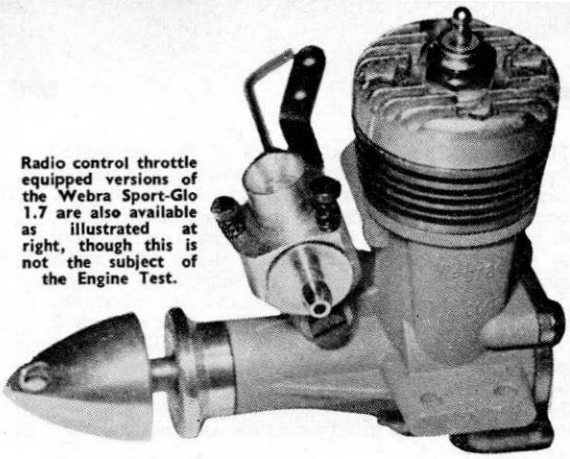
Peter Chinn's

ENGINE TEST

WEBRA Sport-Glo 1·7



Radio control throttle equipped versions of the Webra Sport-Glo 1.7 are also available as illustrated at right, though this is not the subject of the Engine Test.

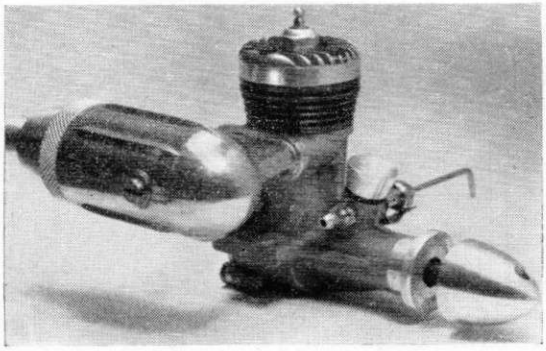
A FEW of our readers may remember the West German Webra Sport-Glo 1.7 as a slightly out-of-the-rut, small glowplug engine, that appeared in the mid 'fifties.

The new Sport-Glo, introduced in the spring of this year, is, however, in no way connected, despite it name, with the earlier model. Admittedly, it is a shaft-valve glowplug engine of similar displacement but is an entirely fresh design, better made and of substantially higher performance.

Manufactured by the firm of Fein und Modell Technik, now owned by Martin Eberth, the Sport-Glo was designed by Guenther Bodemann, underwhose direction it is made at Fein und Modell Technik's West Berlin factory. In appearance, the engine bears an obvious family resemblance to the Webra Glo-Star 3.4 cc. engine. Construction is also similar, the main difference being that the Sport-Glo employs a bushed main bearing, in place of the twin ball-bearings of the larger model.

At just under 1.7 cc., the Glo-Star is a trifle bigger in swept volume than engines in the popular 1.5 group or the American .099 class. Being outside these two classes, however, is of little account since neither constitutes a significant contest category at the present time. The Sport-Glo is, in fact, most likely to appeal to the "sport" modeller or for small R/C models, especially as a throttle type carburettor is available if required. The manufacturers also make a neatly-fitting silencer, especially designed for the Sport-Glo.

Among the many improvements that the 1966 Sport-Glo has to offer, in comparison with its earlier namesake, are a stronger and better finished crankcase with the crankshaft running in a bronze bushing, instead of directly in the crankcase material, a counterbalanced crankshaft, with larger diameter journal and bigger porting, and a lighter piston with a stronger gudgeon-pin. Instead of a reverse-flow scavenged type cylinder with internal flute type transfer passages and diametrically opposed ports exhausting into a collector chamber with single outlet, the 1966 Glo-Star uses conventional loop scavenged porting. The new engine is nearly an ounce heavier than the old model, but this is more than compensated by increased power output and stronger construction.



The Sport-Glo is seen here with the maker's large volume silencer which can easily be taken apart for cleaning.

Construction

The main casting comprises crankcase and front housing in pressure diecast aluminium alloy. It terminates just above the level of the cylinder ports, the cylinder itself being machined in one piece complete with cooling fins. The crankcase includes a cast-in phosphor-bronze main bearing bush, substantial beam mounting lugs, a large exhaust duct, a short, inclined intake boss and ample webbing around the front end. A machined aluminium venturi insert, with rubber sealing ring, plugs into the intake boss and is retained by a plated spraybar type needle-valve assembly. The exhaust duct is strengthened by a centre post, drilled and tapped for mounting the optional silencer.

The cylinder has orthodox transfer and exhaust ports of similar area, positioned to give transfer opening 55 degrees each side of bottom-dead-centre and exhaust timing of 65 degrees each side of B.D.C. A graphited asbestos gasket makes the joint between the cylinder base flange and the top of the crankcase and a gasket of similar material is used to make the cylinder head joint. The cylinder head is of pressure diecast aluminium and includes a centrally located 1.5 volt Webra No. 2 glow-plug. Two screws secure the head to the cylinder and two more, longer, screws pass through the cylinder fins, fore and aft, to tie the complete cylinder assembly to the crankcase.

The crankshaft has an 8 mm. dia. journal and a 3.5 mm. solid crankpin. Counterbalance is provided by cut-away web flanks each side of the crankpin. The shaft is case-hardened and is bored for a 5.5 mm. gas passage. The shaft o.d. is also very slightly relieved for a short distance between the front end of the journal and the valve port and there is a shallow oilway in the main bearing surface extending forward to this point. The valve port is rectangular and is timed to open at 48 deg. after BDC and to close, fairly late, at 55 deg. after TDC—according to measurement of our test engine. The intake boss is bored 6 mm. dia. into the main bearing. The venturi reduces this to 4.5 mm. bore at the fuel jet position, choke area being further reduced by the 2.5 mm. dia. spraybar.

The piston has a flat crown and a straight baffle and has a continuous gudgeon-pin band. The fully-floating gudgeon-pin is placed high in the piston and the piston skirt is relieved approximately .001 in. on diameter below the gudgeon-pin. The piston skirt is quite long and the top of the crankcase backplate is therefore cut away to provide the necessary clearance at the bottom of the stroke. A diecast connecting-rod is used.

Drive to the prop is effected via a strong machined aluminium driver which fits onto a taper machined on the crankshaft, beyond which the shaft is reduced to 5 mm. with metric thread for a solid machined aluminium spinner-nut. The propshaft is of ample length to accommodate all appropriate prop pitches.

The Webra Sport-Glo silencer is of the non-baffled expansion chamber type, similar in general design to (but rather better looking than) the standard Enya silencer. It comprises a pressure diecast aluminium body section, with integral duct, into which a machined rear section, with short tailpipe, is screwed. A single long screw secures the complete unit to the Sport-Glo's exhaust duct. This is a method of attachment that has not proved very satisfactory on some larger engines, but appears to be quite adequate in the case of the Sport-Glo. For an engine of the Sport-Glo's size, this silencer is quite large and this, together with the lack of restriction in the movement of gasses from the exhaust port to the expansion chamber, results in very little loss of power.

SPECIFICATION

Type: Single cylinder, air-cooled, loop-scavenged two-stroke cycle, glowplug ignition. Shaft type rotary-valve induction

Bore: 13 mm. (0.5118 in.) **Stroke:** 12.7 m.m (0.5000 in.)

Swept Volume: 1.686 cc. (0.1029 cu. in.)

Stroke/Bore Ratio: 0.977 : 1

Weight: 3.4 oz. (4.3 oz. with silencer)

General Structural Data

Pressure diecast aluminium alloy *crankcase/front housing* unit with cast-in phosphor-bronze main bearing and detachable *rear cover* secured with four hexagon head screws. Hardened, counterbalanced *crankshaft* with 8 mm. dia. journal, 5.5 mm. bore gas passage and 3.5 mm. solid crankpin. Machined aluminium *prop driver* and *spinner nut*. Lapped cast-iron *piston* with flat crown and straight baffle. Pressure diecast aluminium alloy unbushed *connecting-rod*, coupled to piston with 3.5 mm. solid fully-floating *gudgeon-pin*. Machined steel *cylinder* with integral cooling fins. Pressure diecast aluminium alloy *cylinder-head*. Graphited asbestos cylinder head and base *gaskets*. Machine aluminium alloy carburettor *venturi insert* with rubber grommet and retained by plated brass *spraybar*. Beam mounting lugs.

TEST CONDITIONS

Running time prior to test: Approximately 1½ hours.

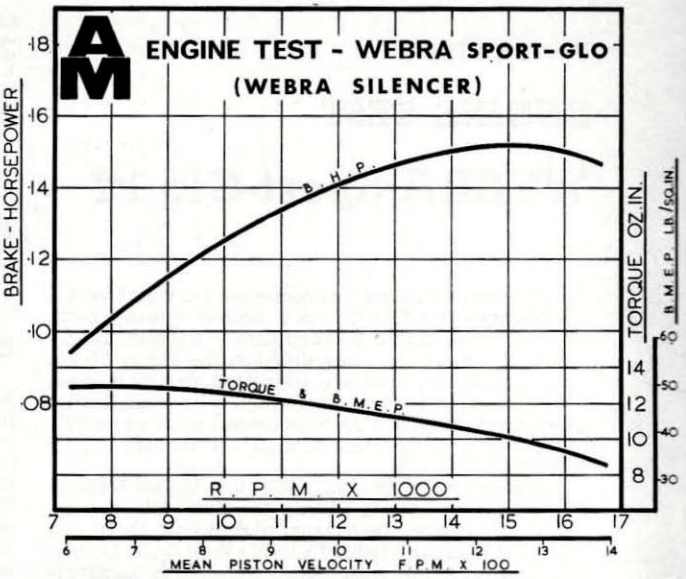
Fuel used: 5 per cent pure nitromethane, 25 per cent Duckhams Racing Castor-Oil, 70 per cent I.C.I. Methanol.

Glowplug used: Webra No. 2, 1.5. volt, 5 mm. reach.

Air temperature: 68 deg. F.

Barometer: 29.8 in. Hg.

Silencer Type: Webra Sport-Glo expansion chamber.

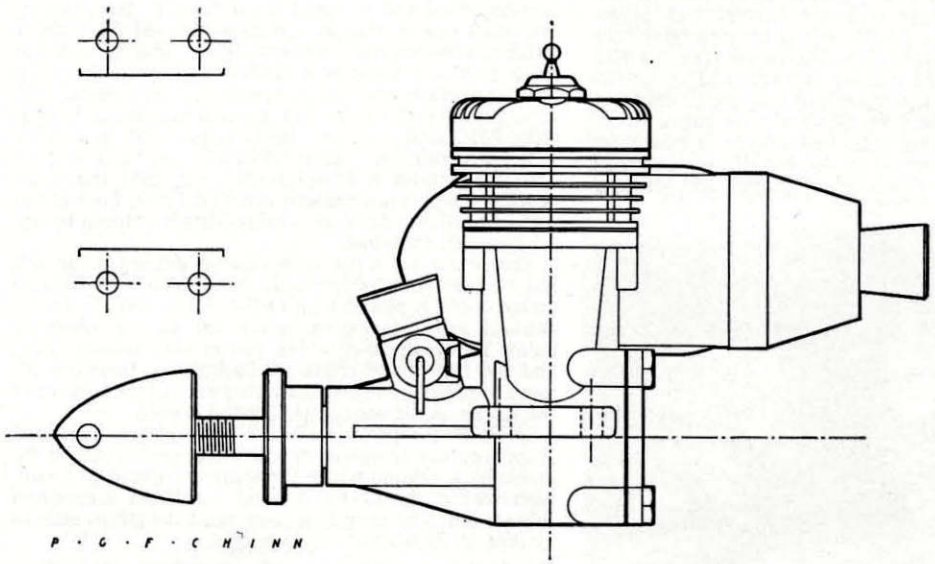


Performance

Two samples of the Sport-Glo were submitted for test by the factory in Germany. These were given a preliminary running-in period of thirty minutes each, followed by a short series of prop tests in order that the better of the two might be selected for further testing. Actually, there was little to choose between them as regards power, but the one selected proved to be about 1 per cent faster on an 8×4 prop, together with very slightly quicker starting.

This engine was therefore given a further half-hour of accumulated running time, followed by a series of prop/rpm checks on straight methanol/castor fuel with silencer fitted.

Figures obtained were as follows: 8,100 rpm. on 9×4 Top-Flite nylon, 9,800 on 8×5 Power-Prop wood, 9,900 on 8×4 Tornado nylon, 10,150 on 8×4 Top-Flite



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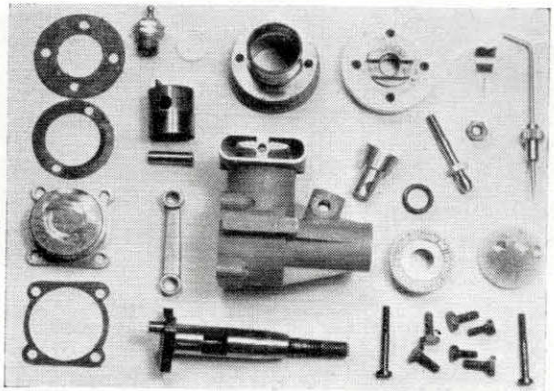
nylon, 11,400 on 8×4 Power-Prop wood, 12,300 on 7×4 Tornado nylon, 13,000 on 7×4 Top-Flite nylon, 14,300 on P.A.W. Trucut wood and 14,900 on 7×3 Top-Flite wood. Removal of the silencer gave a 200 rpm. increase at a 13,000 rpm. load-speed and 500 rpm. increase at a 15,000 rpm. load-speed. The degree of noise suppression obtained with the Sport-Glo silencer is not so great as is obtainable with some silencers which impose more restriction on gas flow, but, as the figures indicate, the loss of power caused by the Sport-Glo silencer is very small.

Torque tests carried out on the Sport-Glo, still fitted with the silencer, but running on a mildly doped fuel (5 per cent nitromethane) resulted in the curves indicated on our performance graph. These display a maximum torque of 13 oz. in. at 8,000 rpm.—equivalent to a bmep. of nearly 50 lb./sq. in.—and a peak output of approximately .152 bhp. at 15,000 rpm.

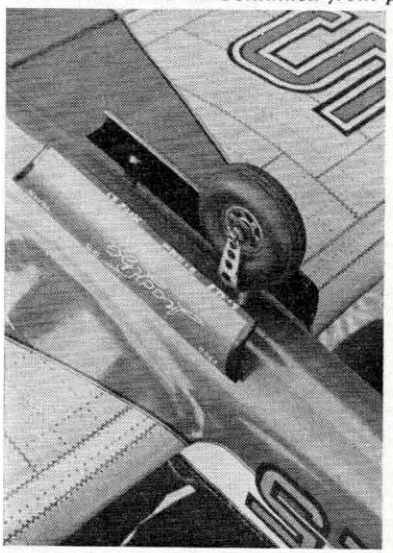
In general the Sport-Glo was easy to handle. Cold starting was good. We found hot restarting a little more critical, and better if the engine were inverted so that there could be no risk of flooding the crankcase. The needle-valve was easy to adjust, becoming just a shade touchy on a very light load, allowing static revs to reach 14-15,000. This should not be encountered in normal operational use, since props which load the engine to static rpm. in the 11-13,000 rpm. bracket (e.g. 8×4, 8×3, 7×4) are most likely to be used.



Parts of Sport-Glo. Design and construction are quite conventional.

To sum up, we found the Sport-Glo a likeable little motor. It performs well and is nicely made. It is also a neat and attractive looking engine, with or without its silencer.

WINNING MODELS *Continued from page 684.*



At left the highly detailed model of Juri Sirotkin showed up with this mono-wheel set-up, gave model bad landings and take offs.

U.S.S.R. Team Race finalists Sharovalov / Radchenko cleaning the model after a brief warm up run prior to the final in which they placed third.

A very small section of Peter Farrar's 2,000 scale model selection on show in the exhibition hangar, drew thousands of spectators and was a rival attraction to the four main events.

Propellers

Glass fibre propellers have really caught on. No less than 18 teams used them as made by Jurgen Bartles including two of the T/R finalists. They have now passed the test of an international meeting and we expect to see them become more popular. For the fast 35 lap model they seem ideal, but the 50 laps models that in the main fly a little slower don't seem to hit peak performance with them, that is with the exception of Stockton/Jehlik who were getting both speed and laps. The other U.S.A. teams and some Canadians used the cuffed root Top Flite Speed 7 x 8 and these seem to work as well as the thin hub Tornado 7 x 8 Plasticote. The U.S.S.R. team racers had small diameter props with generous blade width.

Speed Now Increased

Rolf Miebach who was reported last month to have made 141 m.p.h. at the Bochum contest Germany after the World Champs, in fact exceeded 147 m.p.h. with a Kevin Lindsey pipe and the one sided tailplane "*Stuppi*", Rolf is now working with Kevin on restyled pipes and the motor suitably re-timed to take advantage of the pipes function.