

Mechanical Freight Lift for Transferring Aircraft Parts



The Challenge

A major aircraft manufacturer was expanding production facilities and seeking a way to better utilize valuable floor space by going vertical – installing mezzanines throughout to provide elevated working and walking surfaces for the assembly of large parts. This created the need to transfer tools, parts, and equipment between grade elevation and mezzanine elevation, within the smallest possible equipment footprint. Because of the level of cleanliness of the work environment, field welding was not an option – the equipment must be completely bolted together.

Plus, due to the limited floor space available for the lifts, and because the customer did not want to dig pits to place the carriages below grade, approach ramps had to be designed to accommodate the manual rolling of carts from grade level onto the lifts. The approach ramps also needed to retract out of the way when not in use, so as to not interfere with the ingress/egress of AGVs programmed to deliver parts, etc. in front of the lifts. Finally, because the installation was to take place on the West Coast – special material lift code requirements were imposed – including special signage, GAL interlocks, and the submittal of seismic calculations for approval by a registered Professional Engineer.

The Autoquip Solution

An Autoquip design team worked closely with the equipment integration company that sold the lift, specifically its technical review board to clarify all equipment specifications, installation concerns, and various code requirements. A mechanically-actuated VRC was identified as the best solution for this application for the



following reasons: 1) operates clean, free of any hydraulic fluids, 2) is designed hold elevated positions for extended periods of time without drifting down, 3) utilizes a mechanically-synchronized lifting chain design that can accommodate extremely wide carriages – keeping the carriage extremely level during raising and lowering.

Approach ramps were hinged to the side of each lift carriage and powered up into a vertical, stored position by an on-board mechanical winch when loading was complete and prior to lift operation. Wheel stops were also attached to the surface of the carriage deck to limit the movement of wheeled loads, as the carriage was being raised and lowered. The lifts were also equipped with free-fall arrest devices that would completely stop the descent of a lift in the unlikely event of a catastrophic lifting chain failure. And finally, all welded connections were re-designed to be bolted connections per the customer's requirement. The end user is completely satisfied with this clean and reliable material lift solution, and the state has also inspected and approved these lifts for production.

Lift Specifications for this Unique Application:

Model: FLM-2

Lift Capacity: 2,000 lbs.

Vertical Travel: 108"

Carriage Size: 60" x 132"

Lift Speed: 25 feet per minute

Lift Actuation: Mechanical Gear Motor

Powered Ramp: Mechanical Winch

The Solution Benefits

Autoquip was uniquely qualified to provide a customized VRC design that satisfied all equipment specifications, installation concerns, and various code requirements. The customer has a clean, reliable, and programmable lift solution, which allowed them to maximize the use of available floor space and begin production of their aircraft ahead of schedule.