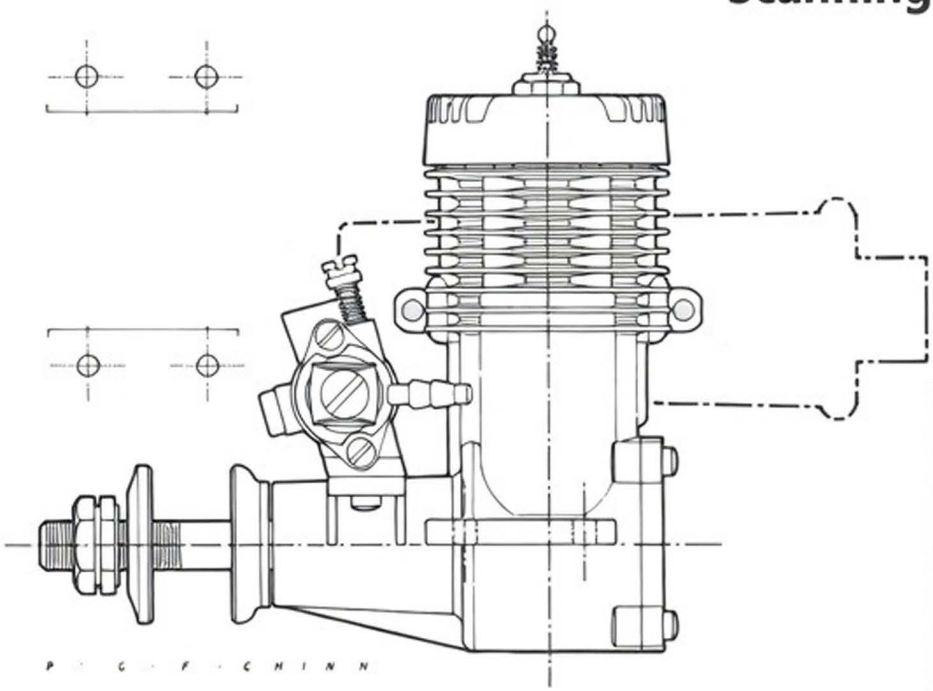
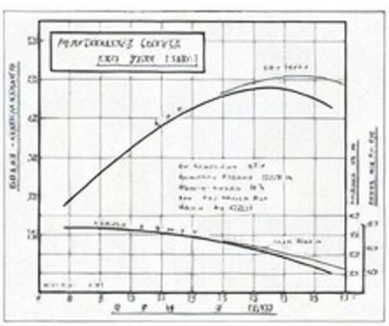
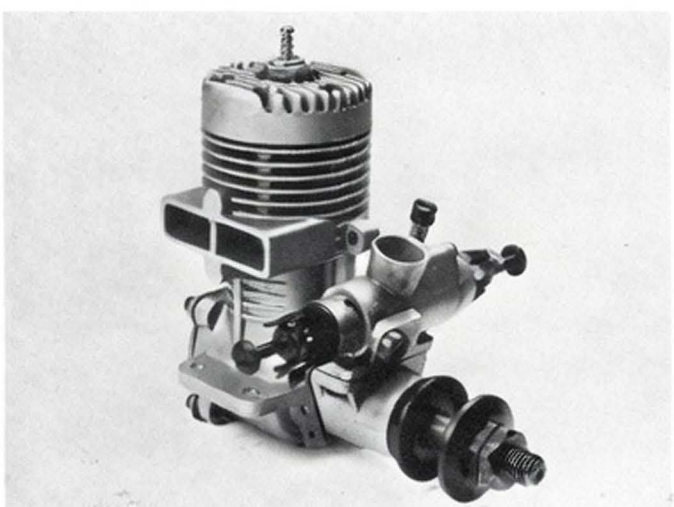
# ENGINE REVIEW



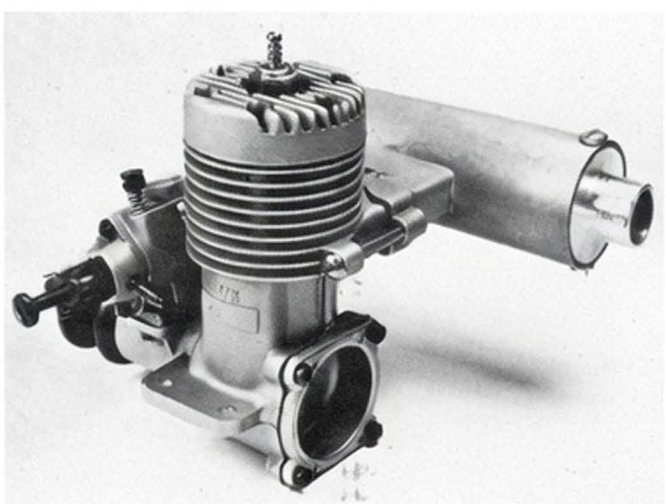
## FOX 25RC



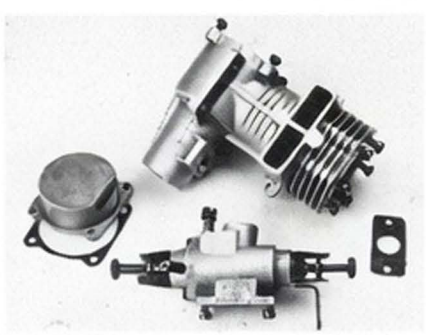


Above average performance and lower than average cost make the Fox 25RC a worthy contender in its class.

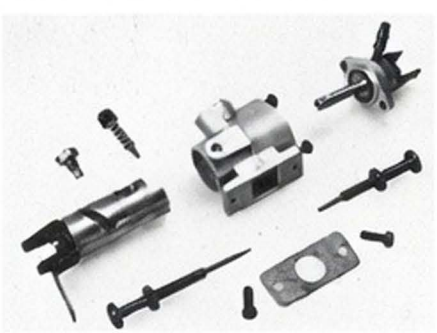


Fox muffler for the 25RC is a revised Type B with closed front end and it utilizes an improved method of attachment.

The 25RC is easy to disassemble for servicing, part replacement.



Matte finish main casting and a sturdier front end than early model; carb is new.



New type carb breaks with Fox traditions with conventional mixture control layout.

## SPECIFICATIONS

*Type:* Single-cylinder, crossflow-scavenged, side-exhaust two-stroke cycle, with crankshaft rotary-valve and bronze bushed main bearing. Throttle type carburetor with automatic mixture control.
*Checked Weights:* 195 grams (6.9 oz) less muffler; 238 grams (8.4 oz) with muffler.
*Displacement:* 0.2470 cu in. (4.047cc)
*Bore:* 0.680 in. (17.27 mm)
*Stroke:* 0.680 in. (17.27 mm)
*Stroke / Bore Ratio:* 1:1
*Measured Compression Ratio:* 7.2:1 (full stroke)
*Power Output (as tested):* 0.455 bhp at 15,500 rpm less muffler; 0.44 bhp at 14,600 rpm with muffler.
*Specific Output (as tested):* 1.84 bhp/cu in. less muffler; 1.78 bhp/cu in. with muffler.
*Power / Weight Ratio (as tested):* 1.06 bhp/lb less muffler; 0.84 bhp/lb with muffler.
*Manufacturer:* Fox Manufacturing Company, 5305 Towson Avenue, Fort Smith, AR 72901.

## by Peter Chinn

• In almost half a century of commercial model aircraft engine production, a lot of motor manufacturers have come and gone. Of course, any engine collector will tell you that as a result of severe production cutbacks during WW II and an unprecedented demand for model motors on both sides of the Atlantic in the early postwar period, numerous second-rate engines appeared on the market, all of which had sunk without trace by 1950. But the truth is that very many more manufacturers have either gone out of business or otherwise given up making miniature i.c. engines during the thirty years that have elapsed since that time. Even the last fifteen years have seen the disappearance of about forty different makes.

All this adds up to one inescapable conclusion: any manufacturer who has survived from the immediate postwar years to the present day must have consistently offered products that have earned him a lot of satisfied customers. Today, the number of manufacturers, world-wide, who can claim to have successfully spanned this period can be counted on the fingers of two hands, and one of the best-known of them is Duke Fox.

The first Fox engine to be offered to the modeling public was the Fox "Hi-Torque" .59 rear rotary disc-valve spark-ignition motor made in California in 1947. The motor for which Fox is best remembered, however, is the famous Stunt 35, winner of innumerable control-line aerobatics contests throughout the world and now in its fourth decade of production. Over the years, a wide variety of types and sizes, ranging from .049s to the current 1.20 cu in. flat-twin, has come from Fox's Arkansas-based factory and, despite the preponderance of imported makes now on the U.S. market, no less than 36 different Fox engines have been featured in the *M.A.N.* "Engine Review" test reports during the 22 years that they have been published.

The 1981 Fox 25RC that is the subject of this month's report was introduced last fall. Actually, it is a development of a design that first appeared some nine years ago and which was dealt with, in its standard free-flight/control-line version, in the July 1972 *M.A.N.,* but the model now covered is the throttle-equipped "RC" (radio-control) version, which has a number of improvements plus a new carburetor and a new muffler. We feel that it deserves inclusion in the "Engine Review" series because it offers particularly good value, especially for the newcomer to the hobby who is looking for an inexpensive engine to power a trainer. It is easy to handle, yet more powerful, by our reckoning, than other crossflow-scavenged bushed bearing engines of similar size.

Construction details are as follows:

MAIN CASTING. A one-piece body casting is used comprising the crankcase, cylinder casing and bronze bushed main-bearing housing, together with the usual beam mounting lugs, a rectangular exhaust stack on the right side and (an exclusively Fox feature) a flat saddle on the crankcase nose to which the carburetor is secured with two screws.

Distinguishing the current model from the original 25, the casting has a larger o.d. main-bearing housing and thicker mounting flange for the carburetor. Also modified is the method of muffler anchorage, which is via a pair of lugs, located fore and aft on the cylinder casing, instead of tapped holes above and below the exhaust stack.

Finally, the casting has a bead-blasted grey matte finish which, we think, looks better than the tumble polished surfaces of the original engine.

CRANKSHAFT. The sturdy one-piece case-hardened shaft has a 7/16" nominal (0.436" measured) o.d. journal and a 5/16" (0.314" measured) gas passage. It has a larger diameter crankpin than the earlier 25 shaft. Measured diameter is now 0.185" (3/16" nominal) instead of 0.155" (5/32" nominal). The shaft is counterbalanced by cutaway web flanks each side of the crankpin and a crescent counterweight opposite.

The shaft has a rectangular valve port, 5/16" long, and this uncovers a circular intake port in the main bearing for a somewhat longer induction period (approx. 189 deg. instead of 175 deg. of crank angle) than in the earlier model. The rotary-valve now opens at 43 deg. ABDC and closes at 52 deg. ATDC, according to our measurements of the test motor.

At the front end, the shaft steps down to a 1/4" dia. propshaft length with four short splines for the prop driver and the usual 1/4-28 UNF thread. The prop driver and prop retaining washer are now of steel, instead of aluminum, and both have serrated surfaces to ensure a firm grip on the prop.

CYLINDER LINER. The cylinder liner or sleeve is a slip fit in the main casting and is located in the usual way by a flange at the top. The sleeve is of leaded steel, with a wall thickness of .044", and uses a single unbridged rectangular exhaust port with, diametrically opposite, a single unbridged rectangular bypass port. The exhaust is timed to remain open for 133 deg. of crank angle and the bypass for 116 deg., according to our measurement of the test engine.

PISTON & CONROD ASSEMBLY. The ground and lapped piston is machined from Meehanite. It has a flat head with a straight baffle 5/32" high and 3/32" thick. A 1/8" solid wristpin is used, pressed into the rear piston pin hole, which is slightly tapered for this purpose. Above the piston bosses there is an annular stiffening rib to assist in maintaining piston roundness. A stronger connecting-rod, machined from bar stock, is used in place of the pressure diecast rod of the early engines.

CYLINDER HEAD. This is a pressure casting with tapered fins and is shaped to form a wedge pattern combustion chamber on the exhaust side of the piston baffle. It is channeled to fit over the flange of the cylinder sleeve with a 10 thou. soft aluminum gasket and is secured to the cylinder case with six Phillips head screws. A Fox long-reach glowplug is located vertically in the center of the head.

Measurement of the combustion chamber volume of the test motor indicated a nominal (i.e., full stroke) compression ratio of 7.2 to 1.

CARBURETOR. After many years during which Fox carburetors have always been of different and sometimes quite ingenious design, 1980 saw a change of policy in which Fox carbs moved closer to the basic design principles used by the majority of other R/C engines. In other words, a barrel throttle with circular choke is now used, the barrel moving axially as it is rotated and carrying with it a separate low-speed needle which reduces fuel flow through the jet tube as the throttle moves towards the idling position.

The decision to fall into line with more familiar carburetor design was not taken, we are sure, because of any shortcomings that it would have worked just as well with a new cylinder head and a single plug. ■