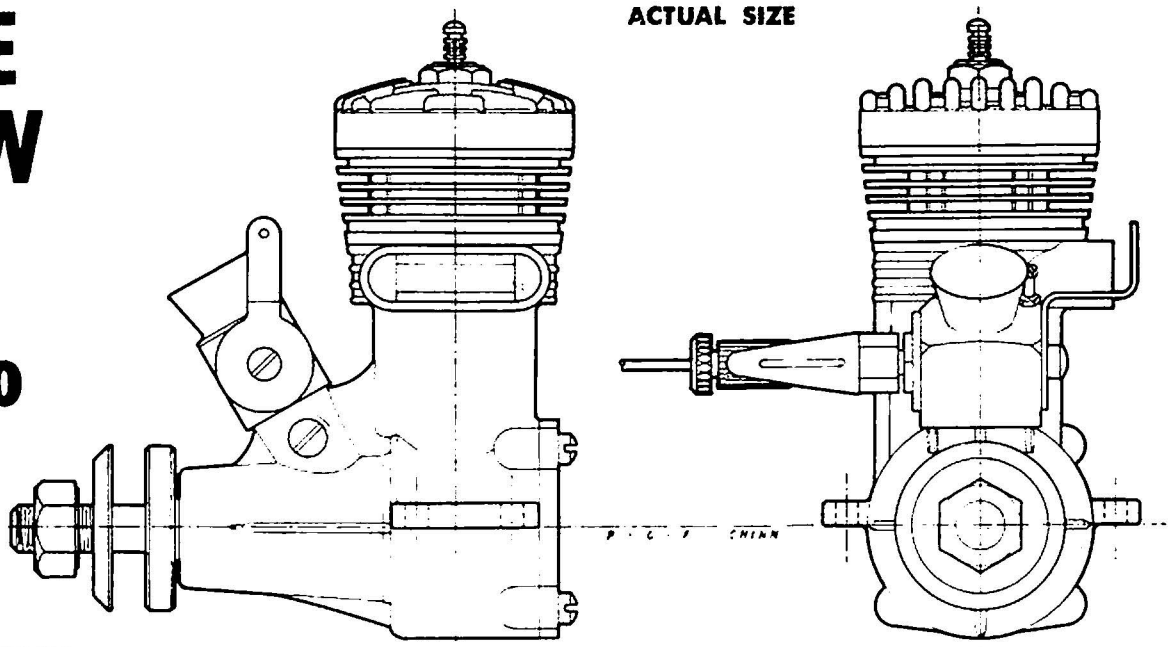
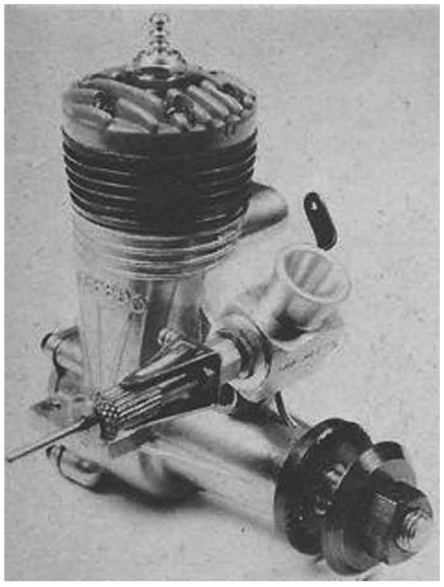
ENGINE REVIEW

K & B Torpedo .19RC

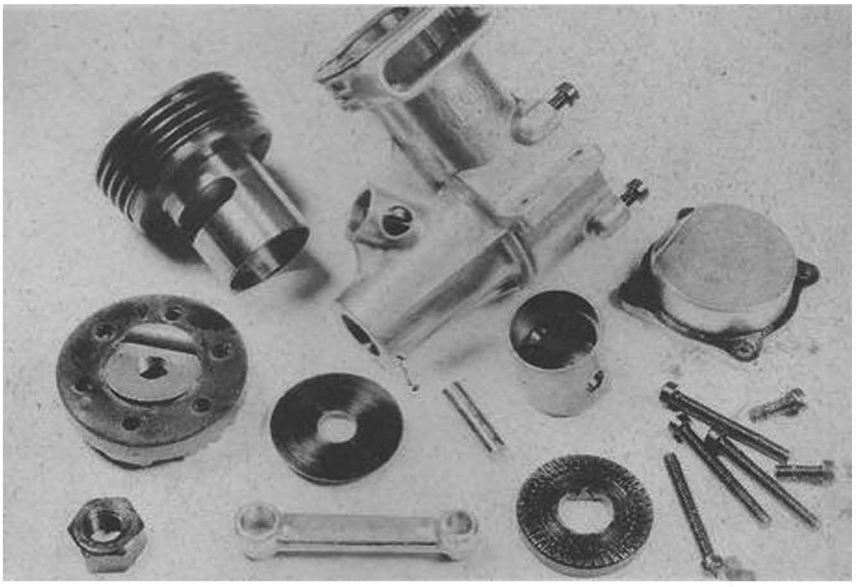


by P. G. F. CHINN

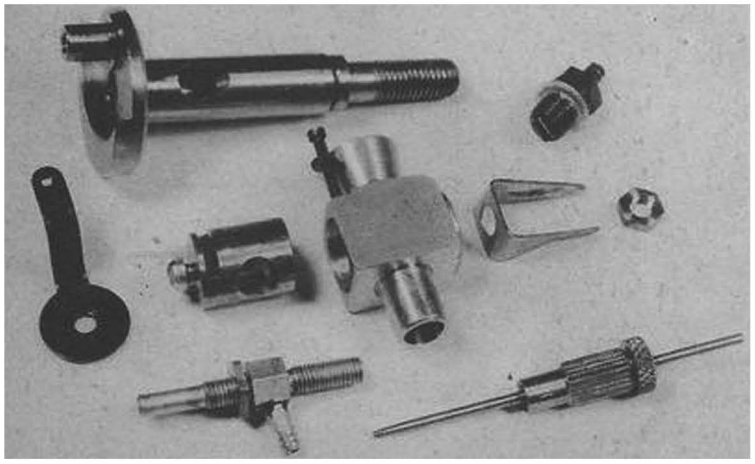
Latest K&B product carries on its tradition of high performing .19 Torpedo engines.



Torpedo .19 RC is based on the original Torp .19, one of the decade's most successful engines.



Above components are basic to other Torp .19's, except intake.



Parts special to .19 RC, shaft has circular valve and small intake port.

► Occasionally, very occasionally, the model engine industry comes up with a product of such outstanding merit that it becomes the standard by which all subsequent designs are judged. Such a motor was the original K&B Torpedo 19.

Introduced ten years ago, K&B's 19 was, to all outward appearances, an orthodox, shaft-rotary, loop-scavenged glow motor, slightly heavier than existing .19's, but having little that a cursory examination suggested would place it at the top of the class for contest work. Yet, within a few months, unaided by ball-bearings, ringed alloy pistons or fancy combustion chamber shapes, the Torp 19 was riding high, trouncing all opposition in Class A speed, as well as in free-flight—in fact, given the treatment by such notables as Bill Wisniewski, this minor phenomenon was soon towing speedsters faster than the then existing Class B record.

Not unnaturally,

many of the features which made the K&B 19 so successful have, over the past few years, gradually found their way into other engines, but it is worth noting some of the ways in which the 19 differed from common practice of a decade ago.

The fact that the engine was around 50 per cent heavier than the average 19 of the period gives us our first clue. In this respect, K&B reversed a trend that had been apparent in model engine design from the days of the Brown Junior and with good reason. Essential to high performance is the reduction of friction and very necessary factors here are structural stiffness and a resistance to distortion at high temperatures. This, the Torpedo 19 achieved in many ways, including generous material sections throughout, to resist mechanical and thermal distortion, a relieved piston skirt to reduce piston drag and accurately aligned and well-finished working surfaces.

High volumetric efficiency—the ability of an engine to fill its cylinder with the highest possible concentraton of pure fuel-air mixture—is a function of gas passage size and shape, port design and timing, combustion chamber shape, etc. Here, too, the Torpedo 19 showed a high degree of development, the capabilities of its induction system being clearly comparable with the best disk-valves (by virtue of the enlarged valve port and gas passage made possible by its larger than average shaft dimensions) and matched by efficient scavenging.

Stemming from the original K&B 19, four other basically similar models have appeared during the past decade: the 2-speed 19, the .23, the .201 and the .19RC and it is with this last model that our present report deals. At the cost of some of the high performance realized with the original 19, the 19RC aims at the improved flexibility and more even low-speed running desirable with a throttle-equipped radio-control engine. It has the following modifications.

The crankcase has the carburetor intake cut off just above the normal spraybar position. A K&B Multi-Speed carburetor (Part No. 730—a smaller bore version of the 729 unit used for the 35RC and 45RC), is inserted into the shortened intake and is locked in place by two set-screws, the standard spraybar holes being tapped for this purpose. The carburetor consists of a machined aluminum body, in which is closely fitted a steel barrel type throttle, operated by an adjustable arm on the left hand side. An idling adjustment is provided by a screw which engages a slot in the barrel. The throttle control operates without interference from the needle-valve or affecting it in any way. The needle-valve is an independent unit which screws into the right hand side of the carburetor, both the needle control and fuel inlet being on that side of the engine. (It should be noted, however, that, if desired, the whole carburetor unit could be re-fitted to provide right-hand throttle linkage and left hand needle control).

The most important internal change on the 19RC is the fitting of a "de-tuned" crankshaft. This has a small valve port of circular section in place of the large rectangular port of the original 19. The port, of 7/32 in. dia., is drilled at a 45 degree angle to the shaft axis, giving an oval shaped opening. Valve timing is approximately 45 deg. ABDC to 35 deg. ATDC. The crankshaft has a ¾ in. dia. journal and a 7/32 in. dia. hollow crankpin. The crankweb is of the full disk pattern with machined-in crescent counterbalance. The shaft, unhardened, runs in a bronze bearing which has two shallow longitudinal lubrication grooves. A blued steel drive washer is used, keyed to a flat on the shaft.

The cylinder is of typical Torpedo design, having integral cooling fins and a blued, corrosion-resistant external finish. Unlike more recent Torpedo designs, which have only two holding-down screws plus two or four short head screws, the 19RC retains the original 19 arrangement of four hold-down screws and two head screws. The head is an aluminum pressure casting with centrally located bar-type plug and is enamelled green. Rubberized asbestos composition gaskets are used under the head and cylinder base flange and will normally require replacement, if and when the engine is dismantled. Unlike the earlier 19, the bypass and exhaust ports have radiused ends instead of being rectangular. The piston is of Meehanite with a filleted baffle and the skirt is relieved approximately .001 in. below the wristpin centers. The forged alloy conrod has an oil hole at the lower end and couples to the piston by a full-floating 5/32 in. dia. wristpin with aluminum end pads.

Our tests of the 19RC were undertaken after the motor had logged approximately four hours running time. Although power output was considerably below that of the original 19 (which delivered well in excess of 0.40 bhp on Supersonic 1000 fuel) the 19RC maintained the 19's excellent handling and running characteristics. Starting was easy both hot and cold and the engine was notably even-running and vibration-free. Response to the needle-valve was positive, progressive and non-critical.

Actual power figures obtained were as follows:

At 8,000 rpm — .205 bhp
9,000 rpm — .227 bhp
10,000 rpm — .250 bhp
11,000 rpm — .272 bhp
12,000 rpm — .288 bhp
13,000 rpm — .291 bhp
14,000 rpm — .275 bhp

The K&B multi-speed carburetor functioned very satisfactorily. To obtain best results, we found it advisable to first warm up the engine with the throttle open and then set the required idling speed with the idling adjustment screw. The maximum range of speed variation possible depends, to some extent, on fuel, prop and climatic conditions and if the idling speed is set too low, there may be a tendency for the engine to cut, if the throttle is opened abruptly after a long spell of low-speed running. With a little experiment, however, a good compromise of reliable maximum and minimum speed operation is possible. Where more power is required, the 19RC is well able to accept high nitro content fuels when adequately broken-in.

Summary of Data

Type: Loop-scavenged two-cycle with rotary valve intake and variable speed throttle.
Weight: 6.5 oz.
Displacement: 0.1994 cu. in.
Bore: 0.640 in. Stroke: 0.620 in.
Stroke/Bore Ratio: 0.969 : 1
Specific Output (as tested): 1.46 bhp/cu. in.
Power/Weight Ratio (as tested): 0.72 bhp/lb.
Price: $19.95.
Manufacturer: K&B Manufacturing Corporation, 5732 Duarte Street, Los Angeles 58, California.