

Fox 29X STD - 1968



THIS ENGINE, introduced earlier this year (and not to be confused with the older model Fox 29X's produced between 1958 and 1962) is the latest offering from the Fox Manufacturing Company of Fort Smith, Arkansas, U.S.A. Coming at a time when engine prices, in general, have been moving upward, the new Fox 29X remains quite reasonably priced (\$14.95, or approximately £6 5s., in the U.S.) for a 5 c.c. engine capable of a fairly high level of performance.

The ancestry of the present 29X can be traced back to the Fox 35X engine which appeared in 1963 and which, itself, set a new standard of performance for low-priced engines. The 35X was later developed into the 36X and it is on the main casting of this engine that the 29X is based. Overall dimensions of the 29X, together with bearer and bolt hole spacings, are identical with the 36X.

Other parts of the 29X have been taken from the Fox 29X-BB twin ball-bearing rear-induction C/L speed type motor. This is typical of Fox design and manufacturing practice which is to ring the changes on certain proven Fox components and combinations to evolve models for different sections of the market. The new 29X is not aimed precisely at any specific contest application. Rather, it is a multi-purpose engine which the purchaser can use for general free-flight or control-line work, including contest F/F, C/L stunt or even (with simple modifications) a bit of 5 c.c. speed work at a club or inter-club level. It really has no exact counterpart in any 5 c.c. engine at present produced in the U.K.

ENGINE TEST

By Peter Chinn

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Like other related Fox models, the 29X uses a one-piece casting to include the crankcase, cylinder casing and main bearing housing. It contains a single needle-bearing to support the rear end of the crankshaft journal while, at the front end, the shaft runs direct in the crankcase material. The crankshaft is of case-hardened steel, with a solid crankpin and fairly generous counterbalancing. The large diameter shaft journal (1/2 in.) has a correspondingly large gas passage (3/8 in.) fed from a rectangular valve port which uncovers a similarly shaped aperture in the bearing to give a quick-opening, quick-closing and very long induction period of some 204 degrees of crank angle. The big 3/8 in. square rectangular carburettor intake is equipped with a detachable venturi restrictor having an i.d. of 9/32 in.

The piston and cylinder liner are exactly the same as those used on the very much more expensive Fox 29X-BB.

The cast-iron piston, of typical Fox design, is light (0.34 oz.), with a flat crown and thin straight baffle. The solid gudgeon-pin, quite small in diameter (5/32 in.) is retained by wire circlips which engage grooves in the piston bosses. The connecting-rod is of machined aluminum alloy with plain eyes.

The cylinder liner has an extremely wide exhaust port which occupies 200 degrees of the cylinder circumference and remains open for 140 degrees of crank angle. Like other related Fox engines, the 29X is a Desaxe (offset cylinder) type engine and cylinder port timing is therefore slightly asymmetrical, the ports opening and closing

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Tough, yet light construction is a feature of all Fox Products, as seen in component view at right.

approximately 2 degrees earlier than would otherwise be the case. The transfer period is approximately 130 degrees.

The cylinder head is also the same as that of the 29X- BB. It has a wedge-shaped combustion chamber and closely spaced machined fins. It is held down with six Phillips screws and has a recessed 10 thou, soft aluminum gasket. There is also a shim of similar material under the cylinder liner flange.

As supplied, the 29X is intended for operation on normal suction feed, the venturi restrictor being small enough to provide ample fuel lift from an ordinary tank. There is, however, a central cast-in spigot in the back plate, which could be drilled and tapped to take a crankcase bleed-off fitting to pressurise a sealed fuel tank and thereby enable an unrestricted intake to be used to release extra power for speed or contest free flight work.

Performance

Handling qualities were very good right from the start. The engine responded readily to orthodox starting preliminaries; namely, fairly generous exhaust priming, when cold, and a one- or two-turn suck-in, when warm. The 29X was reasonably docile and could be hand-started on props down to 8 in. dia. without showing any signs of undue viciousness. Response to the needle-valve control was fairly slow, so that it was necessary to pause after making an adjustment to

determine its effect before making any further readjustment towards the optimum setting, but the engine was not critical as regards the precise setting. As on most Fox engines, the needle-valve control is short, rather close to the prop and tends to be a bit stiff to operate, so that care is needed to avoid bringing one's knuckles or finger tips into contact with the prop.

As received, our test sample, which had been briefly check-run at the factory before despatch, was fairly free and needed little running-in. We gave it a total of one hour of accumulated running time before test began.

The manufacturer's recommended fuel for the 29X is Fox 'Missile Mist' and our performance graph shows the torque and power curves plotted from tests made on the engine using this fuel. A similar performance should be obtainable with home-brew mixtures containing around 20 per cent nitromethane. The maximum torque, which exceeds 50 oz. in. at between 9.000 and 11.000 r.p.m., is very good, as is the maximum power output indicated, at exceeds 50 oz. in. at between 9,000 and just over 14.000 r.p.m., of 0.64 b.h.p.

The above figures were obtained with the engine in standard trim. Somewhat higher power (probably with the b.h.p. peak at between 15.000 and 16.000 r.p.m.) can be expected by removing the restrictor and resorting to a pressurised fuel feed. Higher torque (and b.h.p.) should be realised with still more powerful fuels containing 40 to 50 per cent nitromethane.

The 29X nevertheless runs extremely well and with a quite good power output on more "cooking" varieties of fuel. We made some brief checks on a typical C/L stunt type fuel containing 5 per cent nitromethane. These indicated that maximum b.h.p. would be in the region of 0.50 b.h.p. rather better, in fact (despite the 29X's smaller capacity) than we obtained, last year, on our test of the well established and much favoured Fox 35 Stunt engine.

Typical prop revolutions obtained with the 29X running on 'Missile Mist', included 8.500 r.p.m. on an 11x6 Top Flite wood, 10.100 r.p.m. on an 11x5

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Top Flite wood, 10.400 on a 10x6 Top Flite nylon, 10.900 on a 10x6 Tornado nylon, 12.400 on a 10x4 Tornado nylon, 13.800 on a 9x5 Top Flite wood and 14.500 on a 9x4 Top Flite nylon.

All performance figures were taken with the 29X in standard 'open exhaust' trim. The makers do not offer a silencer for the 29X. A possible solution here would be to use the Tatone 'Peace Pipe' Model 102 which will fit the 29X without modification to the engine.

SPECIFICATION

Type: Single cylinder, air-cooled, glow plug ignition Desaxe two-stroke with crankshaft type rotary-valve and single needle-bearing.

Bore: 0.738 in.

Stroke: 0.700 in

Swept Volume: 0.2994 cu. in. = 4.907 cc

Stroke/Bore Ratio: 0.948.1

Weight: 8.1 oz.

General Structural Data

Pressure die cast aluminum alloy cylinder / crankshaft / main bearing unit with drop in unhardened steel cylinder liner. Detachable pressure die cast aluminum alloy crankcase back plate secured with four screws. Case hardened steel counterbalanced crankshaft having 1/2 in. dia. journal, 7/32 in. dia. crankpin and 3/8 in. bore gas passage and supported in one caged needle-bearing at rear end. Lapped Meehanite piston with baffle and hardened 5/32 in. dia solid gudgeon-pin retained by wire circlips in piston bosses. Machined aluminum alloy unbushed connecting-rod. Pressure die-cast aluminum alloy cylinder-head with recessed .010 in. soft aluminum gasket and secured with six screws. Machined steel prop driver. Brass spray-bar type needle valve assembly retaining aluminum choke insert and reversible for left or right hand control. Beam mounting lugs.

TEST CONDITIONS

Running time prior to test: 1 hour

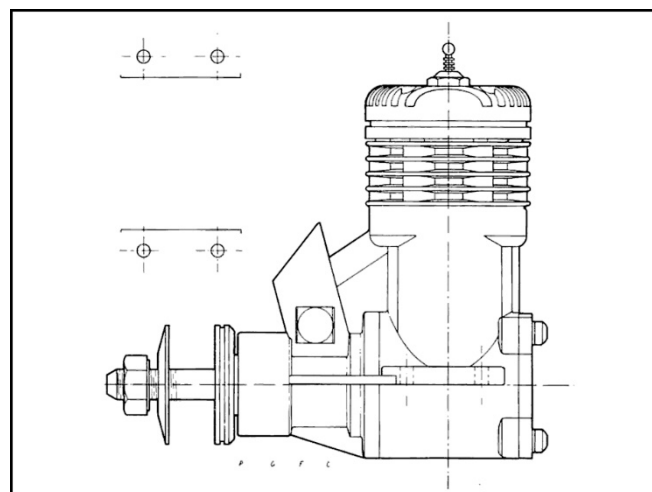
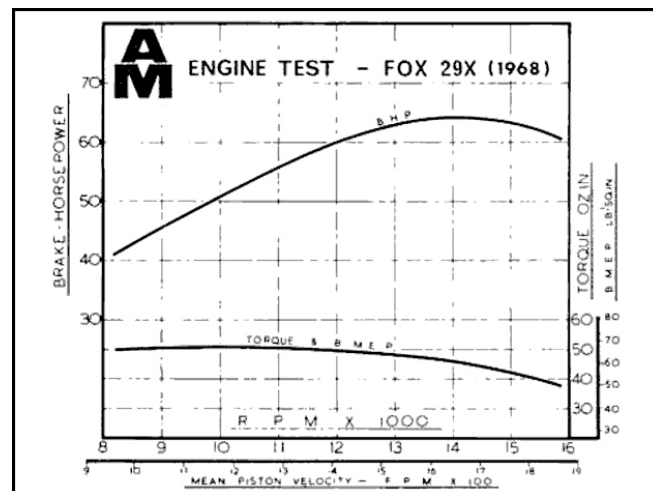
Fuel used: Fox 'Missile Mist' (approx 20 per cent nitromethane rating).

Glow plug used: Fox long-reach, platinum-rhodium filament, as fitted.

Air temperature: 54 deg F

Barometer: 30.00 in Hg.

Silencer type: Nil.



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