

## Fox 35 Rocket 1962

# Engine Review

## '62 Fox .35

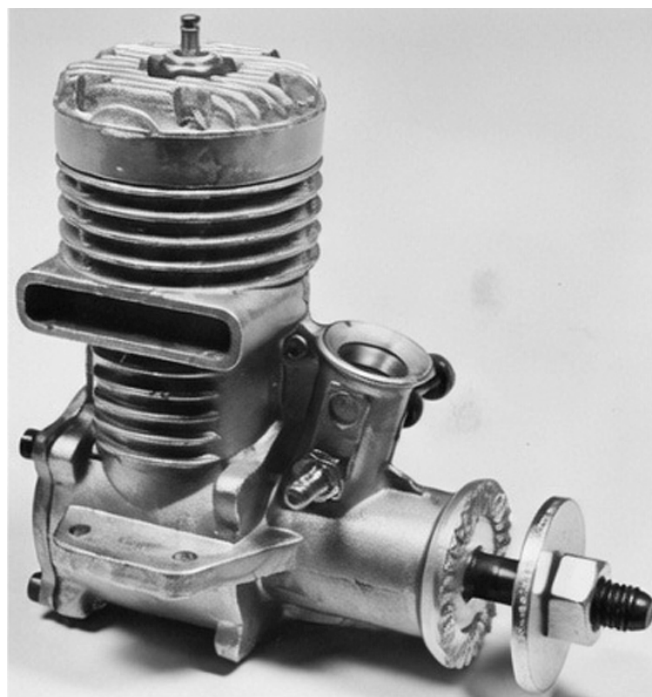
by P. G. F. CHINN

**AND AGAIN ANOTHER NEW ENGINE THIS ONE DESIGNED AND READY FOR INTRODUCTION IN 1962. MODELERS ARE INDEED FORTUNATE. MUST BE THEIR GOOD CLEAN LIVING THAT HAS THE ENGINE MANUFACTURERS CONTINUALLY STRIVING TO PRODUCE THE NEWEST AND THE BEST.**

► New crankshaft, new body casting, new cylinder sleeve, modified piston and rod, sleeved venturi, unpainted head, one third of an ounce heavier. Same needle-valve, back plate, prop washers and nut. This summarizes the basic specs of the new 1962 Fox Rocket, as compared with the original model of two years ago. The price of tire engine remains the same a modest \$11.95.

The original Rocket .35 used the body casting of the 1957 black head Combat .35. Later this casting was modified to incorporate four lugs at the front of the crankcase. In this form it was used for the 1961 Combat Special and .40 models, the integral bearing housing being cut off in the case of the Combat Special and the lugs used to secure this engine's unique needle bearing housing. In its latest form, as used by the new Rocket .35, the casting retains these lugs but is also widened across the beam mount lugs by 3/16 in. Lateral mounting hole spacing has also been increased from 1½ in. to 1 5/8 in. so existing airplanes fitted with tire earlier engines will need modification to accommodate the new Rocket .35.

Like all Fox 35's, excepting the Combat Special, the casting embraces cylinder block, crankcase and main bearing housing, complete with intake, bypass and exhaust ducts, as a single pressure die cast unit. It incorporates a cast-in bronze main bearing which has a shallow longitudinal oil channel to aid lubrication of the front end. Unlike the earlier Rocket, the carburetor intake is drilled



**Externally, new Fox is distinguished by wider beam mounts and no longer carries "Rocket" emblem on side, plain instead of red head.**

out 3/8 in., straight through into the main bearing, and has a separate steel venturi insert. This has permitted a larger intake aperture in the Dearing for better "breathing" and, at the same time, a slightly reduced venturi throat for improved fuel suction.

Several important changes are apparent in tire crankshaft. Firstly, it is now hardened. Secondly, the gas passage through the shaft has been increased 21 percent in cross-sectional area by enlarging its bore to 11/32 in. Thirdly, although, unlike the .40 and Combat-Special, a full circular type web is retained, counterbalance has been substantially increased. Fourthly, the front of the 1 in. dia. journal, between its outer extremity and the valve port, is relieved, forming an oil channel 1/8 in. wide and dividing the shaft into unequal length front and rear journals. The rectangular valve port is 13/32 in. long and, in conjunction with the enlarged elliptical bearing aperture, extends the intake period by about 12 degrees of crank rotation to a full 180 degrees.

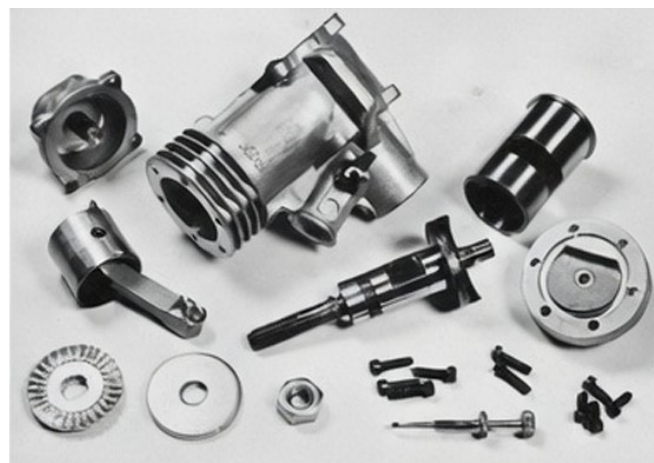
Fox tradition demands a Desaxe type cylinder arrangement (i.e. cylinder offset to the exhaust side relative to the crankshaft axis) so it is no

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surprise to find this feature continued. A thin walled, leaded steel cylinder is also retained but the former, conservative, porting is replaced by ports closely resembling those of the .40 and Combat-Special. The exhaust port is unaltered in depth but extends further around the cylinder and now has a central vertical dividing bar. The bypass port is the same width as before but its depth has been increased by a full 1/8 in. to nearly 5/16 in. Most of this extra depth is due to the lowering of the bottom edge of the port, but the engine falls into line with a current trend in that the top edge is also raised to give a marked reduction in exhaust lead. In other words, the bypass period is now prolonged to within a very few degrees of the exhaust timing by our measurement, 4 degrees each side of BDC: exhaust and bypass periods being, respectively, 142 and 134 degrees.

The design of the Meehanite cast-iron piston is essentially the same as that of the earlier Rocket .35 and features an internal annular rib immediately above the wrist pin to resist ovality occurring either during manufacture or use. The piston has, however, been lightened: the skirt thickness is slightly reduced, the annular rib is a little narrower and a little more metal has been milled out between the wristpin bosses. The full floating wrist-pin has a diameter of 5/32 in. and is slightly harder than of old. It has pressed-in brass end pads. The connecting rod, of 24ST aluminum alloy is as before, except for a slight reduction in the width of the big-end bearing. This is on account of the shorter working length of the crankpin (due, in turn, to the wider counterbalance used) and has the advantage of making for easier assembly and dis-assembly of the engine. The complete piston and rod assembly can now be detached from the crankpin after withdrawing the cylinder liner, instead of the wristpin first having to be fished out through an access hole in the back of the casting. Since this access hole is no longer necessary, the new Rocket .35 does not have it.

The die cast aluminum cylinder head is the same as before but does not have the red enamelled outside finish of the original which, however, is no



**Inside story is one of many changes compared with '59 Rocket .35. New case, modified shaft, lighter piston and new revised porting.**

loss, since the paint did tend to scratch and chip rather easily. The head shape is such as to give a pent-roof type combustion chamber on the exhaust side of the piston baffle. The plug is central and there is a soft aluminum blow-out proof gasket located in a channel in the head. Six Phillips screws secure the head to the cylinder.

On test, we found that the improvements to the Rocket .35 were most evident in better handling characteristics. Power, so far as our particular example was concerned, was not greatly increased and although we were able to record virtually as high a peak output on a 5 percent nitromethane fuel as had previously required 15-20 percent nitro, maximum torque was about the same. Power, on a specific output basis, was not, of course, up to the high level of the .40 or, even less so, to the exceptional figure of the Combat-Special. This is hardly surprising since one does not expect \$14.95 or \$19.95 performance for \$11.95.

A pleasing feature was that only a short break-in was required before the engine was ready to be leaned out. We made rpm checks on various props after a one hour break in, on 5 percent nitro fuel. On a 10 x 6 Tornado, the Rocket .35 turned up 10,900 rpm, on a 9 x 6 Top Flite, 11,800 rpm and on a Power-Prop 11 x 3, 11,700 rpm. Other typical prop speeds were: 12 x 4 Tornado, 8,700, 11 x 5 Power, 9,750, 10 x 3½ Top Flite, 12,900, 9 x 5 Top Elite, 13,050, 9 x 4 Tornado, 14,300,

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9 x 5 Top Elite, 13.050, 9 x 4 Tornado, 14.300,  
8 x 6 Power, 15,250.

Starting was very good, especially from cold, when the engine would usually start first or second flick after priming and the only adverse comment we have to make is that we would like to see a bigger control knob on the needle-valve for more comfortable handling. Needle-valve adjustment is very securely held by a double spring tensioner and this makes the small control knob very stiff to operate. Incidentally, as users may be tempted to ease the needle-valve adjustment by bending the spring, we should mention that this should not be done cold, as the spring is of hard spring steel and will break rather easily.

Maximum torque recorded by the Rocket .35 was 42 oz. in. This was maintained fairly steadily between 6.500 and 10.000 rpm, beyond which, torque fell off to result in a horsepower peaking speed of just over 14.000 rpm where an output of 0.53 bhp was realized. This, of course, was on a relatively mild fuel, such as is recommended for general use, and an appreciably higher performance can be obtained by using hotter fuels such as by adding Fox Hi-Nitro to standard Fox Super fue

To sum up, the 1962 Rocket 35 is easy to start, of useful performance and, despite a moderate selling price, is a soundly engineered job that should give long and trouble-free service.

## Summary of Data

**Type:** Loop-scavenged, two-cycle with shaft rotary valve induction.

**Weight:** 7.85 oz.

**Displacement:** 0.3519 cu. in.

**Bore:** 0.800 in.

**Stroke:** 0.700 in.

**Stroke/Bore Ratio:** 0.875:1

**Specific Output (as tested):** 1.51 bhp/ cu. in.

**Power/Weight (as tested):** 1.08 bhp/ lb.

**Manufacturer:** Fox Manufacturing Co. Inc., 5305 Towson Avenue, Fort Smith, Arkansas.

**Price:** \$11.95.

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