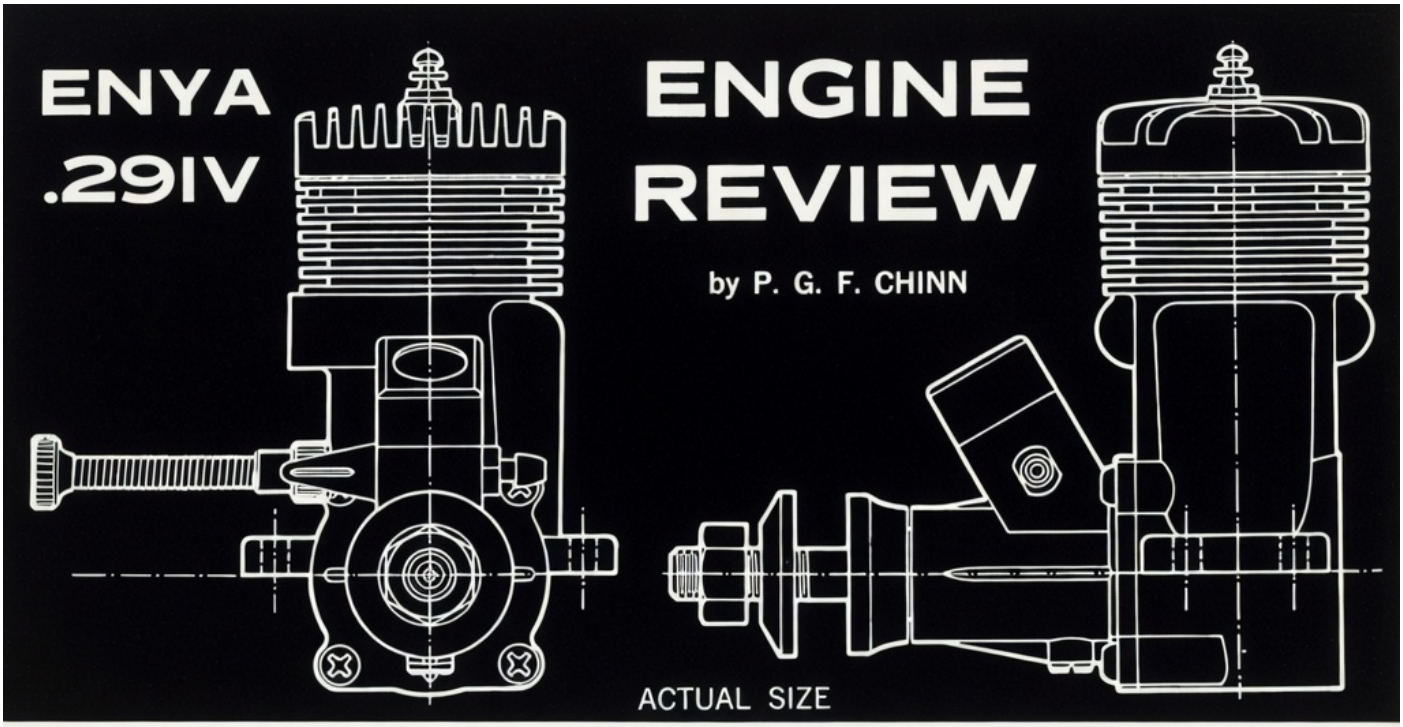
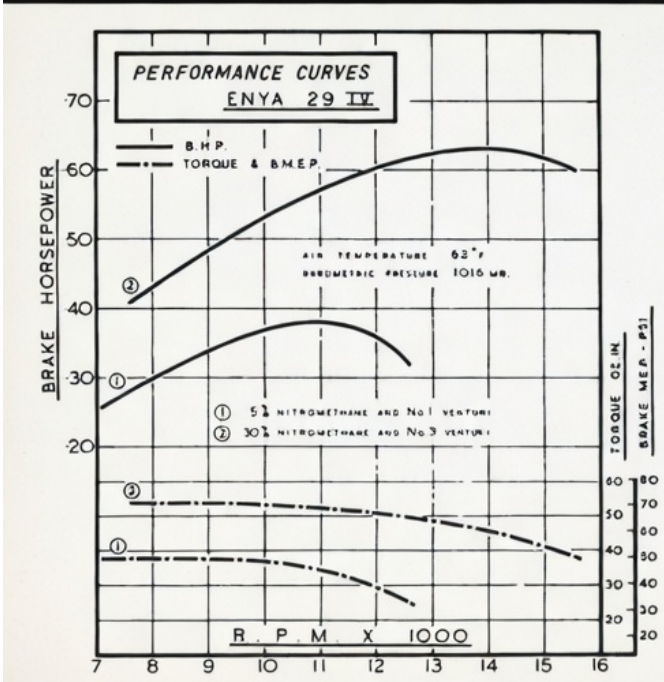
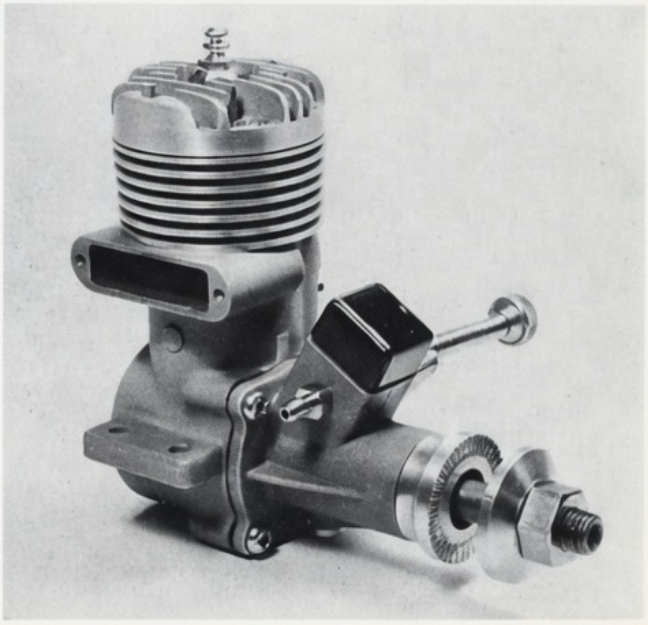
Enya 29-IV







MRC-Enya Company's new .29 series IV engine is a rugged motor capable of high performance under varying conditions. Note plastic intake venture.

BIG FIRST IN RACING ENGINES. VARY COM-PRESSION AND INTAKE APERTURE AT CRANKSHAFT TO SUIT SPEED REQUIRED.

The Enya engines now being imported by the MRC- Enya Company Inc., of Brooklyn, N. Y., are of Japanese manufacture. They are, in fact, one of two leading Japanese makes which, for many years, have enjoyed a favorable reception from model builders in many western countries.

Two designs, in particular, were responsible for Enya engines first claiming the attention of serious model builders outside Japan. Both were introduced in 1956. One was the Enya 15-D diesel which, breaking completely with

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orthodox European contest diesel design, came nearer than any other to equalling the performance of the hitherto unchallenged Oliver Tiger. The other was the 29 Series III, a shaft-valve, bushed-bearing 29 glow that proved ca-pable of outpacing almost every other 29 of the period.

Our test subject this month is the successor to the 29-III, the Enya 29-IV or Model 5224. This was put into production late last year and is the latest of the Enya 29 line that started more than a decade earlier. These engines are manufactured in Tokyo by the Enya Metal Products Co. Ltd., under the direction of three brothers, Jiro Enya, Saburo Enya and Yoshiro Enya.

In general, the design of the 29-IV follows the basic configuration and structural layout that has been common to medium and large size Enya motors for many years, namely: shaft-valve induction, loop-scavenged cylinder, separate crankcase front-end with bushed main bearing, cylinder block integral with crankcase and a cast-iron piston running in a drop-in steel sleeve. Apart from this, some rationalization is evident in that a single basic design now' serves two displacements (29-IV and 35-III)—a normal procedure where a manufacturer makes both .29 and .35 cu. in. engines, but contrasting with Enya's earlier policy of building two entirely separate designs, each requiring different castings, etc.

One of the features which contributed to the high performance of the 29-III was its intake system. Unusual at the time, this featured a rectangular intake aperture as well as a rectangular shaft port. The effect of such an arrangement is to open and close the valve more abruptly and the theory behind it, analogous to the hot-rodder's quick-lift camshaft, is that, as the intake valve remains at an effective opening for a longer duration, relative to the overall valve timing, a greater volume of gas can be inducted.

This feature is continued in the 29-IV, although an entirely new and bigger crank-shaft and front housing are used. The shaft journal diameter has been increased from 11.5 mm, or 0.452 in. to exactly ½ in. and this has allowed the gas passage through the shaft to be opened up from 8.4 mm. to 9.2 mm.

Paris of the Enya 29 IV. Included with each engine ere two cylinder heads, three venturis and a pressure fitting, thereby giving infinite variety of performance characteristics. Note size of intake venturi in crankshaft.

The valve port in the shaft, formerly 12 mm. long, has been lengthened to 15 mm. and the carburetor and intake aperture enlarged accordingly.
Timing, however, has been cut back slightly to 45 deg. ABDC 55 deg. ATDC, for a total intake period of 190 degrees of shaft rotation, 10 deg. less than on the 29-III.

The crankshaft itself is hardened and is of robust proportions with a heavy crescent counterbalance, a 6.3 mm. dia. crankpin and a 7 mm. dia. threaded length for prop attachment. The shaft runs in a bronze bushing in the pressure diecast front housing.
The housing attaches to the main casting comprising the crankcase and cylinder block.

The crankcase cylinder-block is a neatly produced pressure-casting, accurately machined to accept the drop-in sleeve which is located by a flange at the top. A diecast and machined cylinder head makes a metal-lo-metal joint with the rim of the sleeve and six short Phillip screws secure the head to the main casting. The head has a brass thread insert for the glow-plug which is located centrally.

The piston is of orthodox form with a Hat crown and straight fence type baffle. A 5 mm. dia. fully-floating tubular wristpin, with brass end pads, couples the

piston to a diecast aluminum conrod having a bronze bushed big-end. The piston uncovers the exhaust port 10 degrees in advance of opening the bypass, the measured port durations on our example being 132 degrees (exhaust) and 112 degrees (bypass).

The Enya 29-IV is supplied without a glow-plug but this is more than compensated by the extras, included in the purchase price, that are enclosed with the engine in its neat foam-packed transparent box special packaging, incidentally, that MRC have devised. These comprise a spare, high-compression cylinder-head, a pressure nipple and three sizes of venturi. These extra parts enable the engine to be adapted to a wide variety of different duties ranging from sport flying and C/L stunt to team-racing and proto. They also enable the engine to be set up for different combinations of fuel, glow-plug and climate. For example, in countries where nitromethane fuels arc not readily obtainable and where wry high air temperatures are uncommon, the use of the high-compression (9.0 : I) head may be desirable as a means of maintaining high performance. F or the most part the standard compression (7.5 : I) head is adequate: it is easier on glow-plugs and on the engine generally and where extra power is needed, the use of the large venturi and or a high nitro fuel will often suffice. If preferred, the venturi can be removed entirely, in which case forced fuel feed is essential and the crank-case pressurized fuel system can be brought into use. The system provided for on the 29-IV is of the high-pressure type. In this, the rotary-valve is utilized to uncover the pressure outlet only when crankcase pressure is positive i.e. when the piston is on the downward stroke. Other systems, in which crankcase pressure is tapped via a fitting in the center of the back-plate, or in place of one of the back-plate screws, are of the low-pressure type and use the slight positive differential between crankcase compression and depression. On the 29-IV. the pressure nipple screws into a tapped hole below the main beating. Normally this hole is scaled by a brass plug.

As we have suggested, an infinite variety of combinations can be tried with the 29-IV as a means of securing the type of performance that the purchaser needs. For this report, therefore, we decided to run two full series of tests: one showing the engine in a maximum state of "de-tune" i.e. with the smallest venturi and running on a mild fuel of only 5 percent nitromethane content, and the other using the largest venturi and running on 30 percent nitro fuel.

As the performance graph shows, there is a vast difference in the torque (and. in consequence, horsepower > developed by the engine under these different conditions. In the first test, maximum torque was 38 oz. in., equivalent to a brake mean effective pressure of 50 psi. In the second test, these figures jumped to 54 oz. in. and over 70 psi. The increase in peak horsepower was even more dramatic, due to the much higher revolutions reached with the less restricted venturi. Here bhp jumped from 0.38 at 1 1.000 rpm, to 0.63 at slightly over 14.000 rpm.

To illustrate how the Enya responds (a) to the larger venturi and (b) to high nitro fuel, we made some additional checks. On an 11x5 prop, holding rpm to 9200 on the No. 1 venturi ami 5 percent fuel, the Enya went up to 9800 rpm with the No. 3 venturi and then to 10.900 with No. 3 venturi plus 30 percent fuel. In other words, at these fairly moderate speeds the bigger venturi increased rpm by only 6.5 percent but the high nitro fuel increased rpm a further 11.2 percent. On a 9x4 prop, however, speeds rose from 12.300 to 13.600 and 14.700 or 10.6 percent and 8.1 percent improvements. This, of course, is what one would expect, the large venturi contributing a steadily increasing share of the performance increment as load is reduced and rpm are raised.

Between these two performance ratings, a variety of intermediate levels is obtainable using the No. 2 venturi and or intermediate fuel grades. Nor does one have to stop here. An output of .63 blip for a .29 engine on 30 percent nitro fuel is very good, but, by bringing the high compression head into use, plus a wide open intake, pressure feed and. possibly, a still more powerful fuel, it is not unreasonable to expect that maximum output could be pushed up to .70 bhp; perhaps approaching .80 bhp under ideal conditions.

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Handling qualities of the Enya were good. Cold starting required a prime through the exhaust; hot starting merely a single preliminary choked flip of the prop. The needle-valve was fairly sensitive: even one notch (about 9 degrees) off the critical setting when using the small venturi being enough to drop rpm by 2 or 3 hundred, but it was, nevertheless, easy and comfortable to adjust and held its adjustment firmly when set.

We also tried the 29-IV fitted with the Enya M-200 Muffler. This is of pressure cast aluminum construction and adds about 216-oz to the weight of the engine, but is very effective in reducing the distance to which the exhaust note will penetrate and does not seriously affect performance. On a 10x4 Tornado Nylon prop, the engine lost only 250-300 rpm with the muffler fitted.

Incidentally, we used K&B KB-IL glow-plugs for our tests of the 29-IV. Preliminary checks with these against Enya No. 3. No. 4 and No. 5 platinum-rhodium filament glow-plugs, indicated that the K&B had equal or superior performance and was therefore judged suitable for this engine.

Summary of Data

Type: Loop-scavenged two-cycle with shaft rotary-valve induction.
Weight: 8.0 oz.
Displacement: .2995 cu. in. or 4.908 c.c. Bore: 0.736 in. Stroke: 0.704 in.
Stroke/Bore Ratio: 0.957 : 1

Specific Output (as tested):
1.27 bhp/cu. in. on 5 percent nitromethane fuel and small venturi.
2.10 bhp/cu. in. on 30 percent nitromethane fuel and large venturi.

Power Weight Ratio (as tested):
0.76 bhp/lb on 5 percent nitromethane fuel and small venturi.
1.26 bhp/lb on 30 percent nitromethane fuel and large venturi.

Price in USA: $15.95.
U. S. and Canadian Distributor: MRC- Enya Company Inc., 5300 21st Avenue, Brooklyn, New York 11204.

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