

Peter
Chinn's

RADIO Commentary MOTOR

Bernhardt 61 Re-tested

One of the most popular of the many imported motors handled by Irvine Engines during recent years has been the German Bernhardt 61, originally sold under the 'Veco Europe Series' label and, since the end of 1972, also as the HB 61.

There have been some minor changes to the engine since it was first reported upon in this column in its Veco-Europe form and we therefore took the opportunity recently of rechecking its performance in the current HB 61 version.

Following approximately two hours' intermittent running on a straight 3 to 1 methanol castor oil mix, tests were carried out on our standard R/C test fuel containing 5 per cent pure nitro-

methane and 20 per cent castor oil (Newton-R) and with the open front HB silencer fitted. The HB engines are supplied without glowplugs: we used a K&B long-reach idle-bar plug. Typical prop rpm recorded under these conditions included:

8,800 rpm	on a 14x6	Top-Flite maple
10,300	" " "	13x5½ Top-Flite standard
10,800	" " "	12x6 Top-Flite maple
10,600	" " "	an 11x8 Top-Flite maple
10,600	" " "	11x7¾ Bartels glassfibre
11,400	" " "	11x7 Top Flite maple
12,200	" " "	11x6 Top Flite maple
12,700	" " "	11x6 Power-Prop maple

Compared with the performance obtained three years ago with the first production model Bernhardt 61, maximum torque was a little lower with this later motor but its peak horsepower was reached at slightly higher rpm. Actual peak output was practically unchanged at approximately 1.10 bhp (at 13,000 - 13,500 rpm) with silencer. Strangely enough, although the HB air-scavenged silencer caused virtually no power loss over the usable rpm range with the earlier engine, there was a small but definite power loss when the same silencer was fitted to the later model. This amounted to 100 - 200 rpm when the engine was loaded for speeds in the 11,000 - 12,000 rpm bracket, rising to 300 - 400 rpm at 13,000 - 15,000 rpm.

As one would expect, the HB silencer does not subdue the exhaust note very effectively in its standard form. However, the manufacturer now includes a machined alloy plug for blanking off the frontal vent. We did not check the effect of this but, as it reduces the total escape area from about 142 sq.mm. to less than 64 sq.mm. - i.e. about the same as for a tolerably effective 60 size expansion box type unit - it is fair to suppose that this would give reasonably effective suppression, with a probable power loss of 15 - 20 per cent, or 500 - 700 rpm on 11 in. props of 7 - 8 in. pitch.

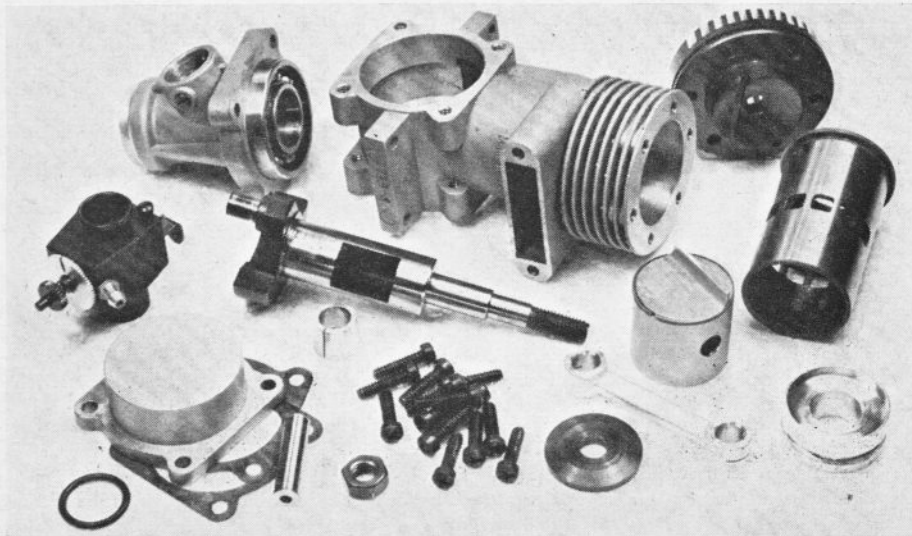
Handling remained good, with docile starting qualities and satisfactory throttle response.

HB 61 Fan-cooled Conversion

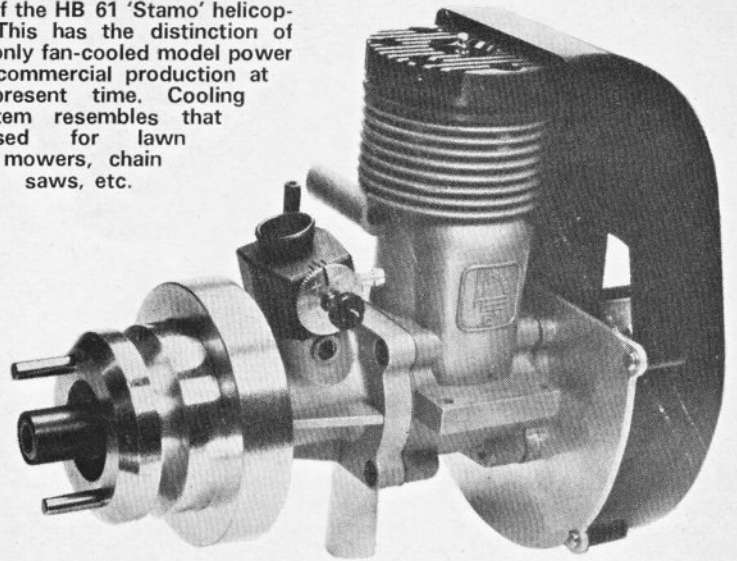
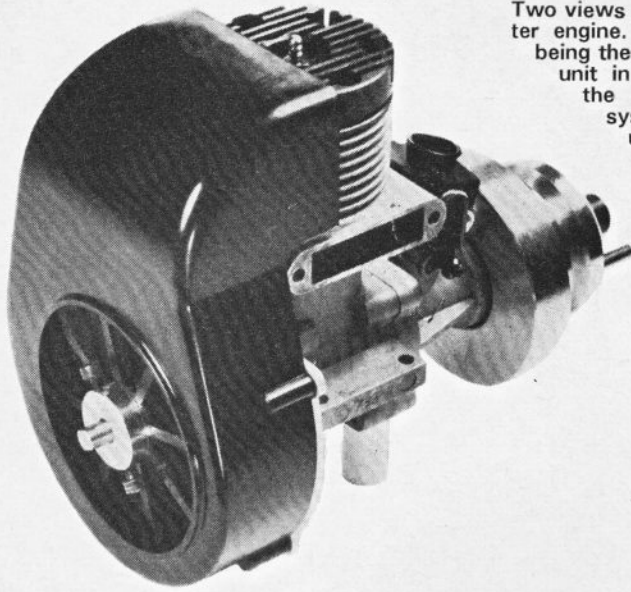
Standard equipment for the Graupner Bell 212 helicopter

Although no longer as low-priced as it was when first introduced three years ago, the Bernhardt 61 is still quite good value. HB 61 version shown here has HB silencer with forward vent plug inserted.

Parts of the HB 61. Differences between this and original Veco-Europe series include deletion of skirt transfer ports in piston and liner, a hardened instead of chromed, cylinder bore and a revised crankshaft. (All these mods. are also now incorporated in the Veco-Europe version.)



Two views of the HB 61 'Stamo' helicopter engine. This has the distinction of being the only fan-cooled model power unit in commercial production at the present time. Cooling system resembles that used for lawn mowers, chain saws, etc.



distributed in the U.K. by RipMax, the 'Stamo' fan-cooled version of the HB 61 is now available as a separate item for helicopters or, with a different flywheel, as an alternative to the water-cooled HB 61 for marine use.

Although the Stamo is unique among current production model power units, its cooling system is essentially the same as that widely employed for small petrol engines used in lawn-mowers, etc., i.e. a simple centrifugal fan is driven at crankshaft speed and is encased in a shroud which ducts the airflow to the cylinder and head.

Most of the parts of the standard air-cooled HB 61 are the same as those used by the Stamo with the exception of the crankshaft and crankcase backplate. The shaft has its crankpin drilled and tapped with a left hand thread for a special spigot which engages the fan shaft driving disc. The replacement backplate houses two 6 x 19 mm. ball journal bearings to support the fan shaft. The moulded fan has eight radial vanes and an alloy boss by which it is secured with two set-screws to flats on the shaft end. The fan casing consists of a 2 mm. thick aluminium alloy plate, fastened to the rear of the crankcase by the backplate mounting screws, and a moulded black polythene shroud that is attached to the plate with four self-tapping screws.

The only difference between the helicopter and marine Stamo engine is in the flywheel used. The helicopter flywheel is of aluminium, weighs 5.2 oz., is 2.32 in. o.d. and is fitted with two steel pins to engage the helicopter's clutch unit; whereas the marine flywheel is of brass, weighs 11.8 oz. and is 1.73 in. dia.

The weights of the various versions of the HB 61 are 14.6 oz. for the standard aircraft version (18.0 oz. with silencer), 23.4 oz. for the Stamo helicopter motor and 30.7 oz. for the Stamo marine engine.

