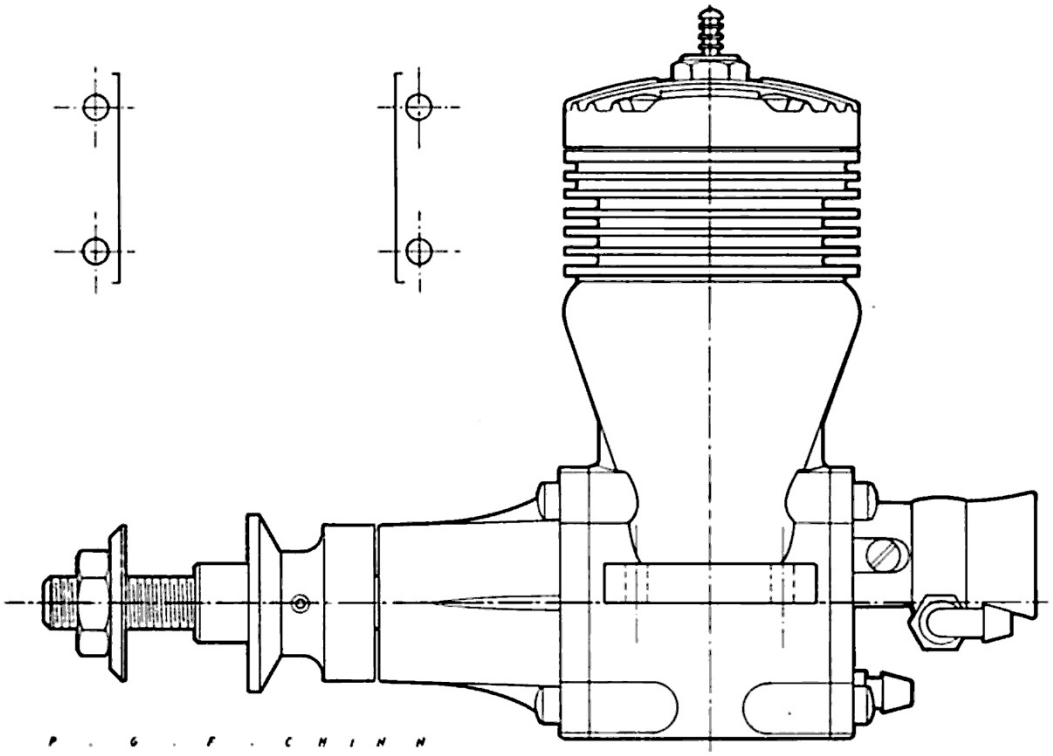
K&B 40 Torpedo Series 69R STD

ENGINE TEST

by Peter Chinn

K&B 40 Series 69R



FOR MANY YEARS, the American K&B factory had no official wholesale distribution channel in the U.K. In 1968, however, speed flier Ron Irvine was granted the U.K. sole distributorship for K&B engines and when K&B took over the manufacture of certain Veco products, this concession was extended to include Veco motors as well.

Irvine Engines now hold stocks of all the current K&B built engines in fact, they can supply more K&B variants than the factory in America! This is because Ron Irvine has adapted some motors to other applications (e.g. the now discontinued 29F to R/C use) and has also produced water cooled marine conversions of most of them for the benefit of model boat enthusiasts.

With the acquisition of the Veco R/C engine range, the K&B factory discontinued production oi their ten year old Torpedo 45 model and the largest K&B Torpedo engines now made are the various “40” models.

The Torpedo 40's are essentially high performance contest or racing type motors. In standard form, they are intended primarily for control line rat racing and for the larger types of free flight power duration models. In ‘R/C’ form, they are strictly for the pylon-racing enthusiast, the standard K&B 40 R/C carburettor giving only a limited throttling effect and virtually no idle, as such.

The original type Torpedo 40, the ‘Series 66’ shaft valve model, was dealt with in the ‘Engine Test’ series nearly two years ago. Our present report covers the rear induction Torpedo 40 ‘Series 69R’ introduced a few months ago to supersede the previous ‘Series 67’ model which also had rear rotary valve induction.

The main difference between the Series 69R and the previous Series 67 unit is in the shape of the transfer passage. When the original Series 66 model 40 was introduced, it was basically similar to the Series 64 Torpedo 35 but had a revised main casting with the transfer passage shaped much the same internally but considerably widened externally. The extra metal thus provided has now allowed the internal dimensions of the passage to be correspondingly increased in the Series 69F and 69R models. Enlargement is effected by milling the casting at the sides and top.

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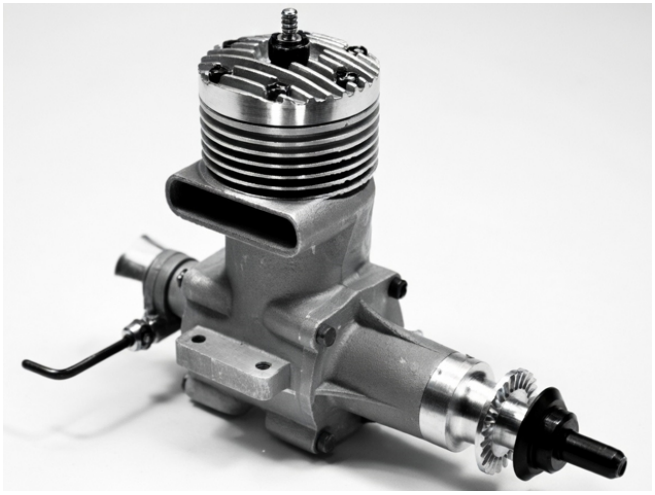

Technical details on the Torpedo 40 Series 69R were given in last month's 'Latest Engine News' column and some further data is included in a table in this month's L.E.N. We will not, therefore, repeat this information. It will be sufficient to remark that its design follows a classical racing model two-stroke layout. It uses an integral cylinder casing and barrel type crankcase, with inserted cylinder liner, twin ball bearing crankshaft in a flange fitting front housing, separate back-plate with rotary disc type induction valve and a ringed aluminium piston. The latter has a single Dykes pattern piston ring (the K&B was the first commercial model engine to have this feature) and now has a gudgeon pin with pads made of PTFE instead of the aluminium and (earlier) brass pads previously used.

Owners of Series 67 engines who wish to have them modified to Series 69R specification can have this done by Irvine Engines at moderate cost. Either model can also be converted to the Series 69R R/C specification.

Performance

For most of our performance tests of the Torpedo 40 Series 69, a fuel mixture containing 30 per cent, pure nitromethane was used. This is the equivalent of a commercial mixture containing 43 per cent, of blended nitro.

As the graph shows, the power available on such a mix was pretty shattering, the engine indicating an output close to 1.2 b.h.p. at around the 17.500 r.p.m. mark. The rate at which the Series 69 gobbles such relatively expensive fuel is also rather shattering. We did not make an accurate check of the engine's rate of fuel consumption but became aware that it was consuming fuel faster than most of the many R/C 60's we have tested over the past few years.

Checks on mild fuels resulted in a very sharp drop in power (about 22 per cent, at 11.000 r.p.m.) when the engine was loaded down with a big prop. Interestingly enough, however, there was a less severe loss (only about 12 per cent.) on mild fuels if the engine was allowed to really unwind, as maximum torque was realised at substantially higher revs than was the ease on high nitro fuels. In other words, pro-vided that one is interested only in running the engine at revolutions near its b.h.p. peaking speed (and this will usually be the ease, anyway, since no one buys a K&B 40 for C/L stunt or 'cabin sportster' use) it is quite feasible to use a more economical mixture for practice flights, reserving high nitro mixes for competition use.

Taking this a stage further, we raised the nitro content to 50 per cent pure. This only added 300-400 r.p.m. on typical props but would be worth trying for out-and-out contest use.

All the K&B 40's we have tested previously (three of them) have been pleasant to handle and the Series 69R was no exception. Pressure feed was, of course, employed for our tests. Using the standard rotary- valve timed crankcase outlet tended, we found, to make the needle setting a trifle tricky and we suspect that a low pressure tapping (c.g. via a fitting to replace the upper

back-plate screw on the transfer side) would be better here. Actually, the engine will run on suction feed on the bench but would probably be too sensitive to variation in fuel head for this to be used in a model.

Starting was very easy. Hand starting on a small prop would occasionally result in reverse rotation initially, but nipping the fuel line and another flick would usually set the engine running immediately in the right direction. Running qualities were generally excellent with smooth, steady firing, especially on light loads but also on heavier loads when medium to high nitro content fuels were used.

The Torpedo 40 is obviously of particular interest to 'rat-racing' enthusiasts. Previous versions have proved popular in this particular control line class, weight of less than 81 oz., it offers truly phenomenal performance for example: 14.500 r.p.m. on a 10x6 Top Flite Maple or 16.300 r.p.m. on a 9x6 Top Flite Maple.

Power/Weight Ratio (as tested): 2.26 b.h.p./lb.
Specific Output (as tested): 182 b.h.p./litre.

SPECIFICATION

Typo: Single cylinder air cooled, glow plug ignition two stroke with disc rotary valve induction and twin ball bearings.
Bore: 0.840 in.
Stroke: 0.720 in.
Swept Volume: 0.3990 cu. in - 6.539 c.c.
Stroke/Bore Ratio: 0.857 : 1
Weight: 283 grammes 8.41 oz.

General Structural Data

Pressure die-cast aluminum alloy crankcase/ cylinder-block unit with unhardened drop-in cylinder liner. Pressure die-cast aluminum alloy main bearing housing secured with four screws and containing one ¼ x ¾ in. front and one 3/8 x 7/8 in. rear ball journal bearings. Internally counterbalanced disc-web crankshaft with pressed-in hardened 7/32 in. dia. crankpin. Machined aluminum alloy piston with baffle and single Dykes piston ring.

Forged aluminum alloy connecting-rod, unbushed, with lubrication slit at lower end. Fully floating 0.180 in. dia. hardened tubular gudgeon-pin with PTFE end pads. Pressure die-cast aluminum alloy cylinder-head secured to cylinder casting with six screws. No head gasket.
Pressure die-cast aluminum alloy crankcase back plate secured with four screws.
Ultra light weight non metallic valve rotor, bronze bushed and rotating on hardened steel pin pressed into back plate. Provision for high-pressure type crankcase pressurised fuel system via rotary valve timed bleed hole in back plate.
Machined aluminum alloy drive hub fixed to crankshaft with rolled pin.
Removable ¼ in. dia. mild stool prop stud with hexagon nut and steel washer. Machined aluminum alloy carburettor venturi with six peripheral surface jots fed from external collar containing needle-valve assembly.
Beam mounting lugs.

(a) R/C typo carburettor. K&B Part No. 4049 (Converts standard engine to R/C Pylon Racing typo).
(b) British made marine conversion parts (flywheel and water cooled cylinder casing) from U.K. distributor.

TEST CONDITIONS

Running time prior to test: Approx. 2 ½ hours.
Fuel used: 30 per cent pure Nitromethane. 25 per cent Duckham's Racing Castor oil, 45 per cent ICI Methanol.
Glow plugs used: K&B KB-1L platinum filament, long reach, as supplied.
Air Temperature: 70 deg. F. (21 deg.C.).
Barometer: 29.80 in.Hg
Silencer: Not fitted.

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