Ghost in the machine

Cyclist tests the technology that has forced the UCI to start checking beneath the skin of World Tour team bikes – concealed motors

Words PETER STUART Photography HENRY CARTER

On Stage 2 of this year’s Tour de France, Mark Cavendish finished a frustrating fourth in the sprint for the win. Insult was added to injury immediately afterwards when his bike was inspected to check whether he had a motor fitted. Many people thought it ridiculous and demeaning that such an investigation was required, but the potential for cheating with hidden motors is real. They do indeed exist, and we’ve got one.

There are various ways in which motors can be integrated into a bicycle. They can be placed in either the wheel hub or at the bottom bracket. Hub motors, though, are complex and bulky items – certainly not fitting within a svelte carbon hub. So, if one of the goals is concealment, that leaves us with a cylindrical motor inserted into the seat tube, and this technology has been around for some time.

The Vivax-Assist (below) is the descendant of the Gruber-Assist motor, an ingenious device launched in 2008 that turns a bevel gear fastened to the crank axle and gives a power boost of around 100 watts. The new Vivax-Assist is quieter, with a more compact and well-hidden battery. Whereas the main battery used to sit in a large seatbag, it is now located in the bottle, although the motor also has an internal battery that can power a bike for 60 minutes.

The power switch, previously secreted under the saddle, is now housed at the bar-end.

Some might think it odd that the UCI should be seriously concerned about this technology being used in the pro peloton, but in recent months the authorities have been taking it extremely seriously.

Motor doping

In the infamous CIRC report into doping in cycling published in March, a section on page 85 was dedicated to ‘technical cheating’. Part of that page read, ‘The Commission was told of varying efforts to cheat the technical rules, including using motors in frames. This particular issue was taken seriously, especially by top riders, and was not dismissed as being isolated.’

Consequently, the UCI has raised the fine for contravention of Article 1.3.010 (forbidding electrical assistance) to a new maximum fine of 1 million Swiss francs (£674,000) and began...
implementing regular checks on bikes in the pro peloton. Why all the suspicion, though?

One of the most famous rumours of motorised assistance surrounded Fabian Cancellara in 2010. Italian journalist Michele Bufalino posted a video alleging Cancellara’s hand movements and rapid accelerations were indicative of someone using a motor. Another Italian, ex-pro Davide Cassani, examined the Gruber-Assist system to demonstrate how it could be used by the pro peloton. Commissaires inspected Cancellara’s bike and no sign of a motor was found, nor was the specification of his bike suitable for the motors available. Cancellara replied to the accusations by stating they were ‘so stupid I am speechless’.

Yet the concern has been raised at the highest level of the sport. ‘The UCI takes extremely seriously the issue of technological fraud such as concealed electric motors in bikes,’ the UCI said in a statement. ‘We have been carrying out controls for many years and although those have never found any evidence of such fraud, we know we must be vigilant.’ The UCI wouldn’t comment on whether it had reason to believe motors were being used in races, with UCI head of communications Sébastien Gillot stating simply, ‘It is our utmost responsibility to be vigilant, knowing that the technology exists.’

Whether the threat is real or unrealistic in the pro ranks, the technology is now available to all racers, amateurs and elite riders alike, meaning there’s the possibility that criteriums and TT races could already be infiltrated with stealthy users of electric motors.

‘There’s no way of me knowing. It could have already happened,’ says Steve Punchard, UK distributor of Vivax-Assist, when asked if the UK race scene is vulnerable to such cheating. He claims almost all of his customers have bought the unit with pure intentions – to keep up with club mates or spouses. ‘Most of my customers are coming up to retiring age,’ he says. ‘This system is really for the cyclist that wants to keep up with the people they’re cycling with now.’ The manufacturer, Vivax Drive, confirms that riders aged over 60 are the main customers for its motors.

Punchard describes one customer who raised his suspicion, though. ‘They bought a Vivax-Assist from me with the battery, but they didn’t even ask me for fitting instructions, so they must have known what they were doing.’

With so much speculation and suspicion surrounding these motors – much of it based on very few facts – we decided to try one out.

Pressing the button

Vivax sent Cyclist a Vivax Passione CF for test – a bike frame that has been custom built to fit the motor, although the unit can be retrofitted into many frames. The first impression was that the bike was a little heavy at 9.9kg, but no more than one might expect from an entry-level frame. Otherwise, the frame is completely normal in appearance and feel.

The Vivax CF is made of carbon but has a reinforced seat tube to accommodate...
Taking the unit around one of our local 6km loops on a windy day, we were sure that on a lighter build we could have ridden every bit as fast without the motor. The rider controls the motor via the bar-end switch (shown in situ, right) — a discreet way of concealing the operation of the unit.