

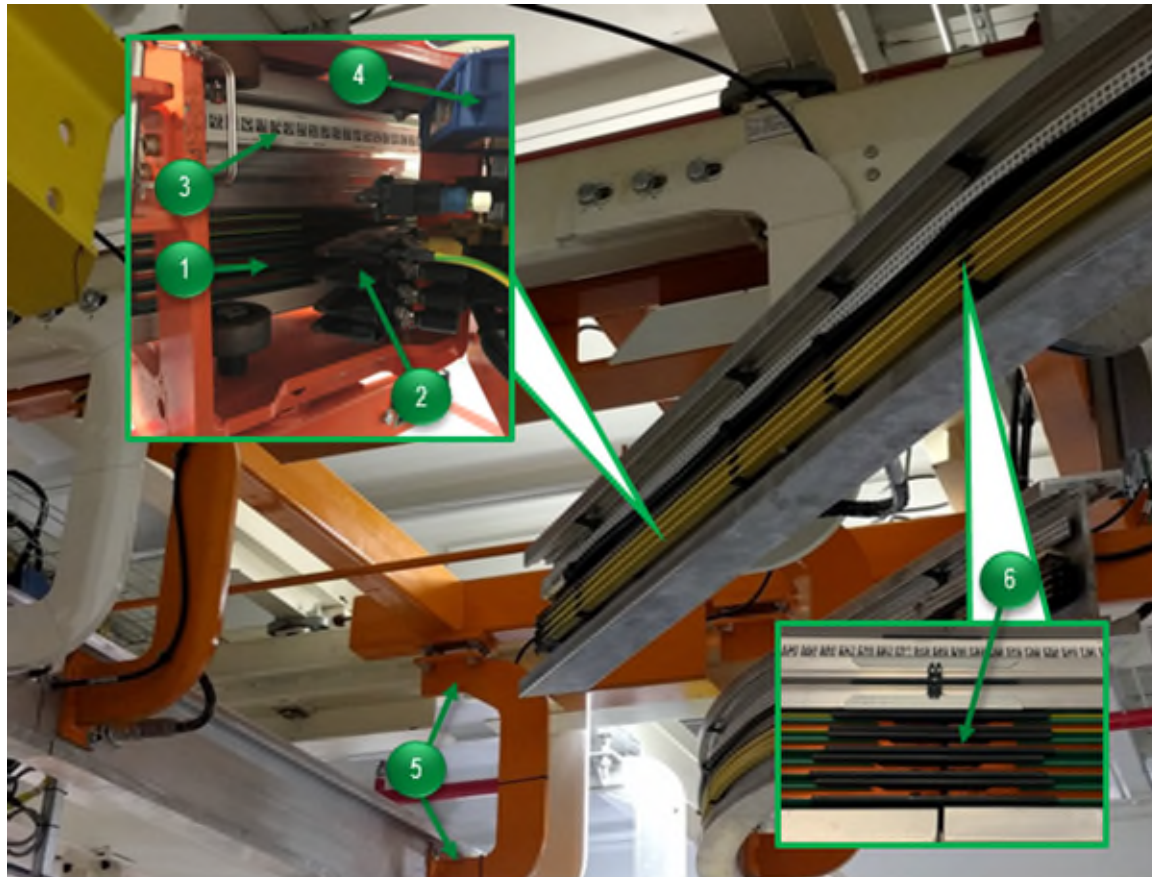
EMS System Components

Your electrified monorail system (EMS) system contains the following major components:

- EMS Rail
- EMS Upper Trolley Assembly
- EMS Lower Trolley Assembly
- EMS Vacuum
- EMS Crowder
- EMS Switch



EMS Rail

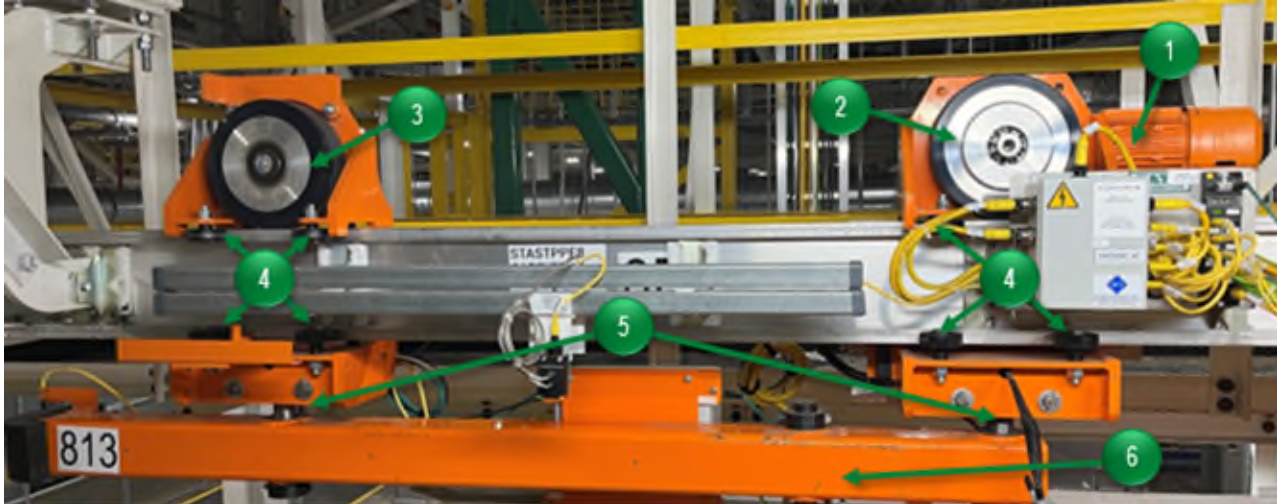








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|---|--|---|
|  1 Conductor Rail |  3 Code Rail |  5 Yokes |
|  2 Current Collector |  4 Code Rail Reader |  6 Conductor Rail Connector |

EMS Rail Overview

The conductor rail utilizes copper and stainless steel as conducting metals and is housed in PVC. The current collector is attached to the upper trolley assembly and fits into the grooves of the conductor rail and passes an electrical current. The conductor rail is where the system is guided through its operation. As the trolleys move through the railing, its position within the system is known by the code rail that is being scanned by the code rail reader. The rail structure is supported with a series of yokes to provide stability as the system is in operation. The conductor rail connectors join multiple sections of railing to allow ease of transfer from one to another.

EMS Upper Trolley Assembly



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|---|--|---|
|  1 Gearmotor |  3 Idle Wheel |  5 Kingpins |
|  2 Drive Wheel |  4 Side Guide Rollers |  6 Load Bar |

EMS Upper Trolley Assembly Overview

The upper trolley assembly moves the lower trolley assembly through the system along the rail. The gearmotor acts on the drive wheel to provide momentum while the idle wheel keeps the movement aligned. Both wheels are equipped with side guide rollers to provide stability for the front and rear of the entire trolley. The wheel assemblies are connected to a load bar via kingpins that ultimately attaches to the lower trolley assembly.

EMS Lower Trolley Assembly



Load Bar



Part Touching Pins



Part Touching Pads

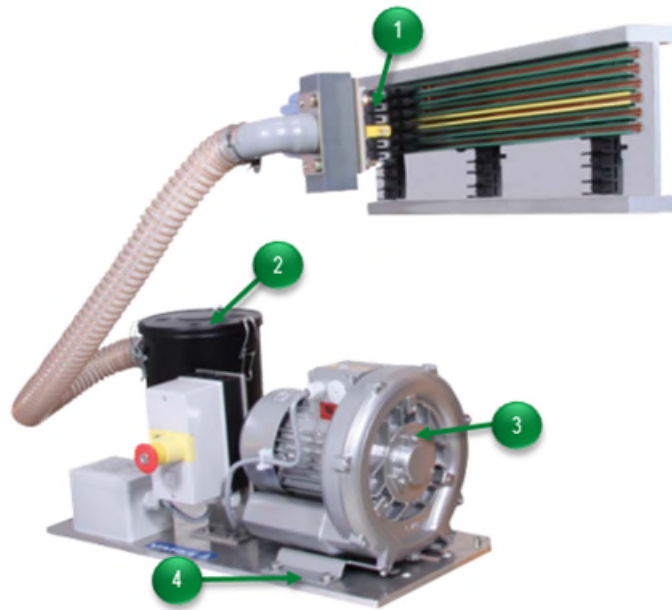


Carrier Frame

EMS Lower Trolley Assembly Overview

The lower trolley assembly is connected to the upper trolley assembly via the load bar with kingpins. The carrier frame houses the product as it travels through the EMS system. The part touching details, such as pins and pads, are the only parts that come into contact with the product.

EMS Vacuum



1 Suction Head

3 Exhauster

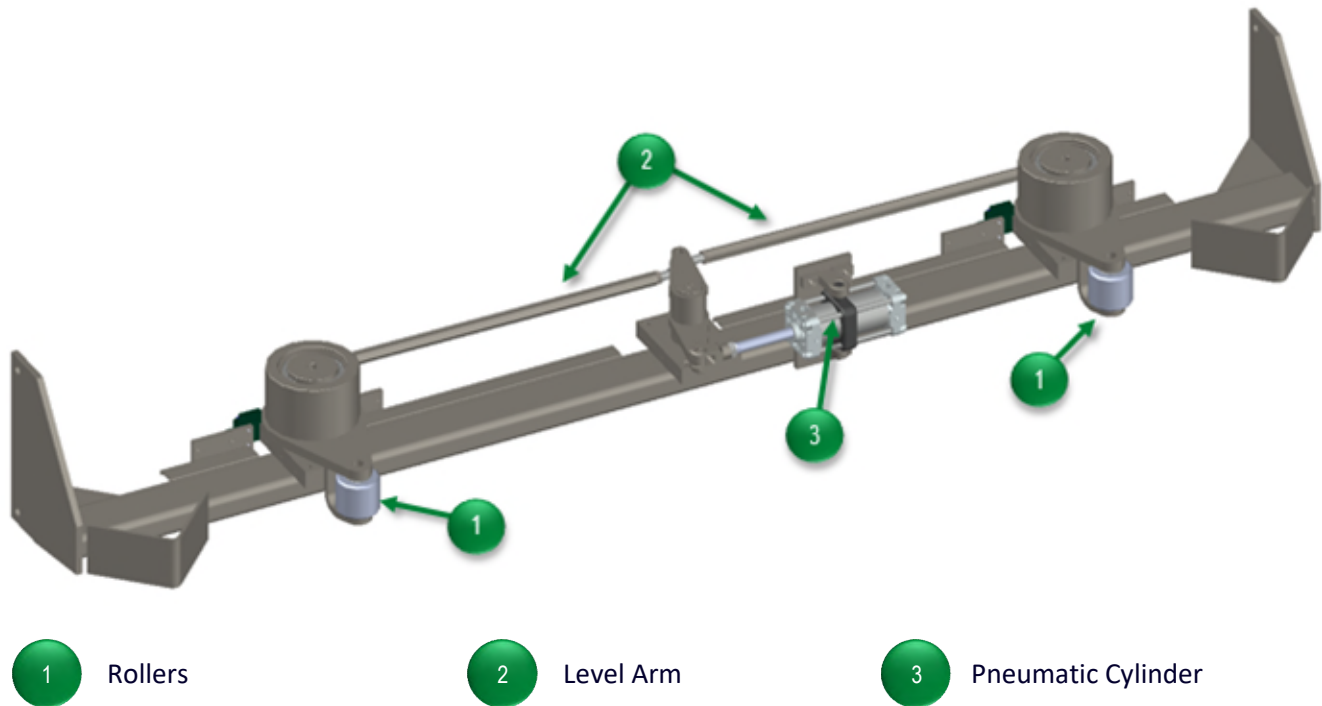
4 Mounting Plate

2 Filter Housing

EMS Vacuum Overview

The EMS rail requires little maintenance once installed, however, does have a vacuum option that can be installed to automate the maintenance process. The vacuum can be mounted as part of the upper trolley or as an individual unit within the system. The suction head fits into the grooves of the conductor rail and removes dirt and debris that may be stuck within the housing. The absorbed particulates move into filter housing unit, which contains a disposable filter cartridge that traps and removed them. The airflow then travels to the exhaust where it is expelled from the vacuum.

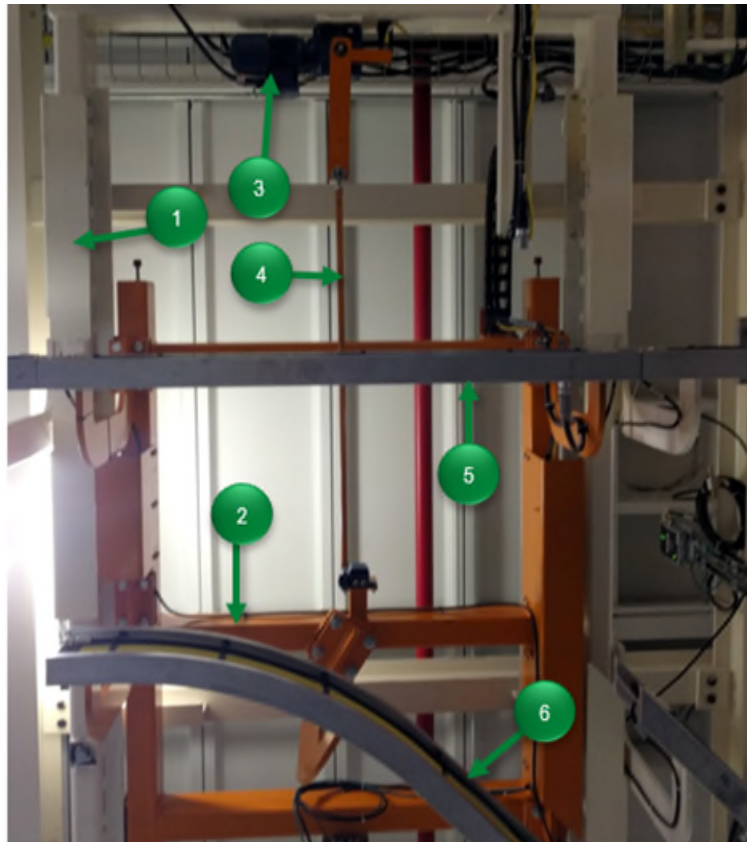
EMS Crowder



EMS Crowder Overview

The EMS Crowder is used to precisely place the lower trolley assembly to allow tooling to interact with the product or carrier frame. The EMS Crowder's are mounted in the robot stations to prevent the lower trolley assembly from swaying during the robot seal application cycle. The Crowder's are pneumatic controlled with clamping arms and rollers that are connected to a lever arm controlled by the stroke of a pneumatic cylinder.

EMS Switch



- | | | | | | |
|---|---------------|---|------------|--|----------------|
|  1 | Frame |  3 | Gearmotor |  5 | Straight Track |
|  2 | Movable Frame |  4 | Torque Arm |  6 | Curved Track |

EMS Switch Overview

The switch features an outer fixed frame with rails and an inner movable frame with rollers that ride on the rails. The modular construction uses tubular steel members that provide a rigid light framework.

An electric motor gearbox and torque arm that is on the outer fixed frame moves the track switch inner frame. The inner movable frame carries both the straight and curved monorail track. The inner frame has adjustment caps to allow the correct alignment of the tracks. In addition, a positive stop physically prevents the EMS Carriage from entering the track switch until the correct alignment has been achieved.

Each track switch has two proximity switches to assure the correct positioning of the movable frame. An error signal is available from each rail switch when it is not in a correct position.