

# R.T. Patterson Company, Inc.

## Engineers and Consultants

### CLIENT

General Motors Powertrain  
Bedford, IN

### PROJECT

Update Robotic Cells & Die Cast Machines for  
Elect Powertrain Castings

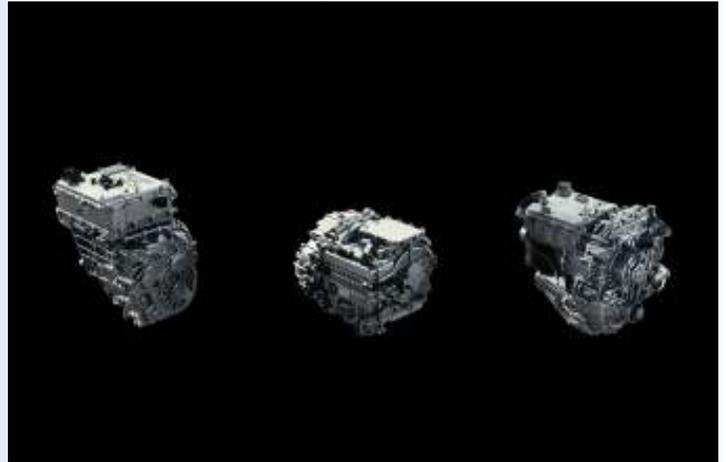
### PROJECT SCOPE

General Motors was buying new die casting equipment to produce electrical powertrain transmission housing and cases in Die Cast North for 5 cells. RTP provided concepts and final for robotic cell layout, cell and die cast machine equipment design, technical review of third-party OEM, installation scope of requirements-drawings and construction engineering assistance. Additionally, RTP provided design for most new process related pieces of equipment and safety enhancements. This was a top priority for GM.

### RTP SCOPE OF WORK

RTP provided the following services:

- Assist in the development of the Scope of Work for OEMs.
- Develop multiple concepts for Robotic Die Cast Cell arrangements for plant building with tight column spacing.
- Prepare detailed specifications and Scope of Requirements for OEMs and install contractor.
- Develop design drawings for:
  - Develop Dual Robot Die Cast Cell process layout at floor and basement level for group of 5 Electrical vehicle aluminum transmission cases and housings.
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### RTP SCOPE OF WORK - Continued

- Mechanical, Piping, Ductwork and Electrical utilities installation on two plant levels for equipment on eighteen 3500Ton clamp capacity Die Cast Machines with robotic cells on two floor levels.
- Provide Die Cast Machine Piping upgrade for conversion to accommodate more advanced die.
- Develop additional safety guarding, platforms and handrails for die cast machine and die cast cell.
- Develop new part marker and buffer stand with advanced features.
- Develop equipment installation jig for precise location of robotic components in cell to reduce cell to cell variation and decrease install time.
- Development of 50 ton die loading path.
- New advanced overflow knock-off system.
- Perimeter fence with special gates and custom panels with light curtains and reach in guards.
- Develop 10 end of arm tool concepts, evaluate robot loading-reach and quick tool change cart.
- New sound absorbing scrap chutes for overflow knock off and saw for 2 different foundation styles.
- Update equipment utility rack for dual vacuum unit, two thermal control units and one super cooler unit with robot controller platform.
- Provide on-site construction assistance engineering during installation for 6-months.

