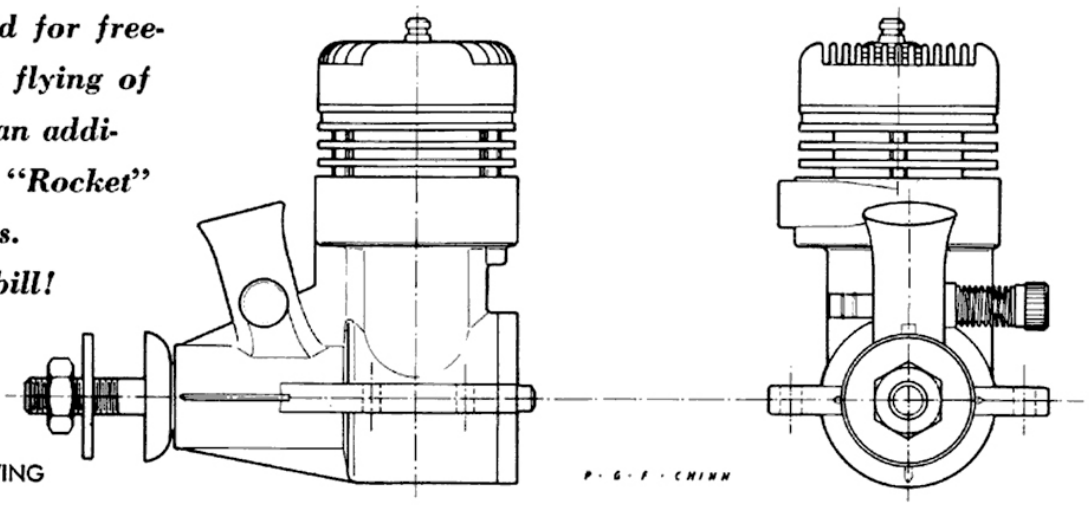
Fox Rocket 15

Admirably suited for free-flight and sport flying of all types .15 is an addition to the Fox "Rocket" series of engines. Should fill RC bill!



Fox 15 Engine Review by P. G. F. CHINN

► Admirably suited to free flight and sport flying, and joined by the Fox 09 (MAN October 1959) and Rocket 35, the 15 appears as part of the new low priced "Rocket" series of engines which are clearly intended to widen Fox clientage.

The .15 cu. in. (2.5 c.c.) displacement has been popular in Europe for a decade or more and, whereas only a handful of motors of this size are made in America, the European market abounds with 15's. In this connection, it is interesting to note that no other comparable engine sells at a lower figure than the Rocket 15. While it may not be the world's most powerful .15, the Fox rates well on a power per dollar basis.

Design wise, the Fox Rocket 15 follows orthodox practice in that it is a loop scavenged, lapped piston motor with shaft rotary valve induction and a plain (bushed) main bearing. The manner in which this basic layout is resolved structurally, however, contains one or two interesting features.

The hardened crankshaft, for example, has a full 3/8 in. dia. journal, which is appreciably larger than on most glow 15's. The unhardened steel cylinder, which has integral cooling fins, has an unusually deep (¼ in.) base flange. A 1/8 in. deep exhaust port is cut through the flange while, on the opposite side, the bypass port is machined into the base of the flange to mate with the bypass passage in the crankcase casting.

One very unorthodox feature, but one which has been a characteristic of all Fox engines since the 59, is the Desaxe cylinder. In this, the cylinder axis is offset to the exhaust side, an arrangement which offers certain theoretical advantages in regard to port timing and the reduction of piston side-loading. The ignition plug is also offset slightly in the head to the exhaust side. The cylinder head, incidentally, has been changed since the 15 was first introduced: a new casting with neater finning and slightly modified internal contours is now used.

The Rocket 15 is built around a pressure die-casting comprising crankcase and main-bearing housing, and including carburetor intake, beam mounting lugs, bypass passage, and exhaust stack. The walls of the casting are quite thin but strength is built into the right places: the front end is adequately webbed and additional stiffness is provided by the beam mount lugs which extend forward into the bearing housing. A bronze main bearing bush is used. The back-plate is secured with two screws into the ends of the mounting lugs. A boss is formed in the center of the back-plate recess, presumably for drilling and tapping for a pressure tank system or other accessories. A horizontal web extends across the back-plate recess connecting the boss and sides.

Model Airplane News Magazine May 1960 by Hlsat

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Though conventional, the .15 has some interesting features. The crankshaft has 3/16 in. diameter journal bigger than most .15's.

These are the .15 parts. Odd feature of Fox engines is slightly offset cylinder to reduce cylinder wall wear on down stroke.

A left hand needle valve control is pro-vided. Being pressed into the carburetor body, the spraybar cannot be reversed and it is knurled to prevent any risk of working loose or rotating. The threaded needle unit is machined in one piece and cannot, therefore, become loose or detached from its control knob. A coil spring is used as a friction device to hold needle settings.

The piston is machined from meehanite and has a parallel skirt (unrelieved). It has a flat head and a thin vertical baffle. A 1/8 in. dia. full-floating solid wrist pin, placed fairly high, is employed. The connecting rod is a diecasting and couples to a 5/32 in. dia. crankpin. The cylinder assembly is tied to the case by two long screws placed, fore and aft, which extend from the head, through the cylinder fins, into the crankcase. Two short screws, one each side, secure the head to the cylinder. An aluminum head gasket is used. The base gasket has a crescent shaped cut-out to clear the bypass and this cut out is repeated on the opposite side, presumably to ensure even gasket compression and eliminate any risk of the cylinder pulling down out of alignment.

Except for the slight bias introduced by the Desaxe layout, porting timing is fairly conventional. The shaft valve opening occupies 180 degrees of crank rotation. The exhaust period is generous at approximately 145 degrees (approximately 70 deg. ABDC to 75 deg. ATDC) while bypass period is approximately 125 degrees. No supplementary air induction is used.

Our tests of the Rocket 15 were proceeded by a three hour break-in. Previously, designer Duke Fox had, very frankly, told us that, although the vast majority of customers had been very satisfied, a few had stated that they did not find the engine very easy to start. It is always risky tone dogmatic on the strength of experience with just one or two examples of any particular engine, so we can only say that we found no cause for complaint with our test sample. The engine may not he such an easy starter in inexperienced hands as, for example, the Fox 09 (which is outstanding in this respect), but any modeler with a little experience of model motors should not have any difficulty.

The instruction leaflet does not state the needle-valve setting. We found that the best running setting on our particular motor was IK to IK turns open, increasing to about two turns for a cold start. A rich setting to produce four cycling is, of course, necessary during the initial break in period. Incidentally, due to the slight torsional springiness caused by the coil spring friction device, there was a tendency for the needle to jump back, after ones fingers were removed, when making a fine adjustment. This was only a very small movement, but, when adjusting for maximum power, was sufficient to make a noticeable difference in rpm. Therefore, it was necessary to twitch the control knob

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round a few degrees, before releasing it, in order to fix the optimum setting.

Following torque and rpm tests, the following brake horsepower curve was obtained:

At 9,000 rpm .176 bhp.
10,000 rpm .197 bhp.
11,000 rpm .213 bhp.
12,000 rpm .223 bhp.
13,000 rpm .228 bhp.
14,000 rpm .222 bhp.
15,000 rpm .201 bhp.

The makers claims are for an output of approximately ¼ hp. Our best figure of just under .23 bhp at slightly over 13,000 rpm suggests that this is a fair claim which may be exceeded under favorable conditions. Running qualities were good, smooth and even, particularly at the higher speeds. The engine is also capable of running “clean" at rpm well in excess of the peaking speed.

Summary of Data

Type: Loop-scavenged two-cycle with shaft rotary valve induction.
Weight: 4 oz.
Displacement: .1476 cu. in. or 2.419 c.c.
Bore: .590 in.
Stroke: .540 in.
Stroke/Bore Ratio: 0.915:1.
Specific Output (as tested): 1.55 bhp/cu. in.
Power/Weight Ratio (as tested): 0.92 bhp/lb.
Manufacturers: Fox Manufacturing Company Inc., 5305 Towson Avenue, Fort Smith, Ark.

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