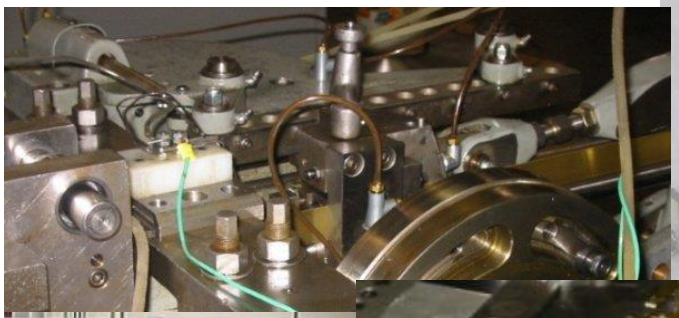


smallparts INCORPORATED

"Excellence & Service with Integrity"

CELEBRATING 50 YEARS

Small Parts to Solve Big Problems

Introduction to SPI - 2021

Introductions

Jerry Villalobos
Business Development Manager
Small Parts Inc.
600 Humphrey St
Logansport, IN 46947
956-777-5294

Doug Azbell
VP Sales & Marketing
Small Parts Inc.
600 Humphrey St
Logansport, IN 46947
574-739-6323

Ben Stephenson
Customer Service
Small Parts Inc.
600 Humphrey St.
Logansport, IN 46947
574-739-6227

Tyler Hiser
Application Engineer
Small Parts Inc.
600 Humphrey St.
Logansport, IN 46947
574-739-6261

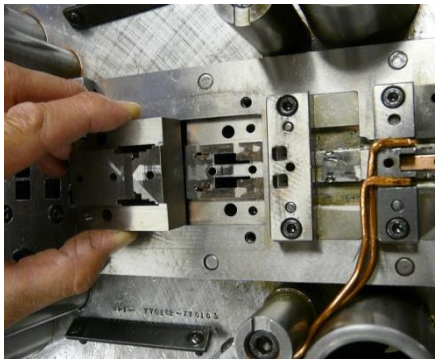
Who is Small Parts?

- Privately owned high precision stamping company established in 1958
- Specializes in high-speed metal forming of non-ferrous metals
- Plant locations in Logansport, Indiana as well as Juarez and Reynosa Mexico
- Industry leader in automated process development
- Extremely financially stable and able to invest

"Excellence & Service with Integrity"

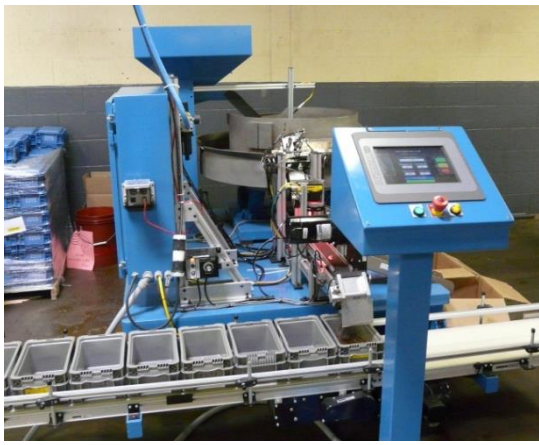
What's new at Small Parts?

- Advancements in tooling design & construction which increase part quality & reduces secondary operations



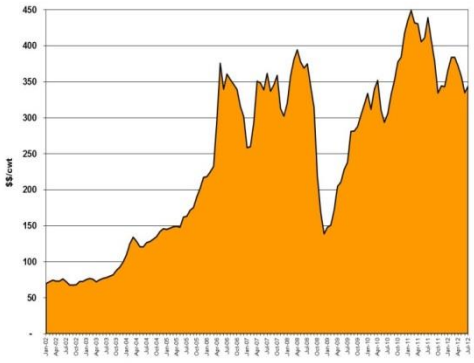
- Automation which replaces manual operations to improve part quality and price

- Co-development of component design with our customers to optimize manufacturability, piece price, tooling cost along with part functionality



- Transforming punch press parts to slide parts which results in better material utilization and therefore, less scrap

- Ability to access various material sources and alternative material specifications along with the ability to offer firm pricing on typically volatile materials



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Slide Forming Can Save Money

Slide Forming

- Up to 30% in scrap savings due to blank layout
- Runs 26 to 400 strokes per minute

Is your part appropriate for slide forming?

	Slide	Press
High Volume (> 250k)	X	X
Wide blank layout		X
In-die welding/tapping	X	X
Burr direction important	X	
Limited tooling budget	X	

Company Profile - Summary

- Small Parts, Inc will be a stable company for years.

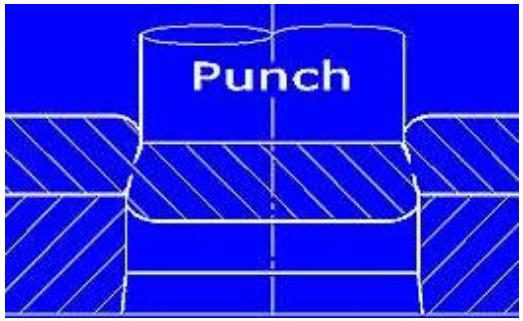
- Small Parts, Inc enjoys opportunities to innovate manufacturing processes which can benefit both **Customer** and Small Parts, Inc

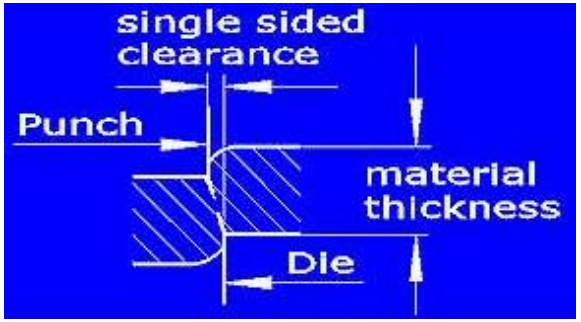
- Small Parts, Inc has domestic plant locations in Logansport, Indiana. Mexican plants in Juarez and Reynosa.

- The major differentiators of Small Parts, Inc are
  - Multiple process choices to select the right one for the job, including stamping and slide forming
  - Access to a wide array of materials
  - Manufacturing process innovation
  - Ability to provide stable material prices

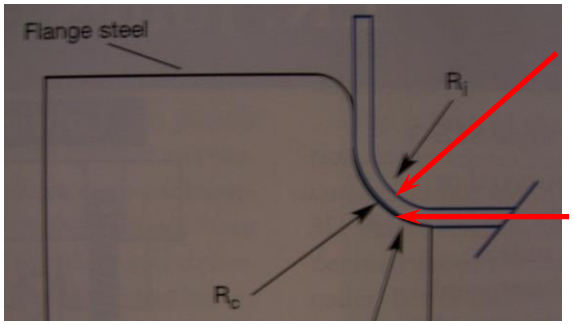
Stamping Basics

- Features are not exactly “cut” but rather sheared under force, which requires clearance and limits the feasible tolerances

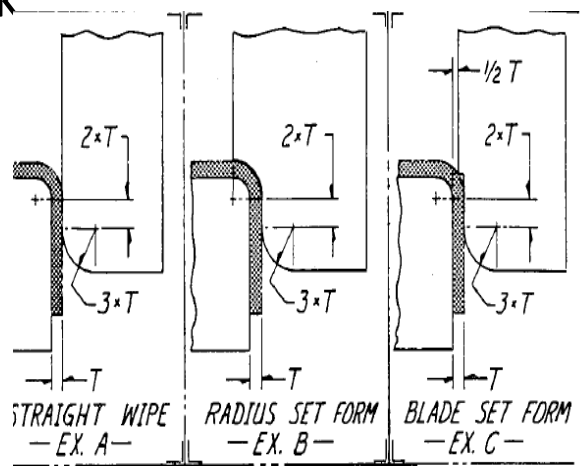




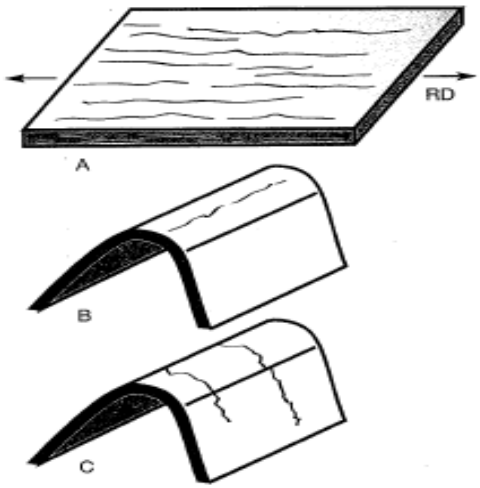
- Inside radii are controlled by the tool, while outside radii are theoretical and subject to spring-back & metal flow



- Bends can be “wiped” in different ways, but only some features are precisely controlled by the tool, and all subject to spring-back



- Folding with the grain can sometimes lead to cracking



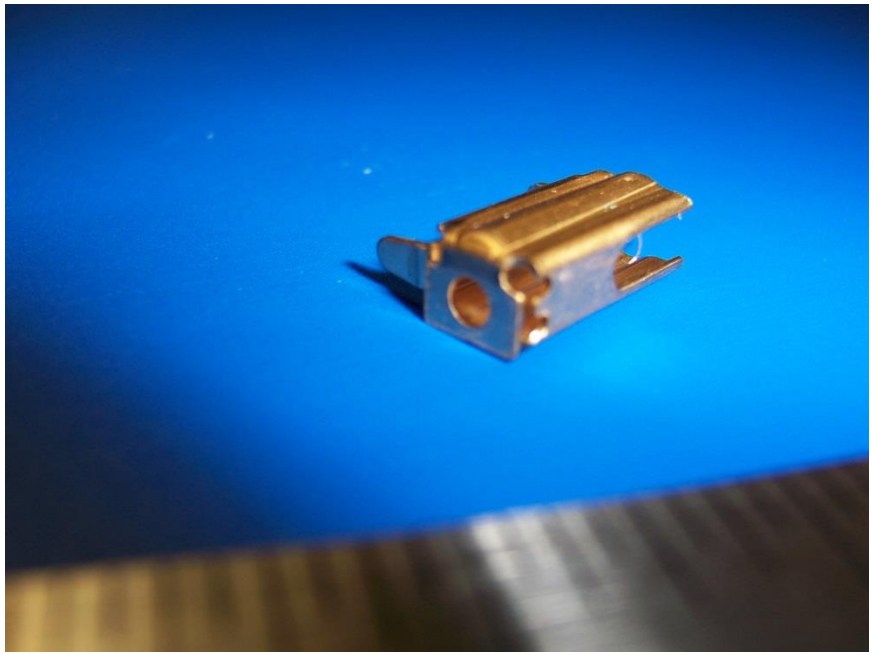
What drives costs of stampings?

- Some cost drivers of stamped components:
  - Blank dimensions and configurations
  - Unnecessarily tight tolerances on non-critical features
  - Quantity, orientation, and tolerances of forms
  - Secondary operations for features or assemblies
  - Material selection
    - Formability (cost due to material compensations)
    - Availability (premiums for proprietary v global)
    - Material Cost (not using lower cost metals)

Increasing Tooling Precision

Problem

- Customer's motor had issues with the brush position and retention, resulting in noise
- Customer instituted extremely tight tolerances on the brush box as the remedy



Solution

- Small Parts worked with the customer to identify what tolerances were feasible in metal forming and critical to the problem the customer was having.
- Small Parts worked to build and develop the forming process and very precise tooling to address the customer's problem

Delivering a Narrower Range

Problem

- Customer had a “jaw” part and was losing money due to assembly fall-out and warranty issues.
- Customer was requiring manual measurement at Small Parts after stamping to sort parts within a smaller range of spring-back

Solution

- Small Parts implemented an in-die measurement system to detect “good” or “bad” parts
- Machine alerts operator if parts are rejected so die can be adjusted
- Small Parts avoided costly secondary measurement while sorting parts to select a smaller portion of the manufacturing range

Cost Effective Automated Sort

Problem

- Existing supplier was having difficulty detecting washers with insufficient heat treatment
- After a “walk home” event by the OEM it was evident thrust washers needed to be 100% inspected, 100% of the time
- Conventional approaches for 100% inspection for hardness, flatness, and nicks or scratches would be expensive.

Solution

- Small Parts built cost-effective, automated inspection systems
- Automatically inspected for:
  - Hardness Range
  - Dimensional Accuracy
  - Damage
  - Mixed Product
- Technology can be adapted for various applications

Eliminate Manual Bolt Insertion

Problem

- High volume terminal was tooled with a manual bolt insertion process
- When the volumes increased the manual process proved to be too costly

Solution

- Small Parts Inc. redesigned the die to automatically feed and install the bolt inside the die.
- Worked with the bolt supplier to improve their part and ensure the part worked well with the new die.
- The solution yielded a process cost savings of 10%

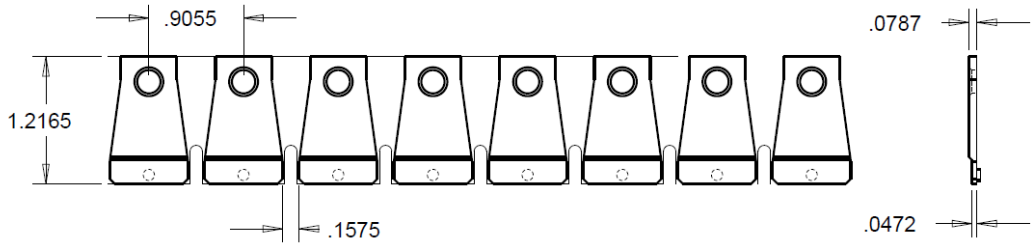
Reduction in Scrap

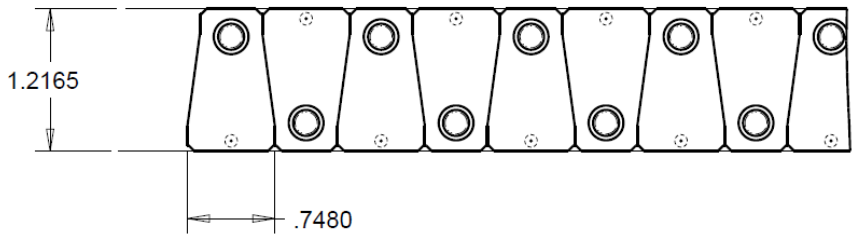
Problem

- A new customer had a part they originally intended to run on a punch press operation
- A punch press operation resulted in nearly 40% scrap of an expensive nickel material

Solution

- Re-designed the tool layout
- A multi-slide application was selected
- Running on a multi-slide press resulted in scrap reduction of 85%.





Eliminate Secondary Process

Problem

- Customer's part design required two separate pieces to be stamped and assembled.
- This design resulted in 2 separate die's and assembly fixture.

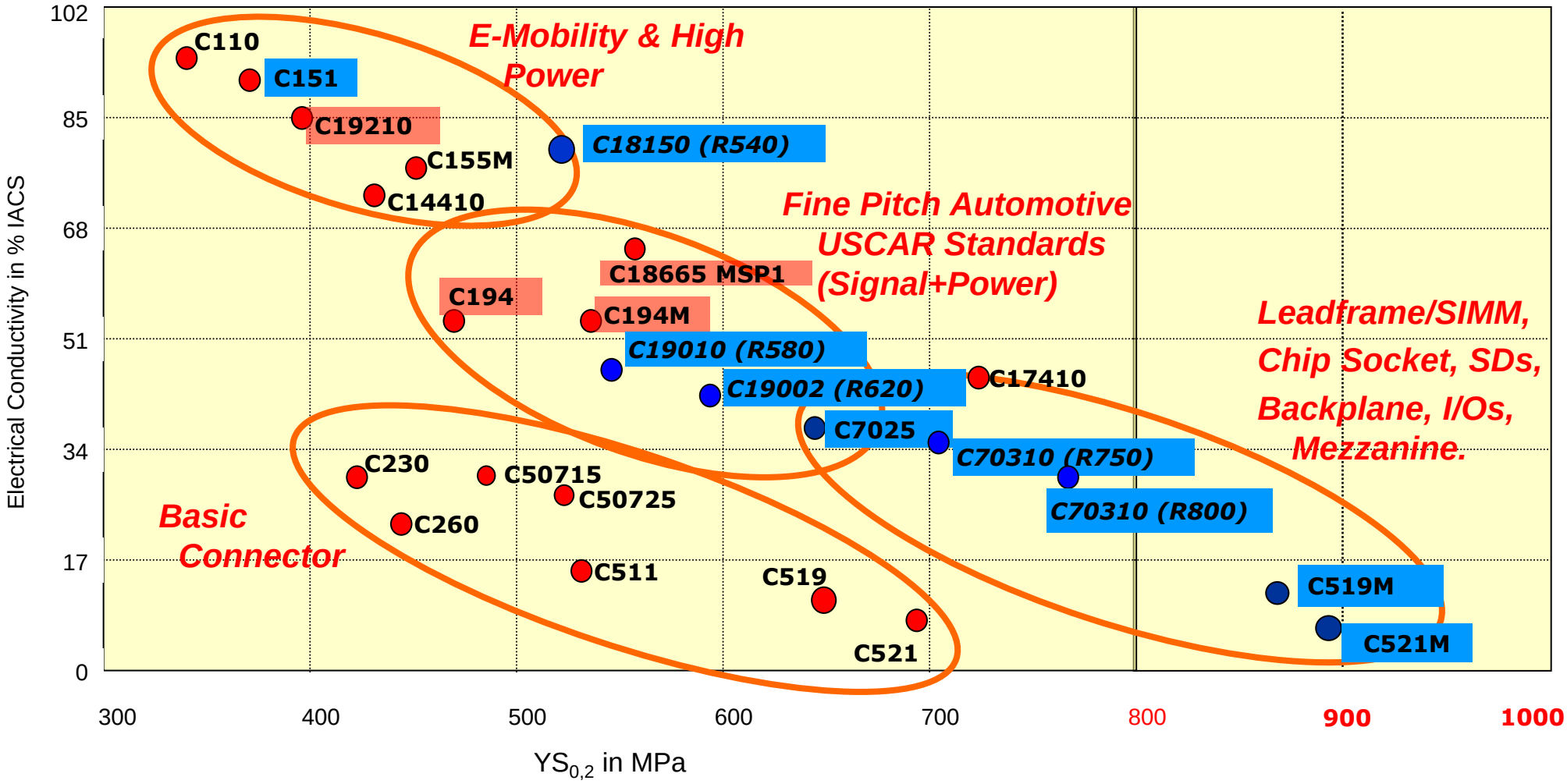
Solution

- Small Parts developed the process to feed two perpendicular strips of material into the press to stamp and assemble the components in-die, thereby eliminating a more costly secondary assembly process

Problem Solving by Small Parts

- Our in-die technology ensures high quality and minimal manual or secondary processes
- Our automation group develops cost effective solutions for increased quality and productivity
- We continue to demonstrate innovative solutions to customers manufacturing issues
- Our experienced design team can optimize your design if involved early in the development process
- We have been actively working with customers and offering innovative solutions for years.

ABC Metals Enabling Technology for Material Solutions



Basic CON = Low Conductivity, Moderate-High Strength (Brasses & Basic Bronze)
LF / Chips = Medium Conductivity, High Strength (Special CuNiSi, CuSn Alloys)
USCAR Std = Moderate Strength, Med-Hi Conductivity (CuNiSi, CuMg, CuFe)
High Power = Moderate-Low Strength, High Conductivity (CuCrZr, CuMg, CuZr)

ABC Metals

A proud supply chain partner

UNCOIL THE POWER!™

MPI Commodity Mgt Systems = Predictable Results

Problem

- Commodity market volatility created raw material pricing instability for an OEM requiring frequent adjustments to their material costs

Solution

- ABC Metals through SPI secured a firmed price the OEM for 3 years via an innovative hedging, strategy.
- **This program began before and was supported through the ‘recessionary’ storm of 2008/2009

ABC Metals

UNCOIL THE POWER!™

Holistic Supply Chain Solutions

Problem

- The original maker of C155 was no longer effective in its production; leading to quality and delivery issues.
- Supply chain to a large manufacturer was jeopardized, with line down issues looming.

Solution

- ABC Metals intervened by offering an alternate alloy STOL77 CuMgSn available globally.
- Qualifying process was quick & seamless.
- Price reduction offered.
- ABC logistics kept line running the customer was uninterrupted

ABC Metals

UNCOIL THE POWER!™

ABC Key Message Summary

- ABC Metals offers full-line support for metal consumers:
  - Access to a wide portfolio of 'Name Brand' High Performance & Engineered alloys supporting global platforms.
  - Enabling technology and alloy services for design phase decisions in OEMs, Tier I assembly houses, Tier II-III stampers and fabricators, etc.
  - Stable and predictable materials cost control using MPI's innovative and proprietary strategies (financial & inventory & hedging modules).
  - Corporate stability and capitalization to support long-term growth and service needs in the Americas (North, Central & South).
  - Multi-plant footprint that directly supports USA and Mexico with corporate wide TS-16949 certification.
  - Processing expertise coupled to internal logistics solutions that mitigate line downs while preserving ROCE goals.

ABC Metals

A proud supply chain partner

UNCOIL THE POWER!™

ABC Metals Product Offering: > 40 Connector Alloys & Coatings

for electronics, automotive & interconnect industries!

Alloy Family	ASTM Reference
Standard Coppers	9 Varieties
Standard Brasses	10 Varieties C210, C220, C230, C240, C260, C268, C270, C272, C274, C280
Standard Tin Bronzes	5 Varieties C51100 C51000 C51900 C52100 C54400

Alloy Family	ASTM Reference
12 Varieties Standardized HPA Alloys	C14410 C14415 C15500 C19210 C19400 C42500 C4252 C50715 - KLF5 C50725 - KLF5Z C7025
Specialty Cu-Ni Bronzes	5 Varieties C70600 C75200 C75400 C75700 C76200

Alloy Family	ASTM Reference
High Performance Alloys Globally Available	C151 CuZr C155M Stol77 C19010 Stol76 C19002 Stol76M C19002 ECO C18665 MSP1 C194M Stol79 C64725 Max251 C70310 Max375 C18150 Stol95
Coatings Electro-Tin, Tin Silver, Tin Alloy & Hardened Tin	Reflow Electro Tin Hot Tin Dip Sn HT SnAgSb SnAg4 SnAg 95/5

Contact ABC Metals for Globally Available Alloy Equivalents (See Brochure)

Thanks!

Jerry Villalobos

Business Development Manager

jervil@smallpartsinc.com

(956) 777-5294 Mobile

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