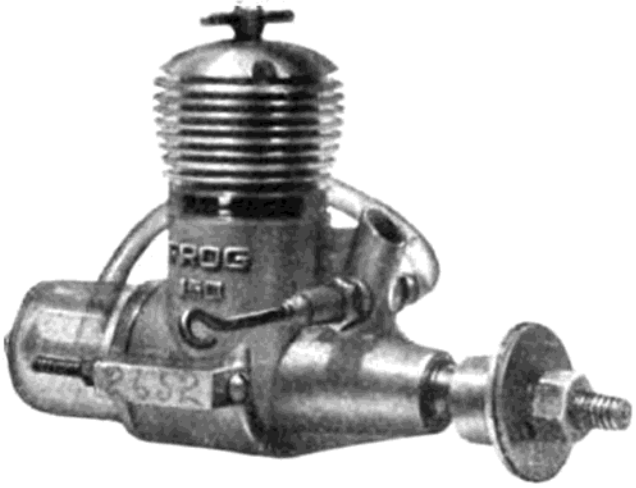


The

150

IN last month's *Engine Analysis* I spoke of the interest which attaches to the new products of old-established manufacturers, and the Frog " 150 " forms another excellent example. At the last *Model Aircraft Exhibition* in 1946, I remember seeing on the Frog stand, the prototype of a small diesel engine about to be put into production. This did, in fact, appear on the market shortly afterwards as the Frog " 100," which for some years was so popular, especially as a beginner's engine. This old timer, together with the later " 160 " and " 180 " engines, has now been superseded by this latest Frog effort.

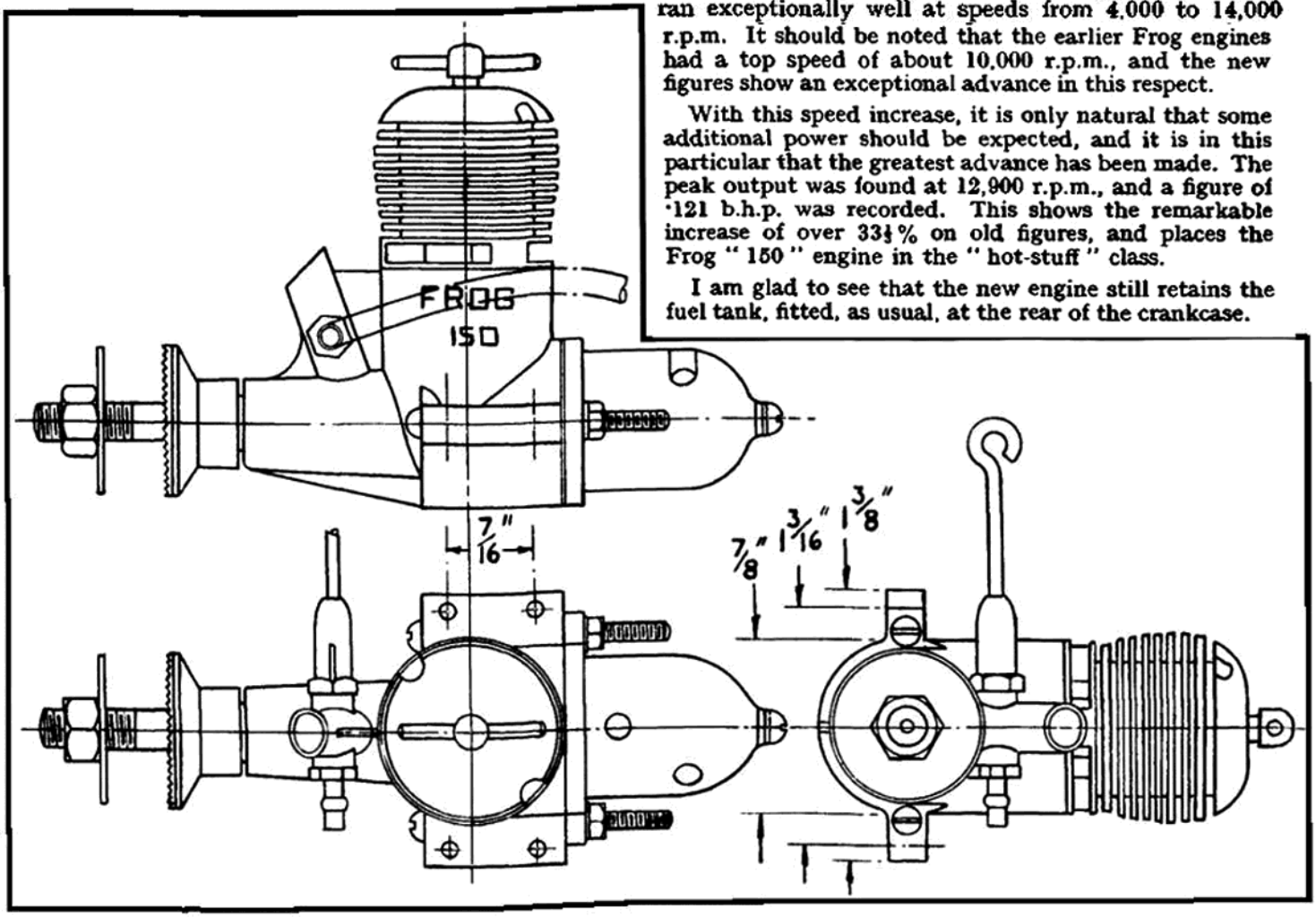
It must be said that the latest Frog engine bears little resemblance to its predecessors, in type, appearance or performance, because whereas the earlier engines were chiefly noteworthy for their reliability, and fair output at moderate speeds, the new " 150 " has been lifted into the super class in all these respects.

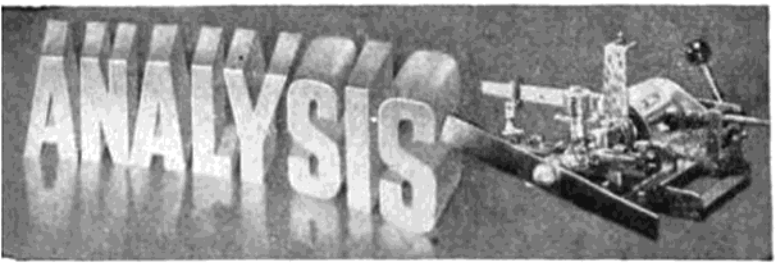
In appearance, it must be confessed, the new " Frog " engine has lost some of its individuality, as it follows closely the lines of some units already on the market. At the same time, the quality and finish of the die-castings seem to have been greatly improved, so that the engine has a cleaner and neater appearance than of yore.

I have had reason before to speak of the good running qualities of the Frog range, because the even running at all reasonable speeds simplifies the engine testing. The new " 150 " still retains this character, and the engine ran exceptionally well at speeds from 4,000 to 14,000 r.p.m. It should be noted that the earlier Frog engines had a top speed of about 10,000 r.p.m., and the new figures show an exceptional advance in this respect.

With this speed increase, it is only natural that some additional power should be expected, and it is in this particular that the greatest advance has been made. The peak output was found at 12,900 r.p.m., and a figure of ·121 b.h.p. was recorded. This shows the remarkable increase of over 33⅓% on old figures, and places the Frog " 150 " engine in the " hot-stuff " class.

I am glad to see that the new engine still retains the fuel tank, fitted, as usual, at the rear of the crankcase.





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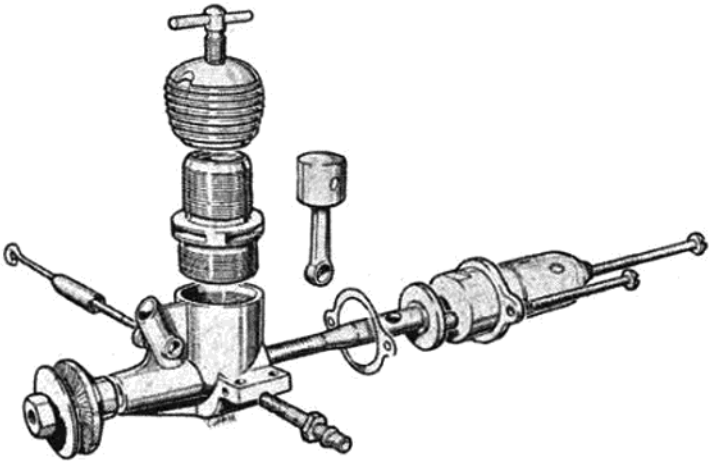

TEST

Engine : The Frog " 150 " Diesel. 1·49 c.c.

Fuel : Frog " Powa-Mix."

Starting : When cold the engine was primed for starting in accordance with the makers' recommendation. This was not necessary with a warm engine, and starting was excellent at all times.

Running : In spite of its advanced design, this engine was remarkably flexible, and ran well and evenly at all tested speeds. At the higher ranges the needle setting appeared to be rather critical.

B.H.P.: Starting at ·058 b.h.p. at 4,500 r.p.m. the curve shows a steady rise in power to a maximum of ·121 b.h.p. at 12,900 r.p.m., with a steep drop above this speed. At 10,000 r.p.m. the power was shown as ·107 b.h.p., so that it is advisable to run as near the 13,000 mark as possible for best results.

Checked Weight : 3·1 ozs. including fuel tank.

Power/Weight Ratio : ·625 b.h.p./lb.

Remarks : In assessing the power/weight ratios, it must be remembered that this takes into account the fuel tank ; most engines of this modern type are supplied less tank. The power/weight ratio of the Frog engine may, therefore, appear lower than some other published figures. At the high end of the speed range, fuel consumption was fairly rapid. But running at 11,000 r.p.m. on an 8 in. × 5 in. prop. the consumption was favourably measured when 15 c.c. of fuel was consumed in 5 mins. 32 secs. This was repeated before and after the main test, always giving the same results. Team race enthusiasts will recognise the economy on fuel. The time to consume fuel in the tank supplied was 1 min. 38 secs.

GENERAL CONSTRUCTION DATA

Name : Frog " 150."

Manufacturers : International Model Aircraft Ltd., Morden Road, Merton, S.W.19.

Retail Price : 49/6 including Purchase Tax.

Delivery : Immediate.

Spares : Immediate.

Type : Compression Ignition.

Specified Fuel : Frog " Powa-Mix " or equal parts by volume of Ether, Paraffin and Castor Oil.

Bore : ·5 in. **Stoke :** ·460 in.

Capacity : 1·49 c.c. ·091 cu. ins.

Advertised Weight, complete with tank : 3·125 ozs.

Compression Ratio : Infinitely variable.

Mounting : Beam or radial, upright, inverted or "side-winder."

Recommended Airscrews : Free Flight, 8 in. × 5 in. Control Line, 8 in. × 6 in.

Recommended Flywheel : 2½ ozs.

Cylinder : Steel, hardened, ground and honed. Screwed into crankcase.

Cylinder Head : Duralumin, turned and screwed to cylinder.

Piston and Contra Piston : Meehanite, ground and lapped.

Crankcase : Aluminium alloy, die-cast.

Connecting Rod : Forged Hiduminium RR56.

Crankpin Bearing : Plain.

Little End Bearing : Plain.

Crankshaft : Steel hardened and ground.

Induction : Crankshaft rotary valve.

Special Features : Although of different construction to the earlier engines in the Frog range, all the well tried and proven basic design features, including the original internal transfer passages with bevelled tops, are retained, to give high power coupled with compactness and light weight.