Chrysler Motors

Providing Robotic Machine Tending to a Tempering Furnace at Chrysler

System Overview:

Headquartered in Auburn Hills, Mich., Chrysler Group's product lineup features some of the world's most recognizable vehicles. Fiat contributes world-class technology, platforms and powertrains for small- and medium-size cars, allowing Chrysler Group to offer an expanded product line including environmentally friendly vehicles.

For this project, Bastian Solutions was sub-contracted by Aichelin Heat Treatment to provide robotic machine tending to a tempering furnace within Chrysler Motors' Kokomo, Indiana transmission plant.

How It Works:

Parts are presented to the robot on an EWAB conveyor. The parts sit on a 'puck' that is conveyed, to us. The puck is locked in place so the part is always in the same location and orientation. The robot picks the part and places it into the oven. The oven conveyor is metal which shrinks/stretches with temperature, so before the robot picks/places parts we use a sensor on the end of arm tool and run it over the oven to find the exact location of the conveyor/slats. We record/set the position of the oven conveyor and then pick and place parts one at a time into the oven. When six parts have been loaded, the oven indexes and we load more. If parts are not presented, the oven will still index to avoid burning up the parts in the oven.

Parts at the other end are always located in the same position, so we do not sense parts on that end. Sensors on the oven tell us which slats have parts, and the robot picks them one at a time and places them onto the same puck that we picked from on the other end.

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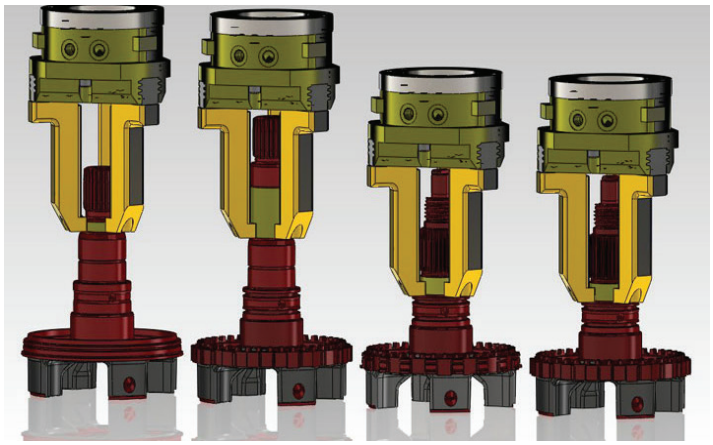
Business Challenges:

- Robot must handle four (4) different sizes of parts similar in shape but unique in size
- Oven conveyor shrinks/stretches with temperature
- Sensors must be used to find exact position of oven conveyor in order to accurately pick parts

Key Technologies:

- Two (2) Fanuc M-10iA six-axis Machine Tending Robot Arms
- Custom End of Arm Tooling (Schunk 3 jaw grippers with gripper fingers designed by Bastian Robotics)
- Bastian Robotics Controls
- EWAB Conveyor
- Aichelin tempering furnace



Results:

- Work cell meets all Chrysler Kokomo specifications, including programming styles/names, hardware used, wiring procedures, drawing sets, paint colors, etc