FOX .07
Engine Review

by P.G.F. CHINN

JUST THE ENGINE FOR SHIP THAT NEEDS "JUST A LITTLE BIT MORE". NO HEAVIER THAN AVERAGE 1/2A OFF! RS MORE USEFUL POWER ON LARGER PROP.

About 95 percent of new model engines that are put into production are built to established popular displacement sizes AMA classes or subgroupings such as .049, .09, .15, .19, .29 or .35 cu. in. In between sizes are rare.

Fox's new .07 is just such an exception, however placement half way in clip placement between Half A and .09. It has been designed primarily as a small stunt motor and also has obvious possibilities as a motor for die beginner and sport filer It h little or no heavier than the average Half A, delivers useful power on above 1/2A size props is easy to handle and is modestly priced. It is for beam mounting but can be adapted to radial mounting.

The engine is assembled around a neat, lightweight pressure casting ern bodying crankcase main bearing and lower cylinder housing, also carburetor intake, beam mount lugs and back-plate attachment. The long carburetor intake is braced to the lower cylinder section with a substantial web and contributes to the strength of the crankshaft housing. The casting is very cleanly produced and calls for a minimum of machining. This is limited to boring and facing the carburetor Intake, boring the main bearing and spray-bar holes and cutting the threads for cylinder attachment.

The crankshaft is hardened and pound and is of the disk web type with a substantial crescent counterbalance. The shaft journal is ¼ in. dia. x 3/4 in. long, has a 5/32 in. bore gas passage and a 5/32 in dia. circular valve port. The shaft terminates 3/16 in. beyond the front of the bearing with three short lands which engage suitable keyways in the machined alloy prop driver to

Photo above is of Fox's new "Compact" an 07. Weight as low as many of present 1/2A's

provide a firm, non-slip drive. The shaft is drilled and tapped for a 4-10 Phillips head prop retaining screw, which is backed up by a special steel washer. This washer ¾ in. thick, is 5/16 In. over its largest diameter but is then stepped down each side to form short bosses, 3/16 In. and a ¼ in. dia. respectively. The purpose of this it not stated out we assume that it is to assist in centering props that arc bored out to these larger sizes rather than to the nominal 7/64 in. prop screw diameter. We certainly found the washer useful in this respect.

The cylinder is machined in one piece from steel probably a leaded steel and is unhardenet.
It has a tingle internal bypass flute and two diametrically opposed exhaust ports, each of which cover a 90 degree segment of the bore surface. Measured exhaust timing of our test motor was 76 deg. BBDC to 76 deg. ABDC. The bypass period was a generous 142 degrees, indicating that the bypass opens only 5 deg. after the exhaust opens. Induction timing is fairly late, the rotary valve opening at approximately 65 deg. ABDC and closing 55 deg. ATDC for a total intake period of 170 degrees.

The cylinder is flanged below the exhaust ports and this flange seats atop the casting, with a gasket between the Joint faces, when the cylinder is screwed home. Above the ports, the cylinder has eight cooling fins, plus one fin on the otherwise plain aluminum head. The head screws

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Picture below shows the many components necessary for engines of any size or displacement.

into the top of the cylinder and an aluminum gasket is used. The head has a shallow coned underside and a built-in 1.5 volt glow filament.The lapped piston is hardened and has a flat head. A ball and socket piston/connecting-rod joint is used, the socket being suspended from the underside of the piston head. The conrod is machined from and couples to a 7/64 in. dia. crankpin. The piston/cylinder fit on our test motor was very good, resulting in excellent compression seal; an aid to easy starting.

The crankcase back-plate is an aluminum alloy pressure die casting and is attached to the case via a flange and three round head 2-48 screws. By using longer screws or studs and nuts, the engine could be converted to firm firewall mounting, where such an installation might be called for.

A brass spray-bar is used, pressed-in. It is installed at an angle through the carburetor to incline the needle-valve rearward, away from the prop disk, and cannot, therefore, be reversed for right handed operating. Tim valve needle is machines) in one piece from steel and has a very fine thread (64 t.p.i.) to reduce sensitivity. A long coil spring is used to snub needle movement.

Fuel recommended for the Fox .07 is Fox Missile Mist, except in very hot weather, when the milder Fox Super fuel may give better results.

Starting the .07 is quite straightforward and we confirmed that the manufacturer's suggested procedure gave positive results. This calls for priming through the exhaust port and cranking the motor for a couple of times before energizing the plug. Incidentally, the instruction leaflet issued with the motor is both comprehensible and comprehensive. The buyer is told everything be needs to know about his motor and its operation and care, in an easily understood manner.

Little or no break-in teemed necessary with our test sample. As a matter of course, our motor was given a few minutes rich mixture running on a 7 x 4 prop, but quickly showed itself ready to hold a constant rpm reading, through a 1 oz. tank of fuel, when leaned out to an even 2 cyc!e. About 45 minutes intermittent running was, however, given before we began tests.

The .07 proved to have an unusually even power output over a wide range of speeds. This was due to the fairly moderate speed at which the best torque figure was recorded (thus giving good lugging power on 8 inch props) which was, nevertheless, combined with an ability to rev, on small props, like a good Halt A. The torque curve declined in practically a straight line as rpm were increased, as a result of which, loading the engine with a prop (hat would drop the revs 25 percent below the peaking speed (i.e. to 12.000 rpm) resulted in a power loss of only 8 percent while, at half the peak speed, output was still over 70 percent.

Actual course of the power curve was as follows:

At	
8.000 rpm	.0630 bhp
9.000	.0680
10.000	.0727
11.000	.0768
12.000	.0803
13.000	.0832
14.000	.0852
15.000	.0867
16.000	.0872
17.000	.0871
18.000	.0860

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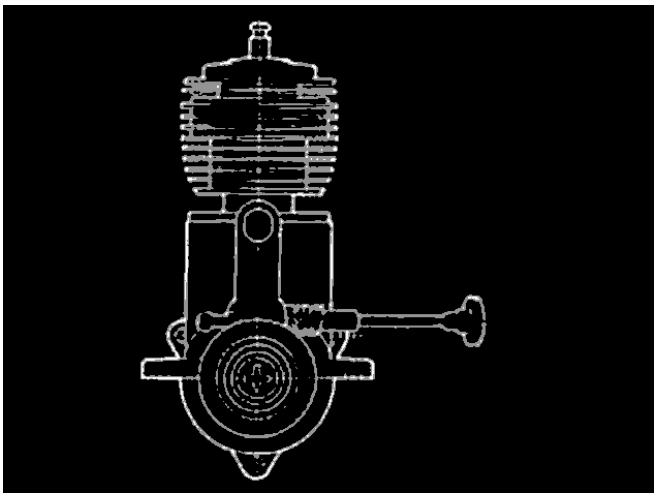
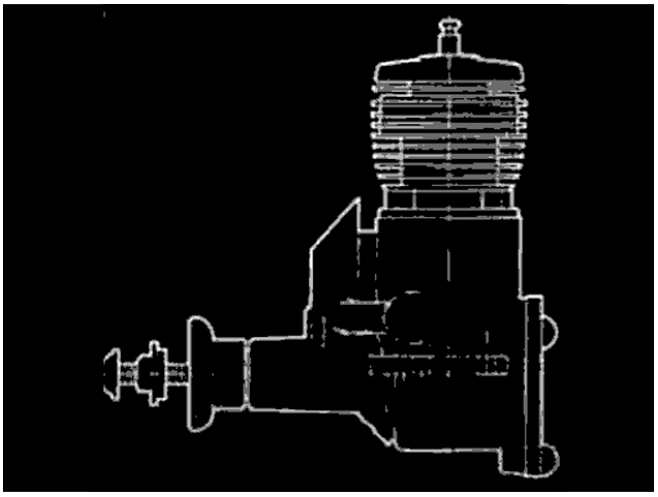
Running qualities were good at all speeds and free from excessive vibration. The engine was fairly sensitive to mixture strength variation but adjustment was not unduly critical, thanks to the fine thread on the needle valve.

Summary of Data

Type: 2 port two cycle with opposed exhaust ports and single bypass port. Shaft rotary valve induction.
Weight: 1.5 oz.
Displacement: .0698 cu. in.
Bore: 0.460 in.
Stroke: 0.420 in.
Stroke/Bore Ratio: 0.913:1
Specific Output (us tested): 1.25 bhp/cu. in.
Power Weight Ratio (as tested): 0.93 bhp/lb.
Manufacturers: Fox Manufacturing Co. Inc.. 5305 Towson Ave., Fort Smith, Ark.
Price: $5.95





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