



BOSCH

Invented for life

Driven by **SENSITIVITY**

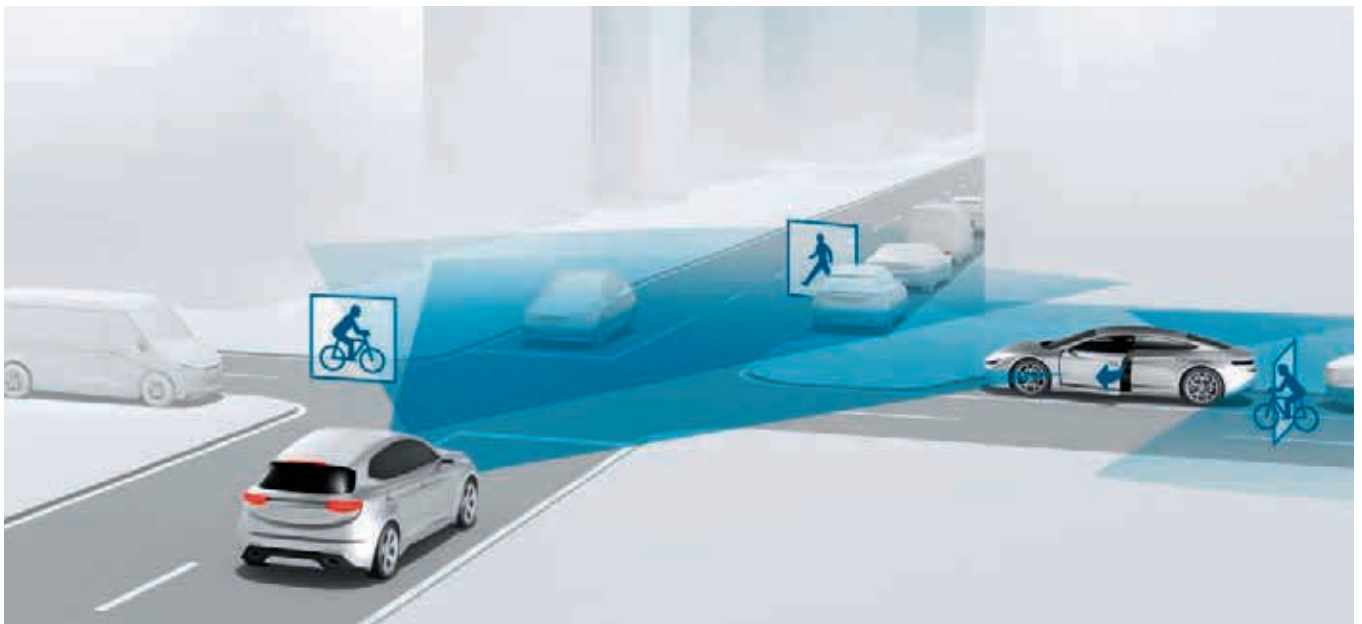


Precision and flexibility for glass fitters

Camera calibration by Bosch for
Advanced Driver Assistance Systems

NEW
with
SCT 417

Proper camera calibration as a key factor for safe driving



Drivers have a wide range of driver assistance solutions at their disposal on the highway and on main roads. Cars have radar sensors and video cameras, allowing them to detect other road users even in complex traffic situations. The system will warn the driver and even intervene if necessary. This is achieved in defined situations through the communication and interaction of a variety of components. The end result is the avoidance of, or at least a reduction in, the number of accidents in city traffic.

With the new technologies around driver assistance systems, glass fitters especially are facing challenges. Therefore Bosch offers the right equipment in order to calibrate sensors any time a new windshield is installed.

Typical ADAS components relevant for camera calibration after screen replacement:

Lane assist systems



Detect unintended departure from the lane, and warn the driver at an early stage, actively help to keep the vehicle in the lane or help changing lanes.

Road sign recognition



Evaluates road sign recognition data and displays relevant information in the instrument cluster, enabling a range of warning functions for the driver.

Automatic emergency braking



Can avoid collisions with other vehicles as well as with vulnerable road users. If an accident is not avoidable, the system at least reduces the speed of the vehicle and the risk of injury.

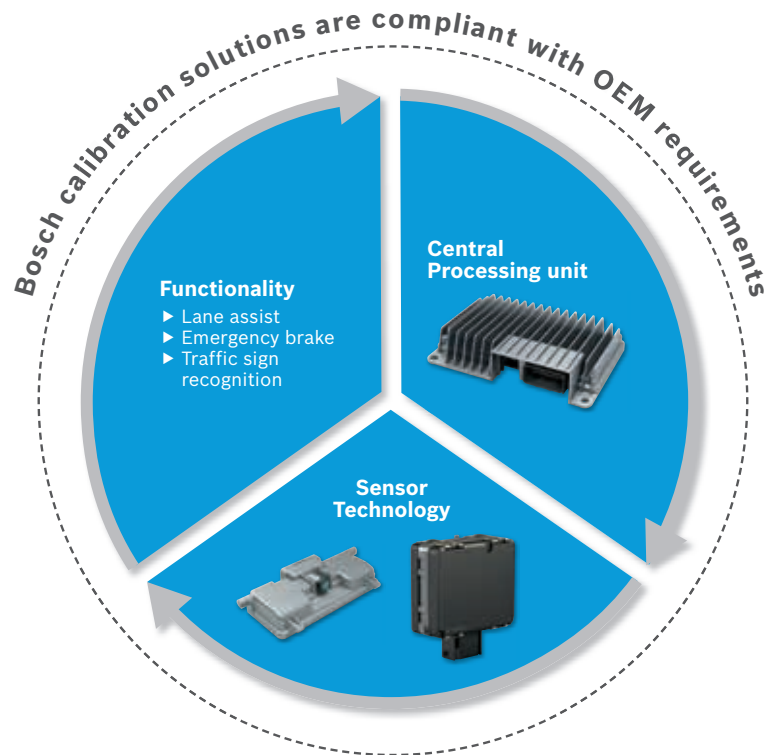
Replace – Calibrate – Drive safely

Good to know:

Calibration of driver assistance systems can be divided into static and dynamic processes.

During the static calibration procedure, a specific calibration board and a suitable diagnostic system are required (e.g. DCU 220). Depending on sensor and system there may also be a mixture of dynamic and static calibrations (e.g. Honda, Mercedes-Benz and Hyundai).

Usually, the static calibration procedure is carried out first and then completed with a dynamic calibration procedure (service drive). The ESI[tronic] 2.0 diagnostic software guides you through the necessary steps.



Typical repair process

Windscreen Damage



Remove and install new windshield



Identify vehicle with diagnostic tool and software (see page 4)



Calibration of ADAS camera (see page 5)



Remove camera



Install and connect camera



Calibration of camera and rain / sun sensor

ESI[tronic] 2.0: Diagnostic software for controlling vehicle specific calibration and adjustment procedures

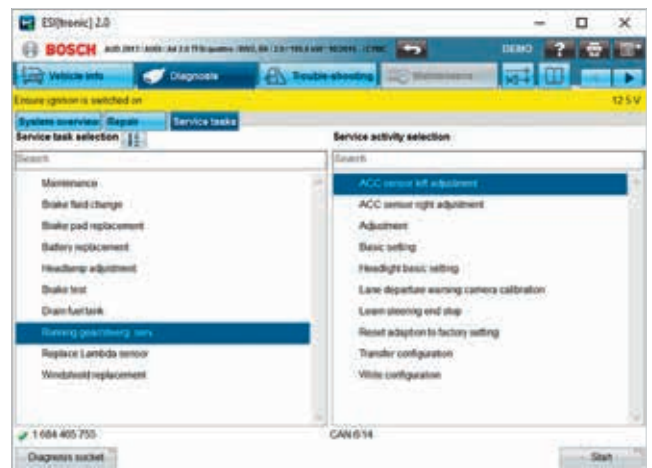


ESI[tronic] 2.0 Online and the new generation of vehicle communication interface KTS 560/590 provides fast access to the diagnostic routines needed for an ADAS system calibration:

- ▶ diagnosis of control unit and sensors combined with system pre/post scan including DTC listings
- ▶ troubleshooting
- ▶ repair and maintenance

Supports besides all common OBD vehicle interfaces as well all current and future vehicle interfaces based on Ethernet (DoIP).

The KTS 5xx series includes also a PassThru interface for programming the control units on the portals of the vehicle manufacturer as per Euro 5/Euro 6.



Powerful Windows 10 PC systems from Bosch control the diagnostics software ESI[tronic] 2.0 online with the Bosch KTS 5xx series:

- ▶ DCU 100 is a portable and robust tablet PC with touchscreen (10")
- ▶ DCU 220 is a combined notebook and tablet PC (11,6") and provides flexible and comfortable working conditions – especially in the rough workshop environment

Alternative:

KTS 350 – the mobile all-round solution with integrated KTS module and OBD cable connector

SCT 415 and 417: Universal calibration fixture for the Multi-Target-Shop

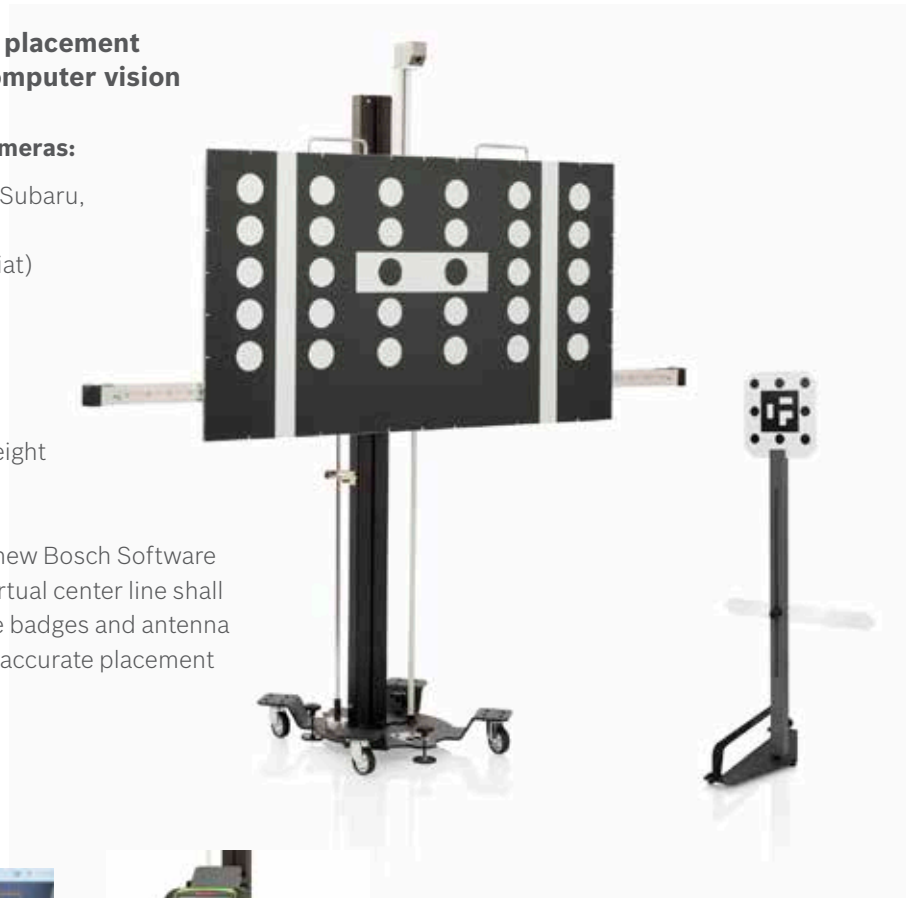
SCT 417: Significant time savings during placement due to Bosch software workflows and computer vision

Supports all calibration methods for front cameras:

- ▶ 1-Point calibrations (e.g. Volkswagen, Nissan, Subaru, Mercedes-Benz)
- ▶ 2-Point calibrations (e.g. Kia, Hyundai, Opel, Fiat)
- ▶ Sequential calibrations with multiple targets (e.g. Honda, Toyota)

Provides efficiency and accuracy:

- ▶ Precision measurement bar with adjustable height and scale for multiple target board mounting
- ▶ Magnetic coupling of target boards
- ▶ Line up with vehicle center line supported by new Bosch Software workflows and computer vision technology. Virtual center line shall match with reference points on the vehicle like badges and antenna
- ▶ Distance measurement aid ensures rapid and accurate placement (conform with OEM requirements)
- ▶ Height ruler with inch and millimeter scale
- ▶ Vehicle specific setup instructions
- ▶ Robust jig design for workshop environment



***Targets not included, refer to Multi-Target-Shop!**



Target for placement on vehicle roof (2nd reference point i.e. antenna)



Bosch software workflows provide best usability and traceability during the setup procedure



Adjustable HMI bracket provides best ergonomics

SCT 415: Rapid setup procedure supported by laser technology

Entry solution, conform with OEM requirements

- ▶ Functions and design features like SCT 417
- ▶ Green center line laser: line up with vehicle center line (e.g. emblem, camera eye, antenna). Visible even in bright ambient light.
- ▶ Distance measurement with tape measures



Note: Retrofitting with SCT 17 (computer vision positioning) possible.

SCT 17 kit:

- ▶ Raiser bar with camera
- ▶ HMI bracket for DCU 220/100 or any tablet PC
- ▶ Software (Android/ WIN)
- ▶ Distance measurement aid (post with target)



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



Calibration target XL-universal for Kia, Hyundai, Fiat, Type 1
 1 690 382 288



Calibration targets universal for Renault, Smart, Infiniti, Type 1 (Set)
 1 690 381 142



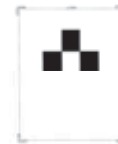
Honda, Type 1
 1 690 381 143



Honda, Type 2
 1 690 382 297



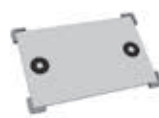
Honda, Type 3
 1 690 382 349



Kia/Hyundai, Type 2
 1 690 382 320



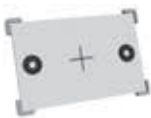
Kia/Hyundai, Type 3
 1 690 382 316



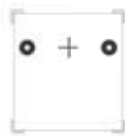
Mazda, Type 1
 1 690 382 318



Mazda, Type 2 (Set)
 1 690 381 234



Mercedes-Benz, Type 1 (Pkw)
 1 690 382 312



Mercedes-Benz, Type 2 (Sprinter)
 1 690 382 319



Mitsubishi, Type 1 (Set)
 1 690 381 218



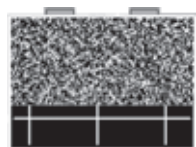
Nissan, Type 1 (Set)
 1 690 381 139



Nissan, Type 2 (Set)
 1 690 381 140



Subaru, Type 2
 1 690 382 329



Subaru, Type 3
 1 690 382 308



Toyota, Type 1
 1 690 382 287



Toyota/Lexus, Type 2
 1 690 382 328



Toyota, Type 3
 1 690 382 355



Volkswagen, Type 1
 1 688 130 250

Multi-Target-Shop Starter kit 1

7 target types consisting of:
 Mercedes-Benz Type 1, Toyota Type 1 and 3, Mazda Type 1, Nissan Type 1, Honda Type 3, XL-Universal

1 690 381 241



Note: Set = 2 targets

Professional DAS service: Calibration of front cameras

	SCT 415/SCT 417 – Target board fixture	
	Front camera – Lane assist	
Manufacturer	Dynamic	Static
Alfa Romeo	—	•
Audi	—	•
BMW	•	—
Chrysler	•	—
Citroën	—	• ²⁾
Fiat		•
Ford	•	—
Honda	—	• ¹⁾
Hyundai	—	• ²⁾
Jaguar	•	—
Jeep	—	• ²⁾
KIA	—	• ²⁾
Land Rover	*	—
Mazda	—	•
Maserati	—	0
Mercedes-Benz	—	• ¹⁾
Mitsubishi	—	•
Nissan	—	•
Opel	—	• ²⁾
Peugeot	—	• ²⁾
Porsche	—	*
Renault	—	• ²⁾
Seat	—	•
Škoda	—	•
Smart	—	•
Subaru	—	• ¹⁾
Suzuki	—	*
Toyota	—	•
Volkswagen	—	•
Volvo	•	—

¹⁾ Depending on the system, in combination with a calibration drive;
²⁾ For some vehicle types also with dynamic calibration; 0 in preparation



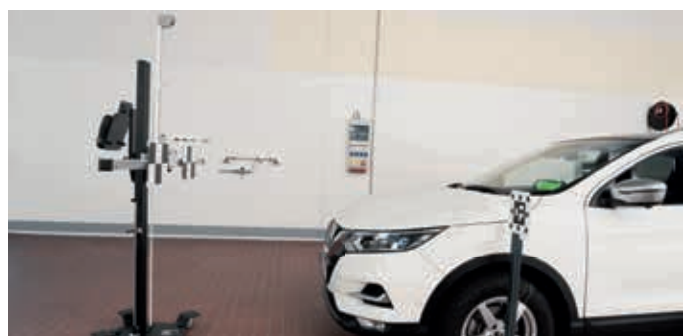
Just plug the targets onto the precision slider using the magnetic clamps



Bar with camera instead of green line laser on the center module



Software workflows with computer vision put efficiency advantage especially on distance of 2–4m



Distance measurement aid delivers precision and time savings

Driven by efficiency

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

Therefore, we have dedicated the last 125 years of pioneering spirit and expertise in research and manufacturing to achieving this.

We continue to work on our unique combination of solutions for spare parts, diagnostic devices, workshop equipment and services:

- ▶ Solutions for efficient vehicle repairs
- ▶ Innovative workshop equipment and software
- ▶ The world's most comprehensive range of new and replacement parts
- ▶ Large network of wholesale customers, for quick and reliable parts supply
- ▶ Competent hotline support
- ▶ Comprehensive educational and training offers
- ▶ Targeted sales and marketing support

Find out more at:
bosch-automotive-aftermarket.com

**What drives you
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