A Suppliers Perspective to Growth

Society of Automotive Analysts
Urbanization trends are driving changes in governmental regulations, consumer behavior and the automotive industry.

Lightweighting will play a critical role in expediting and maximizing these trends.

- ** Congestion ** --> **ridesharing**
- ** Environment ** --> **electrification**
- ** Safety ** --> **autonomous vehicles**
The Shiloh Value Proposition

- Reduce weight
- Reduce complexity
- Reduce emissions
- Reduce overall cost
- Reduce fuel consumption
TRANSFORMATION OF CAPABILITIES

Shiloh Industries founded
1950: Blanking and stamping capabilities
1993: Laser welding capabilities
2012: Technology expansion (Al casting: NA)
2013: Technology expansion (Mg casting: EU)
2015: Geographic expansion (Central Mexico)
2017: Geographic expansion (Mg casting: NA, EU, AP)

Focus: PROCESS EXPERTISE

Focus: PRODUCT VALUE

Increased scale, geographic diversity and focus on product and solution-based value proposition
THE BEGINNING

Advanced Integration

Liftgate Inner and Reinforcements

4-Pc Curvilinear LWB Liftgate Inner

- Eliminates 4 parts
- Steel savings of 5.45 kg
- Vehicle mass savings of 0.90 kg
- Variable Step Technology can be used for sealing issues
Alternative solutions for OEM design needs

**PRODUCT FOCUS**
Body & Interior Structures

- **Steel Solutions:** Strong and affordable
- **Hybrid Solutions:** Customizable for any requirement
- **Magnesium Solutions:** Ultra lightweight and high performance
Frame Rails:
Multi-material and multi-thickness

Shock Towers:
Optimized multi-material solution

Engine Cradles:
Multi-material, high-strength cross members

Rear Rails:
Lightweight, stiff and strong

Engineered to add strength and reduce weight were needed
Technology-led designs to reduce NVH without adding weight

Proprietary ShilohCore™ on a Crankcase Reservoir System:
lightweight; reduced noise and vibration; corrosion resistant
NOISE-REDUCING TECHNOLOGIES
Advanced Materials - ShilohCore™ Dash Panel

- Maintains NVH performance for “Life of Vehicle”
- Reduced manufacturing floor space requirements
- Enabled use of UHSS frame rail while maintaining NVH damping
- ShilohCore applied to vertical surfaces not accessible to LASD robots
- Dash panel stamped with damping patch already in place on the blank
- Slots and welds required for formability of the patch

Reduced total system cost
Reduced weight by 2kg
Reduced NVH by 2dB
NEXT GENERATION TECHNOLOGIES
Advanced Processes - Aluminum Laser Welding

Reduce weight and optimize material without compromising performance and formability

Aluminum monolithic door inners versus Shiloh’s aluminum laser welded door inners

- 20% reduction in weight per vehicle
- 25% cost savings
The future of lightweighting will require more and more multi-material product solutions

We continue to develop core knowledge and expertise:

Materials
- Alloy steels: mild, HSS/AHSS, next generation, stainless
- Aluminum alloys
- Magnesium alloys
- NVH materials

Multi-material joining
- Adhesives
- Mechanical Joining
- Welding: Laser, MIG/TIG, Spot

Welding | Flow Screws | Riveting
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MIXED MATERIAL SOLUTIONS

Crankcase reservoir system

ALUMINUM RESERVOIR
• Integral mounting features
• Fluid passages and integrated connection points
• Weight savings of ~30%

LAMINATE ALUMINUM PAN (ShilohCore™)
• Reduced engine noise
• Reduced transmitted structural noise
• Improved crack resistance with low clearance
• Reduced weight by optimizing structure and material selection

ASSEMBLED SOLUTION
• 18 components assembled and shipped
• Reduction in customer bill of materials
• Ease of attachment for OEM
THE CRITICAL LINK
Upfront Development

Redesigned existing aluminum system; making aluminum lighter…

The key to maximizing lightweighting is through up-front collaboration with our customers

- Estimated total cost of aluminum housing less than cast iron design with nearly 50% weight reduction

- 10 lbs

- 24 lbs
At Shiloh, we believe in:

creating innovative solutions for sustainable mobility and a safer, healthier environment
THANK YOU

For more information visit shiloh.com or contact us at marketing@shiloh.com