

Senior Design Project Description for FALL 2016

Project Title: Pinsetter Machine for 800 Series Horns (UTC_PINSET)

Supporter: United Technologies Corporation (UTC)

Supporter Technical Representative: ASSIGNED

Faculty Mentor: _____ ASSIGNED TBD (check one)

Single Team _____ Dual Team _____ (check one)

Personnel (EN/ET): 2 E, _____ Cp, _____ Cv, 3 M, _____ SE

(Complete if the number of students required is known)

Expected person-hours: (250 per student)

Description of Project:

UTC is a leading manufacturer of fire safety and security equipment. Current equipment that is used to drill and pin the movement assembly for the 800 series horns is antiquated, maintenance prone, and relies solely on pneumatic sequencing. The objective of this project is to develop a prototype of a machine that will replace the old equipment with a safe, reliable, repeatable machine that meets the required time, is constructed with standard components, and operates under a programmable control system.

Initial Project Requirements (e.g. weight, size, etc.):

1. Any operator interface (i.e. levers) shall be adjustable in a manner that the system can be operated with individuals of varying height in a standing or sitting position without posing an ergonomic problem
2. Utility connections shall be clearly labeled with typical and maximum requirements. All electrical and pneumatic connections to have disconnects at the machine. All wiring must conform to the applicable electrical code for the area of installation (i.e. USA = National Electrical Code)
3. Services available at Lincoln facility: Electrical = 120VAC (preferred), 240Vac single phase, or 208Vac three phase. Air = 100 psi maximum
4. Moving machine parts, pinch points, and electrical connection(s) shall be guarded/interlocked to meet OSHA requirements and prevent accidental human contact
5. Light curtains and anti-tie downs are to be incorporated to comprise a redundant system of operation
6. Removable parts for the purpose of routine service or maintenance must not require a person to lift more than 35 lbs.
7. Modes of Operation:
 - Normal Mode ... system will only operate with all safeties activated.
 - Tech Mode... keyed switch can bypass safety features.

Expected Deliverables/Results:

- Prototype of the pinsetter machine
- Electrical & pneumatic schematics provided.



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- Mechanical drawings for all custom parts / tooling
- Operation and maintenance manual
- Programming instructions, software, and any interfacing cables or remote controllers included
- Detailed supplier and parts list (excluding standard hardware)

List here any specific skills or knowledge needed or suggested (If none please state none):

None