

Right: The Bugatti Tourbillon's central display dial. Just 250 £3.2-million cars will be made.

The intention underpinning Bugatti's new flagship hypercar, the Tourbillon, is (at least partly) a repudiation of the GPU-powered transformation and digitization of driving—and it's right there in the name, a tourbillon being the iconic "whirlwind" mechanism that's a hallmark of high-end watchmaking.

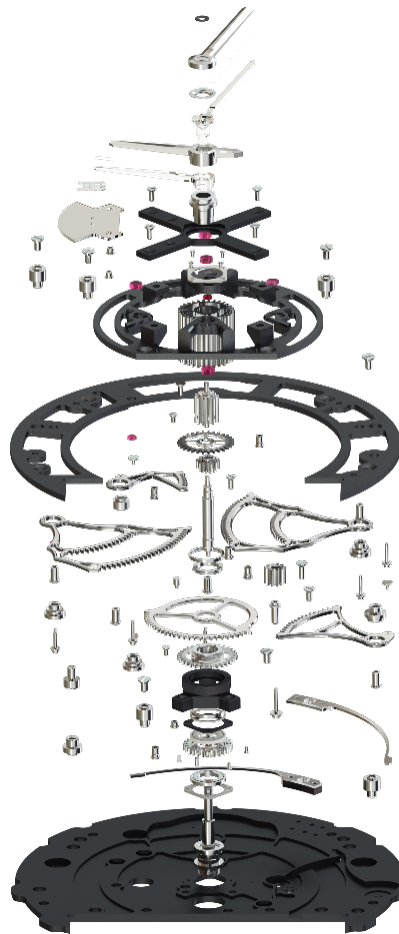
The message, of course, is to heroise horology's craftsmanship and tangible complexity versus the automotive sector's increasing adherence to soulless digitalization of the driver experience. But it's not just in the name: Bugatti directly tapped Swiss horological expertise for its unique instrument cluster of mechanically-driven dials and gauges, lodged within the contours of the steering wheel, whose workings and gears are exposed in much the style of a skeletonized watch.

The French brand's successor to the Chiron, the first model to be crafted under the leadership of automotive visionary Mate Rimac, is in fact its debut venture into electrification, too. But, while a hybrid it may be, its heart remains firmly in visceral combustion power, with a colossal, naturally aspirated V16 engine combining with electric motors to deliver an impressive 987 bhp—matching the output of the original Bugatti Veyron, without relying on turbochargers.

But it's on the inside that the message of analog over digital, mechanics over electronics, and craft over assembly really takes flight. Sure, there's a small screen that mechanically pops up from a recess when you need to activate CarPlay, but otherwise it's all knobs, buttons, and the retro dazzle of its mechanical dashboard.

Bugatti turned to Concepto, a Swiss movement-maker based in the watchmaking town of La Chaux-de-Fonds, to make this happen. While not a marque you'll find on any dials, Concepto is heavily embedded in Swiss haute horlogerie as a specialist manufactory for advanced complications and movements, which it supplies to top-tier brands.

Concepto's team of eight engineers and project managers spent four years developing the mechanics and design for the instrument cluster, at the heart of which are three main



dials: A central speedometer (up to 550 kph) and rev counter (up to 10,000); a dial to the right for electrical and thermal power; and gauges on the left for fuel, battery levels, and power distribution between the ICE and electric motors—eight needles in all. Each component is housed under sapphire glass—as found in luxury watches—within a single aluminum casing, with hand-finished, open-worked gears, large ruby bearings (another trope of watch movement design, ensuring low friction as gears turn), and backlit numbers in 3D to ensure visibility in all conditions. There's also a digital display beneath the speedometer to confirm the analog information from the dials in real-time.

The chief challenge in constructing a mechanical dashboard for a very high-speed car is in the need to withstand extreme vibrations and G-forces without compromising precision. There's more than 600 parts involved, predominantly made from intricately hand-finished titanium, chosen for its durability and lightness. A complex rack system powers the needle movements in sync with the engine's performance, via micro-motors that connect back to hidden electronic components—and this is highly responsive stuff, the rev needle pinging back and forth as the car shifts up and down the gears.

The pièce de résistance, though, may be the housing for the analog instrument panel. Apparently built into the center of the steering wheel, it remains fixed while the wheel revolves around it on a planetary gearbox, meaning a crystal-clear view of the crystal gauges as you bomb around corners.

While many watch brands have sought partnerships with luxury carmakers to amplify their prestige, and indeed used the design language of car engines to inspire movement design, Bugatti's Tourbillon is perhaps the first car to incorporate horology directly in elevating the driving experience. For Concepto, though, which has lodged several patents in the process of developing the Bugatti dash, it's just the start—the firm has cleared 500 square meters of space at its factory for automotive projects.

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Story by Jeremy White

How the art of analog is elevating Bugatti's supercar experience