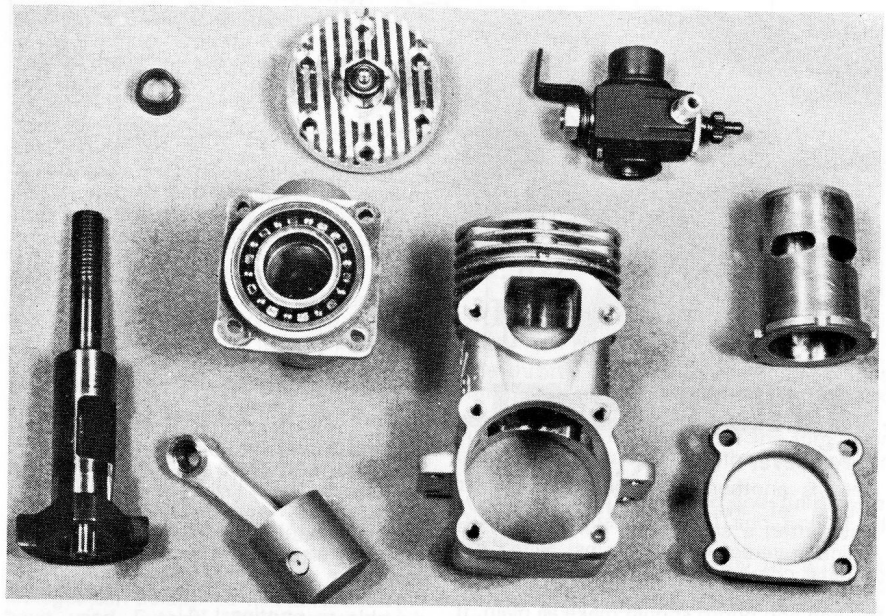

K&B 3.5cc ENGINE TEST

CONDUCTED BY FRED LIVESEY

THE 'out of the box' K & B 3.5cc engine is without doubt the most powerful engine used in model cars. The engine has been around for over 12 months now and a brief history does not seem amiss.

The original examples suffered from a flaw in the connecting rod forgings which allowed the little end to become detached from the conn rod with disastrous results. The consequential damage needed the replacement of piston and liner, conn rod and usually crankcase — because of the large hole!

The crankcase castings appeared to be made from a rather brittle aluminium alloy, and I've seen cases with broken mounting lugs and cracks. How much this is due to the separate front housing isn't plain but most competitors these days glue the front housing in with epoxy or lock-tite.

It's a credit to K & B that as soon as faults were brought to their notice they produced a far better crankcase casting and replaced the connecting rod forging on their later examples.

The front housings still need glueing in — I wonder if this is due to the enormous overhang of flywheel and clutch assembly — and the gears being forced apart by the power.

Bearings have given the same problems as with other powerful engines and are usually replaced by a bearing with a spot welded cage.

If you consider that the engines we use revolve approx. 650 times per second then it is amazing that any of them stay together. The engine has probably been used by more successful competitors than any other and has certainly been responsible for some of the increase in speed this year.

I hope you will forgive a rather longer than usual introduction — but I felt it was relevant. Now to the gritty bit.

Engine Type

3.5cc Schnuerle ported A.B.C. (Alloy piston running in a chromed brass liner) rear exhaust front induction engine. Whew!

Bore 0.650 (16.51 mm) — Stroke 0.640 (16.256) — Displacement 0.2124cu.in (3.481 cc)

Crankcase

Die-cast aluminium alloy crankcase with separate front housing and backplate held with socket cap screws — 24 mm OD x 12mm bore, Rear bearing with brass cage — ⅝" OD x ¼" Bore shielded front bearing.

Crankshaft

Counterbalanced hardened steel crankshaft with 3/16" diameter pressed-in hollow crankpin — 11/32" diameter gas passage — inlet timing opens 40 deg after top dead centre closes 52 deg after bottom dead centre — prop driver located by tapered collet.

Liner

Separate chromed brass liner with a wall thickness of 0.045 located by a top flange. Large rectangular exhaust port with a duration of 152 deg — K & B's own schnurled transfer port system each with a separate transfer passage in the crankcase — with two side angled ports and two steeply upward angled ports facing the exhaust port — all opening simultaneously with a duration of 124 deg.

Piston

Die cast aluminium alloy — gudgeon pin hole drill in one side only — 5/32" diameter hollow gudgeon pin with PTFE end pad, which is located by bridge between transfer passage in the liner.

Connecting Rod

Aluminium alloy forging — phosphor-bronze bushed big-end — oil holes drilled in big and little ends.

Cylinder Head

Finned aluminium alloy combustion chamber ⅛" (3mm) wide squish band — fitted with short reach glow plug. As most competitors will be replacing this cylinder head by one of the heat sink variety — this is the type used for the test.

Carburettor

Perry Micro carb held in by two slotted grub screws — 11/32" diameter spigot in front housing — 0.200" (5.1mm) bore spray tube intrudes into ventury 2mm long x 2mm wide, giving a cross sectional area of 16.43 sq.mm.

Weight

Less silencer — 7.0 oz (198.5 grams)

Distributors

Irvine Engines

Performance

The engine received for test was the No8380 "Plane and car with silencer" but as car competitors are using the dust-bin type silencer I felt it better not to use the silencer provided.

The engine did not feel so tight as some examples I have examined. Test carried out on the same test rig as last month, as — it is hoped, will all other tests, to give us a true comparison.

The manufacturers indicate in their leaflet supplied with the engine that no running in is necessary, but, to be fair — I ran the engine on a mixture of 30 per cent Castor, 70 per cent Methanol for 30 mins. to allow bearings to bed in. The mixture was then changed to the usual 15 per cent nitromethane, 20 per cent castor oil 65 per cent methanol mix for the test.

The engine started very easily with the electric starter and after initial adjustment ticked over steadily at 3000 RPM. Taking readings on the test rig indicated the excellent torque this engine puts out with a maximum figure of 38oz inches at 12000 revs. The maximum power is developed at 21,000 revs per minute giving 0.65 BHP (Brake Horse Power).

Conclusions

The test carried out with an engine basically straight from the box and fitted with (by today's standard) — a small bore carburettor, indicates the reasons for it taking most of the laurels since its introduction. Most competitors nowadays fit either Perry 60, Pumper 61, or large bore P.B. carburettors — and it would be interesting to do a further test on this engine when the new P.B. carb is available. (Buy British!)

Heatsink heads are available from various manufacturers and most car kit manufacturers supply clutch assemblies so no difficulties should be found when fitting to a car.

Already various engine modifications are available. McCoy supply liners and pistons with a really beefy con. rod and various con. rods are available from America. So far as I'm aware the improved K & B rod stands up to it these days.

Probably the best way to buy this engine for the model car enthusiast (or should I say fanatic — we must be mad!) is in the 'Free flight' plane version — less silencer.

These are available now from the usual sources, fit the carburettor of your choice — various competitors have their own view, mine is in favour of P.B. (no connection etc).

Well, if you want the fastest, out of the box — this is the one to buy. A recent letter in Model Cars indicated that the writer disagreed with the view "that it was not a beginners' engine" well — I feel that it can be a bit of a handful when beginning the sport.