

# BIPOLAR BICILINDRICA

## Benelli Tornado 650 S Road Test

Story by Alan Cathcart  
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As a British fan of Italian bikes, I guess it was inevitable I'd end up owning a Tornado 650, that bipolar bicilindrica from Benelli which, 50 years ago, represented a Latin lesson to Britain's best in how to make a 650 twin fit for the second half of the 20th century.

So back in 1985 I bought one of the last such bikes ever made, a 1973 Tornado 650 S2, ironically enough from British Laverda guru Tim Parker, who was emigrating to the U.S. I guess he'd had the Benelli as a way of reminding himself how technically superior the bikes from Breganze were, at least versus Benelli's first postwar attempt at building anything bigger than 250cc —whereas in my case, after a decade of racing desmo Ducatis, I wanted something completely different for my occasional rides on public roads that hadn't been closed to traffic for us to race on.

In the 30 years of ownership before I finally sold it to a friend on moving house in 2015, the Tornado became part of the family, and while I can't say I clocked up a huge mileage on it, it was always there for a spirited Sunday morning ride around the Warwickshire lanes and Cotswold hills, or a summer evening blast out to a riverside pub. Living where I did in the heart of England inevitably meant I'd often meet up at such hostelrys with ex-employees of the local Norton, BSA and Triumph factories, who'd be fascinated to finally see a model they'd only ever read about in magazines, that so closely resembled the tens of thousands such bikes they'd helped manufacture down the years, yet emanated from a faraway factory on Italy's sunshine coast.

### Then and now

They say you don't know what you've got until you lose it, and it wasn't until last autumn when I spent an enjoyable 120-mile day riding round Eastern Pennsylvania with Retro Tours ([retrotours.com](http://retrotours.com)) owner Joel Samick on the 1972 Benelli 650 S in his rental fleet, that I realized how much I missed my occasional Tornado trips. Hopping aboard revealed a different riding position on this earlier U.S. model than my year-later S2, with a more upright, relatively close-coupled stance thanks to the taller, pulled-back handlebar compared to the sportier, flatter one on the Euro-spec S2. But there's the same idiotic place for the ignition key, in the





Benelli

650S

Benelli

Tidy bars and simple gauges (right). The Grimeca four-leading-shoe front brake (far right) was a great performer in its day, and it can still impress today if set up correctly.



## BENELLI TORNAO 650 S

**Engine:** 643cc air-cooled four-stroke pushrod OHV parallel-twin with cylinders inclined forward by 12 degrees, and 360-degree crank (no counterbalancer) in horizontally-split crankcase, 84mm x 58mm bore and stroke, 9:1 compression ratio, 50hp @ 7,400rpm at rear wheel, 39.75lb/ft @ 4,000rpm

**Top speed:** 111mph

**Carburetion:** 2 x 29mm Dell'Orto VHB

**Electrics:** 12v, Bosch coil ignition

**Transmission:** 5-speed with helical gear primary drive

**Frame/wheelbase:** Tubular steel duplex cradle frame, single top tube/ 54.3mm (1,380mm)

**Suspension:** 35mm Marzocchi telescopic fork front, dual Ceriani shocks rear

**Brakes:** 9in (230mm) Grimeca 4LS drum front, 7.9in (200mm) Grimeca SLS drum rear

**Tires:** 100/90 x 18in front, 4 x 18in rear, Avon RoadRiders

**Weight (dry):** 460lb (209kg)

**Seat height:** 31.9in (810 mm)

**Fuel capacity:** 3.3gal (12.5ltr)

**Price then/now:** \$1,779 (1973)/\$3,000-\$6,000



side panel behind your right leg, so you have to feel behind you to click it on, then thumb the massive button to get the Bosch starter whirring for the Benelli's short-stroke engine to burst into life through the musically resonant Lafranconi exhausts, then settle to a lilting 1,500rpm idle most unlike a two-up parallel-twin's usual dull thud, as copyrighted in Britain. Well, the factory it came from was just around the corner from Gioachino Rossini's house in Pesaro where he composed his opera *The Barber of Seville* ...

The earliest Tornados apparently vibrated much more than the S-versions, and I never found the S2 or indeed Joel's S model to tingle anything like as much as a Norton Atlas or even a Bonneville. That's presumably thanks to the copious rubber mounts — what the Italians call "silentbloc" — and the balance weights in the handlebar ends. Joel's Tornado shook a bit at rest, but once I'd selected bottom gear on the clean-shifting one-up race-pattern right-foot gearshift, and successfully grappled

with paying out the ultra-fast action clutch without stalling the engine as it suddenly released, it smoothed right out once under way. Only if you rev it right out to anywhere near the 7,200rpm redline does it start to vibrate unduly, but although the short-stroke engine asks you to do that, shifting up at 5,500 revs sees it running sweet and smooth as you hit a higher gear right in the fat part of the torque curve. Some 3,500rpm in top on the electronic Veglia tachometer is good for 60mph, and 80mph has the engine running at just 5,000rpm, and ready

to go the distance, wherever your fancy takes you. Tornados feel pretty long-legged, the only discomfort coming from the super-hard seat on Joel's bike, which he'd had Sargent's in Florida refoam and recover, evidently over-enthusiastically. My S2's racy-looking seat was much more welcoming.





There's a huge gap between the ultra-low bottom gear and second on the Tornado's five-speed gearbox, then the middle three ratios are close together before another big space to fifth/top, which feels like an overdrive. The four light flywheels have the short-stroke engine picking up revs super-responsively, though the biggest surprise is the huge amount of torque on tap from such a short-stroke engine format, and not only in tight, twisty stretches. The Tornado surges forward when you open the throttle, and top gear roll-on is excellent from anywhere above 3,000rpm, though you must keep it running above that under load, else it'll protest by detonating. Neutral is easy to find, by the way — so this is a congenial bike to ride in town, where the short 54.3-inch (1,380mm) wheelbase and what seems like a not excessive undisclosed fork rake, coupled with the adequately light clutch operation, make the Benelli quite rideable at low speeds in traffic. Despite the fairly hefty 460-pound (209kg) dry weight, it feels well balanced and quite low-slung on its 18-inch wheels,

thanks to the engine's compact build via its short-stroke format, which allowed chassis designer Luigi Benelli to deliver a low center of gravity versus other such 650/750 parallel-twins, and thus an ideal 32-inch seat height.

Such light urban steering might have a downside in high-speed instability, but that's absolutely not the case with the

Tornado — Luigi Benelli had never designed a frame for a bike this heavy or powerful before, but you'd ever guess that from the way it steers. Though the Marzocchi fork does a decent job of ironing out bumps, it gives very little feedback from the front tire, so there's a slightly dead feeling from the steering, though it's super-precise at high speeds, despite the short wheelbase. Stability is absolute — you really do get the best of both worlds from the Tornado, and I can quite see how Chas Mortimer found the Benelli so effective a ride on the Imola circuit's fast, sweeping turns, in its days before chicanes.

The only disappointment on my Retro Tours ride was the very stiff action of the 650 S



Retro Tours' Joel Samick with the Benelli Tornado 650 S.



Tornado's meaty-looking 9.4-inch (240mm) four-leading-shoe Grimeca front brake, which to make matters worse, didn't give so much stopping power even after I'd used the brake lever as a grip exerciser for my right hand. Sorry, Joel — this isn't right, because I know from my old S2 that this is one of the best front drum brakes ever fitted to a series production motorcycle. OK, it's heavier than a four-times-more-costly

9.8-inch (250mm) four-leading-shoe Fontana, the one plus ultra of drum brakes — but in effectiveness it should be right up there, so you must have the wrong brake linings fitted, and the linkage needs work. Benelli got a lot of stick back then for not fitting disc brakes once Tornado production finally commenced, invariably from people who'd never compared those frequently ineffective early discs with a big,



The 643cc air-cooled parallel twin makes 50 horsepower (left). The sweet sounding Lafranconi mufflers (right).



Alan Cathcart hustles the Tornado through a turn (opposite page). An Italian 1972 brochure for the Tornado (left).

properly set up drum brake, like this one could be. Still, there's good engine braking from that 360-degree parallel-twin motor, and without your having to fan the clutch lever to stop the rear wheel chattering under extreme reverse loads.

One of the things I enjoyed most in my 30 years of Tornado ownership was letting other people ride my torquey, eager-revving, stable-handling and above all oil-tight bike, then clocking their reaction on their return. With only 3,000 such

bikes made, and 50% of them sold new in Italy, Tornados are few and far between, so very much a sleeper of a bike that few people get to experience one.

Because it came late to market three years after it was launched, people have generally scorned the drum-braked OHV Benelli 650 — I mean, not even a 700! — as a neo-vintage model that missed the boat. Well, commercially speaking I guess it did — but that's not to say that the Tornado wasn't the right bike at the wrong time — for the bipolar Bicilindrica was better than comparable British OHV twins, but arrived in dealer showrooms too late.

It was an excellent motorcycle that did indeed show British manufacturers what they should have evolved their own parallel-twins into — but didn't. Pity on them. **MC**

