FORI AUTOMATION EOL SAFETY SYSTEMS

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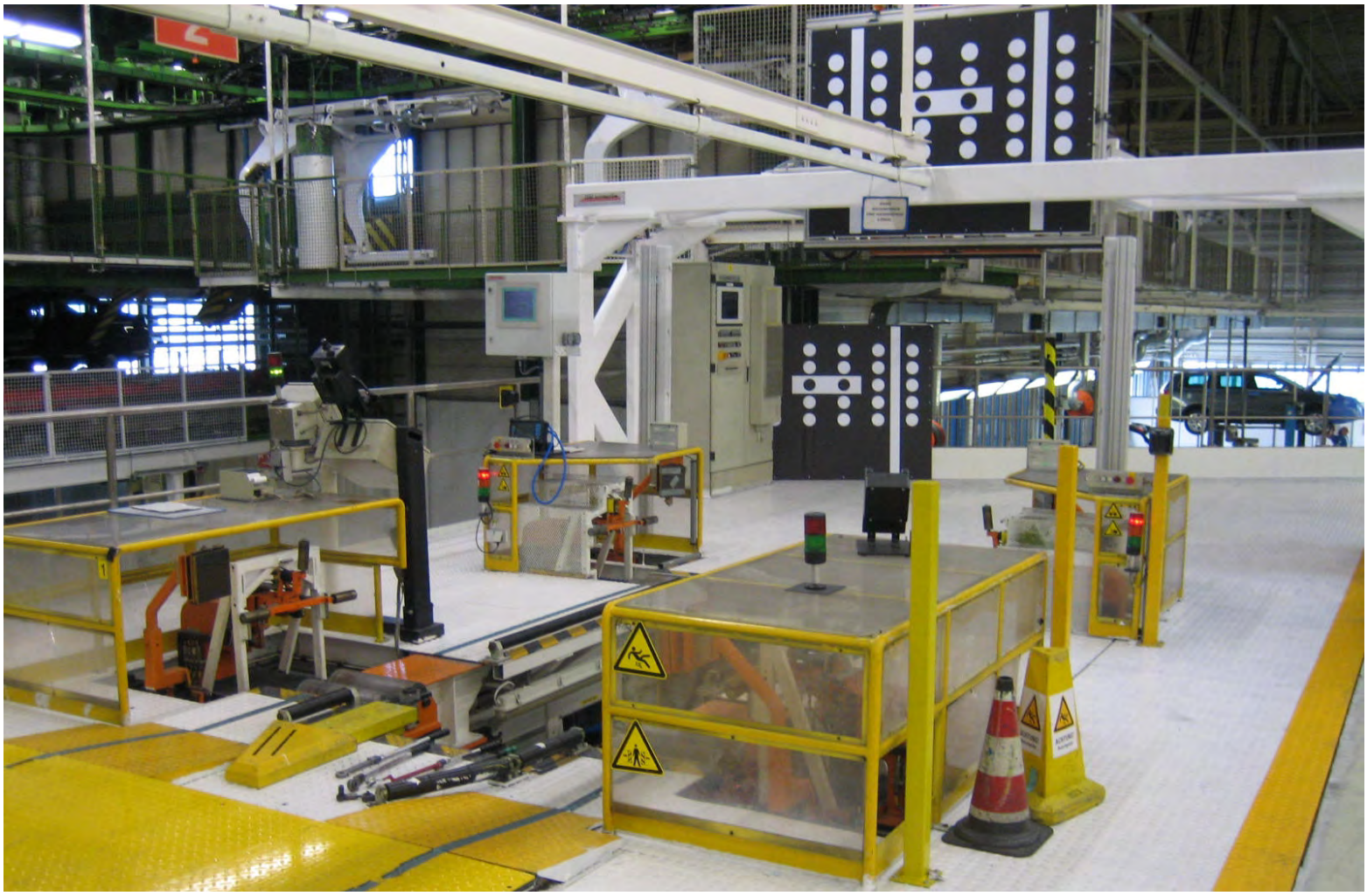
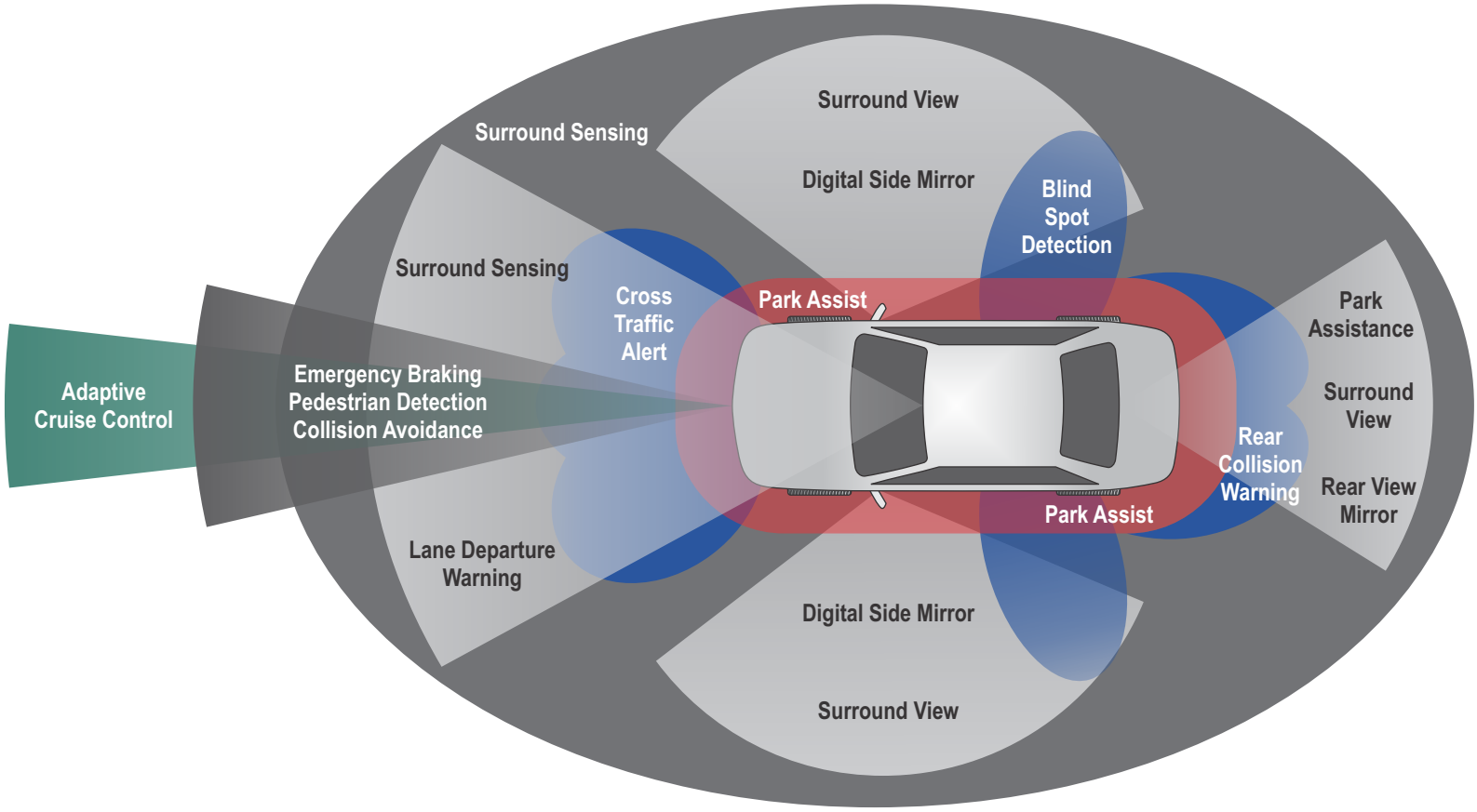
WORLD HEADQUARTERS

SAFETY SYSTEM CALIBRATION

Driver Assist Calibration



Automatic Driver Assist



- Longe-Range RADAR
- LIDAR
- Camera
- Short / Medium - Range RADAR
- Ultrasound / Ultra Short - Range RADAR

SYSTEMS CALIBRATED

Each OEM has different terminology for the EOL safety systems. Fori can calibrate / align all of them.

System List

Cruise Control Systems

ACC - Adaptive Cruise Control
ACC - Autonomous Cruise Control
ICC – Intelligent Cruise Control
LCC – Laser Cruise Control
LRR – Long Range Radar

Camera Systems

FFCM – Forward Facing Camera Module Calibration
FCM – Front Camera Module Calibration
LDP – Lane Departure Prevention
LDW – Lane Departure Warning
RCC - Rear Camera Calibration
RVC – Rearview Camera Calibration
RACS - Rear Anti-Collision Sensor Calibration
TAD – Trailer Angle Detection

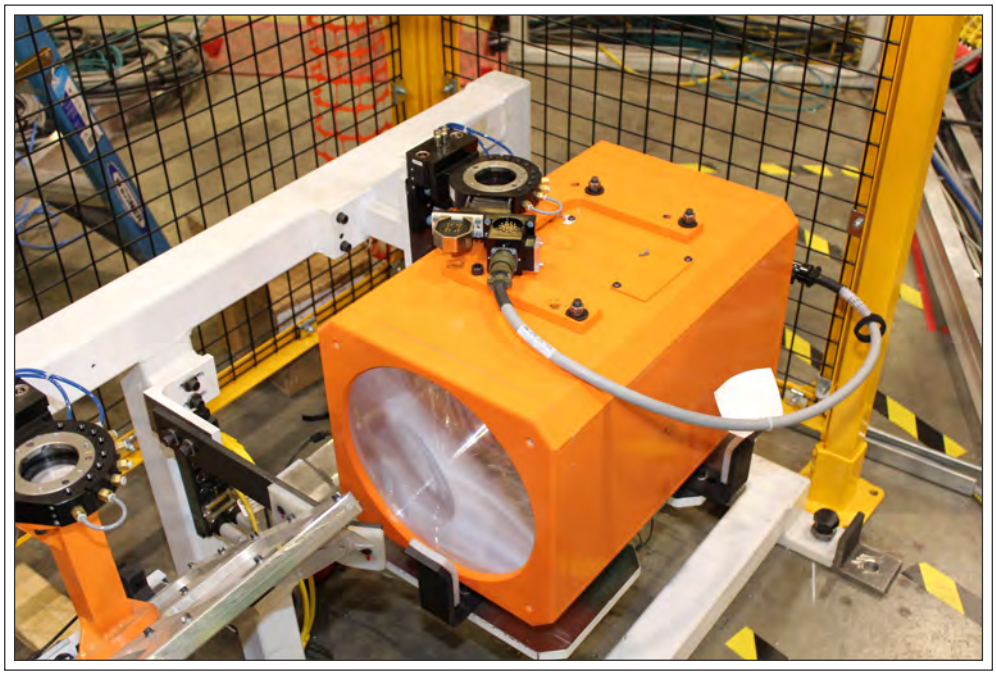
Driver Assist Systems

ADAS – Automated Driver Assist Sensor Systems
AVM – Around View Monitors
DASM – Driver Assistance System Module

Ultrasound

Park Assist

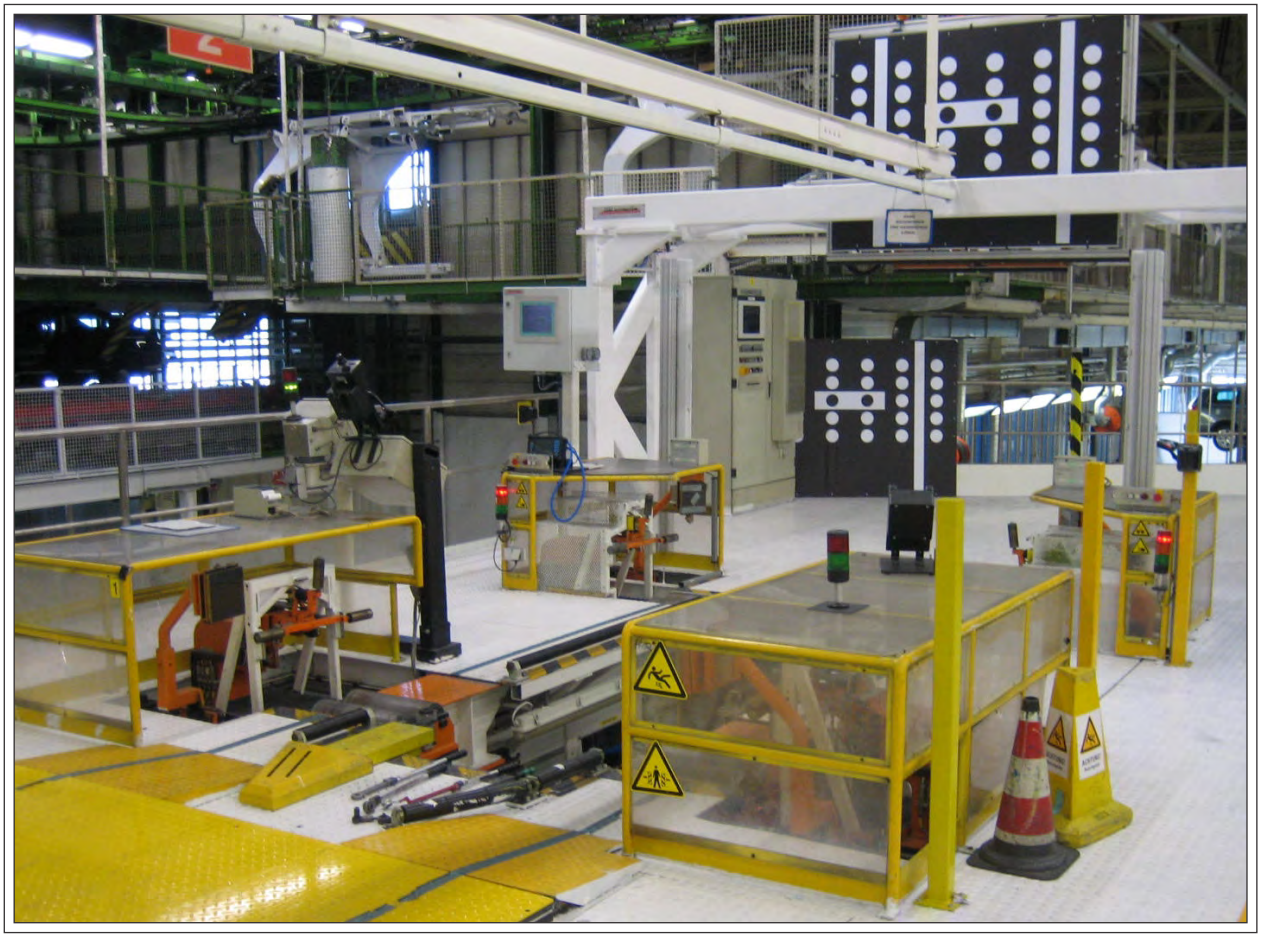
Adaptive Cruise Calibration



Quick Disconnect Tooling Selection

- For ACC sensors containing a small reflective mirror on the vehicle's radar sensor, it is possible to aim and adjust this sensor with a modified version of the Fori HLA camera box
- The modified box contains an LED light sources for reflecting off the sensor mirror, and a pneumatic rotate device to place the box on a small angle to the sensor to avoid "Bounce-Back"
- The Fori HLA camera will then aim the reflect light similar to how it aims a headlamp.

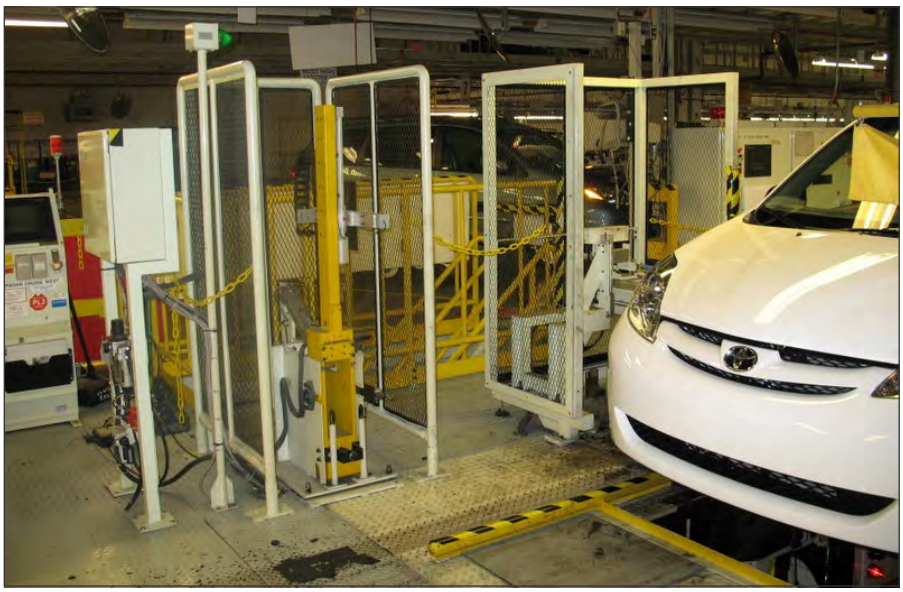
Rear View Camera Calibration



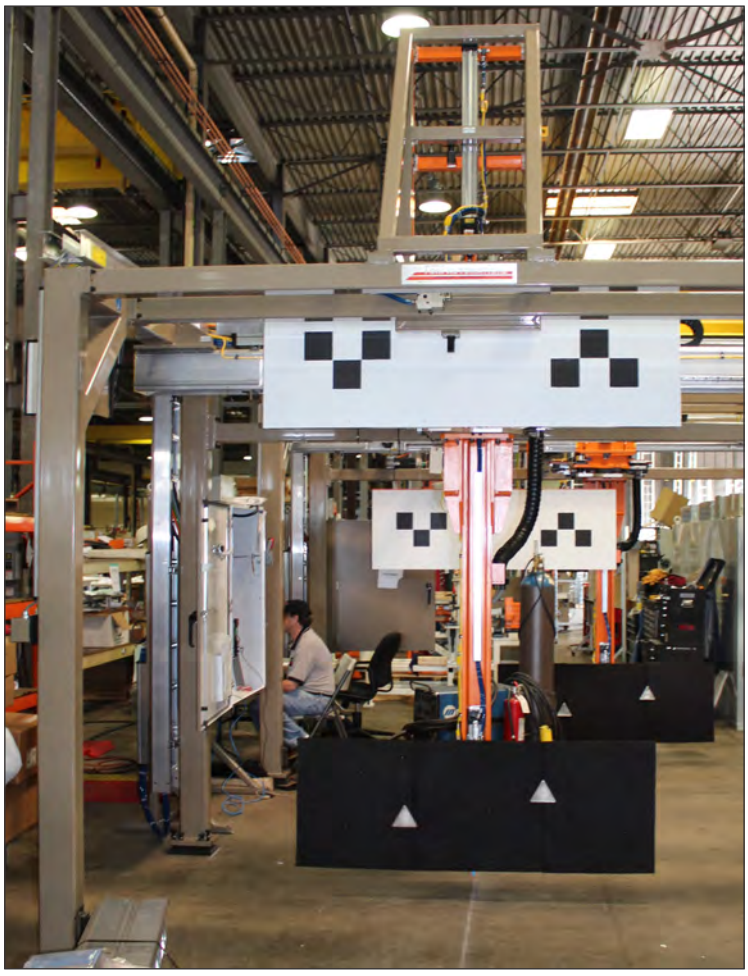
The driver can see on the screen a live view of the rear part of the vehicle. The system indicates in the display the approximation to an obstacle and warns acoustically by small distances between the car and the obstacle. The Fori Unit provides a reference sample (installed behind the vehicle on the hall floor). The rear view camera takes a picture of the sample, and the calibration is independently calculated in the car controller.

Laser Cruise Calibration

- Pneumatic lift system with locking air cylinder to lower target screen and vision system in front of LCC sensor
- Horizontal and vertical positioning of target screen by servomotor
- Vision system to find the location of vehicle sensor and position the target board
- Calibration fixture with LCC sensor to use as reference for vision system and centerline positioning



Adaptive Cruise & Lane Departure Warning



- **ACC System**
- Aluminum back plate with sound absorbent material and adjustable reflector targets
- Horizontal / vertical positioning system for +/-1mm
- Special rotating feature that will turn the ACC target screen 90° for vehicle drive-through clearance
- Control panel interface box mounted near gantry.
- Calibration laser fixture mounted to wheel aligner master calibration fixture.
- Verification laser system to verify horizontal / vertical & target alignment.
- Direct interface from the Fori wheel aligner PC via the OBDII adaptor for initiating the ACC calibration sequence, and aligning to the wheel aligner thrust angle data.
- An estimated cycle time of 15-20 seconds
- PLS scanner to stop all motion if presence detected

LDW System

- Drop-down slide unit that will position the target board in front of the LDW sensor mounted to vehicle's rearview mirror
- Target board features a painted checker board pattern for the LDW reference
- PLS Scanner stops down motion if presence is detective

Vehicle Centering Platforms

Centering platforms can be used for a variety of applications including that for stand alone headlamp aiming systems, for use with Driver Assist Calibration equipment, and other vehicle measurements when centering of the vehicle is required. The platforms contain leveling adjustment to provide a level surface for the vehicle. It also includes front and rear pneumatic centering devices, and vehicle guides.

Laser Cruise Calibration

LRR - Long Range Radar

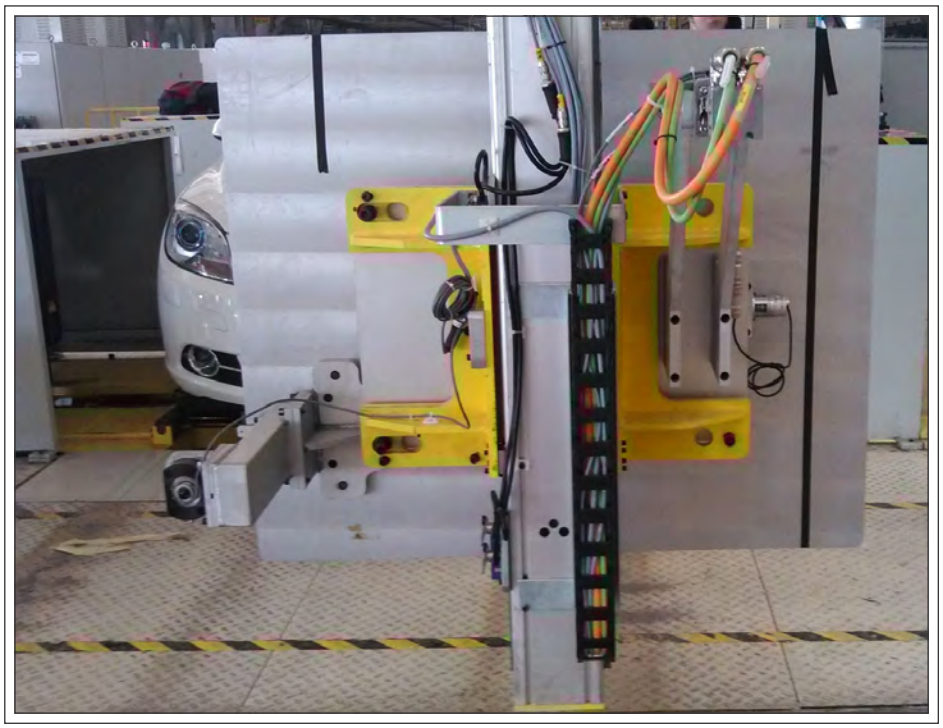
LRR – Long Range Radar

The long range RADAR system senses vehicles up ahead, calculates relative motion and anticipates a collision. At first the system flashes a light and sounds a buzzer while readying the brakes; if the driver doesn't respond, it strengthens the alert with a jerk of the car. If after all that warning the car still enters the danger zone, the radar system takes charge and slams on the brakes. The Fori System calibrates the RADAR to ensure a more accurate reading.

Pneumatic lift system with locking air cylinder to lower target screen and vision system in front of LCC sensor.
Horizontal and vertical positioning of target screen by servomotor.
Vision system to find the location of vehicle sensor, and position the target board .
Calibration fixture with LCC sensor to uses as reference for vision system and centerline positioning.

Lane Departure Warning System

Fori's system calibrate the laser departure warning system. The system is designed to warn the driver when the vehicle begins to move out of its lane when the turn indicator is not signaling that direction.



Lane Departure Warning / Lane Departure Prevention:
The system uses a video camera to detect lane markings ahead of the vehicle and to monitor the vehicle's position in its lane. When the function detects that the vehicle is about to unintentionally move out of the lane, it warns the driver. The Fori system calibrates the lane departure / prevention systems to ensure an accurate detection can be made.

- 90° Mast Rotation to position target board for drive thru clearance
- Optional 180° Rotation for 2 targets
- Automatic verification
- PLS Zone Scanner for protection to personnel within the work area
- Self contained Control system with servo motor drives, I/O devices, interface to WA PLC and PC.

- Frame of steel Structure with leveling jacks for mounting to cement floor or steel plate
- Horizontal servomotor positioning with belt drive for +/-1mm accuracy Vertical Target positioning using servomotor and ball-screwdrive

Note: Standard servomotor is Emerson, can also use Siemens, SEW, AB, Yaskawa, and other suppliers

- Includes custom designed target plate, mirror with mounting, and leveling details.

Note: Can also use customer supplied.
mirror units as required in place of target plate

- Automatic verification using a laser mounted to gantry frame reflect off small mirror on target.
- PLS Zone Scanner for protection to personnel within the work area.
- Self contained Control system with servo motor drives, I/O devices, interface to plant Host PC's or WA PLC and HLA PC when integrated with WA bench
- Optional 90° Mast Rotation to position target board for drive thru clearance
- Optional 180° Rotation if switch between 2 targets mounted to the mast
- Option Semi Automatic Screwdriver for adjusting the ACC/LRR Sensor

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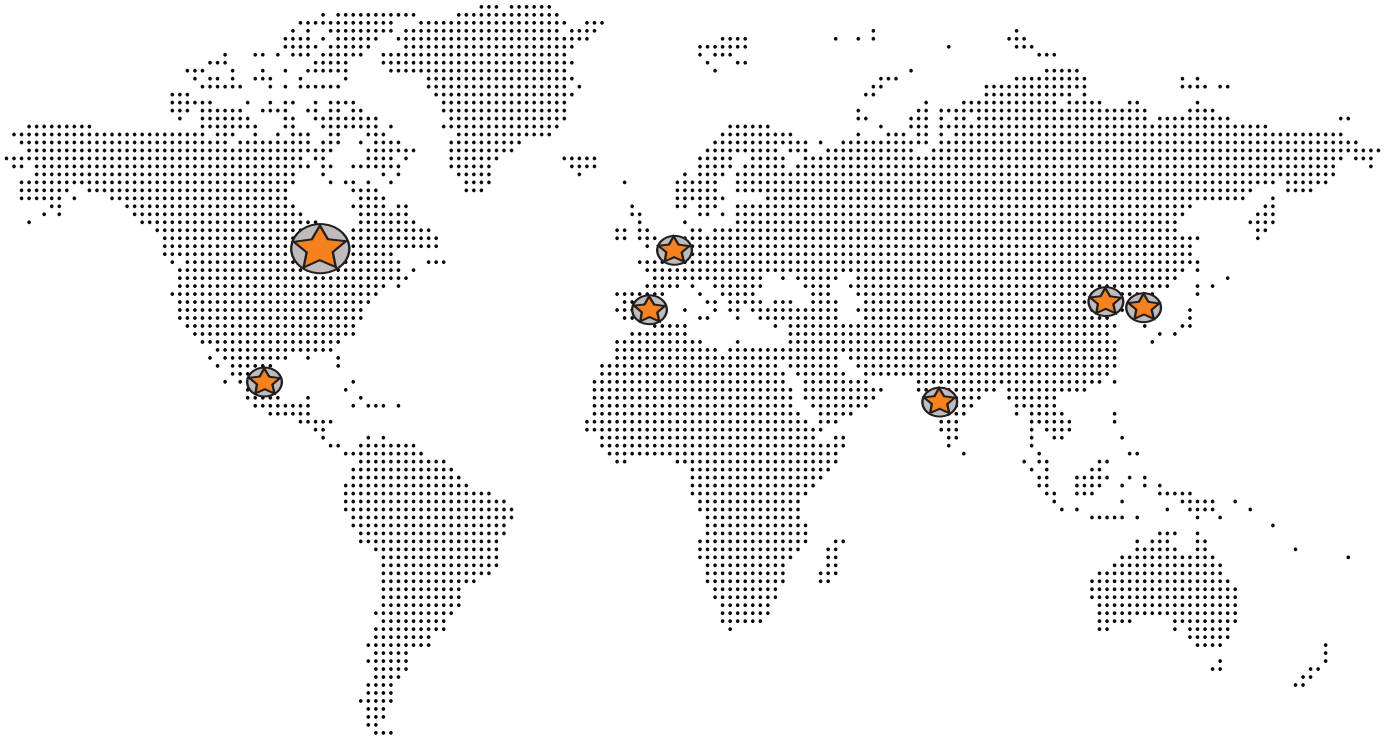

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