

Fox Rocket 15



Known simply as the Fox 15 on its introduction in 1958, this American 2.5 c.c. class engine was later re-designated Fox Rocket 15 to identify it as one of the "Rocket" line of low priced motors others; Rocket 09 and Rocket 35 thereby distinguishing it from the more expensive "contest" Fox models. (This can, however, be a trifle confusing since the new roller bearing 1961 model Fox Combat 35 uses a modification of the Rocket 35 main-casting and, in consequence, at present carries the "Rocket" emblem on the side of the transfer passage.)

The Rocket 15 sells, in the U.S., for a modest \$6.95 (under 50s. at the current rate of exchange) and, despite the addition of purchase-tax and customs duty, is still (at 65s.) one of the cheapest 2.5's available in the United Kingdom. For this price, one can scarcely expect World Championship class performance and the Fox does, in fact, fall short of top contest 2.5 c.c. standards of power output by about 25 per cent. When one remembers, however, that the Fox sells for half the price of most competition engines of this size, its performance, in terms of power per unit of cost, is quite good.

Like the majority of American engines above "Half-A" size, the Rocket 15 is a shaft rotary-valve, loop-scavenged glow-plug ignition engine with plain bushed main bearing. Nevertheless, it does contain uncommon features.

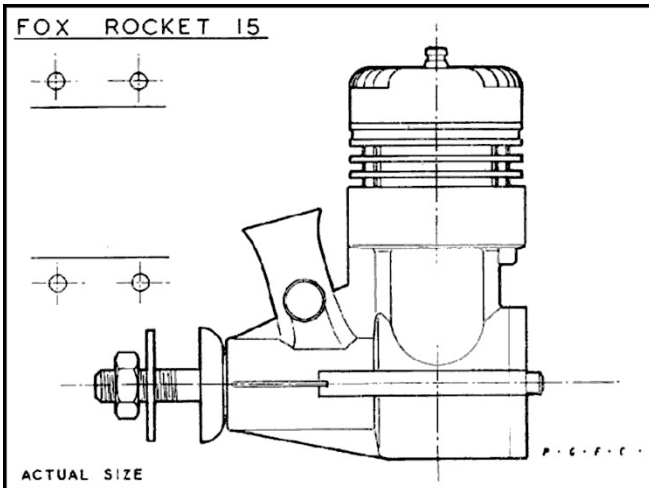
The motor is assembled around a pressure die-cast aluminium alloy crank-case and main bearing unit which calls for very little machining. It carries a

Parts of the Rocket 15, note the square inlet port in the crankshaft and sturdy cylinder assembly. pressed-in brass spray-bar and a bronze main bearing bush. The beam mounting lugs are arranged symmetrically on the centre line and are tapped to receive the two screws retaining the die-cast back-plate. These points could, conceivably, be used for bulkhead type mounting in place of the beam mounts. The crankshaft has an above-average journal diameter, is hardened and counterbalanced.

Like all Fox loop-scavenged motors, the Rocket 15 uses a Desaxe cylinder arrangement i.e. the cylinder is offset to the exhaust side relative to the crankshaft axis. Unlike these other Fox models, however, the 15 has a one-piece cylinder with integral cooling fins (instead of a drop-in liner in an extended main casting) plus an unusual transfer port arrangement. The cylinder has a very deep base flange, ¼ in. thick, the exhaust port being cut through this on the one side, while the transfer port is cut through the cylinder wall and into the bottom of the flange to register with the transfer passage in the crankcase casting. The cylinder is held down with two long screws, arranged fore and aft, passing through the fins from the cylinder head and two extra screws secure the head to the cylinder.

Fairly extensive use is made of aluminium alloy die-castings. In addition to the crankcase and back-plate, the cylinder head, prop driver and connecting-rod are all castings. The threaded valve needle, incidentally, is machined in one piece, with control knob, from mild steel and is not, therefore,

Fox Rocket 15



subject to the petty failures which sometimes beset soft soldered assemblies.

The whole engine is noticeably compact when laid alongside some 2.5's and is also rather lighter than most engines of this capacity.

Specification

Type: Single-cylinder, air-cooled, loop scavenged two-stroke cycle, glow-plug ignition. Crankshaft rotary valve induction. Baffle piston. Offset ignition plug.

Bore: 0.59c in.

Stroke: 0.540 in.

Stroke/Bore Ratio: 0.915 : 1.

Swept Volume: 0.147G cu. in. — 2.419 c.c.

Weight: 4 oz.

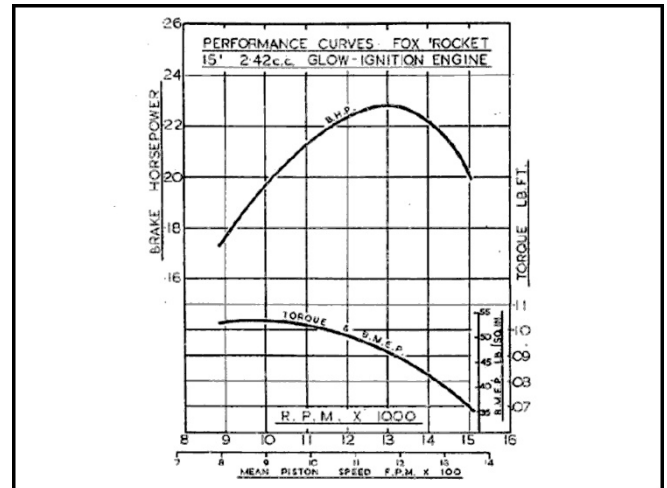
General Structural Data

Pressure die-cast aluminium alloy crankcase and main bearing housing with bronze bush. Hardened and ground steel crankshaft with 3/8 in. dia. journal and 5/32 in. dia. crankpin. Unhardened steel cylinder with integral cooling fins. Meehanite piston with fully-floating 1/8 in. dia. solid gudgeon-pin and pressure die-cast aluminium alloy unbushed connecting-rod. Pressure die-cast aluminium alloy finned cylinder head with aluminium gasket. Pressed-in brass spraybar with steel needle-valve and compression-spring friction device. Beam mounting lugs.

Test Engine Data

Running time prior to test: 3 hours.

Fuel used: two parts Record Nitrex-15 and one part



Record Super-Nitrex to give 20 per cent, nitromethane mixture. Record Methanex used for running-in.

Ignition plug used: Fox short-reach 1.5 volt as supplied.

Performance

A small but sensible instruction leaflet is issued with the Fox 15. In this, the use of Fox "Super-fuel" a general purpose, low-nitro content blend is specified. However, designer Duke Fox has more recently recommended Fox "Missile-Mist," a fuel containing approximately 20 per cent, nitromethane. Missile-Mist is, of course, unobtainable in the U.K., and an approximate equivalent was therefore blended by mixing KK Record Nitrex 15 and Super-Nitrex in the proportions given above.

Starting characteristics of the Rocket 15 were uncomplicated. For a start from cold, the engine responded fairly readily after a port prime. Hot restarts could be quickly obtained with either a port prime or (particularly on the larger prop sizes) after two preliminary choked flicks. Some caution is needed in adjusting the needle-valve when the motor is running, due to its close proximity to the prop. We also found a tendency for the coil spring to cause the needle to jump back a few degrees when the fingers were removed and it was sometimes necessary to go past the desired setting to compensate for this.

General running qualities were good. Running was particularly even under light loads and the engine ran extremely steadily at speeds far in excess of the b.h.p. peaking speed.

Fox Rocket 15

Maximum torque was determined at between 9,000 and 10,000 r.p.m. and reached a value of 0.104 lb. ft. or 20 oz. in. Maximum power occurred at 13,000 r.p.m. where a figure of 0.228 b.h.p. was determined.

Power/Weight Ratio (as tested): 0.92 b.h.p./lb.

Specific Output (as tested): 94 b.h.p./litre.

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