

Press release

Maximum sensitivity during live production

High-precision sensors test the function and haptics of vehicle operating controls

Turn, press or tilt: vehicle interiors are turning into multifunctional control centers as onboard electronics become more commonplace – and that makes driving safer and more comfortable. But before operating controls for the handbrake, GPS, air conditioning and all the other systems can be integrated into the console, they must undergo precision testing by highly accurate sensors. Their main purpose is to test functionality, but they also check whether the controls give drivers the correct sensory response.

A trend that began decades ago with the first power-assisted window lifters has since become the established standard: onboard electrical systems have replaced mechanical equipment in cars to make driving safer as well as easier. Not so long ago, the driver had to jerk and tug on a clunky lever to apply the handbrake – but now, an elegant push of a button is all it takes. And thanks to multifunctional operating controls such as the rotary knob in the middle of the center console, drivers can intuitively access systems such as the GPS, music or air conditioning without having to take their eyes off the road.

These controls must undergo intensive testing to ensure that they work reliably. They are only installed in a vehicle once test systems have proven that they function correctly. At the heart of the test systems are piezoelectric sensors from Kistler, the measurement technology expert: they measure parameters such as the force exerted on a knob or the detent torque of a rotary adjuster. Thanks to their extremely high sensitivity, these sensors deliver reliable results even when very small physical parameters need to be measured. Any values found to be outside of the defined range for the parameters indicate that manufacturing defects or material faults may be present. Testing avoids the costly procedure of dismantling a switch after it has been installed and – in the worst-case scenario – an operating malfunction that could put life at risk.

Functionality and haptics: two key safety factors

Standard parameters apply not only to the safety-related and functional characteristics of a switch, but also to its haptic attributes. Vehicle drivers expect the operating controls to give them feedback that they can hear and feel – for example, to reassure them that their car is parked safely so it cannot roll away. And pressing a button can communicate even more information to the driver: buttons to operate power windows offer less resistance than controls for functions that are much more critical for safety, such as the handbrake. These different levels of resistance correspond to

the operator's natural sensory perception. But in purely technical terms, there is actually no need for such differences.

In these various ways, the tiny measurement sensors deliver multiple benefits for vehicle manufacturers: by ensuring that function tests are precise, they guarantee vehicle safety – and they also help vehicle users to experience the "feelgood factor" as they drive. In short: piezoelectric sensors from Kistler play an essential part in the continuing evolution of onboard automotive electronics.

Image material (please name the Kistler Group as picture source)

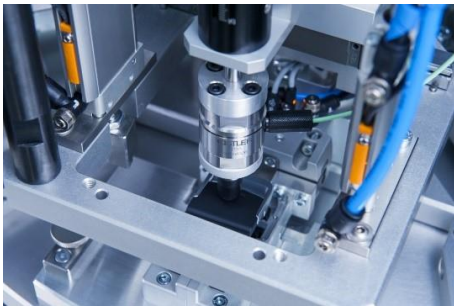


Multifunctional operating controls give drivers intuitive access to multiple systems such as the GPS, music or air conditioning. When plant manufacturers need highly sensitive testing of operating controls, sensors from Kistler – the measurement technology expert – are often the solution of choice.



Many car drivers appreciate navigation systems that are integrated into an onboard computer. These systems can be comfortably controlled with just one knob, known as the rotary adjuster. Various functions of other onboard systems such as the air conditioning or radio can also be controlled intuitively by turning, tilting or pressing the knob.

To ensure the quality of these operating controls, the automotive industry relies on automated end-of-line testing systems. These special-purpose machines are deployed at the end of the production line. They perform automatic haptic testing to guarantee the required quality of multifunctional switches, even when large quantities are being produced.



Testing the functionality and haptics of an electronic handbrake: faulty products can quickly lead to fatal consequences for drivers and other road users. But defective components can have just as devastating an impact on the suppliers themselves. Depending on its scale, a product recall can easily spell financial ruin for the company that has to launch it.

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About the Kistler Group

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