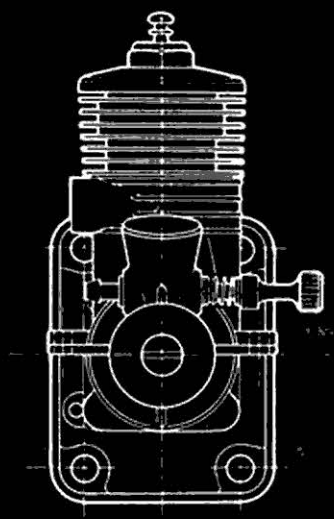
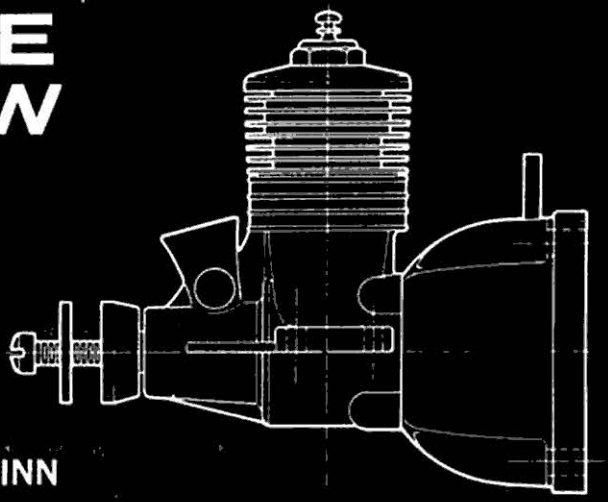


ENGINE REVIEW

The STALLION .049

BY PETER G. F. CHINN



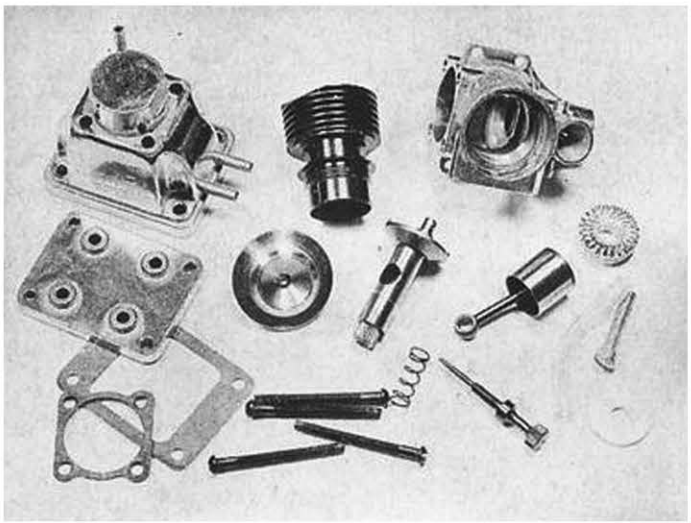
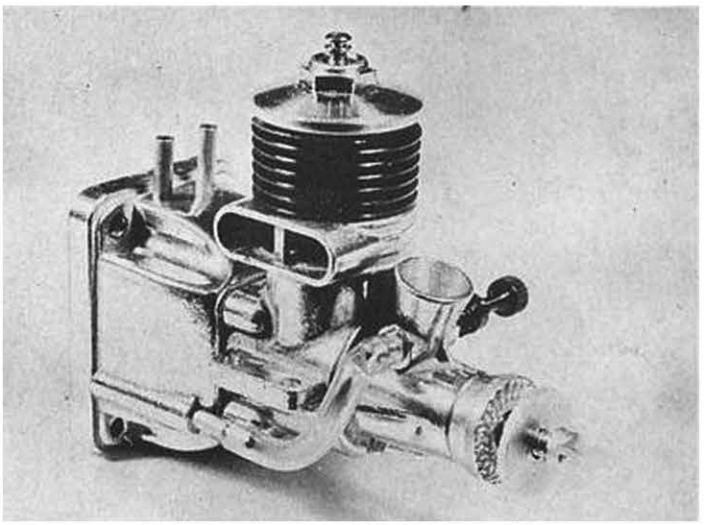
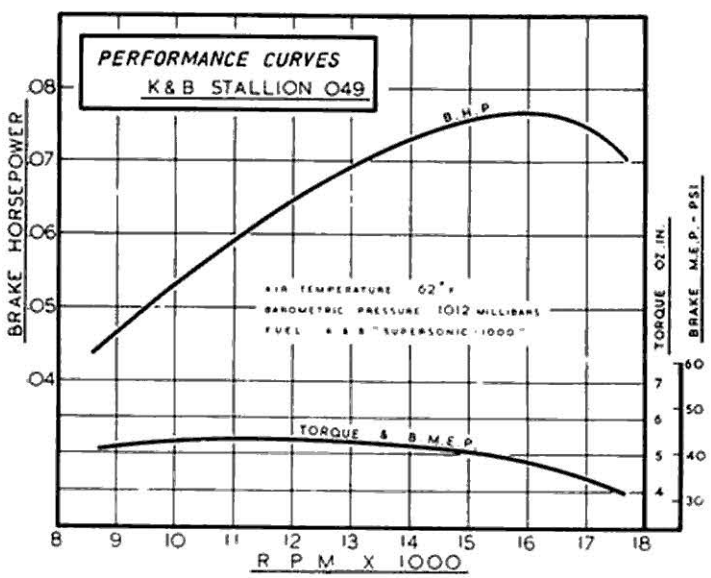


Photo of dismantled engine shows rugged, practical construction of engine and tank mount. Optional backplate available for use without tank.



Compact and functional K&B's new Stallion .049 is excellent value at only $3.95. Engine handles well and had good performance on test.

K&B'S NEW STALLION SERIES OFFERS GOOD, RELIABLE ENGINES WITH PLENTY OF SOLID POWER FOR SPORT OR CONTEST FLYING AND INEXPENSIVE IN ADDITION.



► To the majority of modelers, the name K&B is more usually associated with engines in the medium displacement group, rather than with Half-A motors. Nevertheless, K&B were among the pioneers of really small engines. Fifteen years ago, they announced the K&B Infant-Torpedo of only .020 cu. in. displacement, which was subsequently followed by a .035 and a .049 when the Half-A class for motors of under .05 cu. in. was established. Later, K&B manufactured the Allyn Fury range of small motors and, a little over four years ago, designed and put into production the Tornado 049, widely used in the Aurora plastic ready-to-fly models.

These various small engines have differed quite appreciably from each other in both design and construction. K & B has, therefore, accumulated a considerable amount of experience in small glow motor manufacture, over the years, and it is interesting to see that the new Stallion 049 is a further example of this policy of continually developing and changing design. It is, in fact, an entirely new engine and none of its components is interchangeable with those of previous or existing K&B models.

A common displacement and, virtually, the same bore and stroke however, clearly invites comparison between the new model and K&B's Tornado 049, especially as they are identically priced at only $3.95. Points of similarity extend to the use of a radial tank-mount, steel conrod, a ball-joint piston assembly and dual opposed exhaust ports—but not much else.

In contrast to the Tornado 049, which originally used a diaphragm type intake valve and currently employs a copper reed valve, the Stallion reverts to an orthodox crankshaft type rotary-valve. Both engines have large capacity fuel tanks, but whereas the Tornado unit is of non-metallic molded construction, the Stallion uses an aluminum diecasting. An appreciably larger and more intricate crankcase unit is used by the newer engine. It has a much heavier main bearing and is provided with lugs for optional beam mounting. The appearance of the engine is rendered more "squat," due to the design of the new case, and the shorter cylinder and head, plus a slightly longer frontal overhang. The crankshaft, in addition to being longer, also has a larger diameter main journal. Piston and connecting-rod assemblies are similar, but while the Tornado piston used an integral swaged socket to hold the ball-ended conrod, (the usual copper plating being used to keep the interior of the piston ductile during surface hardening of the skirt), the Stallion employs a pressed steel retainer and wire snap-ring inside the piston skirt.

The Stallion cylinder is an unhardened steel component, machined in one piece with integral fins and, in accordance with the popular trend in loop-scavenged engines, it uses dual opposed exhaust ports and dual opposed internal bypass flutes. Essentially, it is therefore similar to the Tornado cylinder (except that the latter has only one bypass flute), but has fewer and larger diameter cooling fins about the exhaust ports and omits all finning below the ports. It has a flange below the ports and is externally threaded beneath this, for attachment to the crankcase.

The crankcase block extends upward as far as the lower cooling fin, but the actual joint between the cylinder and case is made by the cylinder flange (previously mentioned) and an annular seating within the case approximately 7/32" below its top edge. The exhaust ports are, therefore, encased within the casting and a semi-circular exhaust chamber is formed between the cylinder and case to collect exhaust gas for discharge through the single right-hand stack.

The hardened crankshaft has a ¼" diameter journal and a 3/16" diameter gas passage. A circular, 3/16" diameter, valve port is used and registers with a similar sized intake aperture in the main bearing. The shaft runs directly in the crankcase material which is high density, pressure cast aluminum and the minimum bearing wall thickness is .095 in. The front end of the shaft is knurled and has a pressed-on aluminum prop driver.

The fuel tank/radial mount is an aluminum pressure casting, into the rear of which is recessed a solid diecast rectangular cover. The front end of the tank forms the crankcase backplate and has a central boss to pack the unwanted crank chamber volume. Four long screws pass through the back cover and tank to secure them to the engine crankcase. The tank has three pressed-in brass tubes forming filler, vent and delivery pipes. Paper gaskets are used to make the joints between crankcase and tank and tank and back cover.

The screw-in cylinder head forms a conical combustion chamber and seats on a .005 in. soft copper gasket. It has an integral glow filament, although reference to the g.a. drawing may suggest otherwise, since a standard ¼ in. glowplug size hexagon is machined on the head, thereby giving the superficial impression of a separate plug and making it possible to remove or replace the glowhead with a standard plug wrench. Removal of the cylinder from the crankcase is aided by two flats provided on the top fin.

As an alternative to firewall mounting via the tank mount, the Stallion is equipped with narrow beam mount lugs in the usual position on the crankcase. Since the tank is much wider than the crankcase and would mean cutting away the engine bearers to clear, a separate crankcase backplate is available for the Stallion to enable the regular tank mount unit to be discarded when the motor is beam mounted.

K&B's recommended fuel for the Stallion 049 is Supersonic-1000 and all our tests, following a one-hour break-in on Supersonic-100, were carried out with this fuel.

Handling characteristics on test were orthodox and without complication. No started spring is fitted, but the engine was easy to hand start and, except from dead cold, a couple of choked flips were the only preliminary required. Port priming was also effective provided that care was taken not to flood the motor. The needle-valve was non-critical in adjustment and held its settings firmly.

Maximum torque recorded on test was just over 5.4 oz. in. at around 12,000 rpm and maximum power was .077 bhp at 16,-000 rpm, a good performance for a sport type motor and especially so for such a low-priced product. Typical prop speeds included 12,200 on a 6x4 Tornado, 14,400, 14,600 and 15,100 on various Top Flite 6x3's, 15,900 on a 5x4 Tornado and 17,-200 on a 5¼x3 Top Flite. The Stallion ran steadily and evenly at all speeds tested. During preliminary running, vibration caused loosening of one of the tank screws, but this was no doubt aggravated by the rigid metal test mounting and seems unlikely to occur with the engine mounted in a model, although periodical checking of the tank screws for tightness would not come amiss, of course.

In all, the Stallion impressed as a rugged, easy handling and practical small motor of good performance at a rock bottom price.

Summary of Data

Type: Reverse-flow scavenged two-cycle with shaft rotary valve induction.
Weight: 2.25 oz. including radial tank mount.
(1.7 oz., less tank, but with crankcase backplate fitted).
Displacement: 0.0496 cu,in. or 0.813 c.c.
Bore: 0.400 in. Stroke: 0.395 in.
Stroke/Bore Ratio: 0.9875 : 1
Specific Output (as tested): 1.55 bhp/cu. in.
Power/Weight Ratio (as tested):
0.548 bhp/1b (including tank mount).
0.725 bhp/1b (less tank mount).
Price: $3.95.
Manufacturer: K&B Manufacturing Corporation, 12152 Woodruff Avenue, Downey, California.