Robotic Integration in the Vehicle Conversion Process at Trimming Stage

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Allied Mobility is the UK and Ireland leading manufacturer of adapted and special purpose wheelchair accessible vehicles.

Aims
- Accurate Tool
- Fast
- Convenient
- Safe
- Profitable

Conversion

Process

Automation and Robotic Integration in the Factory / Eliminate challenges

Switching from Circular Saw to Plasma and Manual Handling Elimination

Dealing with Challenges Including Cutting Parts with Complex Shapes Such as Vehicle chassis underbody

- Fanuc S-420iL RJ2 Robotic Arm Plasma Cutter
- Touch Trigger Prob for positioning
- Magnetic Gripper
- Plasma Torch Design
- Safety Cage
- Smoke Extractor
- Widely used by the car manufacturers

- Understand The nature of the Cut and process
- Know the challenges
- Nature of the structure
- Methodology of cut and strategy
- Research and optimizing the cut
- Build an algorithm for the cut path and parameters optimization

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- Experimental research provides the data needed for different types of analysis and consideration of events and processes in order to generate useful information for a complex problem solving mainly for an unknown process mechanisms such as Multi-layered Metal Cuts.
- Plasma cutting process modelling requires a certain number of experiments which consists of measuring the output system based on different sets of input parameters
- Provides the information needed to understand the process mechanism

Change:
- Manual Tooling: Circular/ Reciprocating Saws
- Production Process
- Factory Layout
- Moving Vehicles Manually

Research Experiment:
- The influence of the Plasma Parameters (Cutting Current, Gas Pressure and Cutting speed)
- Effect of the gap distance between two sheets on the Quality Cut
- Plasma flame deflection effect on the second sheet
- HAZ, Structure change, Kerf size, Dross size, Cut edge roughness, Sheet distortion
- Optimal Cutting process (DOE)