

PETER CHINN tests the WEBRA SPEED 61

MADE IN West Berlin for more than twenty years, Webra engines are now also manufactured at Enzesfeld in Austria. The Webra Speed-61—sometimes referred to as the “Austro-Webra”—is an exclusive product of the Austrian factory, not to be confused with the well-established Webra Blackhead 61 produced in Germany.

Almost the only features which the German and Austrian Webra 61s share are the Webra TN type carburettor and a 24 × 22 mm. bore and stroke. The Speed-61 is a Schnuerle port motor of totally different design. It is, in fact, much closer, in design and construction, to a smaller Austrian rival, the HP 40F, the result of one designer, Peter Billes, having been responsible for both engines.

Design and construction summary

Main Casting. This comprises the crankcase barrel and full length finned cylinder casing in pressure diecast aluminium alloy. It includes beam mounting lugs, transfer passages and a short exhaust duct.

Cylinder. Hardened steel liner, closely fitted to cylinder casing and located by flange at tip. Centrally bridged exhaust port on right side, timed to open and close at 71 deg. each side of BDC. Two main transfer ports angled to direct gas to left side of cylinder and timed to open and close at 60 deg. each side of BDC. Rectangular third port diametrically opposite exhaust port, chamfered on its top edge to sweep gas upward and timed to open and close at 55 deg. each side of BDC.

Crankshaft and front end assembly. Counterbalanced hardened steel crankshaft with 15 mm. o.d. main journal and 3/8 in. dia. front journal. Pressed-in 6 mm. dia. solid crankpin. Rectangular valve port timed to open at 35

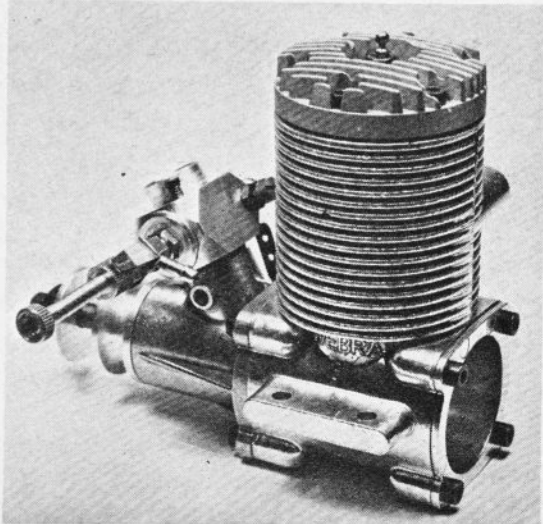
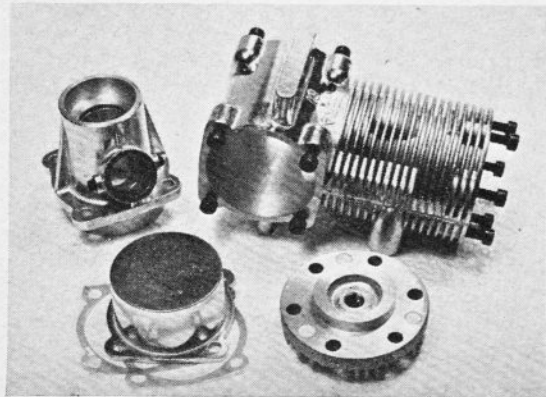
deg. ABDC and close at 45 deg. ATDC and admitting gas to 11.1 mm. bore gas passage. Shaft supported in one 15 × 28 mm. 9-ball steel-caged ball journal bearing at rear and one 3/8 × 3/4 in. 8-ball steel caged ball journal bearing at front. Pressure diecast aluminium alloy bearing housing with 13mm. i.d. intake boss, secured to crankcase barrel with four Allen cap screws. Paper gasket. Machined aluminium alloy prop driver keyed to shaft with steel 2.5mm. square sunk key.

Piston and connecting-rod assembly. Flat crown, deflectorless, forged aluminium alloy piston with single, pinned compression-ring and rectangular third-port window. Piston has rectangular skirt cutaways fore and aft to prevent masking entry to transfer passages. Forged aluminium alloy connecting-rod, 39 mm between centres, with bronze bushes and lubrication slits at both ends. Tubular 6 mm. o.d. gudgeon-pin retained by wire circlips in piston bosses.

Cylinder-head. Finned, pressure-diecast aluminium alloy with shallow bowl-shaped combustion-chamber surrounded by 4 mm. wide squish band. Centrally located glowplug. Head secured to cylinder-casing with six Allen screws. No gasket: head makes metal-to-metal joint with liner flange.

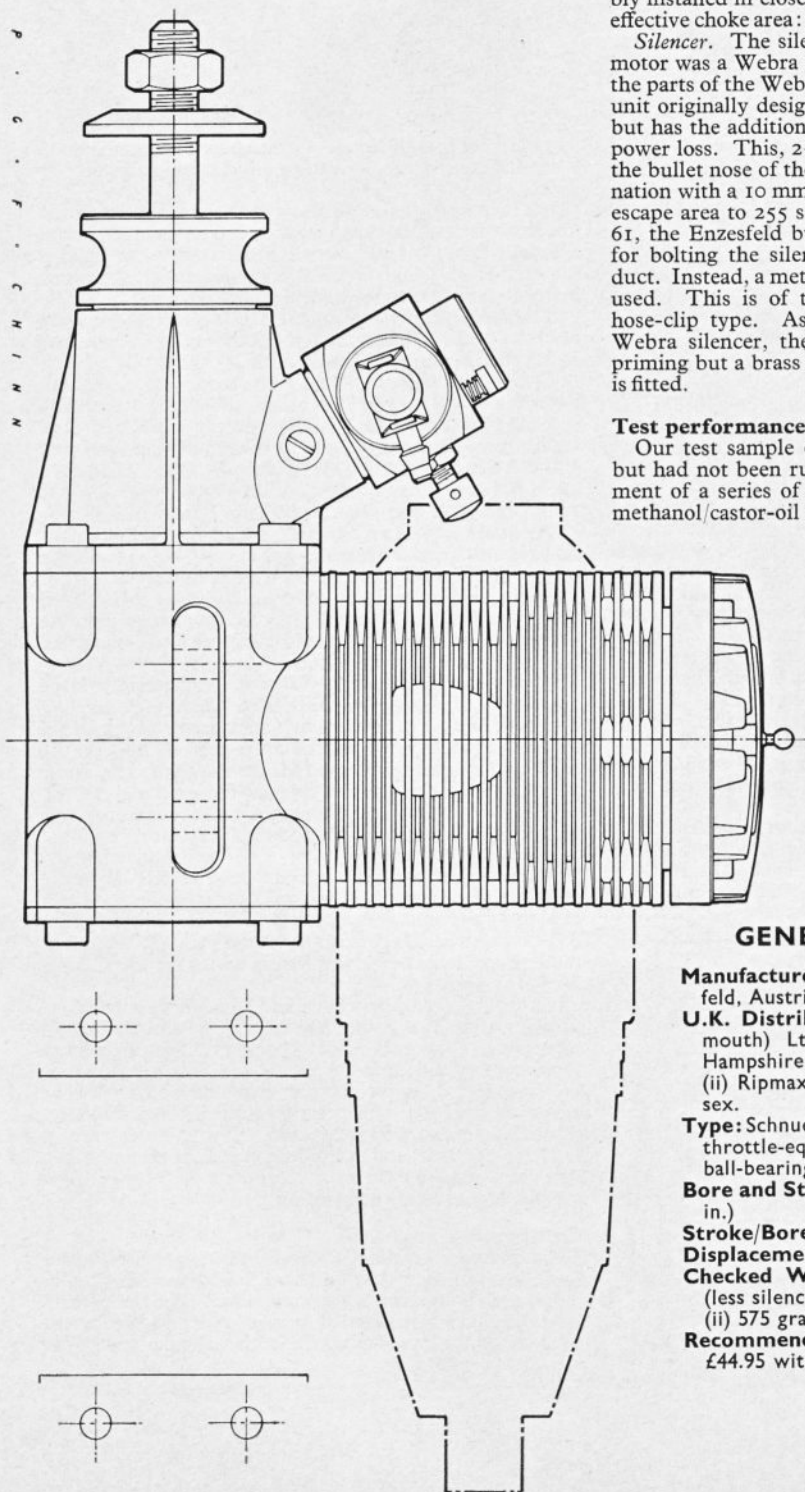
Backplate. Deeply recessed pressure diecast aluminium alloy, secured with four Allen screws. Paper gasket.

Carburettor. Webra TN two-needle automatic mixture control type, with 8 mm. i.d. choke. Machined



WEBRA SPEED 61F

—SHOWN ACTUAL SIZE



aluminium alloy body containing ground steel throttle barrel. Idling mixture needle mounted in outer end of throttle barrel. Throttle barrel moves sideways as it is rotated so that idle needle tip enters main jet as throttle is closed, thereby reducing fuel flow. Low-speed mixture strength adjustable by screwing idle needle in or out. Main mixture control via orthodox needle-valve assembly installed in closed end of throttle housing. Nominal effective choke area: 35 sq. mm.

Silencer. The silencer supplied for use with our test motor was a Webra vented front type. This is based on the parts of the Webra Type 100/61 expansion chamber unit originally designed for the Berlin-made Webra 61, but has the addition of a large bore vent tube to reduce power loss. This, 2½ in. long, has been inserted through the bullet nose of the expansion chamber and, in combination with a 10 mm. i.d. tailpipe, increases the effective escape area to 255 sq. mm. Unlike the German Webra 61, the Enzesfeld built engine does not have provision for bolting the silencer direct to the engine's exhaust duct. Instead, a metal strap around the cylinder casing is used. This is of the Italian "Serratus" worm-drive, hose-clip type. As with all previous versions of the Webra silencer, there is no provision for exhaust port priming but a brass nipple for pressurising the fuel tank is fitted.

Test performance

Our test sample came direct from the manufacturer but had not been run in. It was given our usual treatment of a series of short rich runs on a straight 75/25 methanol/castor-oil mixture. It was found to be quite

—continued overleaf

GENERAL INFORMATION

Manufacturer: Webra/M.Eberth, A-2551 Enzesfeld, Austria.

U.K. Distribution: (i) Model Aircraft (Bournemouth) Ltd., Norwood Place, Bournemouth, Hampshire.

(ii) Ripmax Ltd., Green Street, Enfield, Middlesex.

Type: Schnuerle loop scavenged, shaft rotary-valve, throttle-equipped glowplug engine, with twin ball-bearings and ringed aluminium piston.

Bore and Stroke: 24 × 22 mm. (0.9449 × 0.8661 in.)

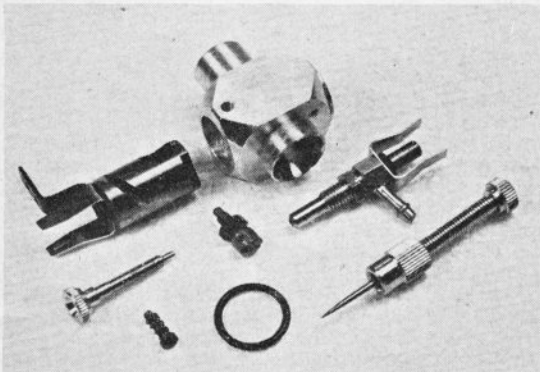
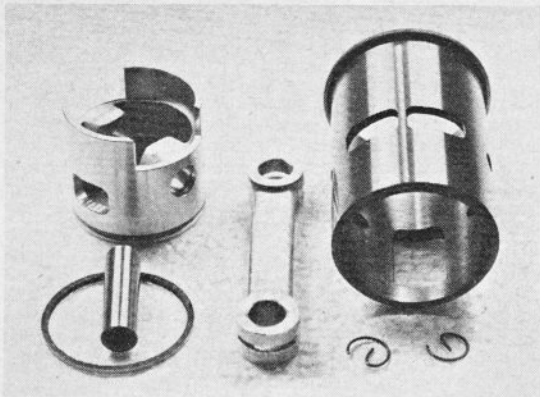
Stroke/Bore Ratio: 0.917 : 1.

Displacement: 9.953 c.c. = 0.6073 cu.in.

Checked Weights: (i) 465 grammes—16.4 oz. (less silencer)

(ii) 575 grammes—20.3 oz. (with silencer).

Recommended Retail Prices: £39.95 less silencer
£44.95 with silencer.



was very easy at all times. Compression remained good when the engine was hot and resulted in quick restarts by hand.

Running qualities were also good. After replacing the needle, the needle-valve response was as one would expect, *i.e.* more sensitive when the engine was loaded for high speeds, but it was not at all critical, there still being about a $\frac{1}{4}$ -turn leeway even at peak power.

The Speed-61F was also notable for its steady running qualities and we found the level of vibration to be rather better than average for a 10cc motor.

Power—less silencer. The gross torque of 120 oz.in. determined on test is just about the highest we have recorded for a 10 cc. engine on 5 percent. nitro fuel. As a result, the performance on large diameter props was well above average, reaching, for example, 9,500 rpm on a 14 x 6 Top-Flite maple, 11,000 on a 13 x 5½ Top-Flite standard and 11,900 on a 12 x 6 Top-Flite maple.

Torque was well maintained as load was reduced and, as a result, the brake-horsepower curve plotted from the torque and rpm figures shows a peak output of almost 1.50 bhp at just over 15,000 rpm. Again, this is well above average and is equalled by no more than just one or two other very high performance throttle-equipped R/C engines at the present time.

Power—with "silencer". With its exceedingly large outlet area, it is not surprising that the engine's silencer had no effect on the Speed 61's maximum torque or on its performance on all normal prop sizes. Thus, on the 11-inch diameter props used for aerobatic models, some impressive figures were obtained: for example, 11,700 rpm on an 11 x 8 Top-Flite maple, 11,600 on an 11 x 7½ Bartels epoxy-glassfibre, 12,600 on an 11 x 7 Top Flite maple and 13,800 rpm on an 11 x 6 Top-Flite maple.

Admittedly, at higher speeds, torque fell off more rapidly and, as a result, there was a drop in power output of about 5 percent. at the peak (which was reached about 600-700 rpm earlier) but on the usual 11 in. dia., 7 to 8 in. pitch props, it makes little difference whether the silencer is used or not.

Unfortunately, as we have had to report on previous occasions, the low power loss resulting from the use of this type of silencer is achieved only at the expense of an unacceptably high noise level.

Throttling. As we have found with other Webra engines equipped with the Webra TN carburettor, throttle response was very good. The mixture control was easy to adjust and safe idling speeds of around 2,400 rpm were obtained on 11 x 8 and 12 x 6 props, plus satisfactory mid-range operation.

Comment

An impressive engine. Powerful yet easy to handle and smooth running. Its "silencer," however, is totally inadequate and cannot be recommended. The Speed-61F has a sufficient reserve of power to stand the 15-20 percent. power loss of a more effective silencer *and still be more than competitive.*

free and cool running from the beginning, but was given a total of approximately 60 minutes running time before being subjected to performance tests. At the end of this period it was found to have gained about 150 revs when loaded for speeds of around 12,000 rpm.

All performance tests were carried out on our standard test fuel containing 5 percent. pure nitromethane and 20 percent. castor-oil. This added, on an 11 x 8 prop, 200 rpm to the speed achieved on straight fuel. Glow-plugs used were standard Webra long-reach type. Atmospheric temperature at the time of testing was 62 deg. F (17 deg. C) and barometric pressure was 30.4 in.Hg. (1016 mb.).

Starting and running. As supplied, our test sample had a slightly defective needle-valve. The needle itself was off-centre in its threaded brass thimble and this made it difficult to obtain a precise mixture adjustment. We changed the needle and had no further trouble. Starting

