

**CES 2022**

The background of the slide is a horizontal band featuring an abstract digital design. It includes glowing red and blue lines that form wireframe-like structures, possibly representing architectural or engineering models, set against a dark background.

# Distinction & Experience

# Index

|                                     |    |                                      |    |
|-------------------------------------|----|--------------------------------------|----|
| FreeForm™                           | 4  | LiDAR                                | 16 |
| Long Rails                          | 5  | Magna Vision™ Panel                  | 17 |
| IP Nesting                          | 6  | Magna Mezzo™ Panel                   | 18 |
| Stadium Swivel Seat                 | 7  | Active Rear Spoiler                  | 19 |
| FlecsForm™                          | 8  | SmartLatch™                          | 20 |
| Surface Element Lighting            | 9  | SmartAccess™                         | 21 |
| Intelligent Interior Lighting       | 10 | SmartAccess™ Power Frunk             | 22 |
| Decorative Lit Surface              | 11 | SmartAccess Power Charge Flap        | 23 |
| Multi-Access Thermoplastic Liftgate | 12 | SmartAccess™ Power Flush Door Handle | 24 |
| ICON™ RADAR Long-Range              | 13 | Haptronik™ Motion Control            | 25 |
| ICON™ RADAR Mid-Range               | 14 | In-Glass Interactive Touch           | 26 |
| ICON™ RADAR Ultra Short-Range       | 15 |                                      |    |

# FreeForm

Magna FreeForm™ is an innovative new seat trim cover technique that provides OEMs with a single smooth, seamless styling surface with hidden tiedowns. It enables the freedom to achieve endless design possibilities, high seat concavity, improved seat back comfort and enhanced cleanability.



Smarter



Cleaner



Lighter



Design



New Mobility



First to Market



Patented



Exclusive@Magna

## Competitive advantage/differentiators

- Remarkable design & styling flexibility
- Allows for rapid mid cycle trim changes
- Reduces production variation, improves overall quality and craftsmanship
- Limited capital requirements make it applicable to large scale global programs

## Benefits

- Provides a highly concave surface without material bridging or traditional tie-downs
- Allows for various shapes and crisp styling lines that result in prominent visual effects (Seamless A or B surface designs)
- Provides a back panel with a “soft touch” while maintaining shape, improving rear seat occupant knee clearance

SOP

Ideation

Discovery

Concept

Development

Series Preparation

In Production

# Long Rails

Magna's power Long Rail technology provides ease of reconfigurability and flexibility for various occupant and cargo situations. The vehicle cabin can be reshaped to offer a more useable and collaborative interior for the autonomous vehicle, ride sharing and car sharing scenarios of the future.



Smarter



New Mobility



Electrification

## Competitive advantage/differentiators

- Enables conference / cargo mode seat arrangements
- Power version with quick and comfort adj
- Manual override ability
- Removable seat attachment
- Mountable inside the floor

## Applications

- 2 row or 3 row SUV and Commercial Vehicle configurations

## Additional Information

- These weights are estimates and based on CAD, they are subject to change
- Manual Long Rail –
  - Generic Lower Channel (Mass: 2.3735 gm/mm)
  - Generic Upper Channel (Mass: 1.1686 gm/mm)
- Power Long Rail -
  - Generic Lower Channel (Mass: 3.872 gm/mm)
  - Generic Upper Channel (Mass: 1.3083 gm/mm)

SOP

Ideation

Discovery

Concept

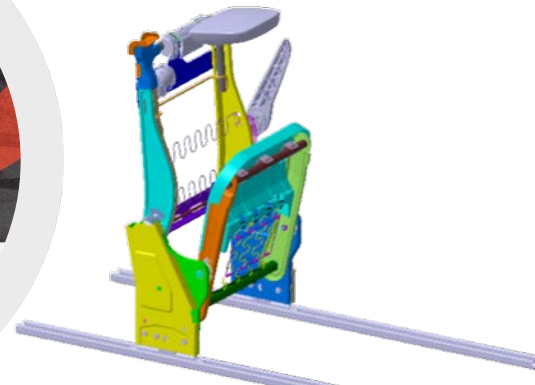
Development

Series Preparation

in Production

# IP Nesting

The passenger seat nests into the instrument panel by combining stadium cushion flip-up and long rails to provide cargo storage space for improved mobility. The use of a stadium cushion and long rails provides additional cargo storage space and an enhanced user experience by offering an adaptable, flexible interior.



Smarter



First to Market  
Opportunity



Co-Development  
Opportunity



New Mobility



Autonomy



Electrification



Magna Exclusive



Patent Pending



Industry First

## Competitive advantage/differentiators

- One step, single-handed operation to move seat to IP nesting position
- Seat back recline
- Fore/aft comfort adjustment
- Integrated restraint system (ABTS capable)
- Option for power IP nesting

## Applications

- Coupes, Sedans, MPVs, SUVs and Commercial Vehicles

SOP

Ideation

Discovery

Concept

Development

Serial Preparation

in Production

# Stadium Swivel Seat

Magna's Stadium Swivel Seat technology provides a flexible, reconfigurable seating solution for future mobility scenarios including autonomous vehicles, ride sharing and car sharing. The ease of operation and adaptable interior space enhance the occupant's experience.



Smarter



New Mobility

## Competitive advantage/differentiators

- Enables conference / campfire seat arrangements
- Best-in-class swivel mechanism package and stadium cushion enable compact swivel arc
- Low rotational efforts and high rotational stability through use of rolling elements in swivel mechanism

## Applications

- 2 row or 3 row SUV and Commercial Vehicle configurations
- Improves consumer social engagement

SOP

Ideation

Discovery

Concept

Development

Series Preparation

in Production

# FlecsForm™

Advanced lighting technology that utilizes high speed direct transfer technology of mini LEDs onto flexible circuits to enable thinner, more efficient lighting solutions that enhance styling.



Smarter



Safer



Electrification



First to Market



Patented



Design

Co-Development  
Opportunity

Exclusive@Magna

## Competitive advantage/differentiators

- Uniform lighting in an extremely thin and flexible package
- Enables complex shapes and endless design possibilities
- Provides styling freedom for brand/series signature lighting
- Robust and cost-efficient OLED alternative light source
- Thermally efficient, low power consumption and lightweight
- Communication display capabilities
- Supports intricate animation function
- Functions – Tail, Stop, Turn, Backup
- White LED development for high lumen output (fog, DRL, low beam)
- RGB color in development
- RFQ Ready

SOP

Ideation

Discovery

Concept

Development

Series Preparation

in Production

# Surface Element Lighting

Homogeneous and vivid LED panels offering unique 3D styling opportunities and customizable animations.



Smarter



Safer



Electrification



Design



Co-Development  
Opportunity



Industry First



Patented

## Competitive advantage/differentiators

- Thin 3D embodiment (minimum thickness 4mm)
- High luminous intensity
- Curved surface designs are possible
- Brand differentiation with animations
- High reliability
- OLED style design language at lower cost

## Applications

- Taillight
- Individual element animation
- Rear stop light (under development)
- Rear turn indicator (under development)

SOP

Ideation

Discovery

Concept

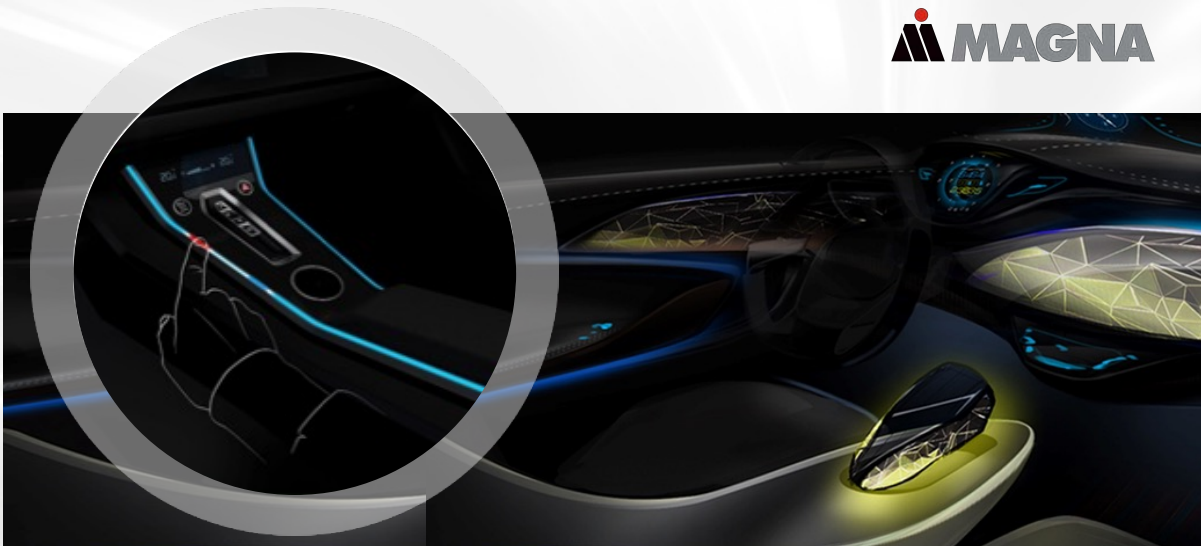
Development

Serial Preparation

In Production

# Intelligent Interior Lighting

Functional ambient lighting stripes creating new consumer experiences. Enabling enhanced functionalities including dynamic animations, communication and function control.



Smarter



Electrification



Autonomy



New Mobility



First to Market



Design



Co-Development Opportunity



Exclusive@Magna



Patented

## Competitive advantage/differentiators

- Fluent and dynamic animations
- Enables sharp contrast
- No need for LED calibration at Tier 1 or OEM
- Dedicated communication network with communication speed >LIN, >CAN (>2Mbit/s)
- Possible 4079 LEDs in 1 chain at full speed

## Applications

- Ambient lighting especially dynamic light stripes/light guides for functional purpose (notification alerts, real time warnings)

SOP

Ideation

Discovery

Concept

Development

Series Preparation

in Production

# Decorative Lit Surface

Illuminated brand distinction by enabling light through exterior surfaces. Decorative designs for lit logos or custom patterns are possible utilizing Magna's advanced processes and materials.



Safer



Design



First to Market



New Mobility



Co-Development  
Opportunity



Exclusive@Magna

## Competitive advantages/differentiators

- Hidden-until-lit lighting effect
- High quality decorative coatings and light through translucent geometry
- Seamless integration into exterior surface part
- Homogenous lit appearance
- Utilizes state-of-the-art light engines

## Applications

- Applications developing with EV/AV regulation updates
- Emerging lit applications requiring flexible parts

# Multi-Access Thermoplastic Liftgate

Lightweight, integrated, split liftgate closure system for evolved access to suit lifestyle demands. Features future forward surface level controls and communication.



Smarter



Cleaner



Lighter



First to Market Opportunity



Electrification



Autonomy



New Mobility



Design



Co-Development Opportunity



Patent Pending

## Competitive advantage/differentiators

- ADAS sensors, lighting, and trim integrated into the surface
- Molded-in texture possible on surfaces
- Hidden-until-lit light effect
- Morphing aerodynamics
- Quick access hatch
- Control/display panel integrated into the surface

## Applications

- Electric vehicles
- Autonomous platforms
- Rideshare platforms

SOP

Ideation

Discovery

Concept

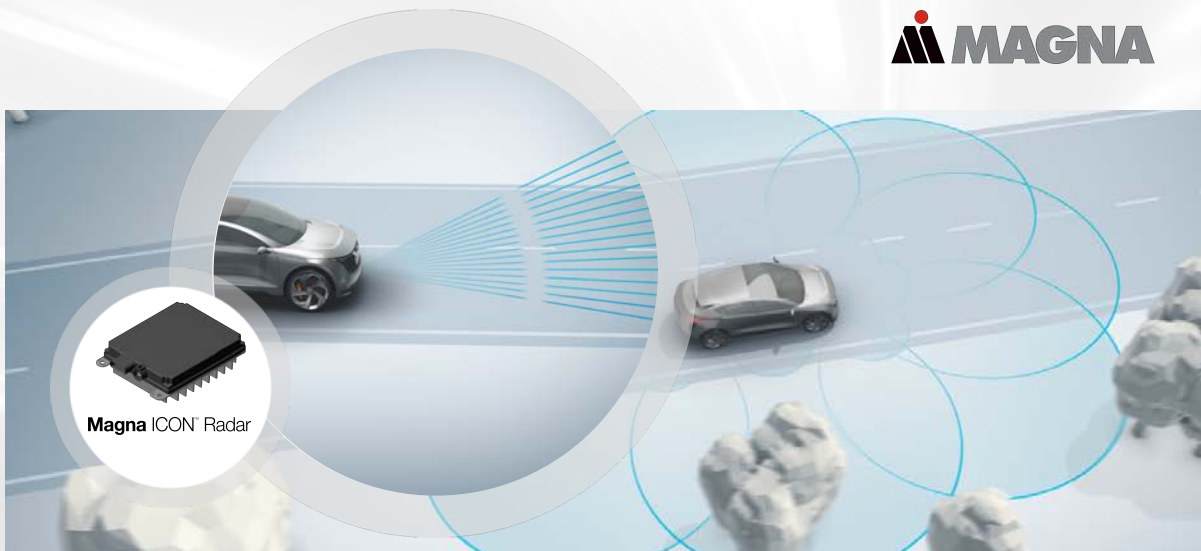
Development

Series Preparation

in Production

# ICON™ Radar Long-Range

The industry's first to market digital code modulation 4D imaging radar. Best-in-class range & resolution, safety through enhanced perception.



Smarter



Safer



Autonomy



New Mobility



First to Market  
Opportunity

## Competitive advantage/differentiators

- Digital encoded Phase Modulated Continuous Wave (PMCW) Radar technology
- 4D sensing enhances perception with object separation in range, velocity, azimuth & elevation
- High dynamic range – detects small objects relative to a larger object
- High vehicle detection range of >300m
- Detection of pedestrians of >150m

## Features

- Full Speed Range ACC with VRU AEB
- Traffic Jam Assist
- Debris on road AEB/AES
- L2+ highway driving support
- Localization & mapping

SOP

Ideation

Discovery

Concept

Development

Series Preparation

in Production

# ICON™ Radar Mid-Range

The industry's first-to-market digital code modulation 4D imaging radar. Our Mid-Range ICON Radar offers a 360° cocoon encompassing >160m, supporting L2+ features.



Smarter



Safer



Autonomy



New Mobility



First to Market  
Opportunity

## Competitive advantage/differentiators

- Digital encoded Phase Modulated Continuous Wave (PMCW) Radar technology
- Superior pedestrian detection – VRU regulation
- Common sensor for all mid-range applications with expanded features
- Angular separation – discrimination of pedestrians and small objects

## Features

- Enhanced Rear and Front Cross Traffic
- Blind Spot / Lane Change Assist
- Lateral Collision Mitigation
- Intersection (Crossing) Protection
- ACC Stop & Go
- Small object detection

SOP

Ideation

Discovery

Concept

Development

Series Preparation

in Production

# ICON™ Radar Ultra Short-Range

Seamless integration by Magna. This USRR allows integration options in existing design elements, including in the door handle, liftgate or interior.



Smarter



Safer



Autonomy



New Mobility



First to Market  
Opportunity

## Competitive advantage/differentiators

- UWB FCMW scalable for 60 GHz or 79 GHz implementation
- Improved occupant safety through biometric sensing
- ADAS sensor – 20m range
- Enhances vehicle access solutions by mapping and classification
- Gesture recognition for feature control

## Features

- Automated & Controlled Door Opening
- ADAS Support & Fusion
  - Blind Spot
  - Park Spot
  - Automated Lane Change
  - Side Clearance
- Interior Sensing – Occupant Monitoring

SOP

Ideation

Discovery

Concept

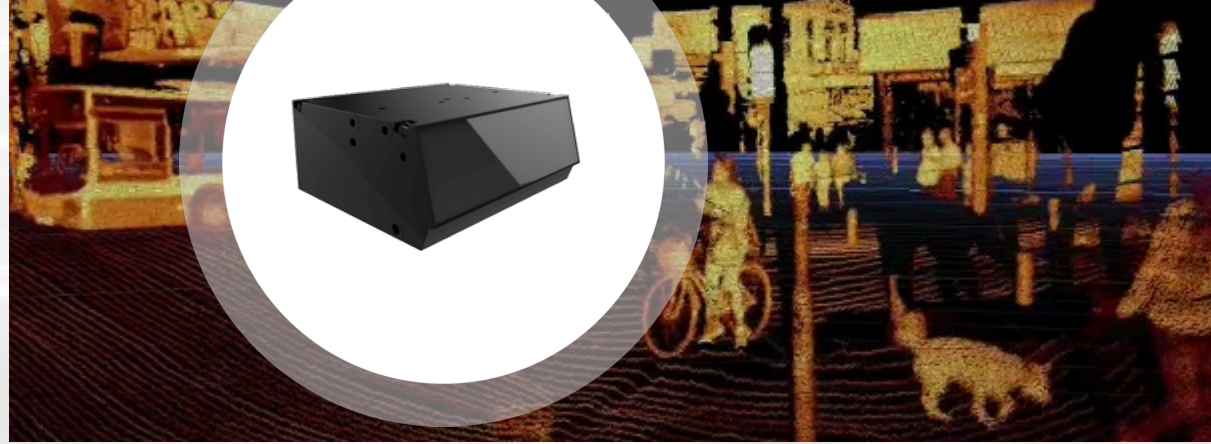
Development

Series Preparation

in Production

# LiDAR

Magna has the 1<sup>st</sup> solid state high-resolution LiDAR. An essential part of ADAS sensor suite to supports L3 hands off highway scenarios and L4/L5.



Smarter



Safer



Autonomy



New Mobility

## Competitive advantage/differentiators

- Solid state for increase reliability
- Dense point cloud for detections and contouring
- Environment imaging and localization
- Dynamically adjustable field of view, range and resolution at run time

## Features

- Object Detection (including small objects like tires) to support hands free driving
- Supports Highly Automated Driving and Fully Automated Driving use cases
- Long range detection capability for low reflectivity targets
- L2+/L3 Supporting Features

SOP

Ideation

Discovery

Concept

Development

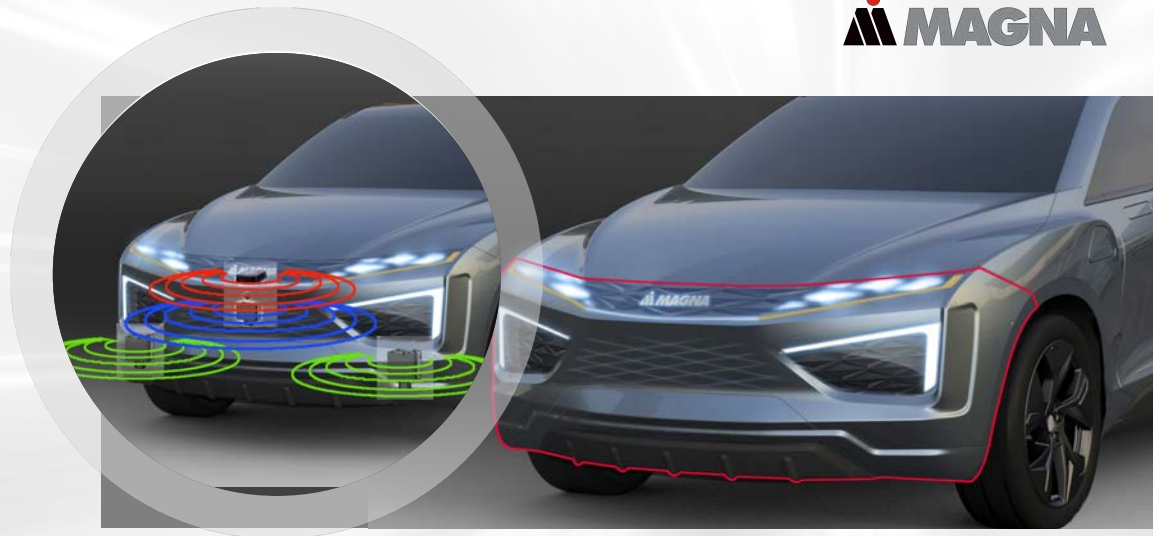
Series Preparation

in Production

# Magna Vision™ Panel



Full front end with functional and decorative elements integrated into one seamless module. Integrating state-of-the-art sensors, cameras, lighting and aerodynamic technologies. Magna's Vision™ Panel enables ADAS capabilities, aerodynamic functionality and allows OEM's unique brand distinction.



Smarter



Safer



Lighter



Magna Exclusive



Design



First to Market  
Opportunity



Co-Development  
Opportunity



Patent Pending



Electrification



Autonomy



New Mobility

## Competitive advantage/differentiators

- Lit surface decoration possibilities including Chrome, Paint and Film effects
- Thin molded panel with large-format in-mold film technology
- Hidden-until-lit lighting features
- Animated lighting capability
- State-of-art radar sensor functional integration
- Integrated forward lighting
- Integrated Class A Active Aerodynamics

## Applications

- Electric vehicles
- Internal combustion vehicles
- ADAS integrated panel modules

# Magna Mezzo™ Panel



First-to-market, large-format decorated front panel using in-mold film. Integrating state-of-the-art sensors, cameras and light technologies to enable unique OEM brand distinction. Combining innovative materials and process technologies to achieve a high-quality lit surface and seamlessly integrate radar.



Smarter



Safer



Lighter



Magna Exclusive



Design



First to Market  
Opportunity



Co-Development  
Opportunity



Patent Pending



Electrification



Autonomy



New Mobility

## Competitive advantage/differentiators

- Lit surface decoration possibilities including: Chrome, Paint and Film effects
- Thin molded panel with large-format in-mold film technology
- Hidden-until-lit lighting features
- Animated lighting capability
- State-of-art radar sensor functional integration
- Materials and process development supported by Covestro

## Applications

- Electric vehicles
- Internal combustion vehicles
- ADAS integrated panel modules

# Active Rear Spoiler



Cleaner

Co-Development  
Opportunity

System integrated into spoiler that optimizes airflow in vehicle wake to minimize aerodynamic drag, which extends range and reduces emissions



| Metric | 3-7                 | 0.06                        | 1.33                           | 22                   |
|--------|---------------------|-----------------------------|--------------------------------|----------------------|
|        | Co Benefit (Counts) | WLTP Fuel Savings (L/100km) | CO <sub>2</sub> Savings (g/km) | Mass Equivalent (kg) |

| Imperial | 3-7                 | 0.29                       | 1.47                           | 34                   |
|----------|---------------------|----------------------------|--------------------------------|----------------------|
|          | Co Benefit (Counts) | EPA Hwy Fuel Savings (mpg) | CO <sub>2</sub> Savings (g/mi) | Mass Equivalent (lb) |

## Competitive Advantage/Differentiators

- Reduces vehicle drag
- Best practice design and utilization to achieve vehicle requirements
- Design flexibility to allow for multiple modes (aero, sport, track, etc)
- Marketing benefits

## Applications

- Applies to hatch profile vehicles (SUV/CUV/Wagon)
- Actuated based on vehicle inputs

# SmartLatch™

Side door latch system where all features and functions are controlled by an integrated ECU not only decreasing cost and weight in the door but allowing for complete styling flexibility.



Smarter



Safer



Lighter



Electrification



Autonomy



New Mobility



First to Market



PACE Award



Design



Exclusive@Magna



Patented

## Competitive advantage/differentiators

- Increased door styling opportunities through electronic handles
- Reduced system weight and cost through elimination of rods and cables (1kg per door)
- Improved safety and communication
- All features controlled electronically through integrated ECU (central door lock, child lock, outside/inside power release etc.)
- Integrated battery backup provides electrical release in the event of main battery power failure
- Cinching and power door control
- Enables features for future mobility

SOP

Ideation

Discovery

Concept

Development

Serial Preparation

in Production

# SmartAccess™

Magna's SmartAccess™ power door is a complete system allowing consumers unique vehicle access experiences. It's easily operated through multiple HMI solutions and features enhanced safety through available non contact obstacle detection, all fully customizable.



SMARTACCESS™ isn't a product, it's an experience



Smarter



Safer



Electrification



Autonomy



New Mobility



First to Market



Design



Co-Development  
Opportunity



Exclusive@Magna



Patented

## Competitive advantage/differentiators

- Features industry first Haptronik motion control
- Easily operated through multiple HMI solutions
  - Capacitive touch keypad / key fob / phone / ehandles etc.
- Obstacle detection provides enhanced safety
  - Available contact and non contact
- Allows for brand differentiation and styling
- Fully customizable feature set
  - Virtual door check, door presenter, ice breaker, cinching etc.
- Available SMARTLATCH™ with cinch enables full door function integration and styling enhancements through eHandles

SOP

Ideation

Discovery

Concept

Development

Series Production

in Production

# SmartAccess™ Power Frunk

Enabling new experiences for EV owners with a complete system for power frunk applications including latches, hinges and power systems.



Smarter



Safer



Electrification



New Mobility



Design

## Competitive advantage/differentiators

- Complete system supplier ensuring safety and reliability
  - Power struts and electronics, frunk latches, frunk hinges, anti pinch strips, HMI
- Improves ease of use and convenience for consumers when opening the frunk
- High output motor inline with efficiency gearbox with high output torque at low noise
- Two ball stud snap-on attachment points for ease of assembly and disassembly
- Dual drive and single drive + mechanical counterbalance available / integrated ECU optional
- Features include power release, cinch functions and pedestrian protection system

SOP

Ideation

Discovery

Concept

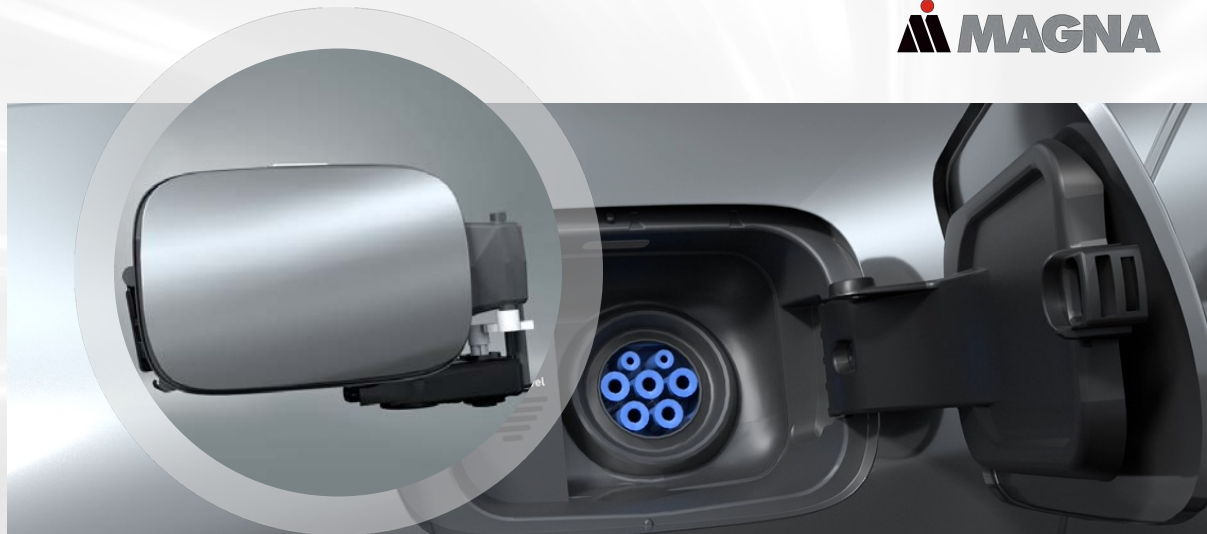
Development

Series Preparation

in Production

# SmartAccess Power Charge Flap

Automated charging flap that allows for easy access to the vehicles charging socket improving the customers experience.



Smarter



Safer



Electrification



New Mobility



Design

## Competitive advantage/differentiators

- Increased comfort and convenience for consumers of electric vehicles
- Intelligent capacitive entry solution available with false trigger protection
- Actuator & gesture opening projects in pre-development
- Available in multiple opening movements
- Available lighting, locking and HMI opening features

SOP

Ideation

Discovery

Concept

Development

Series Preparation

in Production

# SmartAccess™ Power Flush Door Handle

Scalable power flush handle solutions offering consumers unique vehicle access experiences with unique styling options and advanced features.



Smarter



Safer



Electrification



New Mobility



Patented



Design



Co-Development  
Opportunity



Driving Dynamics

## Competitive advantage/differentiators

- Improved vehicle styling with three deployment designs: parallel, rotational, vertical
- Standardized actuator with optimized packaging
- Aerodynamic improvement with enhanced vehicle styling
- Back drivable actuator with high torque output
- Advanced features include NFC, BLE, SureTouch™ capacitive sensor and lighting solutions
- Complete system solution available with SmartLatch™ or standard latching systems

SOP

Ideation

Discovery

Concept

Development

Series Production

in Production

# Haptronik™ Motion Control

Revolutionary motion control software that enhances user experience with tactile feel of door movement enabling enhanced safety features.



Smarter



Safer



Electrification



Autonomy



New Mobility



First to Market



Design



Co-Development Opportunity



Exclusive@Magna



Patented

## Competitive advantage/differentiators

- Customizable effortless motion throughout all operation
- Virtual door check
  - At any moment in travel
- Grade compensation
  - Always same manual efforts
- Anti slam / wind catch protection
- Power assist and movement
- Soft close feature

SOP

Ideation

Discovery

Concept

Development

Serial Preparation

In Production

# In-Glass Interactive Touch

Combination of transparent displays and touch controls in exterior glass surfaces.



Smarter



Lighter



New Mobility



First to Market



Electrification



Driving Dynamics



Exclusive@Magna



Patented



Design



Co-Development  
Opportunity



Autonomy

## Competitive Advantage/Differentiators

- Displays embedded in glass layers
- Clear when off – visible when powered
- Multiple options available – icons, keypads, directional arrows, etc.
- Developing for stationary and moving windows assemblies

## Applications

- Fixed quarter windows
- Movable quarter windows
- Side drop glass
- Liftgate glass
- Roof glass
- Side windows on autonomous vehicles



Forward. For all.