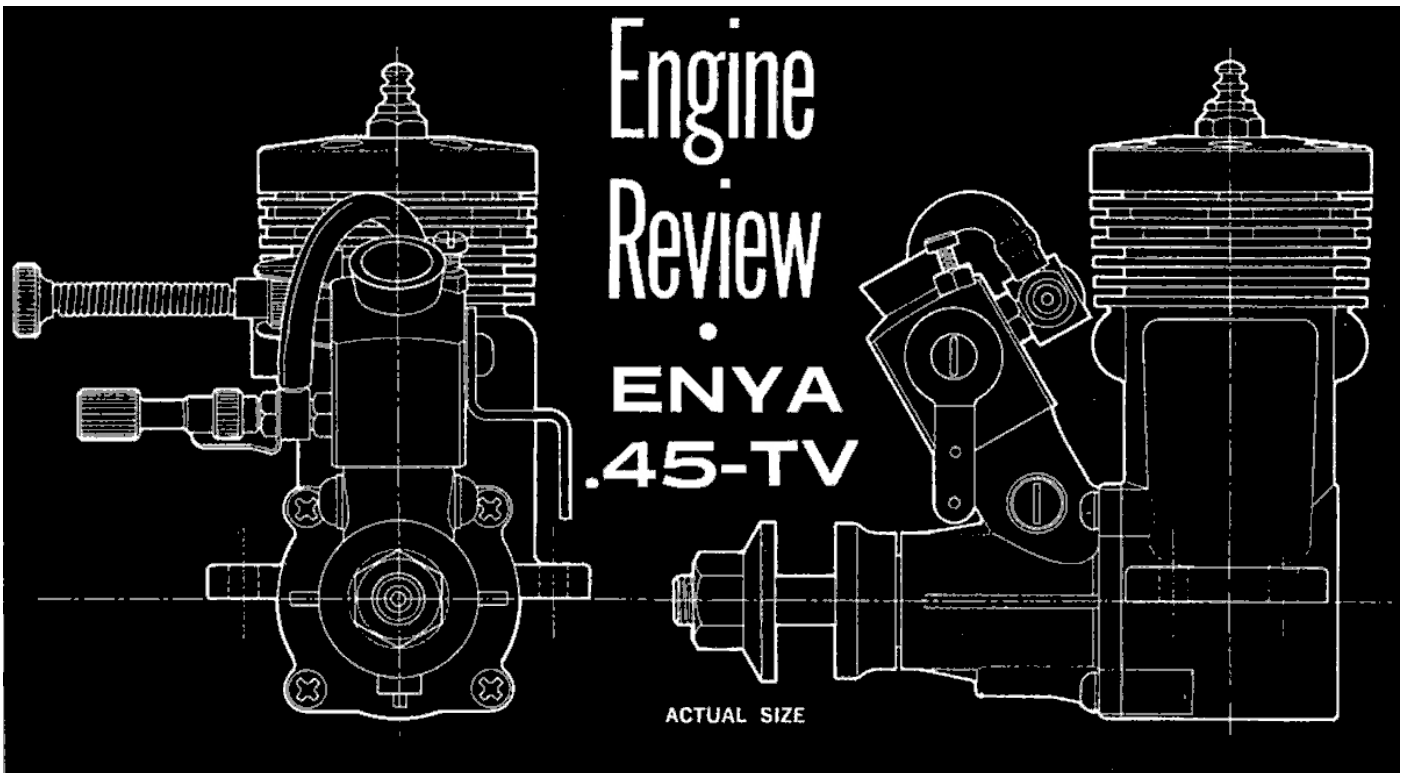


Enya 45-TV R/C



By P. F. G. CHINN

ANOTHER SUPERB ENGINE FOR THE MULTI RC FLIER. DON'T KNOW OF ANY OTHER GROUP WITH A BETTER SELECTION OF POWER PLANTS TO MAKE ITS CHOICE.

► The Enya engines are being imported by the MRC- Enya Company Inc., of Brooklyn. N. Y.

It will be apparent, to any one who follows these Engines Reviews closely, that the power of the Enya 45-TV as indicated by our performance curves, is somewhat above average for an R/C engine of .45 cu. in. in displacement. To be more exact, the power output of 0.66 bhp at 12,000 rpm obtained from our sample on test, was the highest for any R/C 45 encountered to date.

This figure of 0.66 is slightly less than the maker's nominal rating (0.70 bhp) but between 7 and 20 percent more than the various outputs with which the Enya 45-TV has been credited by some other (foreign) independent sources. We feel that this calls for some comment and, since all test results are influenced by certain variables outside our control, we should here report that two such factors were, possibly, in the Enya 45's favor in this instance.

Firstly, this test model came direct from the manufacturer and had been partially broken-in. so it is reasonable to assume that, having regard to the fact that there is always some variation in performance between individual examples of otherwise identical engines, a reasonably "good" (or at least, not below-average) sample was selected. We must emphasize, however, that this 45 was in absolutely stock condition and there was no evidence of its having received special attention of any kind this we determined by a close comparison of the test engine with another, "off the shelf." 45-TV.

Secondly, at the time of testing, atmospheric conditions probably favored the Enya as they were such as to give a correction factor of 97.5 for "standard bhp." In other words, if our power curves were corrected to "standard" atmospheric conditions of 60 deg. F and 30 inches of mercury on the barometer, it would indicate a little over 0.64 bhp rather than 0.66 bhp.

Model Airplane News Magazine March 1965 by Hlsat

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Test model Enya 45-TV proved to have excellent power to weight ratio. High and low speed needle valves and intake restrictor used for idling.

This, of course, is something which applies to all engines and is, in fact, taken into account when tests are conducted on full scale i. c. engines, results normally being corrected to the standard atmospheric conditions we have mentioned. To digress a little, we do not, in these Engine Review reports, correct our bhp figures to an atmospheric standard, because, so far as model airplane engines are concerned and in regard to air temperatures in particular, experience has shown that it is by no means certain that we would be justified in doing so. A model engine which, for example, delivers a high output when run in an 80 degree air temperature, does not always improve in accordance with the accepted correction factor if operated in denser 40 degree air. In some cases, especially those involving small glow motors, it is not uncommon to find that power output is reduced, when, all other factors being equal, air temperature is below a certain level, due to the engine itself working at below its optimum operating temperature for a given fuel and plug.

However, we are getting away from our subject. The fact remains that the Enya 45-TV obviously has considerable potential in the power department and in this respect can hold its own with any R/C motor of similar displacement or weight.

Design wise, the Enya 45 is closely allied to the Enya 35-II. This latter is not to be confused with the latest 35-III model which shares certain basic



Enya 45-TV parts. Carburetor features variable main jet, plus separated needle valve for idle mixture. Model now distributed with finned head.

parts with the 29-IV dealt with in the July 1964 issue. The 35-II was a heavier and bulkier engine than the 35-III and its overall dimensions, while more compact than those of some .45 engines, were proportioned, originally, to serve a .45 displacement as well as a heavy-duty 35. The design, as a whole, is big enough internally to allow unrestricted breathing and is sufficiently solid and rigid to accept the added stress of a large cylinder. The crankshaft, for example, has a full 1/2 in. dia. journal, a 9 mm. bore gas passage and, to balance the increased piston weight in the 45, is extra heavily counter balanced. The cylinder block and crankcase casting, which is produced from dies common to the 35-II and 45, absorbs the extra diameter of the 45 liner without undue reduction in liner wall thickness or bypass cross-section.

That the basic design serves the .45 displacement just as well as the .35 is, of course, clearly indicated by the high performance of the 45-TV already mentioned. This, on the basis of bhp/cu. in. displacement, was almost exactly identical with that of a 35II-TV tested a couple of years ago under similar conditions.

One of the most interesting features of the Enya 45-TV is its large and complex carburetor which, incidentally, accounts for nearly one-fifth of the engine's total weight. The body of the carburetor is of machined aluminum and plugs into the intake, held by two screws. The throttle valve

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consists of a 12 mm. dia. solid brass barrel having a 5.4 mm. choke. Rotational movement of the barrel between fully open and idle positions is controlled, in the barrel in the carburetor body. A clanked arm, for connecting to the throttle servo, is attached to the left hand end of the barrel. Thus far, the Enya 45 carburetor is little different from other R/C carburetors. However, instead of having the fuel jet assembly entering the choke through the opposite side of the barrel, the barrel has a blind end and two separate needle valves are fitted.

The main needle-valve assembly is screwed into the rear of the carburetor body, offset to the right-hand side. Fuel supplied by this needle-valve is then metered, according to throttle opening, by a tapered channel cut in the surface of the throttle barrel which, in turn, feeds a jet hole communicating with the choke. As the throttle is closed, the amount of fuel admitted to the choke is progressively reduced as the cross-section of the exposed portion of the tapered channel is reduced, until, in the idling position, the main jet is cut off completely and fuel is admitted only via the separate idling jet. This consists of a second needle-valve assembly installed in the side of the carburetor below the throttle barrel which allows the idling mixture to be adjusted quite independently of the main needle-valve. The low speed needle-valve is supplied with fuel via a tee fitting on the main fuel line connecting so that only a single hose to the tank is called for.

The rest of the engine is of conventional design, with the possible exception of the crankcase and front housing, which, instead of being an integral unit, as on most current front rotary glow engines, are separate components. This type of layout is, of course, still used by one or two other makes, including some noted racing type engines. The only objection to it is that it precludes the possibility of extending the beam mounting lugs forward, for additional support and added strength to the front end, and is apt to be a source of weakness in a crash. A breakaway plate type engine mount is obviously a wise precaution here.

Material specifications include a hardened

crankshaft, with crescent counter-weight, cutaway web flanks and hollow 1/4 in. dia. crankpin, and running in a plain cast-in bronze bearing. The lightweight piston is of inoculated cast-iron, is relieved on the top edge and has a thin, straight fence type baffle. It couples to a die cast aluminum con rod, bronze bushed at the lower end via a case-hardened steel tubular wristpin having brass end pads. The piston and cylinder liner are hand lapped after being ground and honed.

Port durations are quite generous for an R/C engine and, as measured on our test sample, were as follows. Rotary valve: 190 degrees, opening at 42 deg. ABDC and closing at 52 deg. ATDC; exhaust 132 deg.: bypass 118 deg. The Enya 45-TV is also available as a standard engine without the throttle type carburetor. The 45-TV can, in fact, be converted to the normal 45 merely by removing the carburetor and installing the standard Enya spray bar assembly and appropriate venturi insert.

As delivered, our 45-TV obviously required little further break-in, but was, nevertheless, given a total of about one hour before tests were undertaken. Fuel was our standard 5 percent nitro test mixture. Immediately apparent was the extremely high torque achieved by the Enya which reached 75 oz. in. at between six and seven thousand rpm.

This is equivalent to a brake mean effective pressure of over 65 psi, just about as good as anything we have recorded to date with any R/C engine. This high torque was primarily responsible for the engine's excellent peak power output and especially for its extremely flat power curve, factors that were best seen in the Enya's unusually good performance on large props e.g. 9.500 rpm on a 12 x 6 Power Prop. 8.600 on a 13 x 5½ Top Flite.

The cold conditions prevailing at the time of testing were not conducive to the achievement of ideal idling performance but previous experience in both hot and cold conditions with the Enya 35II-TV (which has precisely the same carburetor except for a smaller bore choke) had

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shown that reliable throttling down to 2.200 - 2.500 could be obtained under reasonable conditions. The Enya R/C engines do not have coupled exhaust baffles and, under normal operating conditions, they seem to perform quite well enough without them, albeit with a very much noisier idle. Adjusting the carburetor, despite its complexity, is not difficult. However, the engine responds only very slowly, when idling, to mixture strength changes and it is necessary to remember this, when setting the low speed needle, so as to allow enough time for the engine to respond to a new adjustment before another is made. Normally, the low speed needle needs to be opened only about half a turn.

Starting qualities of the 45-TV were good at all times.

Summary of Data

Type: Loop-scavenged two-stroke cycle with shaft rotary-valve induction. Throttle type carburetor with compensated mixture control.

Weight: 10 oz.

Displacement: 7.354 c.c. 0.4478 cu. in.

Bore: 22.2 mm. (0.874 in.)

Stroke: 19.0 mm. (0.748 in.)

Stroke/Bore Ratio: 0.856 : 1

Specific Output (as tested): 1.47 bhp/cu. in.

Power/Weight Ratio (as tested): 1.06 bhp/lb.

Price in U.S.A.: \$25.95

U.S. & Canadian Distributor: MRC- Enya Company Inc., 5300 21st Avenue, Brooklyn 4, New York.



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