

BENELLI 125cc SPRITE

What happened to the little Sprite unquestionably made it a lot faster. But does it do its job better than it did before? Ah, there's the rub.

• Dear Editor,

I'm the owner of a 125cc Benelli Sprite. It goes pretty good and all, and it starts right up, but a friend of mine has got one just like it and I want mine to be a little faster than his is. Also, I don't have a lot of money to spend. Can you help me out?

Thanks, Wendell Fern

And the letters, like this one, keep pouring in, from young enthusiasts who own small-displacement motorcycles and bank accounts to match. Usually their motorcycles are pretty hot to start with—(nobody wants to warm over a mo-ped) and the kids figure there's bound to be more where *that* came from.

They're wrong a lot of the time. The quicker small displacement two-strokes (Zundapp 100, Kawasaki 175, etc.) produce between two and three horsepower per cubic inch and are barely lingering among the sane as they come from the factory, and all the amateur tuner has to do is look at one of them and it's either going to go slower, blow up, or not run at all. It doesn't seem to stop the fiddlers from fiddling, though. Hog out those transfer ports. Weld up an expansion chamber. Bolt on a giganto carburetor. Advance the timing. Increase compression. Watch it melt.

Whether you're dealing with a two-stroke engine or a four-stroke, the se-

cret, of course, is matched component combinations, and that's what Joe Rotigni of Cosmopolitan Motors had hooked up to our test Benelli 125cc Sprite. There's no question that his additions increased horsepower output; yet there remains a question as to whether his modifications improved the street-worthiness of a fairly innocuous, yet completely acceptable, road machine. All of Rotigni's modifications were related to engine breathing. (There are two ways to increase horsepower potential: increase displacement or increase engine speed. Breathing, of course, relates to the latter.) As it comes from Italy, the Benelli is equipped with a 22mm carb. It gets shucked in favor of one with a 25mm bore and a reworked intake manifold, and out with the stock carb goes the stock cam. The new cam has .045" more lift and a lot more duration (intake opens 52 degrees Before Top Dead Center, closes 85 degrees ABDC; exhaust opens 85 degrees BBDC, closes 54 ATDC. The stock cam: intake opens 30 degrees BTDC, closes 75 degrees ABCD; exhaust opens 75 degrees BBDC, closes 30 degrees ATDC), and the result is just what you'd expect: the little engine is cammy as hell, with very little power beneath about 6000 rpm, and a whole lot up top. The modified Benelli, though, will rev and rev

and rev, getting to 12,000 if you aren't careful. Power peak is at 10,500 rpm (stock power peak: 8800), and we were shifting at 10,600 during our acceleration runs. High-tension valve springs, naturally, were added, to complement the radical camshaft.

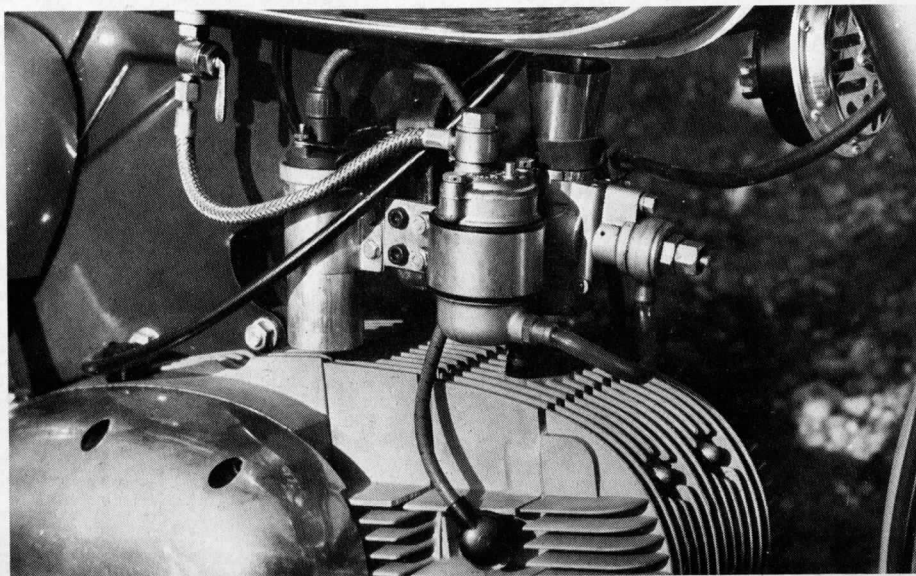
Several things came to light during our drag tests: first, the Benelli was pretty tricky to get off the line without bogging and without wheelstanding. We finally decided to drop the clutch at a full 10,500 rpm, which took care of the bogging all right; the wheelstanding we had to live with. Although the nearly horizontally-mounted engine helps to lower the center of gravity, the motorcycle still transfers most of its weight to the rear tire under acceleration and Zing! up she goes.

Nor did we feel that the Benelli was properly geared for its power/torque characteristics. It would pull quite strong through the first four gears, but it had quite a difficult time pulling fifth gear at all. As the 4-5 gearchange was made the engine would drop down the rpm scale rather drastically, and it felt as if it just plain wouldn't be able to get going fast enough to get back up on the power curve. Sort of like falling through the cellar trap door.

It's quarter-mile times were impressive, though. We made a total of four runs: the first netted 70.75 mph with an ET of 18.28, the last 71.13 mph with an ET of 18.22, which is moving along OK for just over 7½ cubic inches.

During the course of the test we rode the Benelli around town, but we didn't do too much of it—police react to that kind of noise, well, with enthusiasm. In order to fully take advantage of improved intake breathing the exhaust breathing has been "rearranged." In other words, there weren't all that many baffles left in the muffler.

Along with modifications to the camshaft, valve springs, carburetor, manifold and muffler, Rotigni had increased the Sprite's compression ratio to a full 10:1 by cutting .020" off the bottom of the cylinder. As we have said, there is no question that these modifications have quickened the heartbeat of the little Sprite. But the bike demonstrated a tendency to wobble



during our top-speed tests, which suggests perhaps that the frame or the suspension components might not be up to the job.

A word on the rest of the Sprite, that part which was not involved in the modification procedure. The brakes were superlative, fully capable of handling the increased speed. We especially liked the front brake, which felt quite a lot like the binders on several of the good Japanese bikes. The rear brake was nearly as good, only a little oversensitive. Clutch operation was smooth and positive, refusing to drag except when the engine was wrung up to 10,000 rpm standing still. The clutch consists of five drive plates and five driven plates. Interestingly, the springs are semi-permanently attached to the inside of the hub and hook over a retaining ring located external to the clutch pressure disc. So clutch installation/removal is a no-nut operation, since the springs themselves have done away with the need for studs.

The Benelli frame is combination pressed-steel and tubing, with most of the pressed steel nicely out of view beneath the fuel tank and behind the side covers. Pressed steel has a lot going for it: it's cheap to manufacture, it's plenty strong enough, and doesn't seem as susceptible to the transmission of engine vibration as does tubing. Of course, pressed steel isn't as light as tubing, and it isn't nearly as attractive—but on the Benelli nobody's going to see it anyway.

The frame, like that of any bike with a horizontally mounted engine, is a backbone type, the backbone running from the steering head back and down to the lower rear engine mounts. Struts emanating from the backbone serve as seat and shock absorber mounts; the only other appendage save the centerstand is the swing arm. We have noticed on most of the pressed-steel/tubular motorcycles an admirable lack of vibration either at the handlebars or the footpegs. The Benelli was no exception; smooth as glass.

We didn't like the seat much, though, which followed that great old Italian tradition of being narrow and hard, and we didn't like the location of the passenger grab-strap either, which couldn't be avoided—although it could be unhitched.

But back to that engine. Any time horsepower is increased 37½% (from 16 to 22) tractability suffers proportionately, which doesn't matter to a racing machine, but is vitally important to a street machine. Rotigni had done a super job on the Benelli Sprite—but ultimately we have to wonder if it was worth it. ●

