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Current State:

The method shown requires the operator to dip the ring into a container of bearings, balance them, place it over the coupler, and spin the ring until ball bearings are in place. This requires a great deal of refills and inconveniences the operators with spillages.



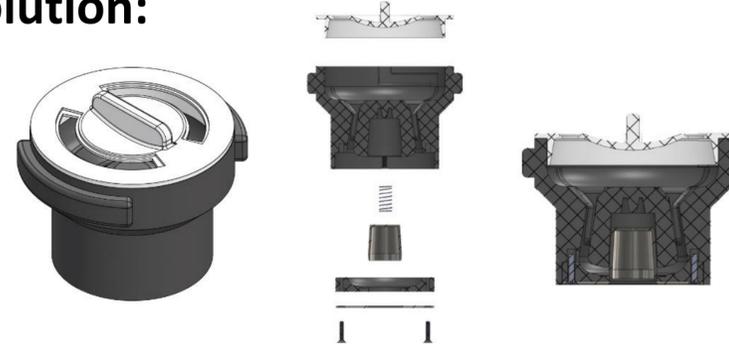
Mission Statement:

Merit Engineering will work with Parker-Hannifin to simplify the current ball bearing installation procedure for their 1/4" 60-series quick-connect hydraulic couplings by designing and installing a standardized semi-automated fixture to increase parts per hour, eliminate spilling, and reduce assembly complexity.

Design Constraints:

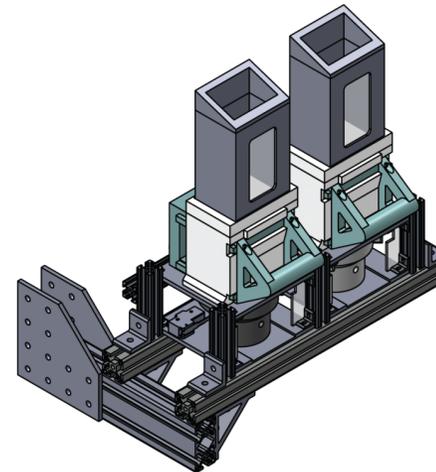
(1) There are two different types of ball bearings. (2) Current quality control methods must be integrated. (3) Must be a safe, reliable, and fail-proof design. (4) Ergonomics must be factored into design. (5) Needs to handle over 100 parts per hour, and (6) Budget of \$5,000.

Solution:



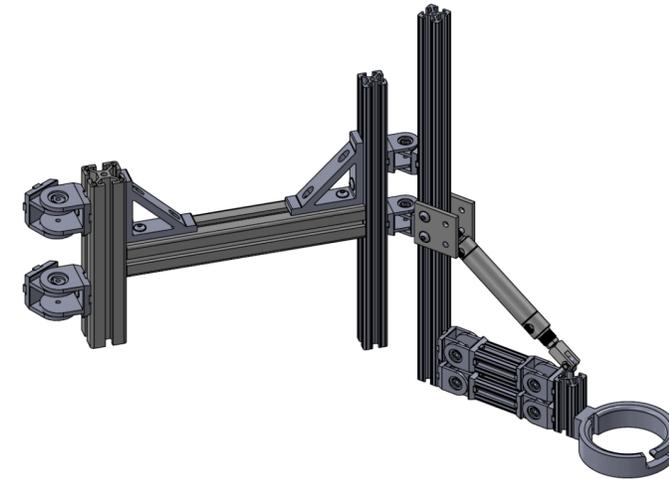
Zero Gravity Arm

The Zero Gravity Arm aids the rising and lowering action of the Gravity Feeder in its holder. It is an ergonomic way to lift the gravity feeder when it is full of ball bearings.



Gravity Feeder

The gravity feeder holds, contains, and dispenses ball bearings.



Refill Station

A refill station was created to simplify gravity feeder usage. The innovative design makes it easier for operators to quickly and consistently refill the gravity feeder without spilling ball bearings.

Conclusion:

The three components that have been implemented to the 1/4" cell include: two Gravity Feeders, one Zero Gravity Arm, and two Refill Stations. All of the added components to the 1/4" assembly cell help reduce the number of ball bearings spilled at the workstation and most importantly prevents the incorrect ball bearing types to be assembled in the incorrect coupler, while only spending \$900 of the budget.

