

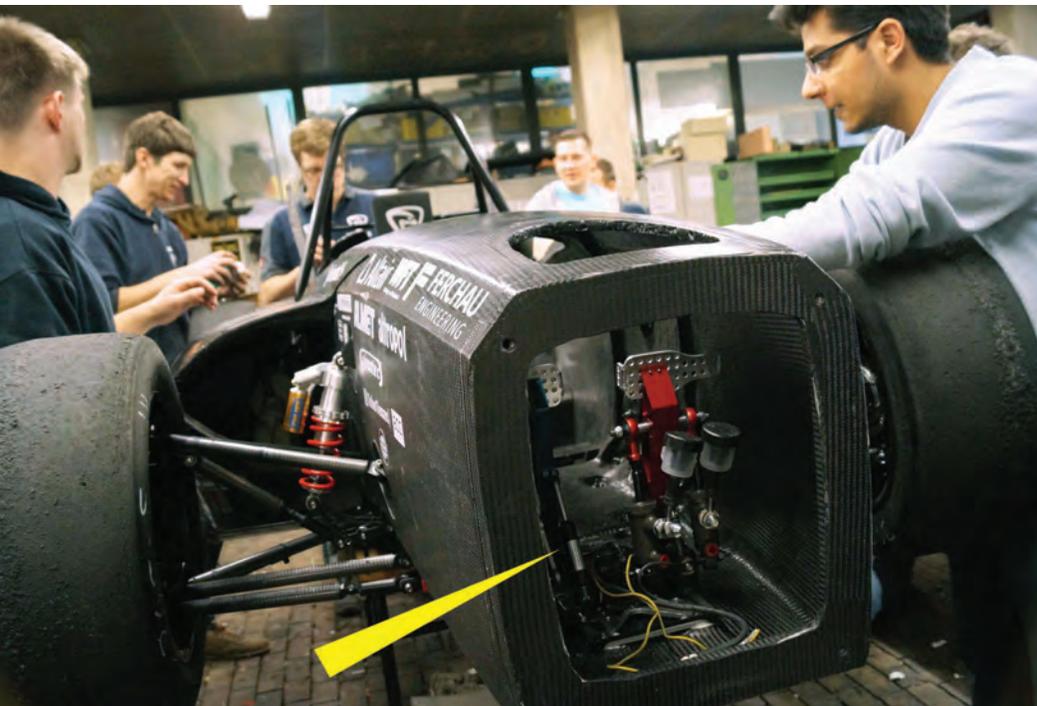
ACE Gas Springs Improve Racecar Acceleration

In the automotive industry, industrial gas springs are typically used as an opening aid for tailgates, trunk lids and hoods. But their recent use in a racecar shows they are capable of more.

The HAWKS racing team, made up of students from the Hamburg University of Applied Sciences, was tasked with designing and building a racecar for Formula Student, Europe's most established educational motorsport

competition. The purpose of the event is to design and build a single-seat racing car, which is then put to the test at the famous Silverstone Circuit. It is not only the fastest car that wins, however. Rather, judges take into account the entire design "package," including a team's cost and business plan.

The H0X, the HAWKS team's latest design, boasted a number of game-changing components—including ACE industrial gas springs, which were critical in the design of the car's acceleration pedal.



ACE is helping students on the HAWKS racing team at the Hamburg University of Applied Sciences outfit a racecar with industrial gas springs. These springs enable the driver to keep the required pedal position more constant despite vibrations from driving, while also stabilizing the driver's foot.

ACE Takes The Lead For

Students. Originally, the HAWKS team had used conventional helical springs to attach the acceleration pedal but were dissatisfied with way the spring failed to stabilize the pedal beneath the driver's foot. One of the students on the team had the idea of using gas springs. "I compared gas spring data sheets from different manufacturers," student Jörn Matthaei said, "and that's when we decided to take a closer look at the ones from ACE."

The Hamburg students consulted technical specialists from ACE Controls International in Langenfeld (Rhineland) on outfitting their

INDUSTRIAL GAS SPRINGS: A FAVORED COMPONENT IN TRANSPORTATION

Other sectors of the automotive industry have benefitted from using ACE industrial gas springs. They are used, for example, in vehicle finishing. Austrian company Königseder Tuning is converting the conventional doors on its Smart Roadster to gull-wing doors using ACE products.

The springs are also being deployed by special-purpose machine manufacturers for the undercarriages of lightweight planes and “paramotor trikes.” In this example, ACE recently developed a custom gas spring for plane manufacturer Martin Rüter. The application, a dual-seated flying trike, required a stroke of at least 100 mm on both sides. When the undercarriage touched down, the spring needed to build up a counter pressure the moment the trike landed. To accomplish this, Martin Rüter and ACE deployed gas springs with a pre-tension of 1 cm. Since then, landings on uneven ground have been safer and more comfortable.

These figures illustrate the general bandwidth of ACE industrial gas springs. Models range in stroke, from 20 to 800 mm, and in force capacity, from 10 to 13,000 N. Also included is a complete range of DIN-standardized connector parts.

H0X racecar with the company’s industrial gas springs. There were many things that stood out to them about this product, including its power and seemingly easy integration into their design. The students were also impressed that ACE had experience coming up with similar engineering solutions for professional racing teams.

In addition to the technical expertise, ACE supplied the HAWKS team with product samples (push type GS-15-40—free of charge. “Partnering with students is very important to us,” said Rainer Loh, the leader of the gas springs team at Langenfeld. “When we support the design engineers of tomorrow, we receive valuable feedback on our products, which lets us improve our offering.”



Industrial gas springs are available from ACE with body diameters of 8 to 70 mm.



The GS-15-40-BB-120 undergoes testing. The part's compact dimensions mean that it can be easily integrated into the racecar's existing design.

Gas Springs Performed Better Than Helical Springs.

The compactness and design flexibility of ACE's industrial gas springs meant that the part could be quickly and easily integrated into the H0X racecar—there was no need to make changes to the existing design. “Saving our customers time and money is a major goal. We want to help them avoid costly modifications,” Loh said.

In this scenario, the springs (type GS-15-40) needed to exert an extension force of 150 N for a stroke of just 40 mm—a requirement they easily met. Universal and tailor-made, ACE's industrial gas push type springs can support muscle power with forces from 2 to 2,923 pounds, or 10 to 13,000 N. Because they are made with high quality materials (steel or stainless steel) and coated to guard against wear, they also boast a long service life.

After integrating the parts, the students found that the ACE spring offset the vibrations of the car, keeping the accelerator pedal in a constant position and stabilizing the driver's foot. “Using gas springs was a quantum leap for us,” noted student Nathanael Peltzer. “You can see it in our lap times, and our drivers say they feel safer.”

To learn more, please visit: www.acecontrols.com