

ACE Mounts Protect Oil-Pump Test Bench From Unwanted Vibration

Students at the South Westphalia University of Applied Sciences have an ambitious goal: they want to reduce the fuel consumption of combustion engines by making oil pumps more efficient. As part of their research, they constructed a large testing station consisting of oil pumps, motors and other equipment on top of a large bench. But the problem was the motor that drove the pumps caused the entire bench to shake—threatening the equipment and making it difficult to obtain accurate measurements.

To overcome this challenge, the university team added low-frequency pneumatic leveling mounts (PLMs) from ACE Controls to the bench. Here's how these components successfully prevented unwanted vibration.

Vibrating Test Bench Threatened Equipment.

According to Sebastian Schuette, a research assistant in the university's automotive program, the key to making drives more efficient lies in the engine's oil pump—by reducing flow rate, then it is also possible to reduce power consumption. For their research, the students analyzed the hydraulic, volumetric and mechanical characteristics of various oil pumps to see how they could improve flow behavior—particularly, how to avoid leakage and reduce friction, for example. The students also assessed the efficiency of each pump's control strategy.



Equipment on the test bench, such as an electric motor, caused the entire bench to vibrate.

As part of the test setup, the students constructed a large 1,500-kg test bench with a length of 2,500 mm and width of 900 mm. They placed various equipment on top of the bench, including oil pumps and an electric motor that drove the pumps at a speed of 300 to 7,000 revolutions per minute. “These speeds caused the bench to vibrate,” Schuette says. “We realized right away we had to counteract this effect.”

As a possible solution, the students outfitted the test bench with six rubber-metal isolators. And while this did help, they realized they needed a better solution; not only did the vibration cause the bench to shake, threatening the equipment on top of it, but the vibrations were strong enough to affect other test benches in the room.

ACE Leveling Mounts Stop Vibration. The university team turned to ACE Controls, which designs and manufactures a variety of products for controlling vibration, including rubber-metal isolators, vibration-isolating pads



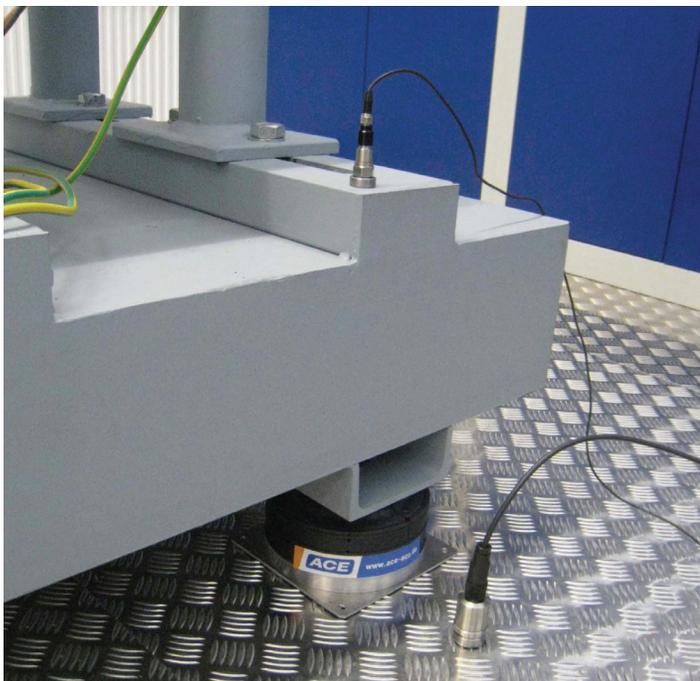
Pneumatic leveling mounts from ACE are suitable for low-frequency applications, such as test benches, measuring tables and high-speed presses.

and pneumatic leveling mounts (PLM). For the test bench, ACE engineers opted for six low-frequency PLMs, which isolate machines from undesirable vibrations and impact forces while maintaining perfect leveling.

ACE PLMs are available in standard or custom designs and are capable of withstanding loads up to 8,800 kg. When used as a vibration absorber, the internal air chamber creates an isolating effect starting at 5 Hz. In addition to test benches, these components are suitable for high-speed presses, measuring tables, fans, air compressors, production plants and other low-frequency applications between 3 and 10 Hz.

“Since integrating the ACE mounts, the test bench no longer shakes, and we can carry out our research without fear the vibration will affect our equipment,” Schuette says. “We have been able to take important steps towards achieving more energy-efficient drive systems.”

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



ACE engineers installed PLMs at six supporting points on the bench to isolate it from unwanted vibrations.