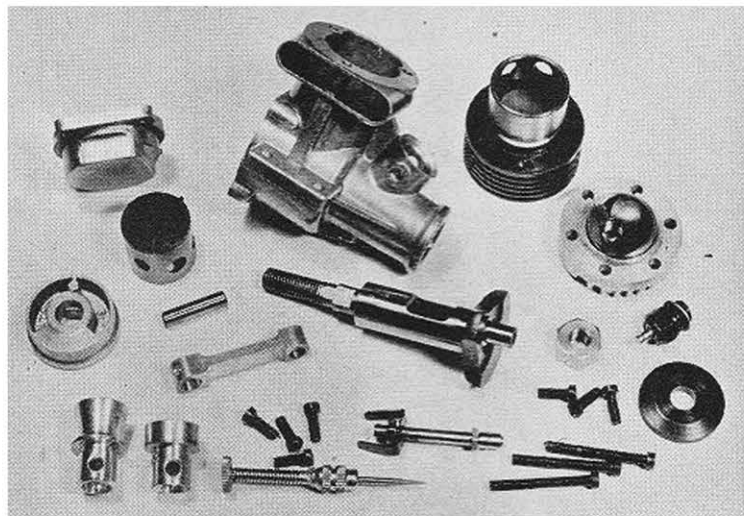
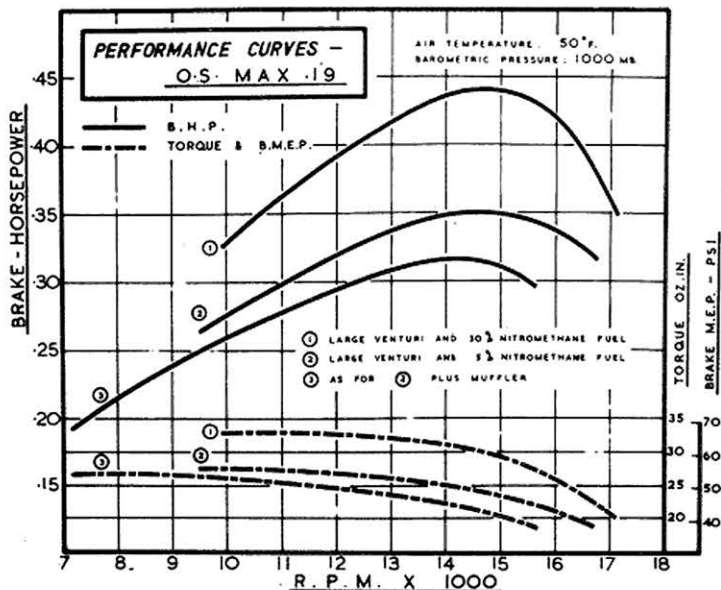
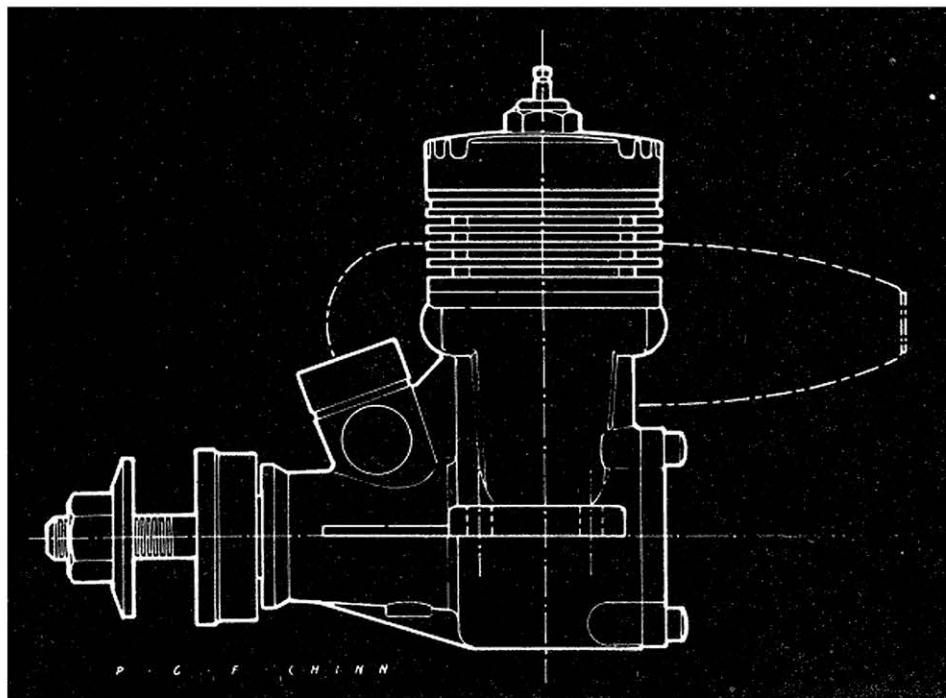


Max .19 with Jetstream muffler fitted. Extension adaptor available to clear side of cowl.



World Engines' new O.S. .19 is powerful and well-made. Includes hardened shaft, machined rod, two interchangeable venturis and counter balanced drive shaft.



ENGINE REVIEW

O.S. MAX .19

By P. G. F. CHINN

DUAL REVIEW—FINE ENGINE AND JETSTREAM MUFFLER—COMBINATION IS A WINNER FOR POWER AND PLEASING CRANKY NEIGHBORS.

► At the last meeting in Paris of the C.I.A.M., the model commission of the F.A.I., it was recommended that the national clubs of member nations should give attention to the question of engine noise and to the desirability of encouraging the development of mufflers.

This re-

commendation, in fact, only served to give official recognition to a situation that has been obvious for some time. In urban areas everywhere, modelers have run into trouble with neighbors and local authorities through causing annoyance with noisy engines. In many cases it has led to the banning of model airplane flying in parks and other public open spaces. Model builders are told: "go somewhere else and fly"—reasonable enough when it concerns those small-town dwellers for whom a ten minute drive is sufficient to bring them out into open country, but not so good for the vast numbers of modelers who live in our sprawling modern cities covering areas of maybe a couple of hundred square miles.

Quite obviously, the general acceptance of muffler equipped engines, for sport flying at least, is long overdue. This goes for everyone concerned. It is not something that can be brought about merely by FAI "recommendation". Exhaust mufflers for model engines are not entirely new: they have appeared on the market, from time to time for the past twenty years. Some of the ready-builts have them now. But the average model builder scarcely gives a second thought to the idea of using a muffler. Why? The main reason, probably, is the non-availability (with a few exceptions) of easy-to-fit, commercially-made mufflers specifically designed for each type of engine. What is required are mufflers which can be fitted easily in a few moments, with just a screwdriver. Modelers should not be expected to have to resort to hacksaws, files, shears or baling wire to fit a muffler to their favorite motor.

A move in the right direction comes from the Japanese Ogawa Model Manufacturing Company, with their new O.S. Jetstream mufflers. These are made in two sizes, Type "S" to suit the current O.S. Max-III .15 and Max .19 motors and a larger size, Type "L" for the Max-III .29, Max-III .35 and Max .49 engines. These mufflers attach directly to the exhaust stack by means of two screws into the tapped holes provided inside the stack. Assembly takes only a matter of a minute or two and the muffler can, just as easily be removed again. Diecast in the same material as the engine crankcase, the muffler looks as though it truly belongs to the engine and has not just been stuck on as an afterthought.

Our Review this month concerns the O.S. Max .19 engine and the opportunity has therefore been taken to test this engine with the appropriate Jetstream muffler fitted, as well as in standard "un-muffled" form.

The Jetstream muffler is of the "expansion chamber" type; that is to say, it consists of a container, of relatively large volume, into which exhaust gases are discharged, no actual sound-absorbing material (such as steel-wool packing) being used. Exhaust noise, it should be understood, is not just the result of a series of "bangs" produced by the ignition of the fuel charge within the engine, but is caused mainly by the sudden release of hot gases at many times atmospheric pressure, which thereby set up sound waves of audio frequency. Discharging the gases into an expansion chamber, prior to their release into the atmosphere, causes the sound waves to be broken down and the emitted notes to be thereby damped.

The effectiveness of a muffler of this type is dependent, among other things, on its volume and on the diameter of the outlet hole or tailpipe. The degree of noise reduction achieved is to some extent de-

pendent, therefore, on the amount of extra weight and bulk that can be carried and on the percentage power loss that can be tolerated. In the case of the Jetstream-S/Max. 19 combination, the manufacturer has erred on the conservative side. The muffler is small (only 2.85 in. long by 0.8 in. diameter) and light (about 3/5-th of an ounce) and results in only a small loss of performance, equal to a reduction of only 200-500 rpm on the most widely used prop sizes. Not surprisingly, therefore, we find that the actual muffling effect is fairly

With the muffler fitted, some change in general handling characteristics was noted—and rather more care was necessary to achieve quick starting. This was probably due, in part, to the fact that one cannot "see" or, more particularly, "hear," what is going on inside the cylinder when the muffler is fitted . . . it is surprising how this can throw you . . . without realizing it, we all tend to be guided by those sucking, popping and crackling sounds that come from inside a motor as we flip the prop. However, it is all just a matter of getting acquainted with a new set of conditions. One thing to watch: avoid getting the motor flooded—it is difficult to clear with the muffler on.

Dynamometer test figures for the Max .19 indicated a maximum output of 0.35 bhp at around 14,700 rpm without the muffler, reducing to 0.32 bhp at a little over 14,000 with the muffler fitted. Most of the power loss comes at the top end; below 10,000, the loss is negligible.

A further dynamometer test was also carried out on 30 percent nitro fuel (without muffler) to test the Max .19's response to hotter fuels. Steadier running and a big jump in torque over the usable speed range was immediately apparent and maximum power went up to 0.44 bhp at 15,000 rpm. At this stage, the smaller venturi was fitted and the engine rechecked on this, using the same 30 percent nitro fuel. A further improvement in steadiness of running was observed. Below 12,000 rpm little or no reduction in output could be detected but up to 500 rpm were lost at the top end. A quick check on power output indicated a peak of approximately 0.41 bhp at 14,000.

The Max .19 is a well-made motor, nicely finished. Its performance, as recorded in our tests, is noteworthy for the high bhp developed on racing type fuels. As a matter of interest, we have also tested the Max .19 in its R/C version. In this form, power was down to .275 bhp at 13,200 rpm on 5 percent nitro but with excellent handling and outstanding throttling characteristics.

Summary of Data

Type: Loop-scavenged, two-stroke cycle with shaft rotary valve induction.

Weight: 5.0 oz. (5.6 oz. with muffler).

Displacement: 0.1928 cu. in. or 3.159 c.c.

Bore: 0.6535 in. (16.6 mm) Stroke: 0.5748 in. (14.6 mm).

Stroke/Bore Ratio: 0.88 : 1

Compression Ratio: 9 : 1

Specific Output (as tested):

1.66 bhp/cu.in. on 5 percent nitromethane fuel, with muffler.

2.80 bhp/cu.in. on 30 percent nitromethane fuel, less muffler.

Power/Weight Ratio (as tested):

0.91 bhp/lb on 5 percent nitromethane fuel, with muffler.

1.41 bhp/lb on 30 percent nitromethane fuel, less muffler.

Price: \$10.98.

Manufacturer: Ogawa Model Manufacturing Co. Ltd., Hiranobaba, Higashisumiyoshi, Osaka, Japan.

U.S. Distributor: World Engines Inc., 8206, Blue Ash Road, Cincinnati 36, Ohio.