



Trac-Cab

Higher Technology Safety Features

Design for Safety

Safety, Code compliance, and mitigation of liability exposure are fundamental design objectives we consider in all our design and manufacturing activities.

Our company was founded to build a better and safer elevator. In researching the Codes and having over 40 years experience in the industry, we identified the areas needing improvement. This document details some of our most important improvements over the old designs for industrial elevators.

Anecdotally, crew men will tell of instances of centrifugal brakes failing during initial testing, cars starting and stopping without warning, and many complaints regarding trying to get proprietary parts or having to send a Safety brake in for inspection and adjustment, simply because it was actuated.

Those problems and many other issues with the old machine designs simply do not exist with the Trac-Cab product. Please take a look at our design improvements and consider Tower Elevator Systems, Inc. for your next elevator project.

Higher Technology TESI 21C Controller

- We manufacture our controllers exclusively with Safety Rated “Fail Safe” PLC processors.
 - There is good reason for this; they are indisputably safer. We believe the ASME A-17.1 Code will adopt the requirement for Safety PLC use in the future, as countries in Europe have done, *but with the TESI 21C Controller the benefits are available to you now.* Using Safety Rated Controllers does cost more, but when you are actually riding in one of these machines you appreciate all the safety you can get.
- Our controller PLC is approved in writing by Siemens Corporation for personnel elevator use. Beware of systems using industrial automation PLC’s not approved for personnel elevator use.
- Our controller is fitted with Dual Station HMI Display Screens.
 - We understand; safer does not mean there will not be problems. If an operating problem strands the car, it is a very stressful event for the riders and the rescue team. The last thing anyone wants is for the riders to exit the car and attempt to climb down from a stranded car, so it is very important problems be identified, diagnosed, and hopefully repaired quickly. With that in mind, we developed a superior Dual Station controller with an HMI graphical display screen in the car and at the base panel. Systems without a base panel display may require a



Trac-Cab

Higher Technology Safety Features

technician to climb to the stranded car to make repairs. This is a big disadvantage compared to a dual station system.

- The TESI 21C Dual Station Controller benefits include; fail safe Safety PLC processor, full feature communications capability, real time car position displayed on the HMI screen, fully automatic landing call stations, extensive touch screen diagnostic/maintenance capabilities, audio VMI Voice Messaging System, and remote alarm with plain text system status. You will always know where the crew and car are and be able to perform diagnostics easily using the HMI graphical display equipped base control panel.
- Over Speed Safety brake drop testing
 - Our dual Safety testing is easily conducted from the base control panel HMI screen using the automatic sequencing feature with precise data collection stored for review. Now it is easy to do safety drop tests not just once a year for Code compliance, but quarterly, or more often if you like, improving your elevator maintenance safety program.

Rescue-Emergency Lowering

- The TESI exclusive Rescue Lowering system uses a patent pending hydraulic motor circuit mechanically connected to the drive system.
 - The oil flow circuit allows unrestricted flow in normal operation and a reduced oil flow when in Rescue Mode. Reducing the oil flow controls the descent speed of the car by restricting rotation of the hydraulic motor, which is mechanically connected to the drive system.
 - Full Height Rated. This simple design provides unlimited lowering distance as the oil is cooled in our reservoir/oil cooler.
 - The system is actuated simply by pressing and holding the Lowering Button on the Car Operating Panel, releasing it to Stop. No timing, stopping to cool, or concern regarding overheating as with our competitors' centrifugal systems. Any questions, or to obtain basic instructions, just press the VMI button for audio instructions.
 - The system defaults to reduced flow each time the car stops, insuring a state of readiness and is continuously monitored by the Safety PLC.
- The Over Speed Governor and actuation of the over speed brakes remain active during Rescue Lowering, so there is no compromise of safety in Rescue Mode.
- Rescue lowering before the TESI innovation, *and still used by our competitors*, is with a mechanical brake that relies on a centrifugal mechanism to slow the car as the rider pulls a lever to slip the motor brakes. This system can work well in some limited



Trac-Cab

Higher Technology Safety Features

cases, primarily very low height minimum duration rescues, because these brakes heat up and lose effectiveness quickly, fading like your car brakes down a long hill.

- It is common to see limits placed on centrifugal systems to a maximum of 30' lowering before stopping to cool the brake is required, sometimes for up to a full minute, before continuing the rescue. If a rider is not trained or does not follow the cooling instructions, the brake could overheat allowing the car to over speed and engage the over speed brake. This will strand the car completely in a no-power situation.
- If centrifugal brake over heating occurs, and is not reported and repaired, the brake could become hazardous for the next rider. There is no easy way to inspect the brake surfaces on a centrifugal system and no simple way to test them. These concerns are completely eliminated with the TESI system.

Safety Over Speed Brakes

- The TESI Dual Drive-Dual Safety design maintains 100% Safety Factor, so we can both rest easy.
 - “No Code Loopholes” is one of our slogans; here is what we are talking about. When a single Over Speed safety brake is installed on a dual drive machine, there can be up to a 50% reduction in Safety Factor at the safety pinion tooth engagement. This is because there are two pinions engaging the rack teeth for the drives, but only one pinion engaging for the Over Speed safety brake.
 - We do not think sacrificing Safety Factor should be tolerated, and especially when the piece of equipment you are under-sizing can be subjected to high shock loading, such as a falling car having the Over Speed safety brake engaged.
- The industry standard over speed brake our competitors use is a centrifugally actuated mechanical brake. A big problem with these centrifugal systems is their lack of use, creating doubt as to their state of readiness, in some cases sitting unused from 1 to 5 years. That inactivity is serious cause for concern as these brakes can accumulate condensation and become corroded, possibly rendering them inoperative. They attempt to mitigate this problem by applying anti-corrosion protection, but there is little doubt the hazard exists.
- **The TESI Over Speed Safety brakes engage each time the car stops**, insuring they are limber and proving they are in good working condition. This is a huge improvement in safety over other brakes that sit idle when the car stops, offering no proof of readiness to operate.
 - Our Safety PLC continuously monitors our Safety brakes and will cause the elevator to enter a “safe state” if an unexpected input is detected, further enhancing safe operation.



Trac-Cab

Higher Technology Safety Features

- **Our brakes only require re-certification every 10 Years vs. the industry standard centrifugal brake that must be re-certified annually.** This improvement in utility function is a big savings for our customers; less machine down time removing brakes and less maintenance costs.

ADVANCED Speed Governor CONTROL

- The ASME A17.1 Code allows up to 40% over the Rated Speed of an elevator as the trip speed for actuating the Over Speed Brake.
 - The faster an elevator car is traveling when the Over Speed brake engages, the higher the shock load on the brake and the higher the G-forces on the riders, so slower is better.
 - *High speed actuation of centrifugal brakes has a history of causing catastrophic failure of the brake case. Ask our competitors if they have had any centrifugal over speed brake or gear box failures and listen closely to their answer.*
- Today, with higher technology, using our digitally set governor, we can set our trip speed at precisely 20% over the rated speed. 20% is way better than 40%, especially if your 40% includes a reduction in Safety Factor due to two drives and only one Safety.
 - *Our competitors' mechanically set centrifugal type governor is not easily set precisely and it is common to see trip speeds of 30-40% over rated speed with their machines.*

Voice Message Information System, (VMI)

- "The TESI Talking Elevator"
 - The system audibly informs riders of Normal and Emergency Operation and Site Specific instructions. The system is easily accessible from the Operator Panel using separate push buttons for the various recordings.
 - The VMI system can be part of an OSHA compliant training program improving safe operation of the equipment.
- The VMI recordings are created using MS Word converted for voice with inexpensive software and then stored on a simple SD memory card. This makes it very easy to create and edit your Voice Message Information system with site specific information.

The TRAC-CAB is a Safer, More Reliable, and Easier to Maintain Industrial Elevator System