AUTOMATION SOLUTIONS FOR TRAILER LOADING WITH AGVS

INTRODUCTION

Does your shipping and receiving dock need better organization? Does fork truck traffic moving in every direction give you a safety concern? Would you like to know how long trailers are parked at your facility or how long it takes to load or unload them? An automated trailer loading (ATL) system might be just the solution you are looking for.

Automated Guided Vehicles (AGVs), also known as Self-Guided Vehicles (SGVs) or Autonomous Mobile Robots (AMRs) are a safe, efficient, and reliable method of moving pallet loads through your facility and onto trailers. It starts with incorporating modern dock equipment. This allows trailers to be positioned and detected, which initiates automatic deployment of the dock levelers. Once all safety circuits are satisfied, AGVs are signaled from the Warehouse Management System (WMS) to start loading the trailer.

ATL Solutions integrate smart dock equipment with AGVs to create a safe, efficient, and organized method to put pallet loads on truck trailers.

ABOUT AGVs

There are two types of AGVs used for ATL: those that can carry two loads side by side, and those that carry single loads. If a single load AGV is being considered, that vehicle must be able to side shift the load so that loads can be placed next to the trailer walls. Other AGV characteristics include:

- Counter-balanced AGVs to allow for free movement of the load
- Extra ground clearance (5” or greater is ideal) and suspension to allow travel over dock plates and uneven, slanted surfaces onto a trailer
- Loads should be no more than 90” wide for dual loads (see trailer dimension chart below)
- Tilting mast with limited height to fit in trailer
- Large wheels (18” or greater is ideal), usually a tricycle wheel pattern allows flexible steering
- AGV Control Software to handle packing patterns for loads and interface with WMS

DOCK EQUIPMENT

Proven companies like Rite-Hite, Kelley, TKO, and Serco can provide dock equipment with sensors and controls so that the dock operation can be controlled using software. Vertical storing dock levelers allow for full control of the trailer loading sequence and provide the best temperature control by allowing the trailer doors to be opened and closed while in position at the door. Other benefits of the vertical storing levelers include:

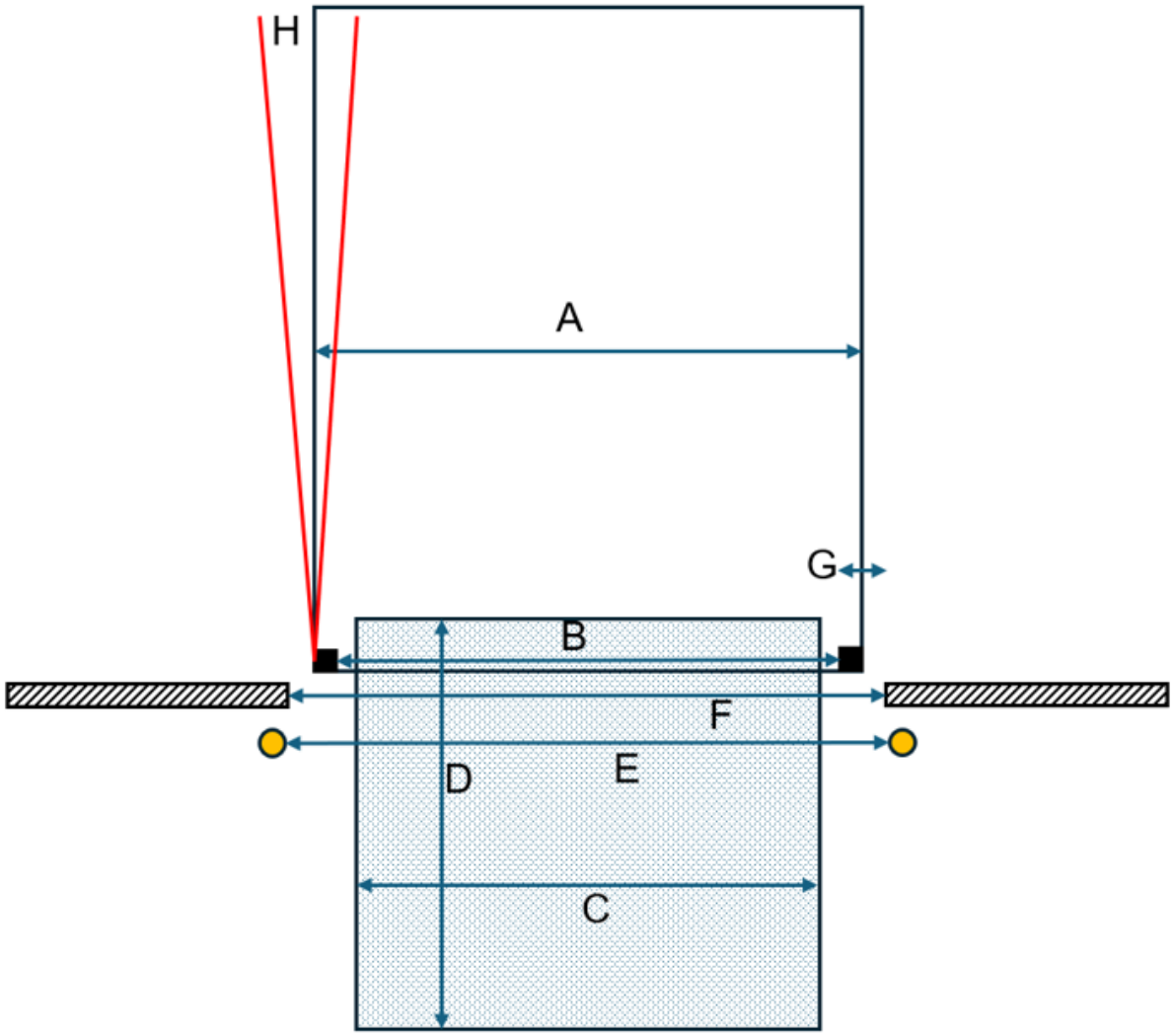
- The overhead door closes to the pit floor creating a better seal of the opening when the dock is not in use
- The pit design allows for easier clean-up of the area and better sanitation practices
- There is a smoother transition from dock to trailer, which extends equipment lifespan and reduces potential for injury to personnel and damage to product
- The control mast can be mounted alongside the leveler to provide a clear view of loading dock and pit area during operation

EQUIPMENT DIMENSIONS

Many types of trailers are used for transporting goods. Refrigerated trailers have slightly less space available for loading than dry trailers. For optimum automated trailer loading, the below dimensions for refrigerated trailers are recommended as minimums:

Item	Measurement	Distance	Comment
A	Trailer Inside Width	97.5”	At Liner
B	Trailer Opening Width	95.5”	At Doors
C	Ramp Width – Minimum	85”	
D	Ramp Length – Minimum	96”	
E	Distance between bollards - Min	108”	
F	Dock Door Opening Width	108”	
G	Trailer Center Offset	+/- 3”	Trailer centered on dock centerline will facilitate operation
H	Trailer Angle	0 Degrees	Trailer should be lined up
	Normal Dock Height	50”	

Refrigerated Trailer Dimensions



NEXT STEPS

To determine if ATL with AGVs is a good solution to improve your trailer dock, a few things need to be evaluated:

1. Data analysis – Description of the loads (pallets or slip sheets) - length, width, height, and weight. How many pallets per day and per hour (what are the shipping hours) are planned to ship out of your facility? How many doors will be utilized?
2. Building analysis - What type of trailers will be loaded and what height is the dock? Is this going to be a new facility or an upgrade to an existing facility?
3. Sanitation and safety analysis – Will personnel be inspecting the trailer before loading and will the trailer be held in place?

If you are ready to explore these topics, contact Bill Grey with Primus Solutions Group (678.627.9274, bgrey@primusbuilders.com). He will work with you to determine the best automation solution to suit your facility.