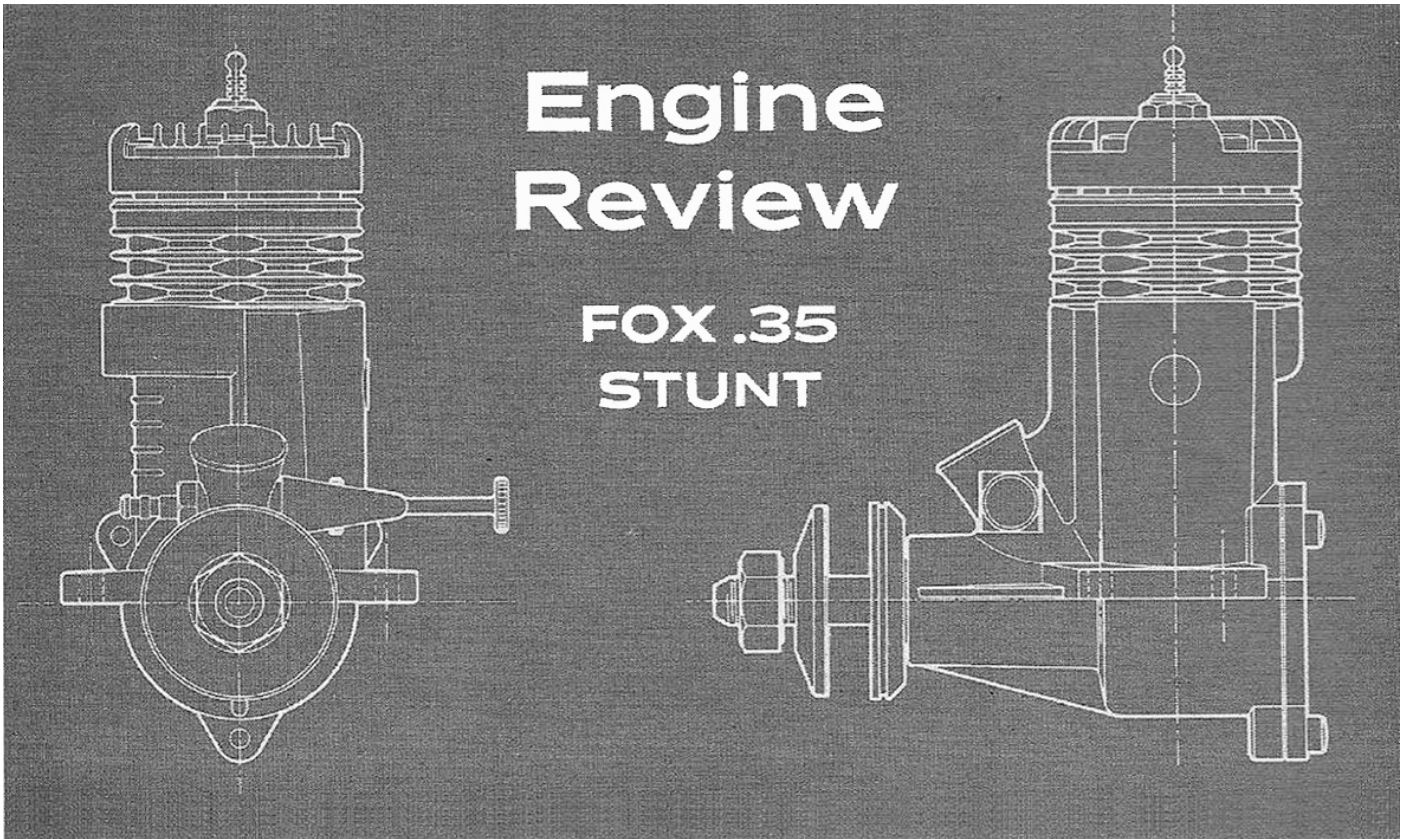


Fox 35 Stunt



After 18 years of production, the Fox .35 is still world's Number One Stunt engine. A deserved reputation of performance keeps it on top.

By PETER G. F. CHINN

► Who reads the Engine Reviews? Potential purchasers of the engines concerned, obviously, but they are also followed by readers who want to know more about a particular motor or its performance statistics, or who want to compare one motor with another merely because of an all-round interest in engines. All of which is fortunate because, so far as helping a C/L stunt fan to decide whether or not to buy a Fox 35 is concerned, you could say that a magazine report is quite superfluous.



Fox .35 stunt motor is the lightest (6.4 oz.) and most compact 35 extant. Made for aerobatics, not speed, it was designed and ported accordingly.

Model Airplane News Magazine June 1967 by Hlsat

Fox 35 Stunt

The plain fact is that when one builds a stunt model, scarcely a second thought is given to the question of a power plant: a Fox 35 goes between the bearers almost as a matter of course. For eighteen years, Fox 35's have been powering stunt winners. More contests, national and international, have been won with Fox 35's than with all other makes added together partly because the Fox is a very good stunt engine and partly because, being universally recognised as such, it is so widely used that other motors are overwhelmed by sheer weight of numbers.

If there is any engine that has enjoyed a more complete monopoly of any type of event and for a longer period of time, we can't call it to mind: the only comparable record we can think of would be in the sphere of full-scale i.c. engines, namely, the domination of the Indianapolis 500 mile race through three decades by the 4 cylinder Offenhauser racing car engine.

Why do people prefer the Fox for stunt work? There are other 35's as powerful; some more powerful. None, however, are as light or compact. Few perform with such reliability and consistency. In short, the Fox does the job it was designed to do and goes on doing it, year after year.

Basically, the Fox 35 is still much the same as it was in 1949, when the original version first saw the light of day, insofar as it remains a shaft-valve motor of 0.800 x 0.700 in. bore and stroke, with a one-piece body casting and bronze bushed main bearing. There have, nevertheless, been quite a few changes since those early models were built. Most of these changes occurred during the first few years of production. Early models had permanent mold castings, cylinder heads secured with four screws and rear covers attached with only two screws. There were fewer fins on the cylinder and head and no strengthening webs on the crankcase nose. The current type has three point back plate attachment, six head screws and the front end is braced by triangular webs each side and below the main bearing. All castings, of course, are now of the pressure-die cast type. There have also been minor internal improvements, including the adoption of better

materials.

Structurally, the Fox 35 is simple and orthodox. The main casting comprises crankcase and cylinder barrel with a short main bearing having a cast-in bronze bushing. It is very light, weighing only a trifle over 2¼ oz. It includes the usual bypass and exhaust tracts and a small inclined air intake placed close to the junction of the cylinder barrel and main bearing. This is bored 9/32 in. into the bearing to form an elliptical intake aperture, of modest area, which registers with a 3/8 in. long rectangular port in the crankshaft. This gives a 180 degree induction period, timed to open and close at 45 degrees after dead centers.

The hardened steel crankshaft has a full disc web with machined crescent counter-weight. It has a 7/16 in. diameter journal, a solid 3/16 in. dia. crankpin and a 5/16 in. bore gas passage. At the front it has the usual Fox splined drive to a steel drive disc and terminates in a conventional ¼ in. threaded section, over which is fitted a steel prop washer and hex nut.

The cylinder sleeve, of .037 in. wall thickness, has moderate port area. The bypass port, in particular, (and in marked contrast to Fox's combat and rat-racing engines) is quite small (0.148 in. high x 0.610 in. wide). Measured port timing on our test engine was: exhaust opens 66 deg. BBDC, closes 66 deg. ABDC, bypass opens 59 deg. BBDC, closes 59 deg. ABDC. It will be observed that, unlike many Fox engines, the Stunt 35 does not feature a Desaxe, or offset, cylinder.

The piston and conrod assembly is of typical Fox design. The lapped meehanite piston has a flat head and, straight baffle and is machined to a .020 in. skirt thickness below the bosses for the wristpin, above which is an annular stiffening rib. The wristpin is of small diameter (nominally 5/32 in.) and has brass end pads. A machined dural conrod, unbushed and without lubrication holes, is employed.

Compression-ratio is fairly low and the cylinder head is of a slightly unusual shape. It is basically a wedge pattern, but shallow and no significant

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squish effect is contributed by the shape on the bypass side. The glow plug boss, however, actually projects below the wedge surface, its depth being such that the bottom of the Fox "Glow master" long reach plug finishes flush with the rim of the boss, well into the actual combustion chamber. The cylinder-head is recessed to drop over the projecting rim of the cylinder sleeve and a 10 thou, soft aluminum gasket is used to make the joint between the two surfaces.

The needle-valve is of the usual Fox pattern. The steel valve needle, complete with operating knob and ratchet wheel, is made in one piece and screws into a brass spray bar. A double sided ratchet spring is fitted and securely locks the needle against the possibility of accidental maladjustment.

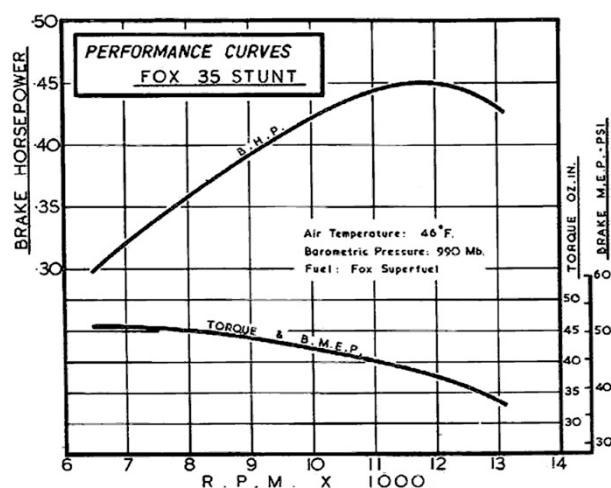
Our test model Fox 35 was an absolutely stock model and was obtained through a Fox distributor, rather than direct from the factory. It was given a careful rich mixture break-in totalling approximately 2 hours, in short runs with a cooling off period between each. The engine performed smoothly from the start, showed no tendency to tighten up and was, to all intents and purposes, broken-in long before the two hours were up. Normally, a bench break-in will not be necessary with these motors. Using the orthodox stunt technique of adjusting the needle for continuous level-flight 4 cycle running, (from which it will break into a two-cycle only when the model is pulled into overhead maneuvers and gravity begins to overcome the centrifugal force acting on the fuel), will normally permit the engine to be broken-in in the air. Naturally, holding the model fairly level, to keep it 4 cycling, most of the time, is advisable for the first few flights.

Using Fox Super fuel as recommended by the manufacturer, and, of course, the Fox Glow master plug as supplied, our test motor turned up 9.400 rpm on an 11 x 5 Top Flite, 10.700 on an 11 x 4 Top Flite and 11.400 on a 10 x 4 Tornado. Getting down to typical stunt size props, a 10 x 6 Top Flite was turned at 10.200 and a 10 x 6 Tornado at 10.300. Judging by past experience of

Fox 35's, we would say that these figures could be slightly below average. Certainly most Fox owners should have no difficulty in equalling or bettering them and may well, therefore, improve on the torque and power figures displayed on our graph, although it should be understood that an output of 0.45 bhp at between 11.500 and 12.000 rpm, for a specialised stunt motor running on a fuel containing only 5 percent nitromethane, is quite good and perfectly acceptable.

Starting was at all times excellent. The needle-valve was a bit slack in its threads on our engine and, since the needle does not have a symmetrically tapered tip, this had a slightly erratic effect when the needle was adjusted, but, once set, adjustments were held firmly and there was no indication of any irregularity of fuel flow. Overloading the engine (i.e. propping for speeds below 9.000 rpm) produced some vibration, but the Fox was notably smooth and even over its normal operating range.

As we said at the beginning, it scarcely needs comment from us to persuade any stunt flyer that the Fox 35 is a good aerobatics motor. We will merely say that our examination and test findings seem to fully justify the confidence which so many stunt flyers have in this engine.



Summary of Data

Type: Loop-scavenged two-stroke cycle with shaft type rotary-valve induction and bronze-bushed main bearing.

Weight: 6.4 oz.

Displacement: 0.3519 cu.in. or 5.767 c.c.

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Bore: 0.800 in.

Stroke: 0.700 in.

Stroke/Bore Ratio: 0.875:1

Specific Output (as tested): 1.28 bhp/cu. in.

Power/Weight Ratio (as tested): 1.12 bhp/lb.

List Price: \$16.95

Manufacturer: Fox Manufacturing Company,
5305 Towson Avenue, Fort Smith, Arkansas,
72901.



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