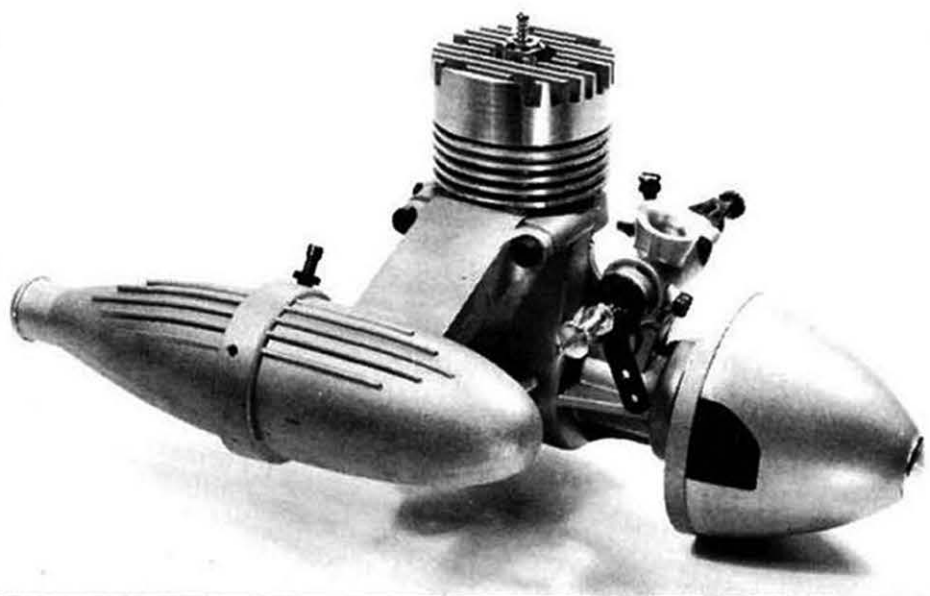


Engine Review Round-Up



FOX 40BBRC "SERIES 6"

by PETER CHINN

SPECIFICATIONS

Type: Air-cooled, single-cylinder, side exhaust, two-stroke-cycle with crankshaft rotary-valve and Schnuerle scavenging.

Bore: 0.840 in. (21.34 mm)

Stroke: 0.715 in. (18.16 mm)

Displacement: 0.3962 cu in. (6.493cc)

Nominal Compression Ratio (full stroke): 10:1

Speed Control: Fox Series 6 adjustable automatic mixture control carburetor.

Checked Weights: 317 grams (11.2 oz) less muffler; 363 grams (12.8 oz) with Fox muffler.

Mounting Dimensions:

Crankcase width: 33 mm

Length (from prop driver face): 72 mm

Height above CL (less glowplug): 65.5 mm

Bolt-hole spacing: 1.5x0.625 in.

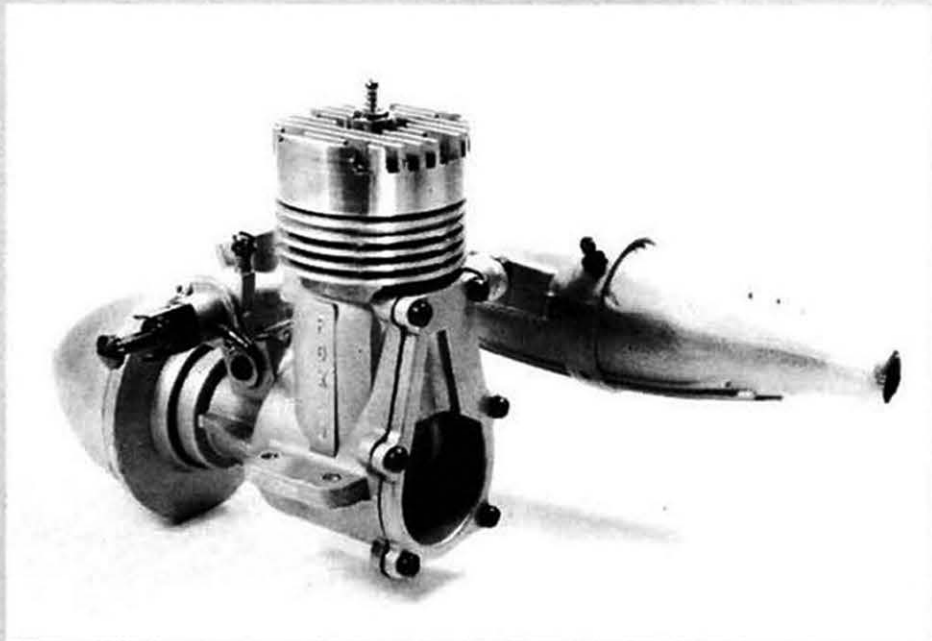
Manufacturer's Claimed Power Output: Not stated.

Manufacturer: Fox Manufacturing Company, 5306 Towson Avenue, Fort Smith, AR 72901.

MOST OF THE better engines on the market are not entirely new models. A new design is rarely so faultless that it cannot be improved upon, so it is usual for a good engine to be a "development" of a previous model. Not surprisingly, the Fox "Series 6" engines are developments of the "Series 5" models dealt with in the January 1984 "Engine Review Round-Up" feature and, as we commented at that time, the Series 5 was, itself, built around a modified version of the earlier Fox Combat-Special Mk. III body casting.

The Series 6 engines currently consist of .36 cu in. and .40 cu in. models in both radio-control (throttle equipped) and standard control-line (non-throttle) versions. The version dealt with here is the 40 radio-control engine, known as the 40BBRC model.

The most significant differences between this engine and its Series 5 predecessor is that it has two ball bear-



One of several unorthodox Fox design points is the engine's tall six-screw backplate. Muffler can be replaced by "tilt-up" type if preferred.



"Series 6" has switched to ABC piston/liner construction. Note unorthodox method of retaining wristpin with small roll pin through piston.

ings, instead of one, and an ABC type piston/cylinder-liner assembly, instead of the long familiar Fox combination of a Meehanite cast-iron piston running in a leaded-steel cylinder sleeve. Actual component parts that are common to both old and new models are limited to the crankshaft, rear ball bearing, carburetor, and crankcase backplate.

The main casting has the addition of a housing to the crankcase nose to accommodate the extra ball bearing. Since the crankshaft is unchanged, the front bearing is of the same i.d. as the rear bearing ($\frac{1}{2}$ inch) but has a smaller o.d. ($\frac{7}{8}$ in.). The body casting has Fox's unique high "back door" which, when removed, uncovers the lower part of the cylinder liner as well as the crank chamber.

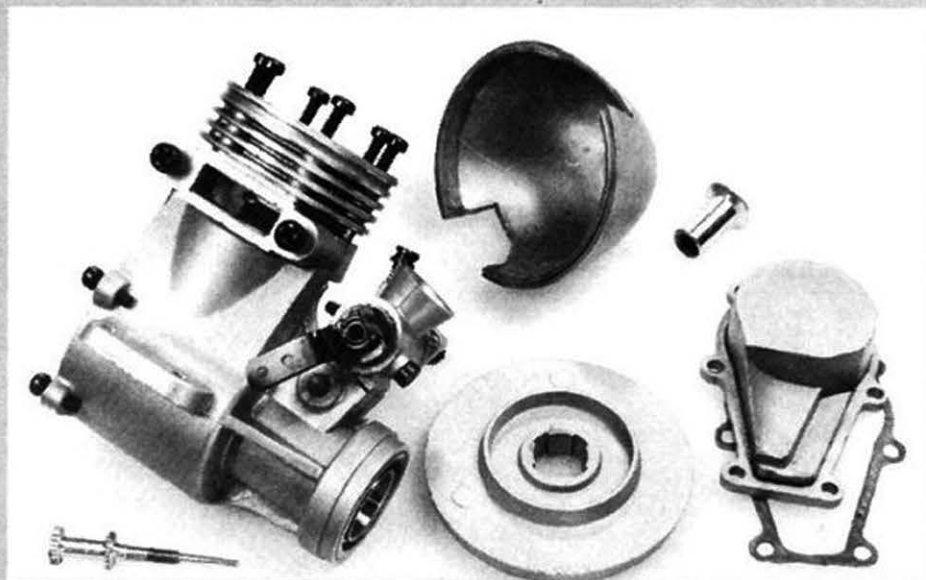
At the front end, the Series 6 engine is equipped with a pressure cast aluminum spinner assembly, an unusual refinement for an R/C engine. In place of the standard type Fox prop driver, there is a robust 2-inch diameter spinner backplate (with serrated driving face for the prop) which is keyed to the usual Fox short splines on the crankshaft. This has a channel into which the edge of the spinner shell fits, in the approved manner, to eliminate any tendency for the shell to expand away from the backplate under high centrifugal loadings. The prop is secured, in the customary Fox manner, by a steel serrated face washer and a $\frac{1}{4}$ -28 UNF nut.

Apart from the aesthetic attraction of its parabolic profile, the spinner offers

two advantages: it provides a positive concentric driving surface for the rubber cup of an electric starter and its 45 gram weight is an aid to smooth running by virtue of the fact that its inertia, like that of a flywheel, helps to smooth out cyclic torque fluctuations. However, if the

from the rest—is maintained. For example, whereas, with other ABC engines, it is necessary to buy a new cylinder sleeve if the piston requires replacement, Fox makes it possible to fit a new piston to an existing undamaged sleeve by offering replacement pistons in four sizes, stepped three ten-thousandths of an inch apart, i.e., .0003 in. undersize, nominal, .0003 in. oversize and .0006 in. oversize.

Also, quite unique, is the method of locating the wristpin in the piston. In place of snap-ring retainers or soft end-pads, a small roll-pin passes diametrically through one end of the tubular wristpin and into adjoining holes drilled from the outside through the piston boss. The machined connecting-rod has a bronze bush at the crankpin end and oil holes at both ends. The complete piston and conrod assembly is very light, weighing



Revised "Series 6" body casting has addition of front ball bearing housing. Also shown are spinner assembly and crankcase rear cover.

owner does not wish to use the spinner assembly, a standard Fox drive washer is available to replace the spinner backplate.

In using an ABC piston/cylinder assembly, the Series 6 breaks with Fox traditions. At the same time, another Fox tradition—always to be a bit different

only 12.2 grams, compared with 17 grams for the Series 5 engine with its cast-iron piston. The benefit of this reduction in reciprocating mass should be evident in lower vibration levels.

The Schnuerle-plus-third-port scavenging system follows the pattern of the Series 5. The unbridged exhaust port is

(Continued on page 90)

flanked by two fairly large bypass ports, with a shallow but very wide third port diametrically opposite. They are timed for opening periods of, respectively, 146 degrees, 112 degrees and 108 degrees of crank angle.

Like the Series 5, the Series 6 uses a two-component cylinder head. However, the "head button" (combustion chamber insert) is shallower, with a slightly sloped, rather than flat, squishband and, as a result, the extremely high compression-ratio formerly used is reduced to a much more modest level, presumably in the interests of easier handling and smoother running. As before, the two-needle adjustable automatic mixture control carburetor is retained in the intake boss with a single setscrew and is sealed with epoxy.

The 40BBRC comes complete with a Fox "Tilt-Down" muffler. This has a volume of 42 ml and an outlet nozzle area of 65 sq mm, which should give a tolerably decent balance of noise suppression against power loss.

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