 in. dia. crankpin. A 1/8 in. dia. oil hole leads into the main bearing from below the cylinder skirt. Machined leaded- steel cylinder with integral fins, screwed into crankcase and seating on soft aluminium gasket. Light weight, flat crown, steel piston, hardened on outer skirt surface and with swaged socket to ball-joint steel connecting-rod. Screw-in aluminium cylinder head with integral glow element. Soft aluminium head gasket. Alloy prop driver, keyed to shaft by three short lands on latter. Pressed-in brass spraybar, with one-piece steel valve needle and control knob.

Test Engine Data

Running time prior to test: 1 hour.
Fuel used: mixture of two parts Record Nitrex-15 and one part Record Super-Nitrex.

Performance

The maker's recommended fuel for the Fox Rockct-09 is Fox "Missile Mist." This is a fuel containing approximately 20 per cent, nitromethane but is unobtainable in the U.K. An equivalent was therefore blended by adding one part Record Super-Nitrex (30 per cent, nitro) to two parts Nitro-15 (15 per cent, nitro).

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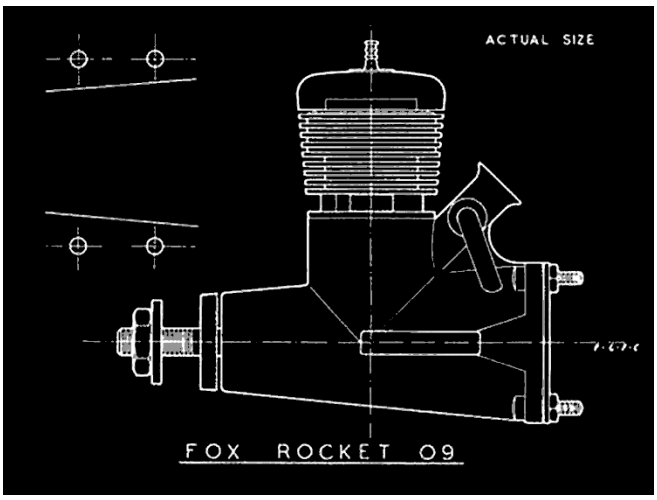

The first due to the excellent handling of our test sample came with the initial start from cold. The maker's instruction leaflet is clearly worded and was followed exactly.

It calls for a port prime for cold starting. The result was a genuine first flick start, the motor cutting out after a few seconds. A further half-turn of the needle-valve was then sufficient to keep the 09 running continuously and evenly.

With the motor warmed up, restarts were virtually instantaneous after a single, choked, preliminary flick of the prop. This excellent starting continued through a wide variety of props and the engine proved remarkably docile with no tendency to " bite " on props down to 6 X 3 size—allowing r.p.m.. well above the peaking speed. On the smaller and lighter props there was a tendency (as with other non-rotary valve type engines) to start in the reverse direction. This, however, was easily dealt with by flicking the prop backwards.

The needle-valve was positive and progressive in operation. Fairly accurate adjustment was necessary to extract the last hundred or so r.p.m., but the 09 would continue to run on an excessively rich mixture, allowing plenty of time to make such adjustment. This latter is particularly welcome in view of the fact that the position of the needle- control, while at a safe distance from the prop, is rather close to exhaust heat.

Torque tests revealed a maximum of 9.2 oz. in., equivalent to a b.m.e.p. of 37 Ib./sq. in. For a 3-port type motor, the b.n.p. peaking speed was unusually high 14,000 r.p.m. where an output of just over 0.11 b.h.p. was realised. The Rockct-09 will, however, rev happily well beyond the peak. The maker's recommended props arc 7/3 and 6/4, wood or nylon. With a 7/3 wood, the test engine reached 13,000 r.p.m. static, and, on a 6/4 nylon, exceeded 15,500 r.p.m. At these higher speeds, the engine is particularly smooth running.

In all, a likeable motor and one that was a pleasure to test.
Power/Weight Ratio (as tested): 0.57 b.h.p./lb.
Specific Output (as tested): 69 b.h.p./litre.

More: https://flyinghlsat.com/search.php?search_keywords=Fox-Engines