



Case Study

One Stop Shop for Vibration Testing



One stop shop for your vibration testing needs.

The Customer

We were approached by our client, a major manufacturer of rail transport vehicle systems, to determine if we could perform vibration and mechanical shock testing on large vehicle subsystems. While the client had an extensive engineering team, they had no experience in designing the necessary large vibration fixtures.

A condition of being awarded the work was that the test laboratory be able to design and fabricate the vibration fixtures, qualify them and perform the test program in accordance with the strict conditions detailed in IEC 61373.

Paragon Systems was awarded the contract based upon our extensive vibration fixture design + build experience.

The Challenge

The largest of the samples to be tested was nearly 5 meters long and weighed over 200 kg. When the fixture weight was included, the total weight to be tested would exceed the load carrying capacity of our shaker tables, so supplementary support was going to be necessary. Although the client was keen to get started quickly, timing was not as much of an issue as geography was. The client's engineering team

was 4,000 km away from our facility.

The Paragon Systems Solution

With the clients CAD model and GD&T, we designed one vibration fixture for each of the clients' devices. The fixture designs needed to comply with the 5 Hz to 150 Hz resonance free frequency range specified in the IEC standard. This can difficult to achieve with fixtures this large while containing weight and cost within reasonable limits.

In addition to the vibration fixtures, we also designed and fabricated a custom head expander as well the supplementary support system and integrated both with the shakers existing package support system.

Project management and good communication are necessary for all projects, especially so for larger projects like this. The project manager assigned to this project used web conferencing tools to keep the client up to date, to perform design reviews and fixture qualification signoffs plus video conferencing for the initial test setup sign-off.

The client's engineers traveled to our facility to witness the actual vibration and mechanical shock tests. Our fabrication shop even made a last minute replacement key to replace the one our client forgot to bring with them.

A demanding vibration test specification like IEC 61373 can complicate a project when the client does not have the resources to provide the laboratory with a specification compliant fixture.

Sourcing one supplier to build a fixture, another to qualify it and a third to perform the testing program adds risk and additional cost to a project.



Tools

- Solidworks CAD Software
- FEA Software
- Manual and CNC Machine Tools
- Unholtz Dickie Vibration Machine
- Unholtz Dickie 16 Channel Apex Controller