

**WARREN**  
AUTOMOTIVE DE MEXICO

**STAMPING, ASSEMBLY &  
WELDING**

# Warren Industries – At a Glance

**Tier 1 & Tier 2**  
Supplier

**1990**  
Founded

**4**  
Plants

**+450**  
associates

**80M (CND)**  
Turnover

**Vaughan, Ontario**  
Headquarters

Canadian supplier of stampings, machined components and mechanical assemblies to the global auto parts industry.

The company also supplies components to the tooling and mould-making industry.

Warren also operates an Innovation and Technology Centre, which engineers products for the automotive, consumer products and healthcare industries

Warren holds several patents for mechanical and electro-mechanical devices.



# DIRECT & INDIRECT CUSTOMERS

Tier 1 Customers:



Tier 2 Customers:



# Warren Automotive México



**Tier 1 & Tier 2**  
Supplier

**100,000** Sq ft  
Building

**2016**

Founded



Querétaro



Quality certifications

**IATF**

**CQC**



# STAMPING

# CAPABILITIES

PROGRESSIVE & TRANSFER

## PRESS

**600**

Ton Press

**50**

SPM

**144" x 60" x 36" SH**

Bed Size

## FEED SYSTEM

**1.0-6.0mm**

Material Thickness

**100-1,000mm**

Material Width

**Full** tool room

Two **20 ton** cranes



# CAPABILITIES

## PROGRESSIVE

### PRESS

**600**  
Ton Press

**30**  
SPM

**144" x 48" x 36" SH**  
Bed Size

### FEED SYSTEM

**1.0-6.0mm**  
Material Thickness

**100-1,000mm**  
Material Width

### PRESS

**400**  
Ton Press

**70**  
SPM

**108" x 48" x 36" SH**  
Bed Size

### FEED SYSTEM

**1.0-6.0mm**  
Material Thickness

**100-1,000mm**  
Material Width

**Full** tool room

Two **20 ton** cranes

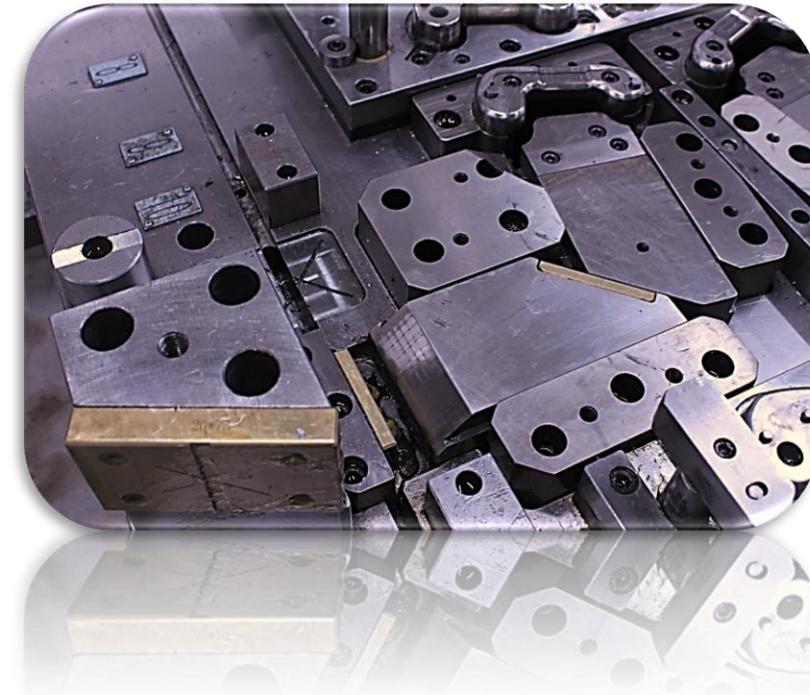


# STAMPING DIE PROCESSES

- Progressive & Transfer
- Extrusions
- In die Tapping
- In die Nut & Stud Staking
- Draw Operations
- Cam Operations
- Tight Tolerance Stampings
- High strength & Dual Phase Materials



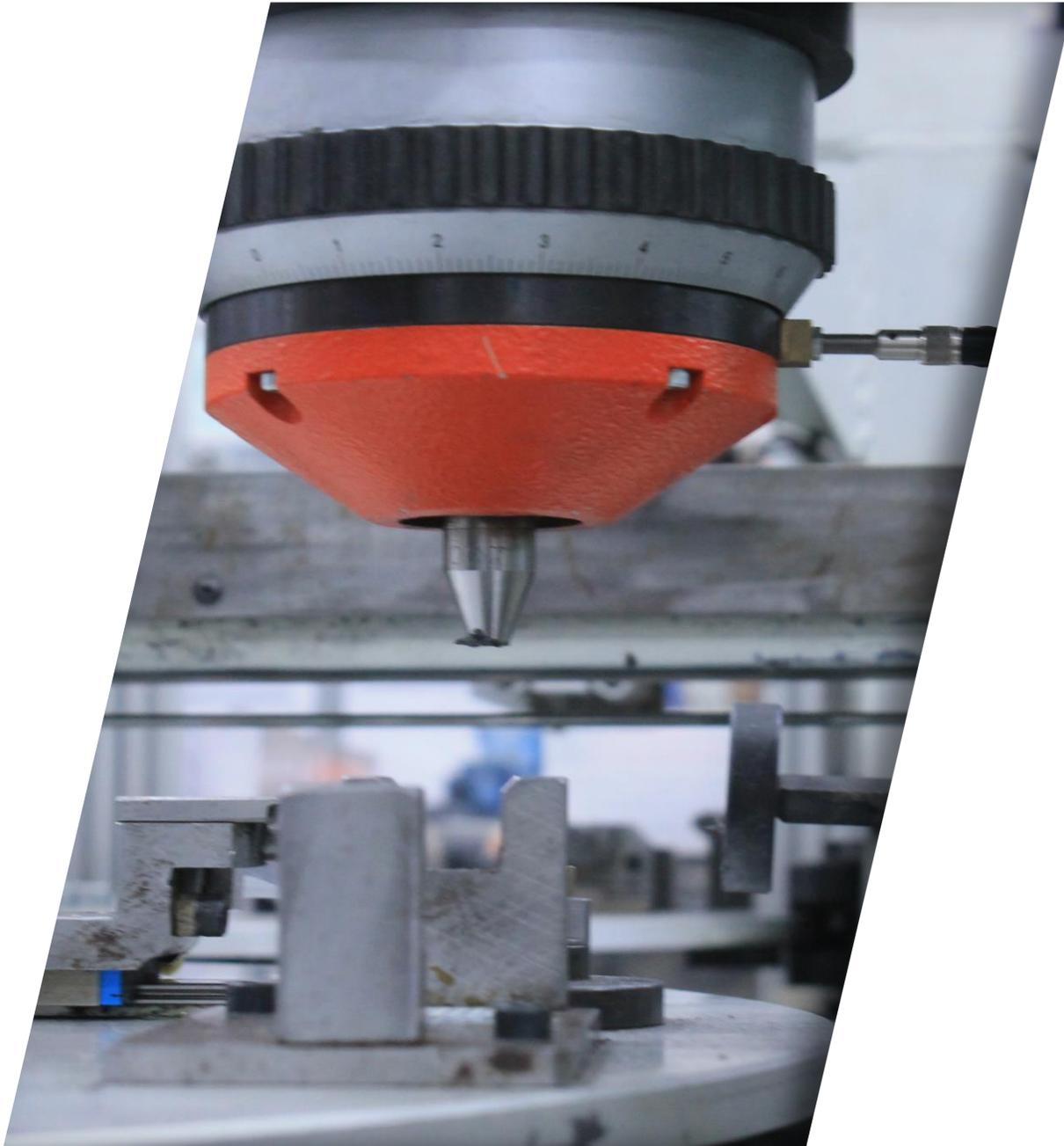
# CAM OPERATIONS



# TIGHT TOLERANCE

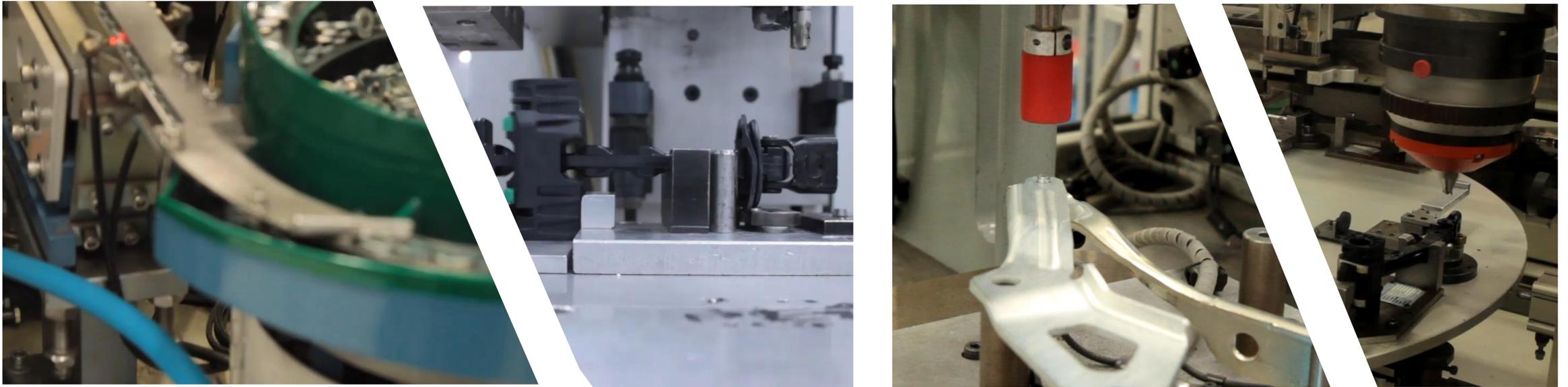
**± 0.2mm** Perpendicularity  
tolerance from mounting surface  
to rivet surface.





# ASSEMBLY

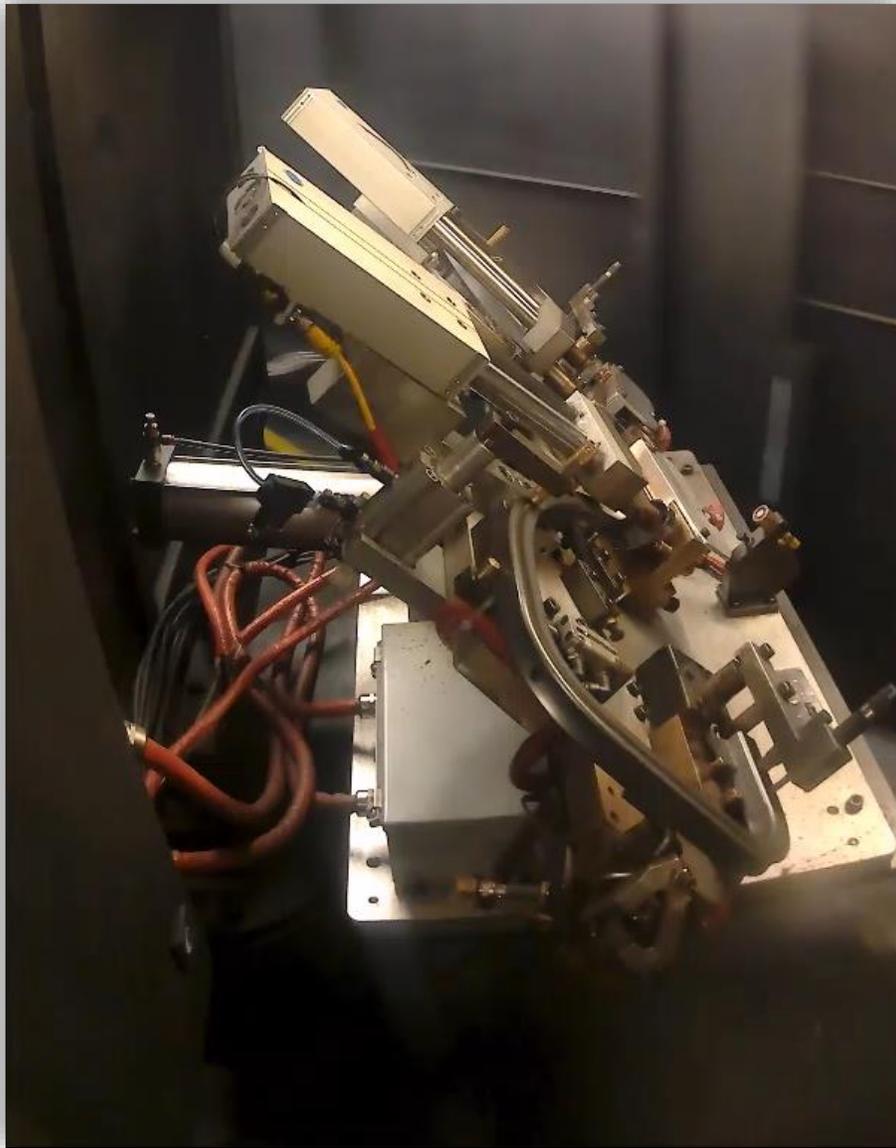
AUTOMATED & SEMI-AUTOMATED ASSEMBLY CELLS



Riveting | Bushing Insertions | Torque Testing | Grease Injection | Oiling

# WELDING





6 axis robot arms

# MIG | MAG | RESISTANCE



Robotic welding cells

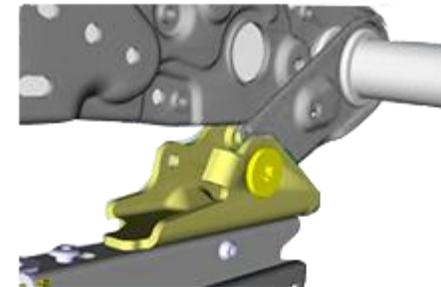
# APPLICATIONS (STAMPINGS)



WINDOW COMPONENTS



SUNROOF COMPONENTS



SEATING COMPONENTS

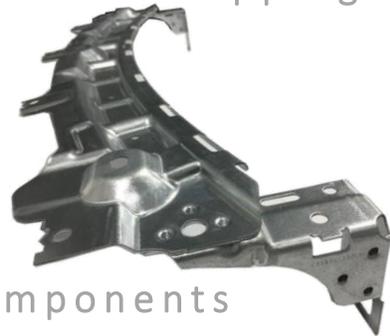
# APPLICATIONS (STAMPINGS)



Roll and lock housings



Front end structural components, brackets, in-die extrusion and tapping



Active Radiator Vent Components



Stamped transmission components (grinding or secondary machining)



Inner door modules (Forming steel), Structural stampings (High Strength and Dual Phase steels), Brackets (various grades of steel)

# MECHANICAL ASSEMBLIES



DECKLID HINGE



HOOD HINGE

# MECHANICAL ASSEMBLIES



DOOR HINGE

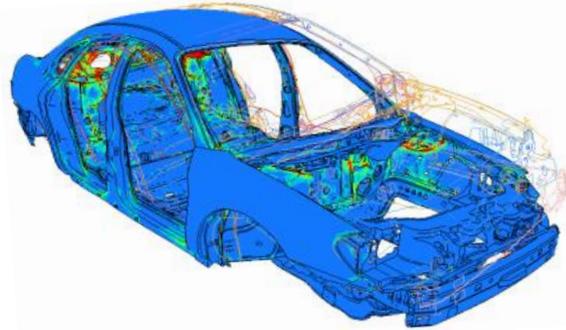


DOOR RETAINER

# FINITE ELEMENT ANALYSIS

Structural Mechanics (Static or Quasi Static Analyses)

Impact and Crashworthiness (Dynamic Analyses)



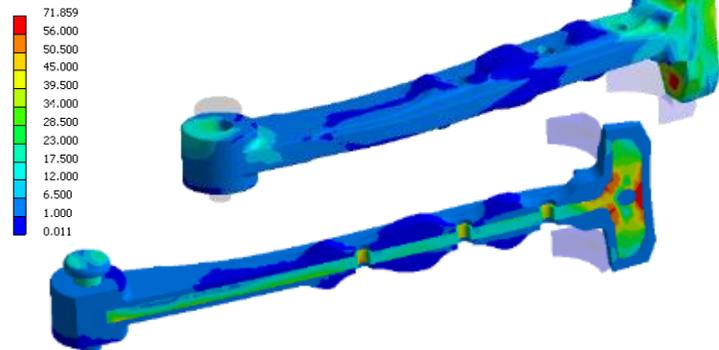
Linear + nonlinear structures, systems and materials |  
Durability | Vibrations | Contact | Load case development  
| Simple to very complex structures



Extremely large deformation events | Vehicle  
crashworthiness | Impact | Material failure | Drop-test

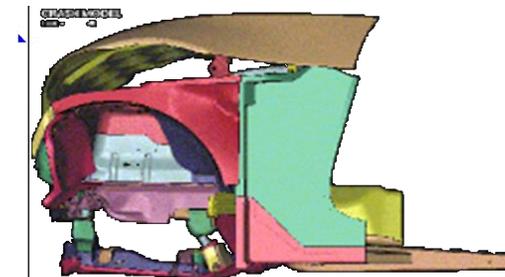
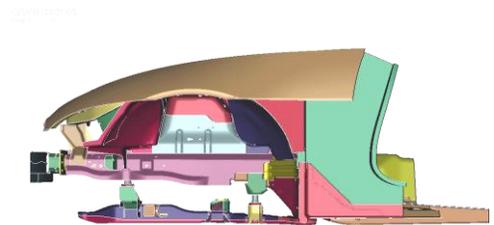
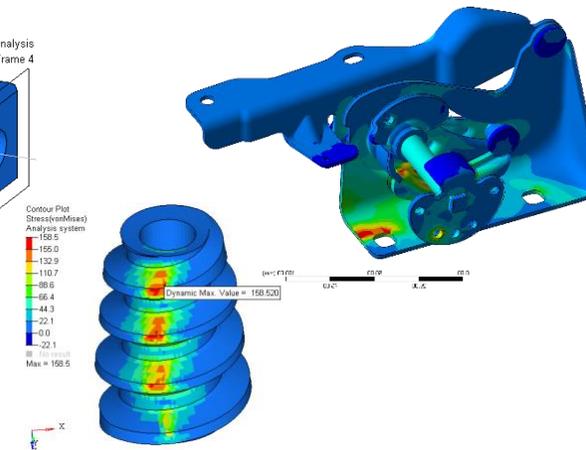
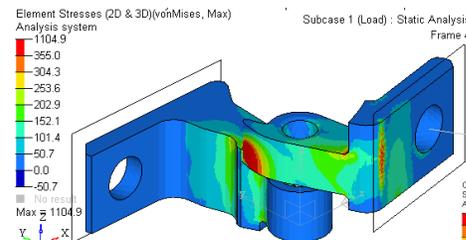
Equivalent (von-Mises) Stress  
MPa  
Max: 7.186e+001  
Min: 1.128e-002  
Step: 4 / 7  
2008/01/19 10:20

*Finite element mesh*



*Stress predictions in moulded plastic*

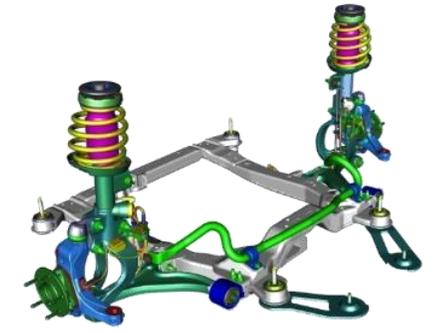
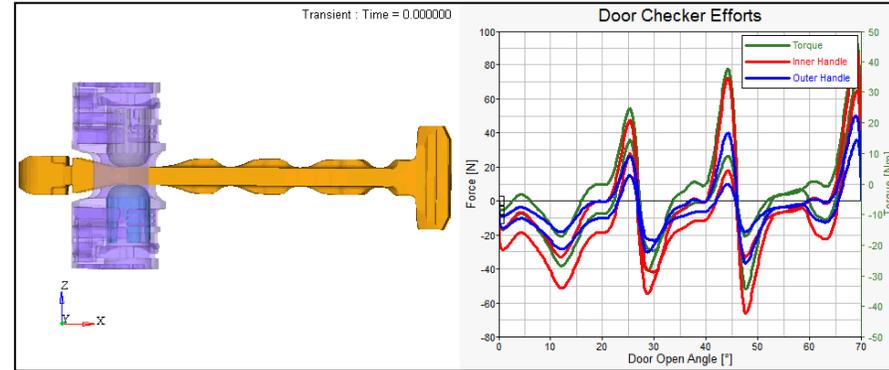
*Stress predictions in steel core*



# SIMULATION

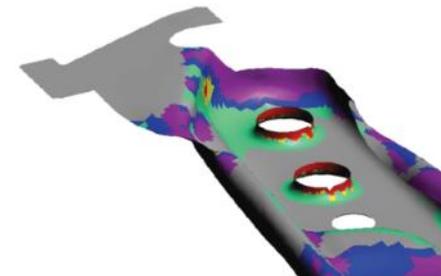
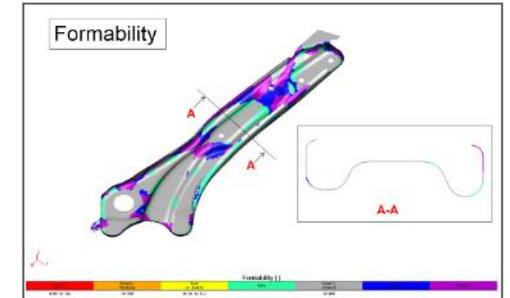
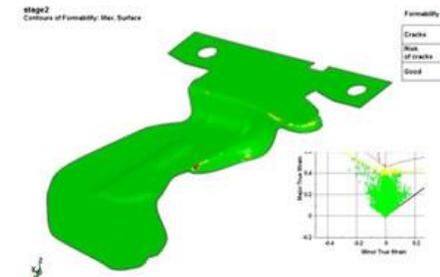
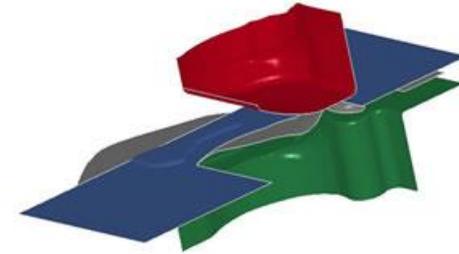
## Mechanisms and Motion

- Multi-body + flex body dynamics
- Vehicle dynamics
- Control of dynamic systems
- Loads development
- Kinematics
- Functional envelope definition
- Tolerance and adjustment sensitivity evaluation



## Manufacturing Simulation

- One-step and incremental metal forming analysis
- Advanced metal forming (e.g. progressive dies, die and process design, SPF, etc.)
- Blank shape prediction
- Strip nesting and optimization
- Formability assessment and process optimization
- Tooling development and prototyping



# IDBS – INTELLIGENT DOOR BRAKE SYSTEM

## Benefits to the End Customer

- Enhanced user experience
- Impact on perceived vehicle quality
- Reliably holds door at any angle (infinite check positions)
- No detents or ramps to overcome while operating door
- No tendency for door to “fall” into a detent position
- Vehicle inclination compensation to reliably hold door on hills
- Static obstacle avoidance
- Dynamic obstacle avoidance (i.e. cyclist avoidance)
- Flung open damping
- Slam closed damping
- Smooth, free-running operation
- Possible end-user programmable features:
  - Adjustable maximum door open angle
  - Door position locking feature
  - Door feel



## Benefits to the Vehicle Manufacturer

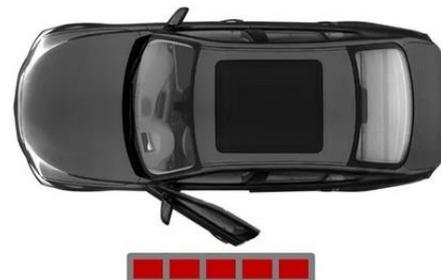
- Competitive advantage from end user recognizable features
- Physical integration: the system is designed to fit into the same location and packaging envelope as most traditional, separate style door checkers
- Can be a scalable (for features) or a consumer selectable option (trim level)
- Fully tuneable and customizable door efforts and feel
- Imparts similar loading conditions on the door and pillar systems as separate style door checkers
- Impact reduction during dynamic events (flung open and slam closed energy absorption)
- Light weight construction
- Integration with existing electronic systems (if desired)
- Ease of installation
- End stop load carrying capability



*Fling and Slam Damping*



*Static Obstacle Avoidance*



*Inclination Compensation*



*Dynamic Obstacle Avoidance*



# iDBS – iNTELLIGENT DOOR BRAKE SYSTEM

Please visit us at: [www.warrenindustries.ca/idbs](http://www.warrenindustries.ca/idbs)

**WARREN**  
INDUSTRIES LTD

HOME IDBS



Welcome to the future of smart doors!

The Warren Industries Intelligent Door Brake System, or iDBS, is a patented electro-mechanical door brake, designed to bring unprecedented levels of functionality, convenience and safety to manually operated automobile doors. When combined with sensors, the system has the ability to adapt to user inputs, changing external conditions or potential safety hazards.





Av Finsa # 3 Bodega C  
Parque Industrial FINSA II  
El Marques, Querétaro  
Tel: +52 (442) 153-7700  
[sales@warren.com.mx](mailto:sales@warren.com.mx)  
[warrenindustries.ca](http://warrenindustries.ca)

THANK YOU