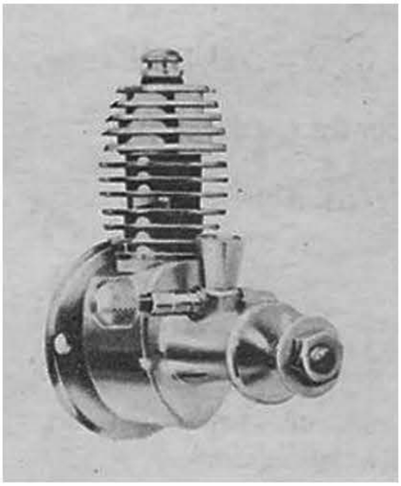
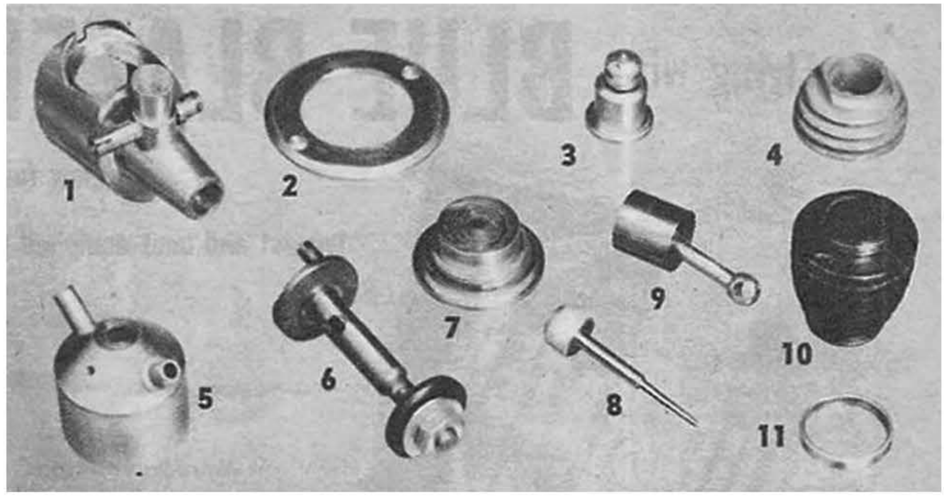
Motor of the Month





Torp Jr.

Bigger than their Infant, but a peanut compared to K&B's big Torp, the Torp Junior gives you a fistful of power for the half-A class

DON'T confuse the newer K&B Torp Junior with the well-known Infant. They look very much alike but the Junior has a larger displacement and delivers over twice the power. The construction is the same, with the Arden type porting and a ball and socket connecting rod. All parts are machined from solid bar stock rather than being cast, and this results in a strong engine. A special glow plug is used to form the cylinder head in the same manner as its baby brother.

All the miniature fans will like this engine. For free flight the tank gives a one-minute run with a large propeller, and the engine pulls well at low speed. Control line, sport and speed fans should be well pleased with high rpm and good resistance to wear. Fuel suction is strong (3¼" fuel level test) and the engine will stunt for anyone who can handle such a small one.

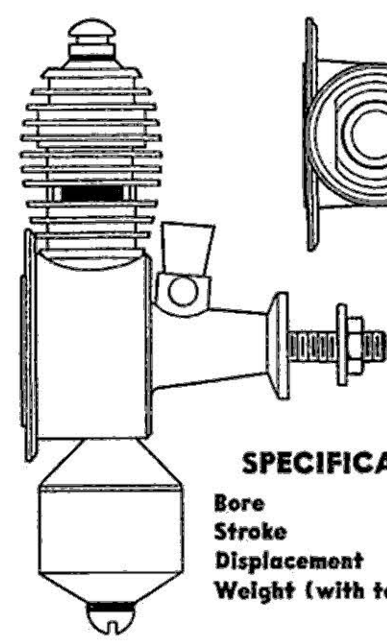
During the test runs an outstanding feature was noticed: the engine can be operated at 13,000 rpm for several hours and still retain its good compression seal for slow rpm. The Torp Junior could very well fly in a speed contest and then go to work pulling a free flight.

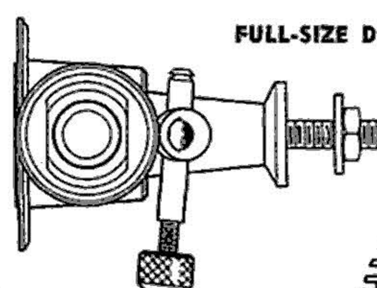
A low-compression ratio and moderately cold plug require hot fuel for peak performance. Commercial AA or Infant varieties are good, or a standard blend hopped up with nitro concentrate will give gratifying results. Starting is more positive with a small prime in the exhaust as well as a drop in the intake. Open the needle valve at least two turns or it will *sput* but not start. The needle valve has a long slender tapered point and is relatively insensitive.

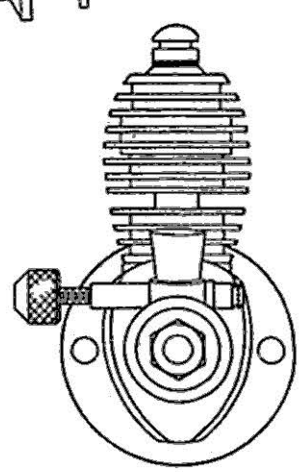
Very little break-in was required on the engine tested as it hit 13,000 rpm after five minutes' running. After fifteen minutes it would continue to run on a lean needle valve setting and appeared to be completely broken in but running was continued for five hours before the rpm test.

This report may be filled with some strange facts and figures that have little meaning to the average modeler. We

FULL-SIZE DRAWINGS

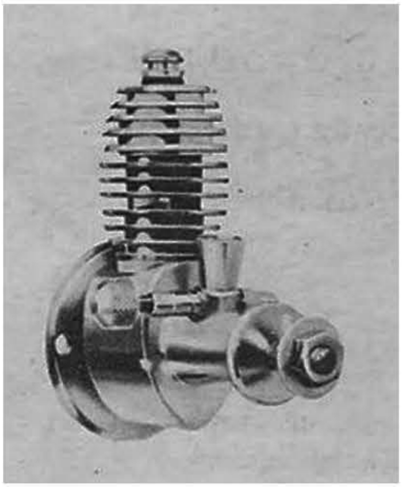






SPECIFICATIONS:

Bore	**.343 inch**
Stroke	**.380 inch**
Displacement	**0.35 cu. in.**
Weight (with tank)	**1.25 oz.**



will present an explanation on one special item in each engine report, so if you make a complete collection the figures will make sense and be of definite value for future reference. Let's dig into "base compression ratio" this month.

Most of us are familiar with "compression ratio," which normally refers to what fraction of the original volume the fuel mixture is squeezed into in the combustion chamber above the piston. Fuel and air enter an engine through a rotary valve or side port when the piston is traveling upward, and are trapped in the base when the valve or port closes.

Further movement of the crankshaft brings the piston down and squeezes the fuel mixture to a smaller volume, creating pressure in the base. Dividing the volume of the base with the piston down into the volume with the piston up gives the base compression ratio or how much the mixture is squeezed together in the base.

High-base compression is a desirable factor because it helps draw fuel into the base and pumps fuel through the bypass and into the combustion chamber with more force. High-speed engines must have high-base compression in order to force fuel into the cylinder fast enough to keep up with the rpm. Stunt engines also perform better with high-base compression due to a stronger suction when the piston is traveling upward.

Various methods used by engine designers to increase base compression include shortening the connecting rod to pull the piston down; squeezing the back plate and crank disk close together and making a flat rod; filling up dead space with counterbalance and metal on the rotary valve disk; and a short stroke designed to reduce diameter of base and clearance for rod.

Base compression alone is not a perfect indication of how well an engine is designed or built, but is one item to consider. Low-base compression may be offset by good port and bypass design or well-shaped piston crown.

Engine Data

Performance. Bare weight (less tank): 1.09 oz. Propeller—5½/3½ wood: 10,200 rpm; 5½/3 plastic: 13,100 rpm; 5/3 wood: 13,800 rpm. Fuel: AA and miniature types on the hot side. Fuel level test: 3¼" at 13,000 rpm.

Design. Displacement: .035 in.^{3}. Class: 1/3 A. Stroke: .380 in. Bore: .343 in. Stroke bore ratio: 1.11. Compression ratio head: 4.75. Compression ratio base: 1.50. Port area intake .0115 in^2.; bypass .003 in^2.; exhaust .0368. Ignition: Special glow plug.

Construction Features. Bearings: crankshaft, aluminum; crankpin, aluminum; connection rod, aluminum and brass; ball joint.

Parts all machined from bar stock—no castings.

Torp Junior Parts Illustrated

Part	Material	Size (in.)	Wt. (oz.)
1. Crankcase	Alum.		
Needle valve body	Brass		.26
2. Mounting flange	Alum.	1 3/32 O. D.	.03
3. Glow Plug	Alum. body	No thread	.05
4. Cylinder head	Anodized alum.		.07
5. Gas Tank	Alum.	5/8 dia. 7/16 deep	.16
6. Crankshaft	Steel (hardened & ground)	.1872 dia.	.16
Drivewasher	Steel	1/2 dia.	.06
Prop washer	Alum.	3/8 dia.	.01
Nut	Brass	6-32 N.C.	.02
7. Crankcase cover	Alum.	3/4 dia.	.07
8. Needle valve	Brass	2-56 N.C.	.03
9. Piston	Steel (hardened & lapped)	.3432 dia. .348 long	.10
Connect. rod	Alum.	5/8 long	
10. Cylinder	Steel	.3435 bore 3/4 long	.22
11. Spacer-cyl.			.01
Total	weight with tank		1.25 oz
	without tank		1.09 oz.