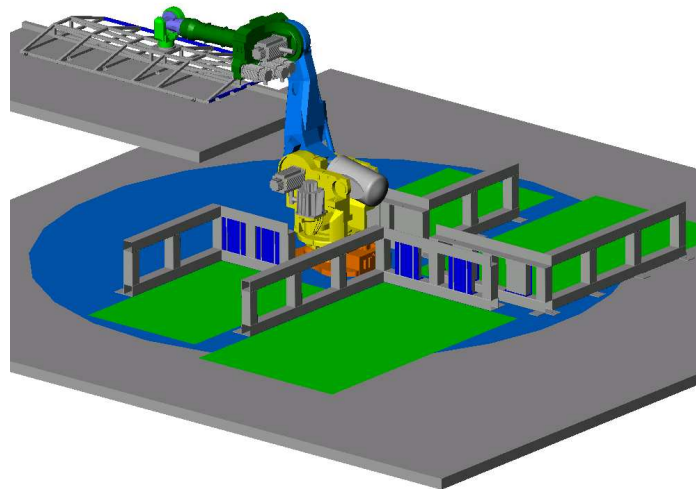


Case Study – Sheet Metal Load

This is a sheet metal kitting and load application. The machine being loaded is a CNC controlled bending machine. There are 54 different parts that run in the system and kits are loaded one part at a time into the machine by the robot.

The challenges with automating this loading process included

- The part range is wide and the parts have features that make the tool design challenging – holes, gaps and missing corners
- The sheet metal is just as received from the blanking press – there is residual oils and dust collected on the surfaces of the parts
- The customer's CNC machine is fast, so the part loading times, especially for the smaller parts in the range, are fast
- The delivery of the system was very short





System Requirements

- Be able to pick and place sheet metal from one of four locations on demand
- Each part magazine is to be able to run any part
- There must be just one sheet per trip
- One tool is to be used for all parts regardless of part features or challenges
- Use a Motoman robot and limited other controls

Description of the Solution

The system uses a Motoman HP165 robot with NX100 controller, a space frame vacuum tool, four floor details with fanning magnets and a skewed roller conveyor for powering the sheets along a datum rail.

The operator loads one or more of the floor details with parts. The sheets should be located to within +/- 1/2 inch of the floor detail frame. The operator indicates through the teach pendant which floor details are being used and selects the sequence to run the parts.

Once the system is started, it automatically loads the feed conveyor and coordinates with the CNC on the bending machine for the load and feed of the next part. The roller conveyor shifts the sheet to a datum rail as it travels into the bending machine.

The one vacuum tool has the cups placed at strategic locations to optimize the cup contact with the variety of parts being run. Local vacuum generators react to the presence or absence of metal in the tool.

Customer Benefits

- Consistent throughput
- Predictable cycle time for a part sequence
- Part to part changeovers and the ramifications of wide part size variations and mixes are irrelevant to the robot loading process
- No human involvement with the lifting and placing of sheet metal
- The flexible and programmable industrial (automotive spec.) robot will have a long and useful life
- Removal of the human element from a very repetitive and boring task

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