CREATING THE SOUND OF A NEW ERA: THE BUGATTI TOURBILLON'S V16



Across more than two decades, the unmistakable sound of Bugatti's W16 has been an intrinsic part of the marque's identity. From the first Veyron and beyond to the Bolide, the Mistral[1] and one-off creations, the 16-cylinder powerplant created a soundtrack as distinctive as the cars themselves. So, when Bugatti embarked on a new era with the Tourbillon[2], creating the sound of its all-new naturally aspirated V16 was about defining a new voice for Bugatti. In the latest episode of the 'A New Era' docuseries, Bugatti engineers reveal how this sound was

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developed, refined and ultimately confirmed, marking the completion of one of the Tourbillon's defining elements.

The starting point for the Tourbillon's sound was therefore not a blank sheet of paper, but Bugatti's heritage. The engineers looked to the marque's past for inspiration, while embracing the fundamentally different character of a naturally aspirated V16 paired with an electric powertrain.

> "Bugatti, from a sound perspective, has never had a very clean-sounding engine. It has always been a little bit dirty and raw, so we decided to keep that as one of the key points of the sound."
>
> ROMAIN VOLATIER
> HEAD OF NVH & ACOUSTICS AT BUGATTI

Translating that philosophy to an entirely new powertrain required an enormous amount of development work. The team worked extensively to refine the acoustic character of the Tourbillon, running thousands of simulations across the exhaust and air-intake systems to find the right balance between performance, refinement and the distinctive rawness that is synonymous with a Bugatti engine.

But the sound had to achieve something more. It needed to create a genuine connection between driver and machine, while remaining appropriate for a car capable of being used every day.

> "As a test driver, it's very important that I can hear the engine and feel the engine speed increasing in connection with the throttle. It's very important for me to connect the sound of the engine with what I'm asking from it through the throttle."
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> PAOLO MAGRONE
> BUGATTI VEHICLE DEVELOPMENT DRIVER

This balance between emotion and refinement was one of the central challenges of the Tourbillon's acoustic development. The engineers had to ensure that the cabin remained comfortable during everyday driving, with the windows closed and the car operating in electric mode, while still allowing the full character of the V16 to come through when the driver wanted it. Lowering the windows offered another dimension, allowing the raw sounds of the intake and exhaust to enter the cabin and creating a far more immersive experience.

Crucially, everything the occupants hear had to be generated mechanically. To accommodate this, the acoustic package was carefully developed to allow the authentic sound of the

powertrain to penetrate the cabin, without relying on artificial engine sound through the speakers.

After years of development, the team reached a decisive moment: the Tourbillon's sound had to prove itself not only emotionally, but legally. The homologation testing would confirm that the carefully developed acoustic character could meet stringent noise-emission requirements without compromising the qualities that make the V16 so distinctive.

> "The car needs to be legal, but the real challenge is to make it legal and still sound good. I think we managed to do that because the car sounds fantastic and we passed all the homologation requirements with flying colors."
>
> ROMAIN VOLATIER
> HEAD OF NVH & ACOUSTICS AT BUGATTI

The maximum permitted noise level for the relevant test is 72 decibels, but achieving that figure is not the result of a single measurement. The homologation process combines several different measurements, including constant-speed and accelerated runs, to determine the final result.

Crucially, the microphones do not hear only the engine. The measured result is a combination of sounds generated by the entire vehicle, including the tires, body and aerodynamic elements. The Tourbillon's active aerodynamics make this particularly significant, with its rear wing generating substantial downforce while also contributing to the overall acoustic signature of the car

Even the environment becomes part of the test. Temperature and wind speed must remain within precise parameters, while gusts of wind can invalidate an otherwise successful run. This required the engineers to conduct numerous preliminary tests before the final homologation session.

With the homologation testing successfully completed, the major phase of the Tourbillon's acoustic development had reached its conclusion.

> "We're still working on small refinements and little details. The big chunk of the project is done and we are here just to close this chapter. It's been a successful and positive testing activity."
>
> PAOLO MAGRONE
> BUGATTI VEHICLE DEVELOPMENT DRIVER

Following three years of Tourbillon development, its acoustic character has reached its final form. The result is a sound designed to heighten the emotional connection between machine and driver.

Raw yet refined when demanded, and entirely mechanical in its origin, the Tourbillon's engine note carries the spirit of Bugatti's past into a new era. Reaching 9,000 rpm, the naturally aspirated V16 adds a further dimension to that connection, creating a sound that is unmistakably Tourbillon.

Watch the latest episode, 'Sound Of A New Era pt.1', on the official Bugatti YouTube channel.

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[1] Tourbillon: This model is currently not subject to directive 1999/94/EC, as type approval has not yet been granted.