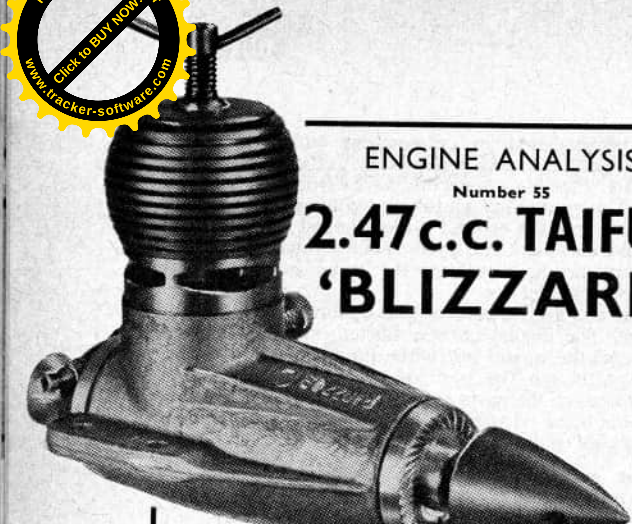


ENGINE ANALYSIS

Number 55

2.47c.c. TAIFUN 'BLIZZARD'

Reviewed by R. H. WARRING

THE "BLIZZARD" IS the third 2.5 c.c. diesel to go into production in the German *Taifun* series, following the plain bearing "Rasant" and the ball-race "Tornado".

On the score of performance the "Blizzard" is a very good engine, easy to handle and achieving a high peak B.H.P. figure of .242 as measured on test at 13,000 r.p.m.

But the Blizzard is not free from criticism. It is very prone to vibrate, particularly on wooden propellers, and this is apparent over the whole of the high speed range. Possibly this is due in considerable part to the very heavy piston employed (which is not counterbalanced in any way). Excessive vibration means loss of power and were the running smoother at speeds above 13,000 r.p.m., certainly an even higher peak power output could be realised without any further modification of the design.

On the credit side, the "Blizzard" is a very easy engine to handle, starting readily and with the controls completely non-critical. The reed valve makes the "Blizzard" extremely flexible and it can be throttled right down to a very consistent tick-over on almost any propeller size merely by backing off the compression.

Reed valve induction, of course, also makes the engine "symmetrical" in that it will start and run in either direction—which is always likely to happen when hand starting with small propellers unless flicked over smartly.

Running proved very consistent at all speeds, with no tendency to miss at the higher speeds and equally smooth and sustained on 11 and 12-inch diameter propellers.

The cylinder gets very hot and having to grasp this small bar with sharp ends proved quite painful over the duration of the test runs. It speaks well for the excellent fit of the contra-piston, however, that at no time, despite the high cylinder temperature and the vibration, did it ever "stick" or tend to work off setting, although perhaps a little on the tight side for easy movement. Nor did any part of the engine itself work loose during all the running, although the rig itself had to be re-tightened!

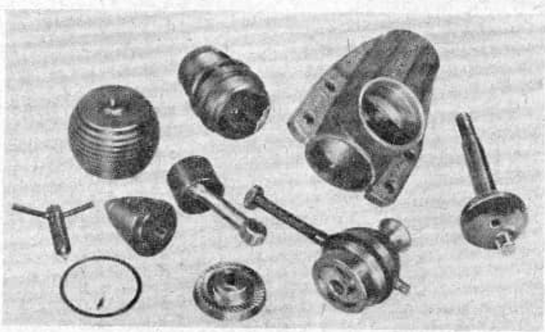
The "Blizzard" was a little on the stiff side when received and even after a reasonable running in period, there was a slight high spot apparent about half way up the stroke. This, however, seemed to disappear once the engine was running and the cylinder and jacket expanded. It certainly had no adverse effect on performance. The crankshaft, of course, needed no running in, being supported by twin ballraces.

Only casting employed is the massive streamlined crankcase unit in light alloy, stove enamelled in grey, mottle finish, which houses the two ball races. Total weight (with both races) is two ounces, for a start! Quite an appreciable amount of machining is done on the crankcase including cutting a channel to clear the con. rod big end. The two identical ball races are press fitted into machined housings, the plain bearing length between them extending a matter of one half the spacing between the races only, then opening out into a larger chamber. This appeared to provide an adequate oil seal. In any case, without a crankshaft port to contend with, oil leakage should not be a severe problem.

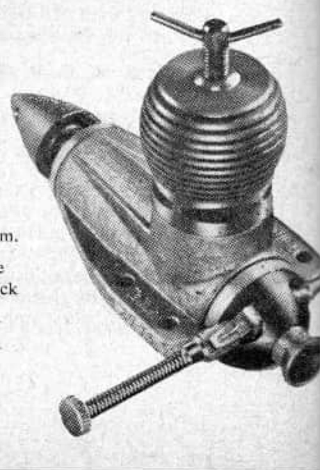
The crankshaft is of relatively small diameter (considering the proportions of the crankcase), being 7 m.m. (.2755 in.) along its length, tapering just outside the front bearing to a 5 m.m. DIN standard threaded length (a 1 B.A. nut will fit this thread, as an "emergency" measure). The shaft is finished by grinding between centres and the grinding operation appears to have been carried out with thoroughness on other surfaces as well which would not normally be considered as good production "economics" (*e.g.*, even on the taper and the edges of the disc). This thoroughness of workmanship and finish, in fact, was apparent on several other components—production cost apparently being disregarded in favour of doing a complete job (or equally it could be argued, some of the components, such as the reed valve assembly, designed without due regard to the most economic method of production).

The cylinder is a very substantial affair, fabricated from steel and heat treated. In form it follows the original Elfin practice of cutting four semi-circular transfer passages up inside the bore and to get around the trouble of the stones digging in when honing to finish, the bore is honed from the top. Bore finish was very good indeed.

The transfer port openings overlap the exhaust to a considerable degree—almost coming level with the top of the exhaust ports. The latter are cut in a very thick flange section, taking chamfered cuts from the outside, but actually yielding a relatively small exhaust port opening. There was no question of exhaust port area not being adequate, however, even at the highest running speeds (*e.g.*, over 17,000 r.p.m.).



Assembled by screw threads in the streamlined crankcase, and featuring reed valve induction, the Blizzard components are seen at left



SPECIFICATION

Displacement: 2·477 c.c. (·151 cu. in.)
Bore: .593 in. (15.06 m.m.)
Stroke: .547 in. (13.9 m.m.)
Bore/stroke ratio: 1.1
Weight: 6¼ ounces
Max. B.H.P.: .242 at 13,000 r.p.m.
Max. torque: 22 ounce-inches at 8,000 r.p.m.
Power rating: 098 B H.P. per c.c.
Power /weight ratio: .037 B.H.P. per ounce
Manufacturers: J. Graupner, Kirchheim/Teck W. Germany.

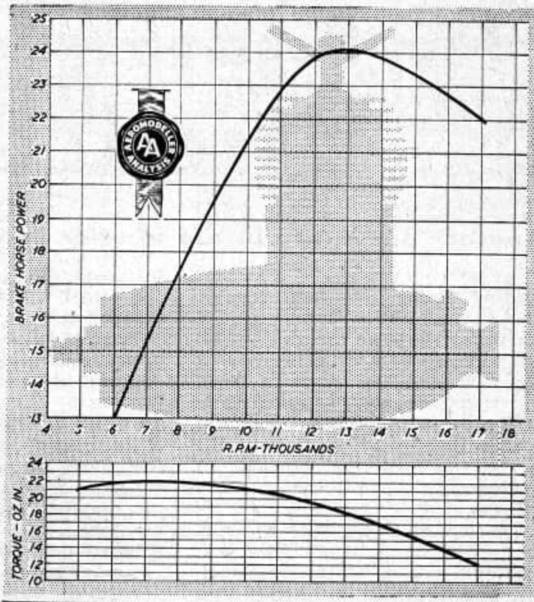
The cylinder accounted for a further 1¼ ounces. The piston complete with con. rod (which could not conveniently be removed without fear of damage) another half an ounce. The piston is of cast iron, machined to very thick walls and ground externally to finish. Gudgeon pin diameter is 4 m.m. (.1575 in.), this component being force fitted in the piston. The contra piston is of hardened steel.

The connecting rod is machined all over from dural or similar high-duty light alloy and in addition the big end is end milled to reduce its overall size. Big end diameter is 5 m.m. (.1965 in.). Both bearing fits were particularly good.

The reed valve induction system is mounted in the crankcase backplate, which is a turning screwing into the crankcase and sealing with a fibre gasket. A double reed in beryllium copper (or similar) is employed, held in place by a light alloy pressing, this pressing also incorporating the reed "stop". The choke tube is turned integral with the backplate and an additional hemispherical turning carrying the spraybar fits over it. The spraybar hole opens into an annular space machined around the choke tube, connecting with the central hole via four small holes. A gauze filter is fitted in a separate turning which screws onto the end of the choke tube, this fitting also serving as a means of locking the spraybar unit to the backplate.

The propeller driver which fits over the tapered section of the crankshaft is a simple light alloy turning, knurled and bossed. The boss diameter is an unfortunate size for British practice—just 1/32 in. over ⅜ in. so that a ⅜ in. drill does not open out the propeller hub hole quite enough. A turned spinner nut is provided in place of a plain nut, again bossed with the same 13/32 in. diameter.

Summarising, a well made engine with a unique design approach and a performance good enough to rate it well up in the 2.5 c.c. class. The quality of the workmanship throughout was most commendable and the extreme flexibility given by the reed valve is a most attractive feature. The vibration experienced on test may not prove troublesome on a model, but is again a feature which we do not like to see on an otherwise excellent runner.



PROPELLER—R.P.M. FIGURES		Fuel used: Mercury No. 8	
Propeller dia. x pitch	*r.p.m.*	*Propeller dia. x pitch*	*r.p.m.*
10 x 6 (Frog nylon)	8,400	9 x 3 (Tiger)	11,800
9 x 6 (Frog nylon)	10,800	8 x 4 (Tiger)	14,000
8 x 8 (Frog nylon)	7,400	8 x 3½ (Tiger)	14,600
11 x 4 (Trucut)	7,500	6 x 9 (Tiger)	14,150
10 x 4 (Trucut)	7,800	7 x 4 (Trucut)	15,200
9 x 6 (Trucut)	8,400	7 x 3 (Trucut)	17,000
8 x 8 (Trucut)	8,000	10 x 4 (Stant)	8,000
8 x 6 (Trucut)	10,100	9 x 5 (Stant)	10,200
8 x 4 (Trucut)	13,200	9 x 4 (Stant)	10,500
8 x 3 (Trucut)	13,700	8 x 6 (Stant)	11,200
7 x 9 (Trucut)	10,100	8 x 5 (Stant)	11,900
7 x 6 (Trucut)	11,500	8 x 4 (Stant)	13,500
		7 x 6 (Stant)	13,600