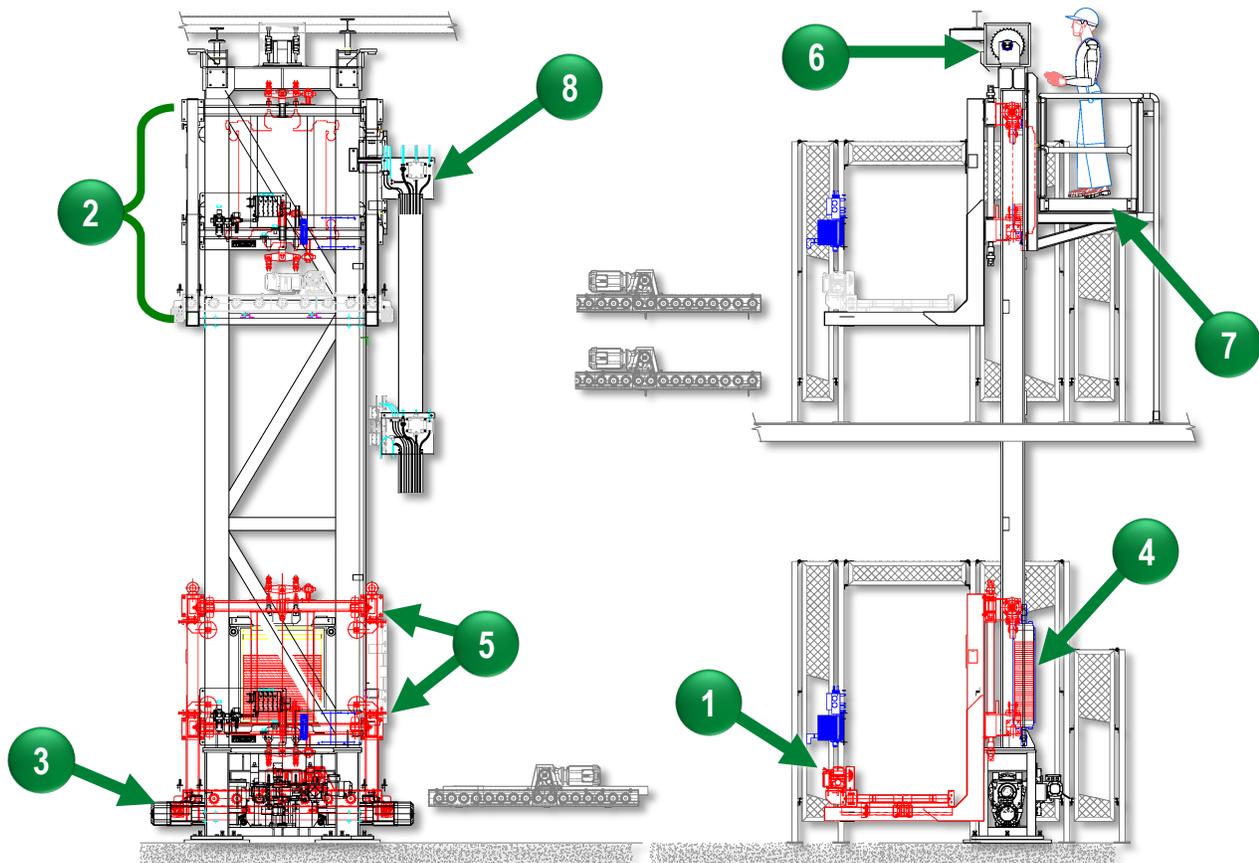


Light Duty VDL with CDLR Typical Components



- | | | |
|---------------------------------|--------------------------------------|-------------------------------------|
| 1 CDLR Roller Table | 2 Mobile Carriage Frame | 3 Floor Level Drive Assembly |
| 4 Counterweight Assembly | 5 Mobile Frame Wheel Assembly | 6 Top Level Idle Sprocket |
| 7 Maintenance Platform | 8 Cat Track Assembly | |

Light Duty VDL with CDLR Conveyor Overview

The light duty single pallet Vertical Drop Lifter (VDL) assembly is a counterweight designed vertical lifter that supports a Chain Driven Live Roller (CDLR) table on a mobile carriage frame for the purpose of transferring product from the pallet delivery system to an unload area at floor level. The VDL is constructed with a two-post wide flange “H” beam structure that is tied together by a cross-tie assembly (truss configuration). This robust structural design ensures stability and durability during operation, even with heavy pallet loads. The integration of the truss configuration further enhances the rigidity and load-bearing capacity of the VDL.

The carriage assembly is chain supported through a floor level drive assembly and terminated back to a counterweight assembly. The carriage is guided by a mobile frame wheel assembly that is encapsulated within the H-Beam construction column for lateral and transverse stability. The VDL drive assembly supported by pillow block bearings is comprised of a drive shaft and sprocket assembly that is direct driven by a main and standby gearmotor. This arrangement provides smooth and reliable vertical movement, while the dual gearmotor setup offers redundancy to minimize downtime in case of a drive failure.

Two sets of chains drive the motion of the VDL carriage. One set wraps around the floor level drive sprocket and connects to the bottom of the carriage and counterweight. The other set wraps around the top-level idle sprocket and connects to the top of the carriage and counterweight. A motor turns the drive sprocket and raises and lowers the chain ends. The chain is tensioned by the weight of the counterweight and the carriage. By employing both upper and lower chains, the system achieves balanced lifting and lowering actions, helping to prevent misalignment and ensuring consistent performance.

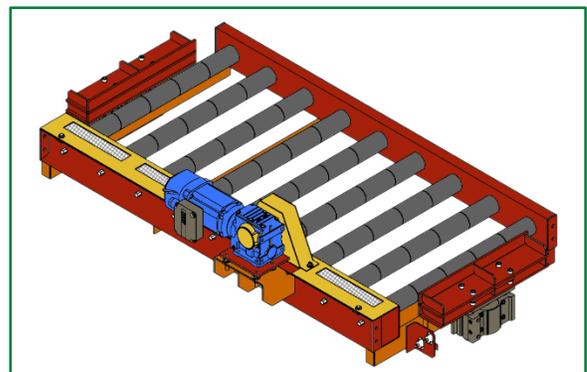
A chain termination assembly is attached to the upper and lower carriage. The chain termination assembly is comprised of a tie arm connected to a balancer mechanism that contains the chain termination assemblies. A limit switch mounts to the side of the balancer to trip in the event of a chain failure. In the event of an individual chain failure the limit switch opens and a stop/failure of the VDL motion is activated. This safety feature is critical for preventing accidents and equipment damage, as it immediately disables motion when a fault is detected.

A CDLR table is affixed the VDL carriage to allow the transfer of a pallet onto and off of the VDL. Pneumatic safety stop devices that mount at each end of the roller table on the carriage ensure that the pallet does not inadvertently transfer off of the CDLR while the VDL carriage is in motion. These stops provide an additional layer of protection, securing the pallet in place during lifting and lowering cycles.

To minimize damage, rubber bumpers are installed at the top and bottom of the lift frame to stop the counterweight in case of system over travel. Rubber bumpers are also installed underneath the carriage arms. The bumpers absorb impact forces, reducing wear and prolonging the lifespan of the equipment.

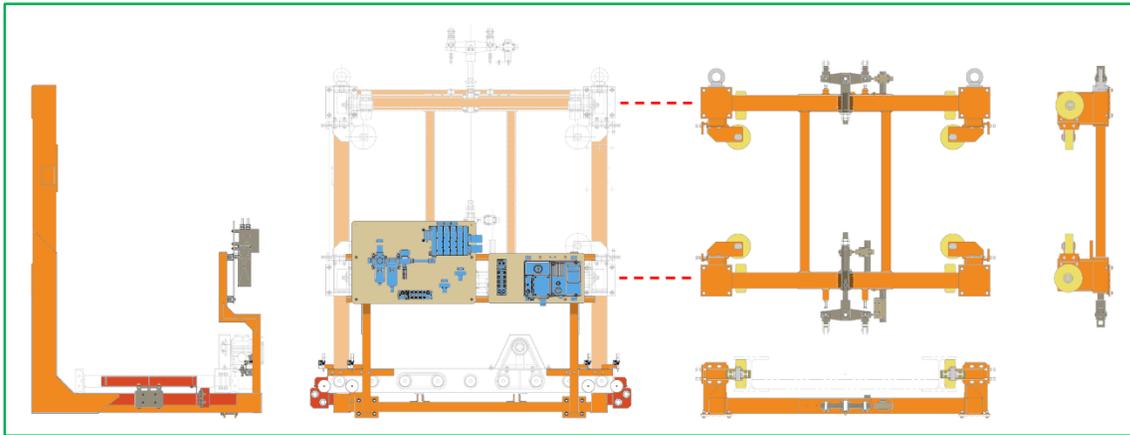


▲ Vertical Drop Lifter with CDLR attached

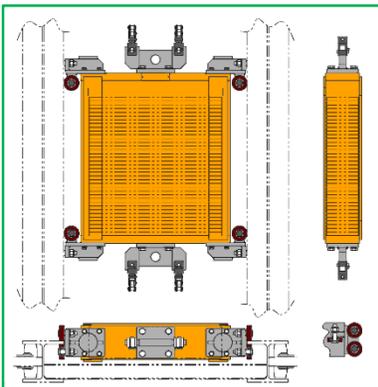


▲ Chain Driven Live Roller (CDLR)

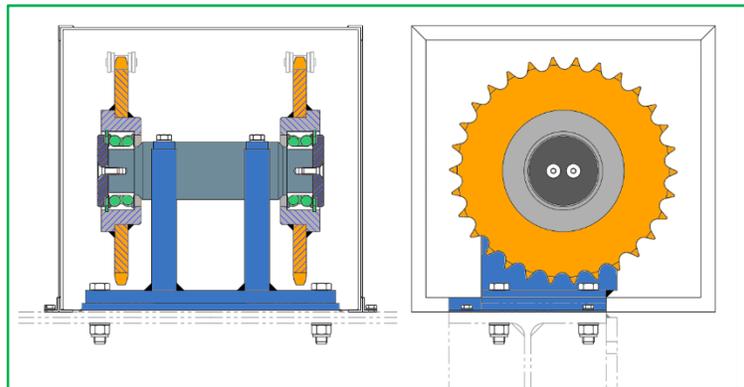
A maintenance platform is provided for access to the idle sprocket assembly. The drive assembly is floor mounted and is guarded by safety fencing. A fence panel is provided to gain access to the drive assembly's maintenance pin to lock-out the drive sprocket prior to maintenance access into the cell. These maintenance and safety provisions are designed to help ensure safe maintenance servicing and to comply with industrial safety standards.



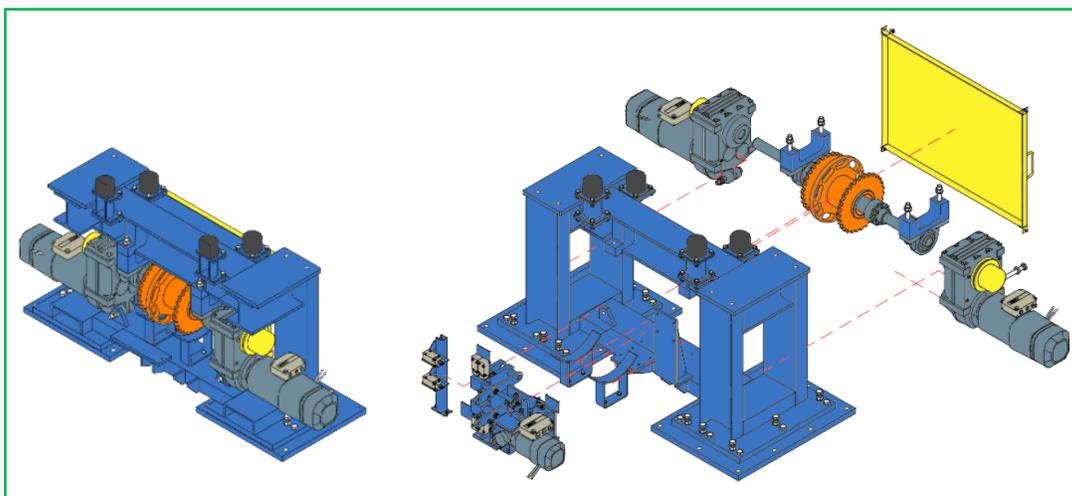
▲ Mobile Carriage Frame (External & Internal)



▲ Counterweight Assembly

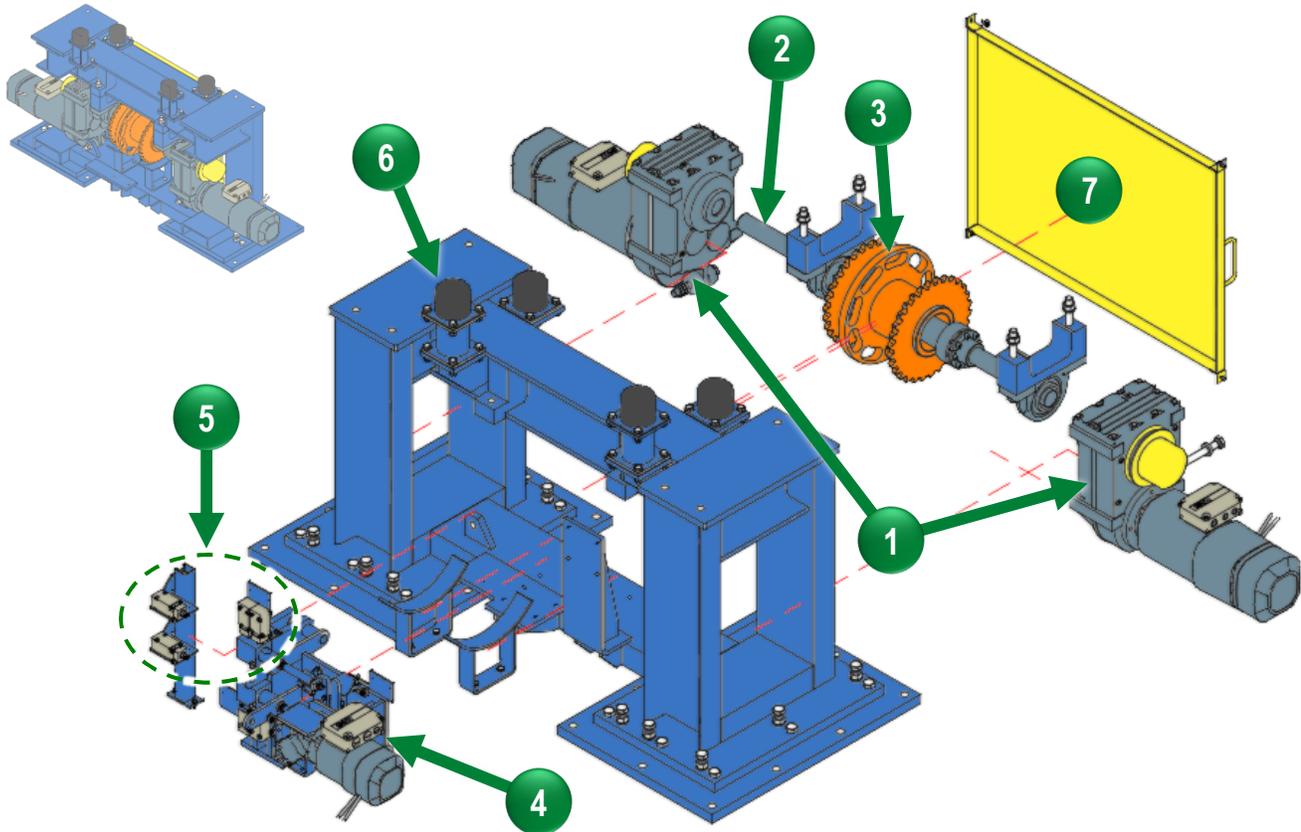


▲ Top Level Idle Sprocket



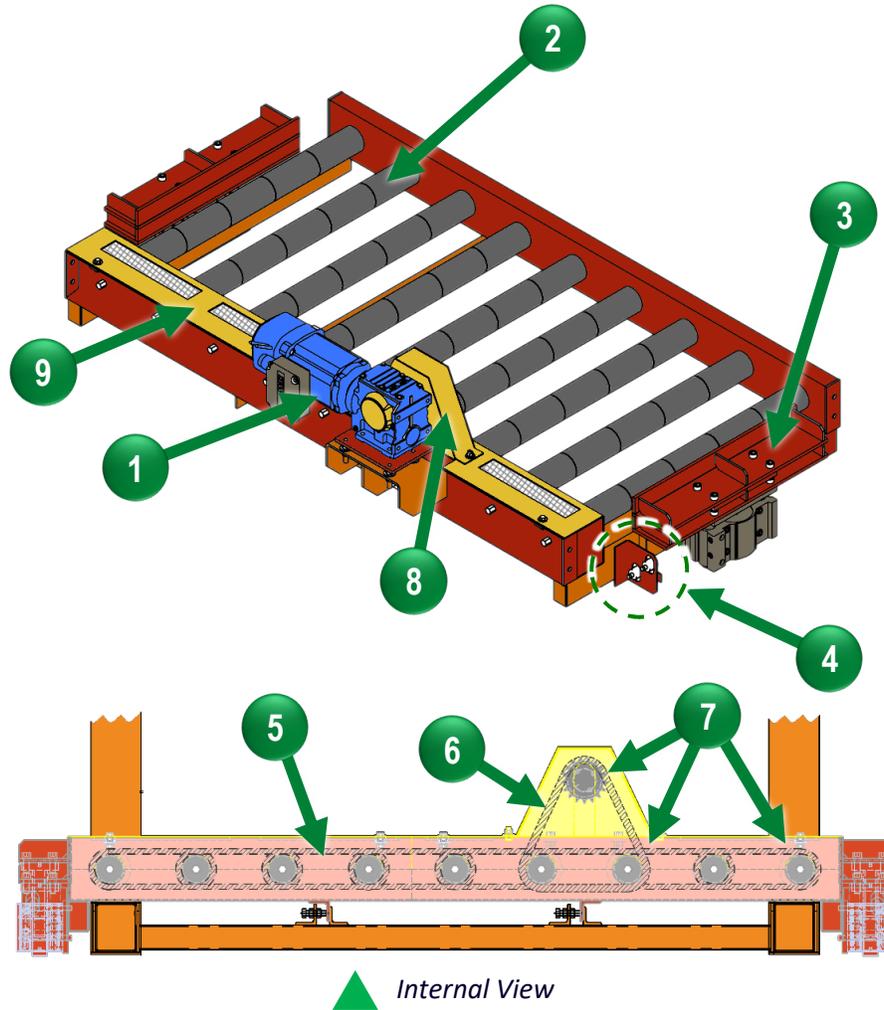
▲ Floor Level Drive Assembly (with exploded view)

Floor Level Drive Assembly



- | | | |
|----------------------------------|-------------------------|-------------------------|
| 1 Gearmotors | 2 Drive Shaft | 3 Sprocket |
| 4 Locking Device Assembly | 5 Limit Switches | 6 Rubber Bumpers |
| 7 Safety Panel | | |

CDLR Table Assembly



- | | | |
|--------------------------------|----------------------|---------------------------|
| 1 Gearmotor | 2 Rollers | 3 Pop-Up Stop Face |
| 4 Sensors & Sensor Flag | 5 Chain Loop | 6 Drive Chain |
| 7 Sprockets | 8 Drive Guard | 9 Chain Guard |