Cox Olympic .15

MA ENGINE TESTS

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The Cox Olympic 15

This is the 125th MODEL AIRCRAFT Engine Test report and, with this not inconsiderable background of experience, we have no hesitation in placing the Cox Olympic 15 on our short list of the most impressive engines yet tested.

The reasons for the high rating of this new American engine are many. Firstly, there can be no doubt that the Olympic justifies its claim to be one of the most, if not the most, powerful 2.5 c.c engines available in the world today. Secondly, this performance is matched by starting and handling characteristics of the highest order. Thirdly, the quality of its construction is to a standard seldom equalled in quantity produced miniature i.e. motors.

In general, the Olympic follows the same basic design and construction as the smaller Cox motors, with the additional refinement of a ball-bearing mounted crankshaft and with beam mounting lugs instead of the radial mount that has hitherto characterised this manufacturer's products. All the typical Cox features, such as reed induction, one-piece opposed port reverse flow scavenged cylinder and hemispherical head with integral glow filament, are retained.

Unorthodoxy has always been a characteristic of Cox engines not only in design, but in construction, too. No castings are used in the Olympic and the crankcase is machined from extruded bar stock. The piston is hardened on the wearing surface only, the interior being protected by a plating of copper so that the socket for the ball ended connecting rod remains soft enough for swaging This latter operation, incidentally, is carried out entirely automatically, on a special hopper fed machine, built for the purpose by the Cox company.

As has been pointed out in prev. articles, Cox engines are remarkable for the fact that the need for running-in, in the ordinary sense, is virtually eliminated.

This has been made possible by working to extremely close tolerance limits in grinding operations, cylinder boring and honing, etc., and, to this end, all such operations are done in a temperature controlled room.

One of the features that must contribute to the performance and handling characteristics of the Cox 15 is the special multi-jet carburettor. This feature, which was first introduced several years ago as a modification for the Space Bug and as a standard item on the Thermal-Hopper, dispenses with the normal spray-bar type needle valve or needle controlled jet orifice. Instead, there are three small jet holes, spaced at 120 degree intervals, through the choke tube, which is of an efficient venturi shape, providing a smooth, finely atomised supply of mixture to the reed valve. These jet holes are connected by a channel machined around the outside of the choke tube. Over this section is the carburettor body, comprising a collar and the needle-valve which meters the amount of fuel reaching the channel.

The Olympic cylinder is machined in one piece, with integral fins. It has two large exhaust ports

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Many of the Olympic's unorthodox features are internal, and an " exploded " view of the components appears in Latest Engine News.

giving an exhaust period of 140 deg. of crank rotation (plus a sub-piston supplementary air induction period of approximately 60 deg.) and two internal transfer flutes. With these latter, incidentally, there is a considerable timing overlap, the transfer opening only 6 or 8 deg. after the opening of the exhaust port. The cylinder head is of the usual Cox hemispherical form, with built-in glow filament to give the smoothest possible head contour.

A feature that may cause some surprise is the starter spring. Spring Starters; are now widely known in the U.S. on small engines fitted to ready-made models, and the average experienced modeller undoubtedly thinks of this as “something for the kids,” and as having no particular merit for “expert” use. In actual fact, the Olympic’s starter is no mere gimmick. As our performance notes disclose, it has strictly practical value as applied to this particular engine.

Specification

Type: Single cylinder, air cooled, reverse low scavenged, two stroke cycle, glow-plug ignition. Reed valve induction plus sub-piston supplementary air induction. Flat top piston with hemispherical combustion chamber.

Bore: 0.585 in.Stroke: 0.556 in.
Swept Volume: 0.1495 cu. in. (2.449 c.c.).
Stroke/Bore Ratio: 0.9504 : 1
Weight: 4.15 oz. including starter spring.

General Structural Data

Machined aluminium, alloy crankcase and main bearing housing. Hardened and ground crankshaft with machined-in crescent counterbalance and 5/32 in. dia. crankpin and running in two 1/4 in. x 5/8 in. ball journal bearings. One piece blued steel cylinder with integral cooling fins, screwed into crankcase. Screw in alloy hemispherical pattern cylinder head, with integral glow filament, and seating on confined copper gasket. Hardened steel piston assembled as integral ball jointed unit with steel connecting rod. Screw in carburettor body unit comprising crankcase back plate, reed valve housing and choke tube. Single 0.004 in. copper alloy reed retained by wire circlip. Separate needle-valve body, metering fuel to three carburettor jets, can be rotated to any convenient angle. Wire gauze intake filter. Beam mounting lugs. Eight coil starter spring of 0.056 in. spring steel wire.

Test Engine Data

Running time prior to test 30 min.

Fuel used: Record Super Nitre (50/50 mixture of Super Nitrex and Methanex used for first 15 minutes miming).

Performance

The maker's leaflet suggests that, no matter how expert the user might be, he follows, to the letter, the starting instructions laid down. This includes the use of the starter spring, and, after trying the engine both with and without the spring, we wholeheartedly agree. This is not because the Olympic is hard to start by normal finger flicking, but because, with the spring, starting becomes so simple and so certain, that there is no good reason for not using it. Like all reed-valve engines, the Olympic will run in either direction and with a tendency to sometimes start in reverse

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rotation with normal finger flicking, especially on small diameter, light props. Using the starter, this bother is eliminated, the spring storing sufficient torque to spin the engine over compression far more effectively than the most vigorous finger flick.

At first, it will usually take a few attempts before the precise prime required is determined, but, thereafter, the Olympic will generally start instantly on the starter spring. With the engine hot, it is not necessary to prime through the ports or even to choke the intake provided the fuel line is full. We made about 30 successive warm starts in this way, using a variety of props and in every case, the motor went off straight away at the first attempt.

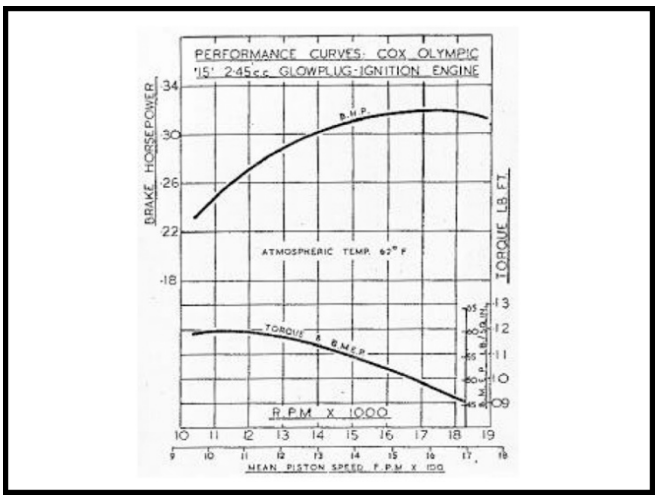
As regards performance, the most surprising thing of all is the substantially improved torque of the Olympic when compared with other 2.5 c.c. glow engines. We were prepared to find that the engine would peak at higher revolutions than any other 2.5 tested, but its torque, indicated in a maximum b.m.e.p. of 6o lb./sq. in., is up to the best diesel 2.5 standards and is better maintained at the higher revs. This gives rise to a b.h.p. of close to 0.32 at approximately 17.500 r.p.m. which appreciably exceeds the performance of any other production type International class engine yet tested.

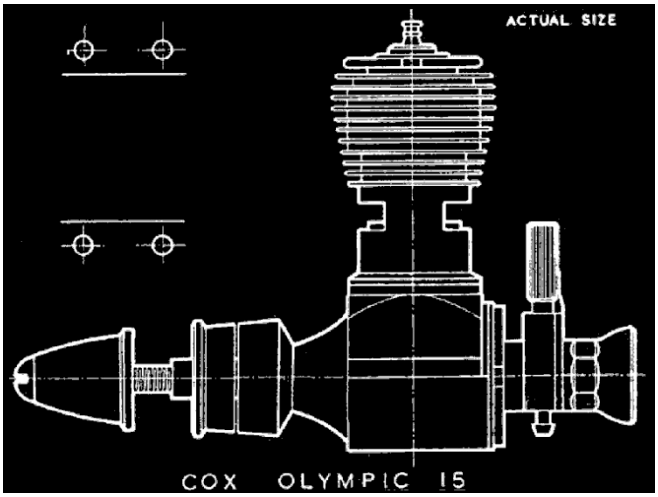
Despite the high torque indicated at 11- 12.000 r.p.m. the Cox is essentially a high speed engine and should be treated as such. On a good 8x4 prop for example, F/F men should find that it can offer up to 1.000 r.p.m. more in the air than the best of the opposition. For C/L team racing it is doubtful whether it has any advantage over a well-tuned Oliver, due to higher fuel consumption, but for C/L speed, it is clearly the most promising Western built 2.5 c.c. engine to date.

The Olympic is built to take a powerful fuel and our tests were carried out on a commercial fuel containing 30 per cent, nitromethane. For pure speed work, it is probable that even more nitro can be used to give still higher performance. Running characteristics are excellent.

Provided that props are correctly balanced, vibration is at a veiy low level and the engine runs extremely evenly. The needle-valve is non-critical and easy to adjust and holds the setting perfectly.

The Cox Olympic 15 will shortly be available in the U.K. and although, with import duty and tax added, the price is likely to be rather higher than for most other 2.5s, we feel sure that it will find a ready sale among contest enthusiasts.





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