

Fox 15X

PETER CHINN tests the

FOX 15X

2.42 c.c. Glow Plug
Motor



Imported by Holt Whitney & Co. Ltd., and distributed by Bradshaw Model Products Ltd., the American Fox 15X is now to be found among the stocks of most model shops. In the U.S., the Fox 15X retails at a mere \$6.95 under fifty shillings and even with U.K. purchase-tax and customs duty added, it remains one of the cheapest 2 ½ c.c. engine on the British market.

Unlike most imported engines (many of which, in the past, have been sold in the U.K. on their attraction as specialised competition engines) the Fox is likely to draw the attention of the “ordinary” modeller because of its low price.

Let us make clear, therefore, that, in its “stock” condition, the 15X is not a contest engine in the generally accepted sense. It is not an especially powerful engine but it is very light, compact, suitable for many different applications and is easy to handle. It does not have the elegant external finish of some of the more expensive American motors, but it is functional, well planned and, we believe, will prove to be serviceable and good value for money.

Actually, as was explained in the “Latest Engine News” column in the June issue, the Fox 15X can be modified to produce much higher performance. As supplied, the engine has a very low compression ratio and, in this condition, is especially recommended for beginner and general purpose applications, for C/L stunt, for R/C and for scale models. The actual power output on standard fuel is not greater than for a good 1.5 c.c. diesel, but since the Fox’s weight is also no

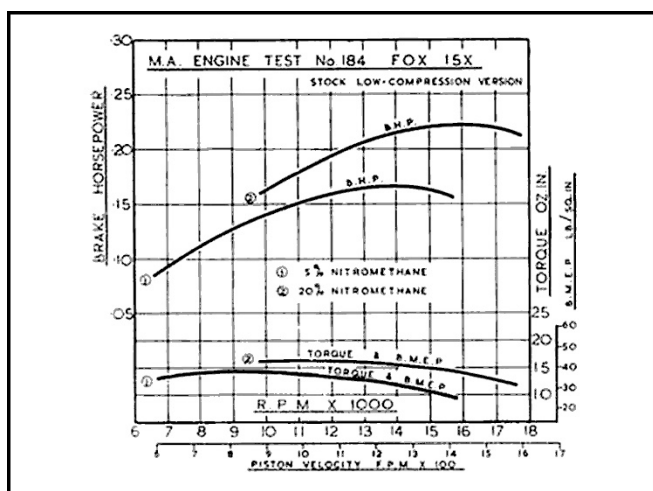
greater, it could, of course, be used as an alternative to the diesels for such applications.

For contest work, the stock low compression 15X responds exceptionally well to the use of increased nitromethane. The use of a medium nitro content fuel such as Cox (blue label) Glow Fuel, will add anything up to 2,000 r.p.m. to the performance obtainable on ordinary methanol/castor fuel, while a hot racing fuel containing, say, 50 per cent, nitro will increase performance still further. In view of the current supply difficulty with nitromethane, however, a cheaper and more practical means of increasing the 15X’s performance is to substantially raise the compression ratio by removing the “decompression spacer” under the cylinder head and replacing it with an additional 0.010 in. gasket. This gives equal or superior results to the use of nitromethane so much so, in fact, that one wonders whether the standard compression-ratio is not unnecessarily low.

Apart from this very simple modification, optional parts can be purchased for the 15X for contest use. Where the engine is intended to be lightly loaded and run at very high speeds (such as in speed C/L work, for contest F/F or in boats where the engine is started out of the water) it is recommended that the 15XX type connecting-rod be used. This is a machined dural rod, colour-anodised red and replaces the die cast conrod of the standard engine. A lightened piston with matched cylinder liner is also available from the factory, as is a complete 15XX type main casting with a better quality bronze bearing.



Fox 15X



At the present time, the complete 15XX type engine is not being offered in Britain anti since the parts required to convert the 15X to 15XX specification cost more than double the price of the standard engine, our present report is being confined to the former. For the benefit of those interested, however, it may be remarked that we have, in fact, tested a 15XX type engine submitted by the Fox factory and on a mild fuel this engine delivered nearly twice the power of the stock engine, reaching 0.32 b.h.p. at 19,000 r.p.m., this being boosted to over 0.40 b.h.p. on 50 per cent, nitromethane.

In general appearance, the 15X, unlike its predecessor the Rocket 15. looks similar to the larger Fox engines. It has a one-piece cylinder-block/ crankcase/main-bearing unit but dispenses with the Desaxe offset cylinder arrangement common to its bigger brothers. 'Flic cylinder liner is a push fit in the casting, flanged at the top where it is held secure by a die-cast deeply finned cylinder head and four screws. The head features a wedge shaped combustion chamber with the glow-plug inclined at 20 deg. so as to bring it flush with the undersurface of the head.

The piston is of cast-iron with a straight baffle (which is higher at the centre than at the sides) and a continuous gudgeon-pin band. The small end is unusual in that the gudgeon-pin is pressed into the rear gudgeon-pin hole but is free-floating in the conrod and front gudgeon-pin hole. Cylinder port timing is 74 deg. BBDC-74 deg. ABDC for the exhaust and 68 deg. BBDC- 68 deg. ABDC for the transfer.

The crankshaft has a full disc type web with the addition of a crescent counterbalance. It has a 3/8 in. dia. journal with a 1/4 in. bore gas passage and a 9/32 in. long valve port. The latter registers with a round intake aperture in the main bearing to give an orthodox 45 deg. ABDC-45 deg. ATDC induction timing.

The engine is very light for a 2 1/2 just over 3 1/2 oz but is of reasonably robust construction. The one-piece main casting is well braced against crash damage and substantial beam mount lugs arc carried forward to help strengthen the bearing housing.

Specification

Type: Single-cylinder, air-cooled, loop-scavenged two-stroke cycle, glow-plug ignition. Crankshaft type rotary valve induction.

Bore: 0.590 in. Stroke: 0.540 in.

Stroke/bore Ratio: 0.915 : 1.

Swept Volume: 0.1476 cu. in. = 2.419 c.c.

Weight: 3.6 oz.

General Structural Data

Pressure die-cast aluminium alloy crankcase/main-bearing/cylinder housing with bronze main bearing bush and drop-in leaded steel cylinder liner.

Meehanite cast-iron piston with flat crown and straight baffle and pressed in 1/8 in. dia. solid hardened steel gudgeon-pin. Die-cast aluminium alloy connecting-rod. Counterbalanced crankshaft machined from case-hardening mild steel and hardened to Rockwell C-58. Ground finish on main journal and crankpin, 3/16 in. dia. threaded length for prop mounting. Die-cast aluminium alloy prop driver engaging three short lands machined on crankshaft. Pressure die-cast aluminium alloy finned cylinder head with 1/16 in. duralumin decompression ring and 0.010 in. soft aluminium gasket. Cylinder head secured with four Phillips screws. Pressure die-cast aluminium alloy back-plate secured to crankcase with two Phillips screws. Pressed-in brass spray-bar, one-piece steel needle and coil spring tensioning device. Beam mounting lugs.

Fox 15X

Test Engine Data

Running time prior to test: 2 hours.

Fuels used: (a) 5 per cent, nitromethane, 65 per cent, methanol, 30 per cent, castor oil. (b) 20 per cent, nitromethane, 55 per cent, methanol, 25 per cent, castor-oil.

Ignition plugs used: K & B KB-1S glow plugs as supplied.

Air temperature: 56 deg. F (13 deg. C).

Barometer: 29.5 in. Hg.

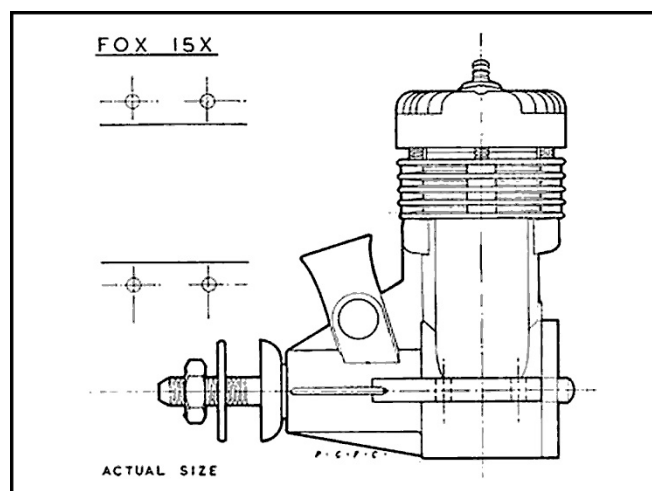
Performance

Two 15X's were received for test. One showed slightly higher performance (about 2 per cent, greater r.p.m.) at the end of a nominal one hour period of running-in and was therefore used for subsequent performance tests. As received, one engine had a burned-out glow-plug and a second plug burned out during running-in. Despite this discouraging start, however, no further plug trouble was experienced in numerous subsequent runs on both engines, including r.p.m. of up to 20,000 and on fuels with up to 50 per cent, nitro.

Starting was trouble free, using the standard procedure of a prime through the exhaust when cold and finger choking the intake when hot. Starting was, however, a little quicker on the 20 per cent, nitro mixture and this gave steadier running, especially at speeds above 14-15,000 r.p.m., and also less ethical needle adjustment.

On test, torque developed by the 15X was at a moderate level, emphasising the importance of propping this engine for r.p.m. near the b.h.p. peaking speeds if maximum available performance is to be realised. Using the low nitro fuel, for example, the 15X reached a maximum of 14.7 oz. in. torque, or slightly under 40 lb./sq. in. b.m.e.p., at around 9,000-9,500 r.p.m. and resulting in a maximum b.h.p. of slightly less than 0.17 at 14,000 r.p.m. By switching to the hotter fuel, output was pushed up to approximately 0.225 b.h.p. at 16,000 r.p.m.

In general, a prop size no larger than 8x4 (F/F) or 7 X 5 (C/L) would be advisable for the 15X if high



performance is required. This applies not only to the standard engine on mild fuel but also when hotter fuels or higher compression ratios are used, since the b.h.p. peaking speeds are then also higher. We would, in fact, suggest that an 8 X 3 1/2 Top Flite prop or any other "fast" 8/3-8/4 prop be tried for F/F. An 8X4 Power, for example, should give a static r.p.m. of not less than 12,500, rising about 1,000 r.p.m. on 20-30 per cent, nitromethane and a further 1,000-1,500 with high compression.

Power/Weight Ratio (as tested): 0.75 b.h.p./lb. (5 per cent, nitro); 1.00 b.h.p./ lb. (20 per cent, nitro).

Specific Output (as tested): 69.4 b.h.p./ litre (5 per cent, nitro); 93.0 b.h.p./ litre (20 per cent, nitro).



More: https://flyinghlsat.com/search.php?search_key=words=Fox-Engines

Fox 15X