Invented for life

BOSCH

Accurate and efficient calibration with Bosch

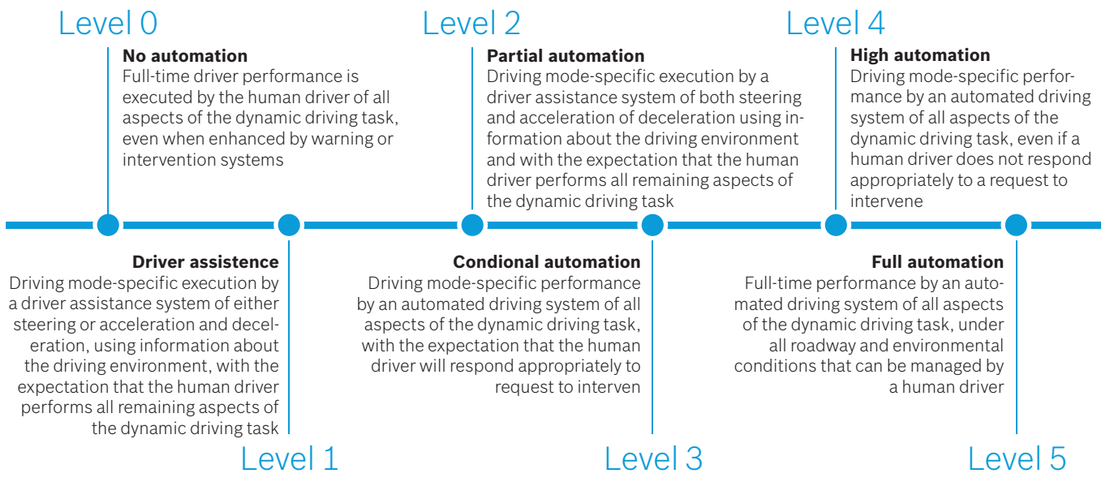
Advanced Driver Assistance System (ADAS)

Complete Sensor Cluster Calibration
as a key factor for safe driving

Advanced Driver Assistance Systems

Advanced Driver Assistance Systems (ADAS) are vehicle technologies that provide safer driving experiences for the vehicle, driver, passenger, and the surrounding environment. ADAS technologies are paving the road to autonomous vehicles which can run full time with only maintenance stops. ADAS' primary goal is to reduce accidents and save lives.

ADAS Technologies are commonly referred to in levels of automation:



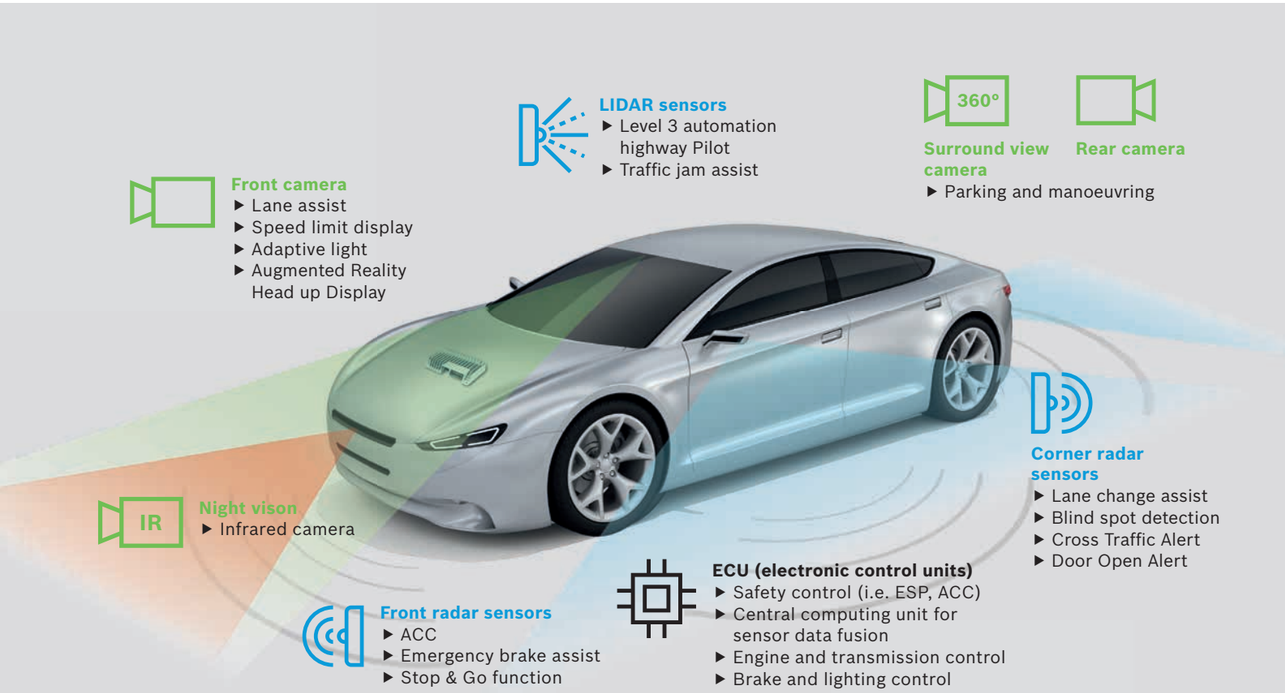
There are two main types of ADAS calibration:
Static and Dynamic. While most vehicles will require one or the other, some vehicles may require both. Here is a quick breakdown of the differences between Dynamic and Static calibrations:

Dynamic Calibration:
- Pre-determined service drive of 5 to 30 miles at set speed intervals
- Initiated though a diagnostic scan tool
- In some cases, may require a pre-alignment or static calibration before the dynamic calibration process
- Difficult during inclement weather and poses a liability for shops sending technicians to drive customer vehicles outside of the shop environment

Static Calibration:
- Placement of targets or radar reflectors at predetermined locations in a static shop environment
- Initiated though a diagnostic scan tool
- Requires fixture and targets in addition to scan tool

Importance of Accuracy and Precision

Precise recalibration is critical
Through our engineering expertise and extensive testing, gain confidence in precise measurements and trust that your customers' vehicles are recalibrated within the tightest tolerances to the strictest standards, correctly the first time



Calibrate ADAS Sensors
precisely and efficiently with Bosch

Diagnostics

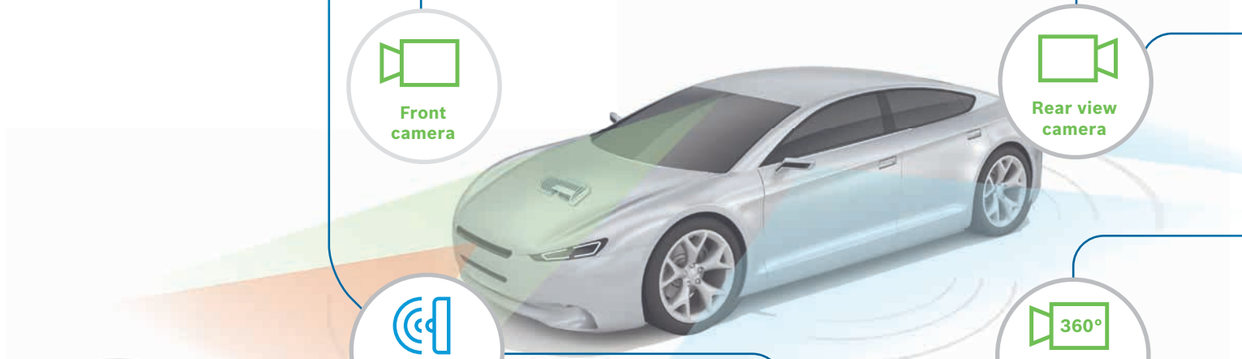
- Data import/export
- ADAS repair information
- ADAS calibration
- Pre/post scan

ESI[tronic]

Bosch **Connected Repair**

Remote diagnostics

KTS



LIDAR sensors

IR

Night Vision

Front camera

Rear view camera

Front radar sensors

360°

Surround view camera

ECU

Corner radar sensors

Note:
Icons green = **Cameras**
Icons blue = **Sensors**

DAS 3000

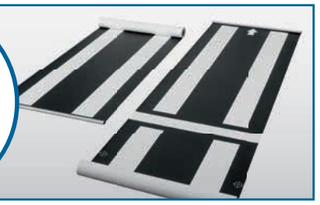
- LIDAR target
- Front radar target
- Night Vision target
- Front camera target

Data base for Target Setup instructions

Bosch ADAS Positioning Software

Mats for Rear view camera

Mats for Surround view camera



Doppler Simulator

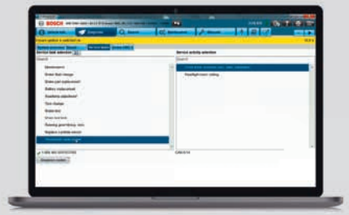
CTA 120

Step 1

Plug in KTS and start automatic vehicle identification

Step 2

Complete pre-scan diagnostics report

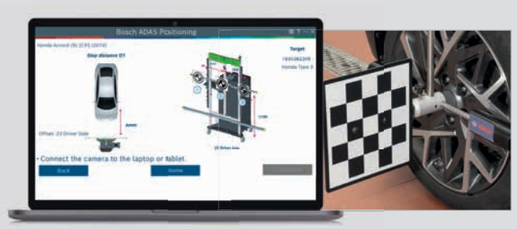


Step 3

Select ADAS system to calibrate

Step 4

Prepare for computed centre line measurement
Follow vehicle specific setup instruction



Step 5

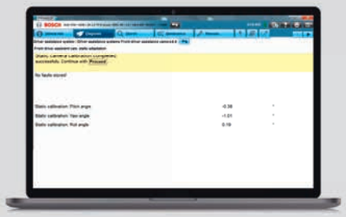
Position the calibration device

Step 6

Place targets

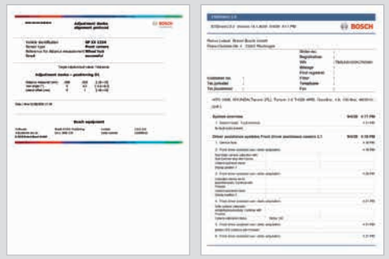
Step 7

Confirm and calibrate!



Step 8

Complete post-scan diagnostics report



Calibrate faster. Generate more revenue. Grow your business ... and Repeat.

The superior ADAS workflow can guide you from set-up through calibration in **half the time** compared to manual processes

The superior ADAS workflow, only from Bosch

Leverage the guided interactive calibration for the most precise and efficient set-up

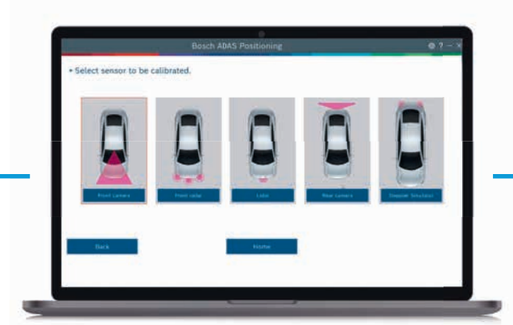
Simplified Set up Process:
Communized OE procedures to simplify set-up and calibration processes

Speed and Efficiency:
Saves shops time and money by getting customer vehicles calibrated faster and with the confidence that it's done right

Start Diagnostic routine
Rapid vehicle identification with system list and error codes. Automatically stored for result protocol

ESI[tronic]

ADAS Sensor selection
Pre-Defined Workflows to meet all vehicle specific pre-conditioning and ECU parameter setting for re-calibration process

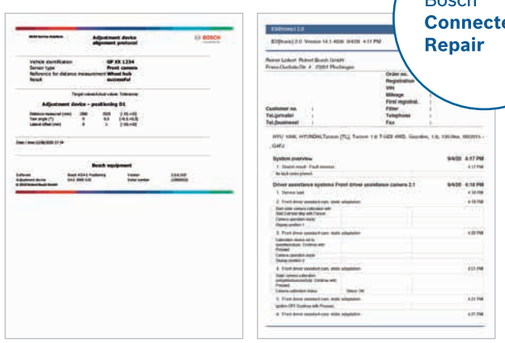


Guided Target Setup
ADAS tool placement with vehicle specific setup information like target type / position / height, reference for distance measurement

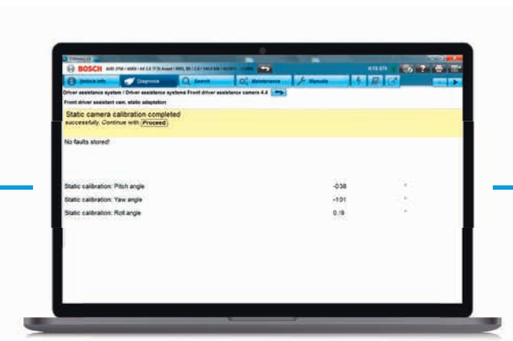
Result Protocol
Complete documentation stored in cloud or file share.

- Pre/post scan
- Sensor re-calibration status
- Tool/Target placement

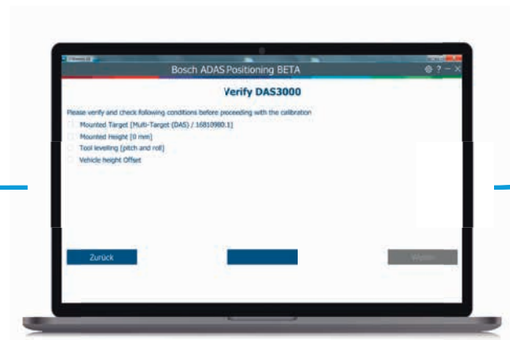
Bosch **Connected Repair**



Start Sensor Recalibration
Diagnostic workflow runs calibration routine and displays result status with quality assessment



Verification
Check box list proofs all pre-sets derived from OEM specifications. i.e. height setting, target board type and roll/pitch angle levelling



DAS 3000: the new universal computer based calibration and adjustment device for ADAS

Front camera | **Front radar sensors** | **LIDAR sensors** (Extension) | **Rear view camera** (Extension)

VOLKSWAGEN GROUP | BMW | ALFA ROMEO | All Makes with appropriate Targets

Picture shows DAS 3000 Scope of delivery

The best evolution of DAS 3000 ever:

- New positioning software for more efficient processes and intuitive operation by
  - Revised navigation including user instructions and user friendly screen displays
  - Visualization of the current position as well as the target position by graphical animations
  - Digital values like distance, yaw angle and lateral displacement display
- New wheel clamps for attachment in seconds and maximum accuracy
- New bumper plate for precise distance measurement to the bumper
- Printout which documents the correct alignment of the calibration device together with the operator/workshop data

DAS 3000 video

https://bit.ly/38edG3V

Your benefits:

- Perfect measurement accuracy according to the highest OEM specifications
- Fast and efficient calibration using a camera based alignment method (no wheel aligner needed)
- Around 50% faster compared to conventional laser-based systems thanks to the intuitive user guidance and calibration routines
- The Multi target board enables both camera and radar calibration with just one board (VW group)
- Multi-brand compatible with vehicle-specific calibration targets (optionally available)
- Everything in one place through an integrated storage box (optional accessory)

Front radar and Front camera system: DAS 3000

Computer based calibration device with fully digital distance measurement and alignment towards the driving axle.

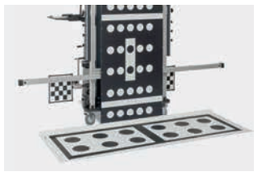
Scope of delivery:

- Trolley and calibration device
- Multi target board (front Camera and front radar VW group)
- Precision measurement bar for installation of vehicle specific target boards
- Integrated dual-camera set
- New positioning software version with an intuitive user interface for the efficient alignment
- New universal wheel clamps
- New bumper plate for the fast and precise distance measurement

Target placement for forward facing sensors (DAS 3000)

Above floor lifts: Offset pre-set system for quicker height setting and program routine for permanent yaw angle display

Designed for attaching LIDAR sensor calibration board and providing software routine positioning specific



Designed for rear camera units calibration with software routine positioning specific

Very ergonomic and comfortable manoeuvering thanks to lateral handles and turning knob for pitch angle adjustment and Radar 3-point calibration tilting

Multi-Target-Shop: Calibration targets for the all vehicle manufacturers

Integrated Multi-Target-Shop container for individual storage and immediate reach

Precision measurement bar for magnetic mounting of target boards and rapid roll angle adjustment

Universal wheel clamps with a circular spirit level for a perfect centring on the wheel. Even on extreme softline rims with sizes from 14” – 24”

Rear and Surround View Cameras
Calibration Mats

Brand specific equipment for the proper calibration of the Rear and Surround View cameras according to the OEM specifications implemented by Bosch routines and workflows.

Near Range Camera Systems for Volkswagen group

360° **Surround view camera**

VOLKSWAGEN GROUP

Calibration set for 360° Cameras Generation 2:
(CTA 500-1)

Main Features:

- Set made by 2 floor mats (8,115 x 806 mm)
- Robust vinyl material (750 g/m²) for safer calibration due to proper waves-free flatness of the mats
- Lateral clamping bars for easier rolling/enrolling
- Cylindrical storage bag for professional packaging
- Minimum floor space requirement (L x W): 9 x 5 m

Alignment method: manual with tape measure

Rear view camera

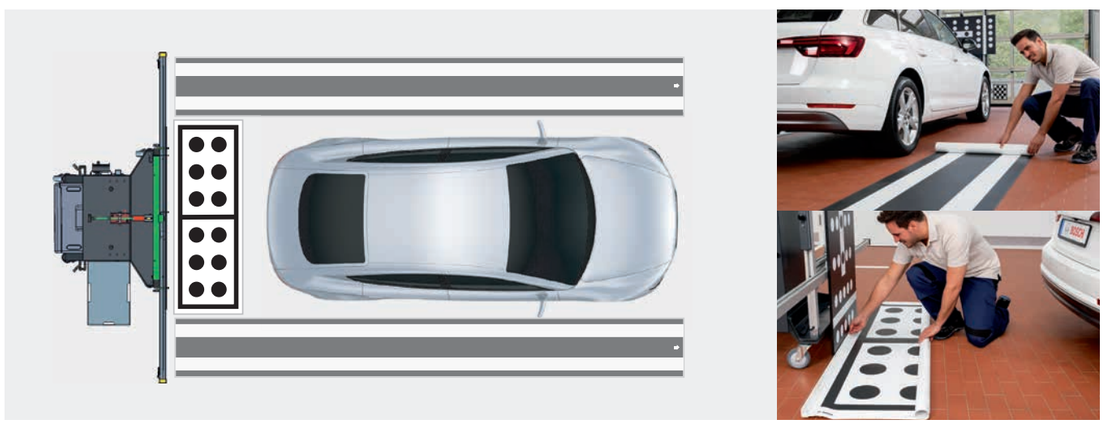
VOLKSWAGEN GROUP

Calibration set for Rear Camera:
(CTA 501-1)

Main Features:

- Set made by floor mat (1,970 x 742 mm) and L-shaped metal frame for proper alignment and setup by DAS 3000
- Robust vinyl material (750 g/m²) for safercalibration due to proper waves-free flatness of the mat
- Cylindrical storage bag for professional packaging
- Alignment by DAS 3000 routine and software workflow specific for a guided, quick and easy positioning
- Minimum floor space requirement (L x W): 9 x 3 m

Alignment method: Computed with DAS 3000

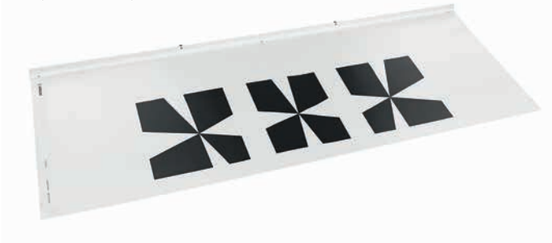


Near Range Camera Systems for Mercedes-Benz

Surround view camera

MERCEDES-BENZ

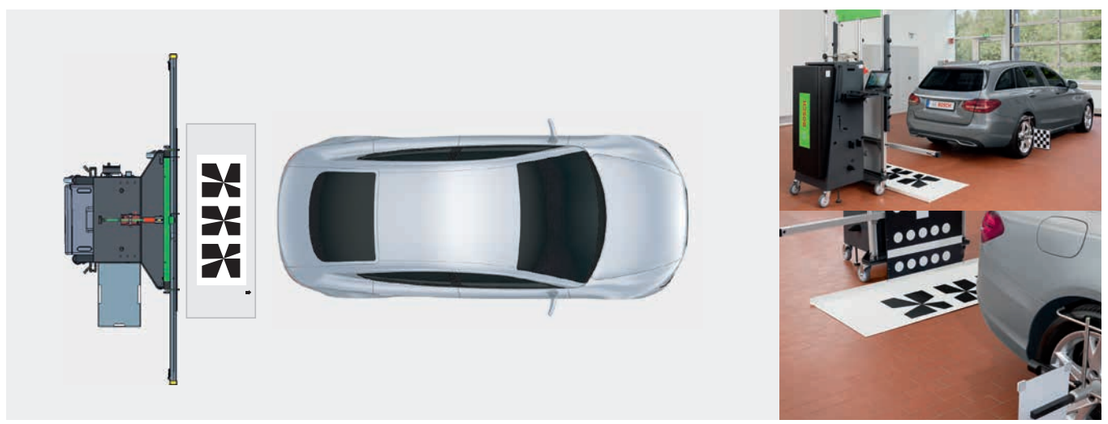
Calibration set for Rear Camera:
(CTA 511-1)



Main Features:

- Set made by floor mat (1,970 x 742 mm) and L-shaped metal frame for proper alignment and setup by DAS 3000
- Robust vinyl material (750 g/m²) for safer calibration due to proper waves-free flatness of the mat
- Cylindrical storage bag for professional packaging
- Alignment by DAS 3000 routine and software workflow specific for a guided, quick and easy positioning
- Minimum floor space requirement (L x W): 9 x 3 m

Alignment method: Computed with DAS 3000



Rear and Surround View Cameras
Calibration Mats

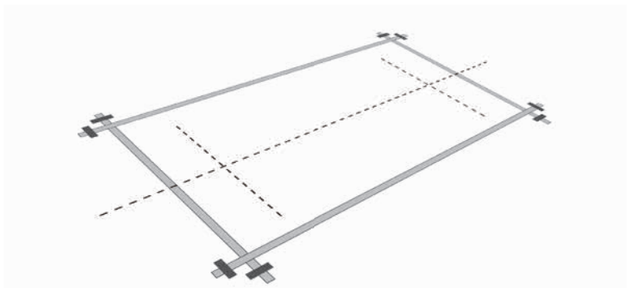
Brand specific equipment for the proper calibration of the Rear and Surround View cameras according to the OEM specifications implemented by Bosch routines and workflows.

Near Range Camera Systems for Nissan

360° **Surround view camera**

NISSAN

Calibration set for 360° Cameras:



Main Features:

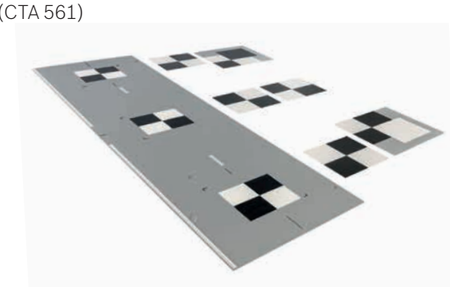
- Draw a reference frame around the vehicle by using customary-colored tapes with adhesive tapes on floor
- ESI[tronic] workflows and Bosch setup
- Minimum floor space requirement (L x W): 9 x 5 m

Alignment method: manual with tape measure

Rear view camera

NISSAN

Calibration set for Rear Cameras:
(CTA 561)



Main Features:

- Calibration mat (4,000 x 1,000 mm) with imprinted targets (200 x 200 mm) for X-Trail, 2 lay flat bar
- Optional targets (trailers) for Pulsar and Qashqai/Juke
- Robust vinyl material (750 g/m²) for safer calibration due to proper waves-free flatness of the mat
- Cylindrical storage bag for professional packaging
- Minimum floor space requirement (L x W): 9 x 5 m

Alignment method: manual with tape measure

Near Range Camera Systems for Mitsubishi

360° **Surround view camera**

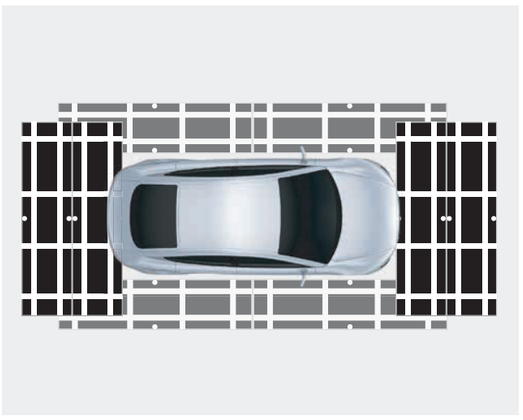
MITSUBISHI

Calibration set for 360° Cameras:
(CTA 550)

Main Features:

- 2 Calibration mats (3,500 x 900 mm) with imprinted pattern
- Robust vinyl material (500 g/m²) for safer calibration due to proper waves-free flatness of the mat
- Cylindrical storage bag for professional packaging
- Minimum floor space requirement (L x W): 9 x 5 m

Alignment method: manual with tape measure

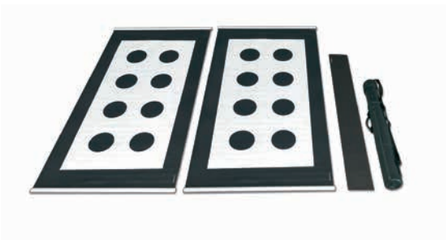


Near Range Camera Systems for Honda/Mazda

360° **Surround view camera**

HONDA | MAZDA

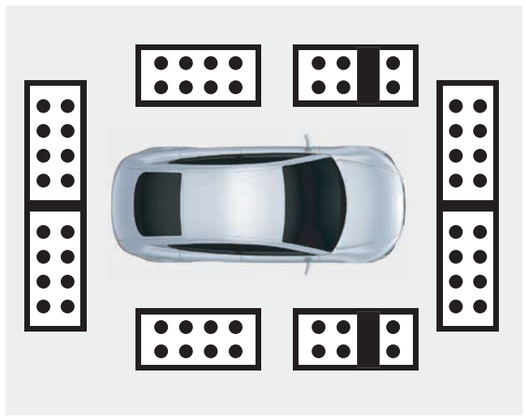
Calibration set for 360° Cameras:
(CTA 542)



Main Features:

- 2 Calibration mats (1,500 x 800 mm) with imprinted pattern
- Robust vinyl material (500 g/m²) for safer calibration due to proper waves-free flatness of the mat
- Cylindrical storage bag for professional packaging
- Minimum floor space requirement (L x W): 9 x 5 m

Alignment method: manual with tape measure



CTA 120: Corner Reflector for calibration of radar sensors

Front radar sensors **Corner radar sensors**

TOYOTA | LEXUS | MAZDA | HONDA | SUBARU | KIA | HYUNDAI | MITSUBISHI

Main Features:

- Universal corner reflector target which is matching with all sensor types and OEM service concepts in scope
- Flexible height adjustment of corner reflector module (150 – 1,200 mm)
- Typical distances between radar sensor and corner reflector are 2.5 – 5 m
- Adapter attached to measurement bar of DAS 3000
- Special image-processing algorithms ensure the exact positioning
- Option to adjust height setting with mechanical indicator-Offset compensation lifting platforms
- Minimum floor space requirement (L x W): 10 x 3,5 m

Your benefits:

- Carrier with attached corner reflector target for Front and Rear Radar calibration
- Fast and accurate setup supported by computer vision positioning
- Carrier designed to connect future targets and alignment technologies
- Result protocol with Target placement data for Proof of Calibration

CTA 120 placement for forward facing radar with DAS 3000

CTA 120 placement for corner radar with DAS 3000

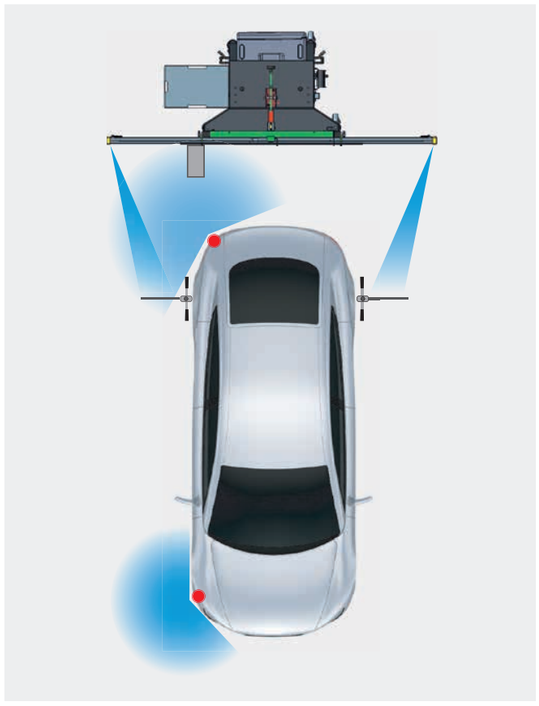
Optional offset ruler to adjust specific height settings or multi-point re-calibrations

Option to adjust height setting with mechanical indicator pointing on vehicle reference point (emblem)

CTA 110: Doppler Simulator for Rear and Side Radar calibration

Corner radar sensors

VOLKSWAGEN GROUP | MAZDA



Main Features:

- Doppler Simulator Module (Rotating Target) attached to quick coupling of DAS 3000 camera beam
- Used for electronic calibration and functional testing of the angle measurement capability of vehicle radars
- Rapid and accurate placement supported by computer vision positioning
- Flexible height setting in a range from 500 – 1,000 mm
- Lateral displacement supported by the ruler of the measurement bar
- Power supply 24 V DC / 1,5 A
- Minimum floor space requirement (L x W): 8 x 3,5 m

Your benefits:

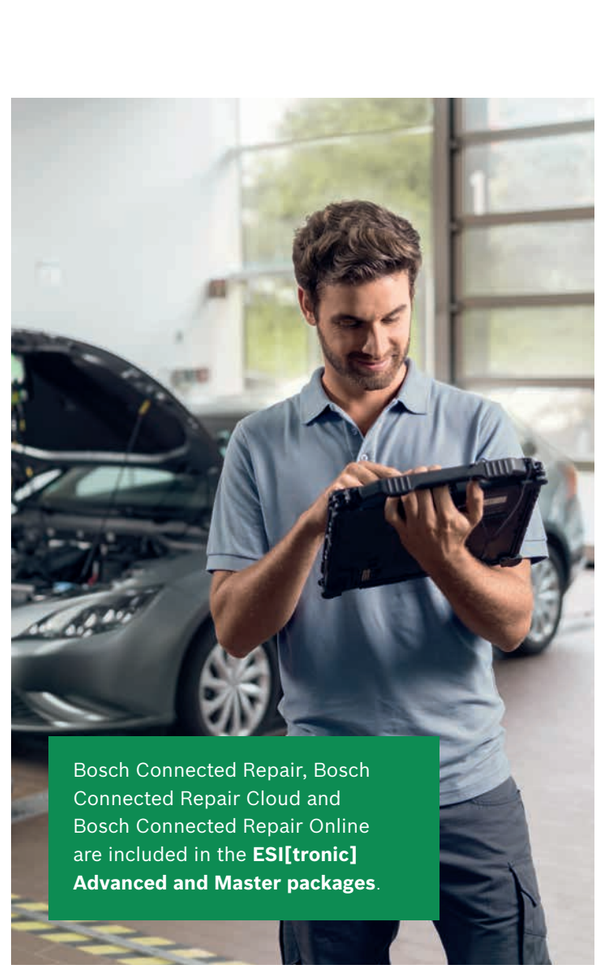
- Doppler simulator for Side and Rear Radar calibration to ensure a proper function of the lane change assist
- Quick coupling with DAS 3000 Camera beam
- Fast and accurate setup supported by computer vision positioning and DAS 3000 rulers
- Result protocol with Target placement data for Proof of Calibration

Quick, easy, connected: Increase efficiency in your workshop with Bosch Connected Repair

Within the workshop there are devices and services that need information: Data about the vehicle, about the fault or required service. All of these systems communicate with the user – but not with each other. Bosch Connected Repair is the perfect solution: software that connects the workshop equipment, vehicle data and repair data. Whether saving test results, fault data, or images according to data protection basic regulation – Bosch Connected Repair has been adapted to meet our customers' every requirement. So that you will remain competitive into the future.

Your benefits at a glance:

- **SAVE TIME**
  Vehicle identification is performed once and then transmitted to all connected devices. At 30 seconds per vehicle, this means time savings of several hours per year.
- **FACILITATE PROCESSES**
  Test protocols, comments and images are directly saved to the digital job card.
- **INCREASE EFFICIENCY**
  All employees can easily access the digital job card and the vehicle status any time. Typos are reduced to a minimum.
- **EXPAND THE FUNCTIONAL SCOPE**
  The measurements results of products by other manufacturers can be attached to an order and benefit from the electronic database.
- **BOOST CUSTOMER SATISFACTION**
  A clear and transparent final protocol provides reassurance to the customer.



Bosch Connected Repair, Bosch Connected Repair Cloud and Bosch Connected Repair Online are included in the **ESI[tronic] Advanced and Master packages**.

What drives you, **drives us**

Bosch technologies are used in most vehicles worldwide. People, and assuring their mobility, is what we are focused on.

Therefore, we have dedicated over 130 years of pioneering spirit and expertise in research and manufacturing to achieving this.

We provide the aftermarket and workshops worldwide with modern diagnostic and workshop equipment and a wide range of spare parts for passenger cars and commercial vehicles:

- Solutions for efficient and effective vehicle repairs
- Innovative workshop equipment and software
- One of the world's most comprehensive ranges of new and exchange parts
- Large network of wholesale customers, for quick and reliable parts supply
- Competent technical support
- Comprehensive educational and training offers
- Targeted sales and marketing support

Find out more at:
boschaftermarket.com

Robert Bosch GmbH
Automotive Aftermarket

Auf der Breit 4
76227 Karlsruhe
Germany

AA/MBC1 EN 2023/08