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CAREYE® SAFETY ANGLE TURN - ASSIST



INSTALLATION MANUAL

STEERING ANGLE SENSOR



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■ GENERAL NOTES

Read this manual carefully, it contains important information and notes on assembly, commissioning and safe operation.

Pay particular attention to the following markings:



Information that serves the proper operation and handling is shown with this symbol. Non-observance may lead to damage or functional restrictions.



Warnings are information that is of particular importance for proper operation and safe handling. These are shown with this symbol.



Hazards that may expose the user to particular danger are indicated with this symbol.

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■ SAFETY INSTRUCTIONS

ABOUT CAREYE® SAFETY ANGLE



- The CAREYE® SAFETY ANGLE system is an assistance system to support the driver. The responsibility for monitoring remains with the driver.
- CAREYE® SAFETY ANGLE is not a direct replacement for the rear-view or exterior mirror system and, due to the variety of situations in road traffic, cannot provide any guarantee regarding the detection rate or error detection rate in operation.
- CAREYE® SAFETY ANGLE is a driving assistance system and therefore serves to support the driver, but in no way represents an automation system. CAREYE® SAFETY ANGLE is designed as a retrofit device for actively warning the driver of potentially dangerous situations. The detection and false alarm rates of the system depend on the installation and the current environmental conditions. No warranty is given by the manufacturer for the situation-related detection or the analysis behavior of the "artificial intelligence" used in the CAREYE® SAFETY ANGLE.
- All components are intended exclusively for the intended use.

CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ Safety Instructions

INSTALLATION



- Installation must be carried out by registered workshops for motor vehicles or commercial vehicles or by authorized workshops, otherwise warranty claims will become void.
- Only install and operate the TIC box, the monitors and the signal elements in a dry and dust-free environment, away from impact areas or the deployment area of an airbag.
- Take care not to damage any important parts or injure any cables or hoses during installation preparations (e.g. drilling holes) and installation.
- The operating temperature is between -20°C and +70°C, the humidity between 20% and 80% (non-condensing).
- Mount the devices securely and tightly according to the section "Mounting". Remove any protective films before commissioning.
- Connect all components only to the vehicle's electrical system with a nominal voltage of 12 to 24 VDC. Ensure the correct polarity of the supply voltage.
- Manual control devices, indicator lamps and displays in the passenger compartment must not be covered by the monitor and signal transmitter.
- During all activities, ensure your personal safety, the safe use of tools and aids, and the securing of the vehicle.

■ Safety Instructions

OPERATION



- Operate the components only on the vehicle electrical system with 12 to 24 VDC nominal voltage of the vehicle.
- Observe the mechanical, electrical and climatic operating conditions.
- Do not use the devices if they show visible damage.
- Protect the cables from heat, sharp edges and aggressive substances such as oils or fuels.
- Do not extend cable connections independently, individual cable sets are available on request.
- Keep the components away from strong electric and magnetic fields.
- Do not use any components other than those supplied, do not plug in any third-party devices.
- Do not glue parts at the components, the solvent could damage the surfaces.
- Make sure that the viewing glasses of the camera(s) are clean and free from scratches, cracks or stone chips. The functioning of the entire system is largely dependent on the quality of the camera images. In the event of a defect or if the viewing glass is cloudy, for example, the camera must be replaced.
- Interrupt the power supply immediately if liquids or foreign bodies have penetrated the devices.
- Do not use the devices in areas with a high risk of explosion.

CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ Safety Instructions

CLEANING AND MAINTENANCE



- The camera(s) are splash-proof - but avoid spraying them directly with a high-pressure cleaner.
- Replace defective, damaged or kinked cables immediately.
- Do not attempt to service the product yourself, as opening it may expose you to dangerous electrical voltages or other hazards. Opening the equipment will void the warranty.
- Regularly check the functions and condition of the components of the turn assistant. In the event of defects, recognizable damage or wear, the product can no longer be used or used safely. Have it repaired immediately.
- Clean the monitors and the signal elements only with a soft, clean and dry cloth. Never use solvents, oils or other cleaning agents.
- Disconnect the power supply during cleaning or maintenance activities.
- Use only original spare parts and have repairs carried out only in specialist workshops authorized by EYYES.
- EYYES accepts no liability for damage caused by failure to observe this manual. This manual is part of the product.

CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ IMPORTANT DOCUMENTS

The following documents are important components of the products, which must be observed accordingly.

DOCUMENT	Installation and Instruction Manual Control Box and Cameras (Part M)
CONTENT	<ul style="list-style-type: none"> ■ Safety instructions ■ Function descriptions ■ Component description ■ Assembly ■ Connection ■ Configuration ■ Operation and use ■ System check ■ Parts overview
ENCLOSED	SET TIC Box TATIC
NOTES	Carry in the vehicle not required



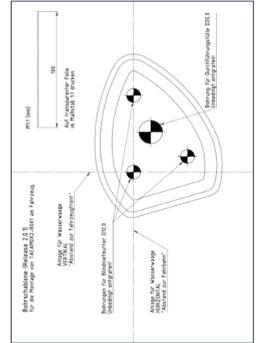
DOCUMENT	Instruction manual (Part B)
CONTENT	<ul style="list-style-type: none"> ■ Safety Instructions ■ Function Instruction ■ Operating and use ■ System Check
ENCLOSED	SET TIC Box TATIC
NOTES	Carry in the vehicle required



CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ Important documents

DOCUMENT	Drilling template
CONTENT	Drilling template for the camera base
ENCLOSED	Camera TACAM
NOTES	---



CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ Imported documents

DOCUMENT	Installation manual steering angle sensor (Part L)
CONTENT	<ul style="list-style-type: none">■ Safety instructions■ Function descriptions■ Component description■ Installation■ Connection■ Commissioning■ Parts overview
ENCLOSED	Steering angle sensor TASEN
NOTES	Carry in the vehicle not required



DOCUMENT	Installation manual Monitor 10 oder 12" (Part D)
CONTENT	<ul style="list-style-type: none">■ Safety instructions■ Function descriptions■ Component description■ Installation■ Connection■ Commissioning■ Parts overview
ENCLOSED	Monitor TAMON
NOTES	Carry in the vehicle not required



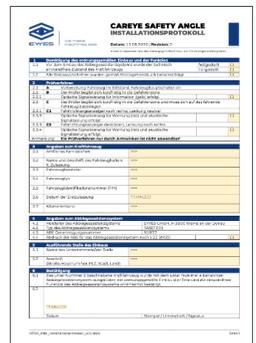
CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ Imported documents

DOCUMENT	CarEye Safety Angle General operating permit
CONTENT	ABE and field of applicatio
ENCLOSED	SET TIC Box TATIC
NOTES	Carry in the vehicle not required



DOCUMENT	CarEye Safety Angle installations protokoll
CONTENT	Logging of the measures in the course of assembly/installation by the installing workshop. This protocol can also be completed electronically.
ENCLOSED	SET TIC Box TATIC
NOTES	Return of the protocol to EYES.



CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ FUNCTION DESCRIPTION AND FUNCTION MODULES

As part of the CAREYE® product suite, the SAFETY ANGLE variant offers a flexible, expandable and safe system for use as an TURN ASSISTANT / BLIND SPOT ASSISTANT with proven safety functions.

The TURN ASSISTANT - also called ASSISTANT FOR THE BLIND SPOT - is suitable as a retrofit solution or for new vehicles, for example commercial vehicles or special and emergency vehicles that have particularly vulnerable areas.

CAREYE® SAFETY ANGLE detects people and cyclists on the basis of artificial intelligence and warns the driver reliably and in real time. Objects that are not relevant are recognized as such and included in the evaluation, thus reducing warnings to the lowest possible level.

The basic version of CAREYE® SAFETY ANGLE as an TURN ASSISTANT consists of the central interface and controller box (TIC box), the signal element and 2 digital camera sensors.

The TIC box processes these camera signals, detects and classifies objects and provides the necessary interfaces for connection to the vehicle electronics. Due to its compact design, the TIC box can be easily mounted indoors.

The cameras are installed in suitable positions on the outside of the vehicle. The heated cameras are available as a compact surface-mounted version or as a stable camera arm. Thanks to its ergonomic and safe design, this camera arm enables optimum observation of what is happening alongside the vehicle - even with bodies wider than the cab - and of the blind spot.



CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ Function description and function modules

If a person or a cyclist is detected in the danger zone when turning, the driver is warned by the optical signal indicator and additionally with a loud sound generator.

The system activates automatically by evaluating the speed of the vehicle, the activated direction indicator and the steering angle. There is no warning when the hazard warning lights are used.

Optionally, light-intensive displays with different diagonals can be used to additionally display the camera images including the detected objects and persons in the danger zone.

Furthermore, the TIC box can be the future-proof central control unit for additional safety and comfort functions available to the drivers:

- the rear view camera with automatic activation as a rear view assistant

CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ FIELD OF APPLICATION

The CAREYE® SAFETY ANGLE turn-off assistant is intended for all commercial vehicles in classes N2 and N3 and for all buses in classes M2 and M3 with more than nine seats including the driver's seat.

An additional steering angle sensor and the turn signal are required for the function of the turn-off assistant.

When using a tilt sensor as a steering angle sensor, please note:

- The tilt sensor is used for vehicles with mechanical steering systems (with or without power assist).
- The mechanical steering force transmission must be provided by a steering column lever that can be moved in a vertical plane; the tilt sensor must be mounted there
- Application on vehicles with a steering system without a vertically movable pitman arm as well as on horizontally movable components such as steering or track rods is not possible.

The system must be completely installed on the vehicle in which the driver contains the warning. In addition to the installation instructions, the following installation conditions must be observed in particular.



CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ Field of application



The Wing type camera must be

- at a mounting height of between 2,300 and 3,800 mm,
- at a mounting distance from the front of the vehicle of between 1,200 and 1,800 mm

be mounted on the passenger compartment or on the body of the vehicle. Care must be taken to ensure that no component protrudes more than 100 mm beyond the outer edge of the vehicle.

It must be ensured that

- the Wing is horizontal to the ground,
- the wing is aligned at 90° to the vehicle axis,
- the mounting position is on as level a surface as possible.

Please ensure that the Wing does not impair direct or indirect vision and that the function of any existing sensors or elements is not impaired.

CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ COMPONENTS - STEERING ANGLE SENSOR

GENERAL

The steering angle sensor from CAREYE® SAFETY ANGLE detects the cornering criterion required for the turn-off assistant by means of tilt sensors.

It is used if this criterion cannot be provided by the vehicle on the CAN bus (described in Part M under "Electrical connection").

For proper operation, the steering angle sensor must be connected to the TIC box and configured and calibrated in the system.

Application conditions:

- The tilt sensor is used as a steering angle sensor on vehicles with mechanical steering systems (with or without power assist).
- The mechanical steering force transmission must be provided by a steering column lever that can be moved in a vertical plane.
- The tilt sensor must be mounted on the vertically movable steering column lever.
- Application on vehicles with a steering system without a vertically movable pitman arm as well as on horizontally movable components such as steering or track rods is not possible.



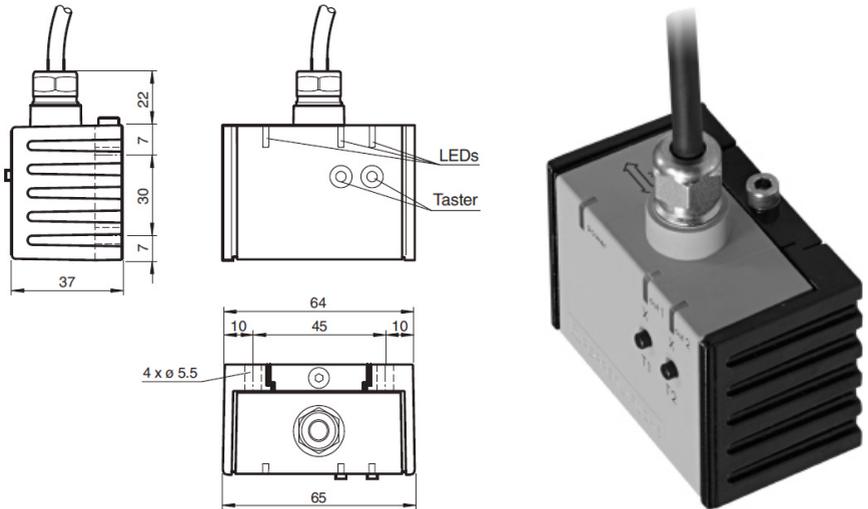
The steering angle sensor is suitable for steering column levers that move in a vertical plane. The manufacturer requires clarification with the specialist workshop.

Please also refer to the document Instruction Manual Part M. Operation of the steering angle sensor must be enabled, configured and calibrated on the system side.

CAREYE® SAFETY ANGLE - TURN - ASSIST
 INSTALLATION MANUAL STEERING ANGLE SENSOR

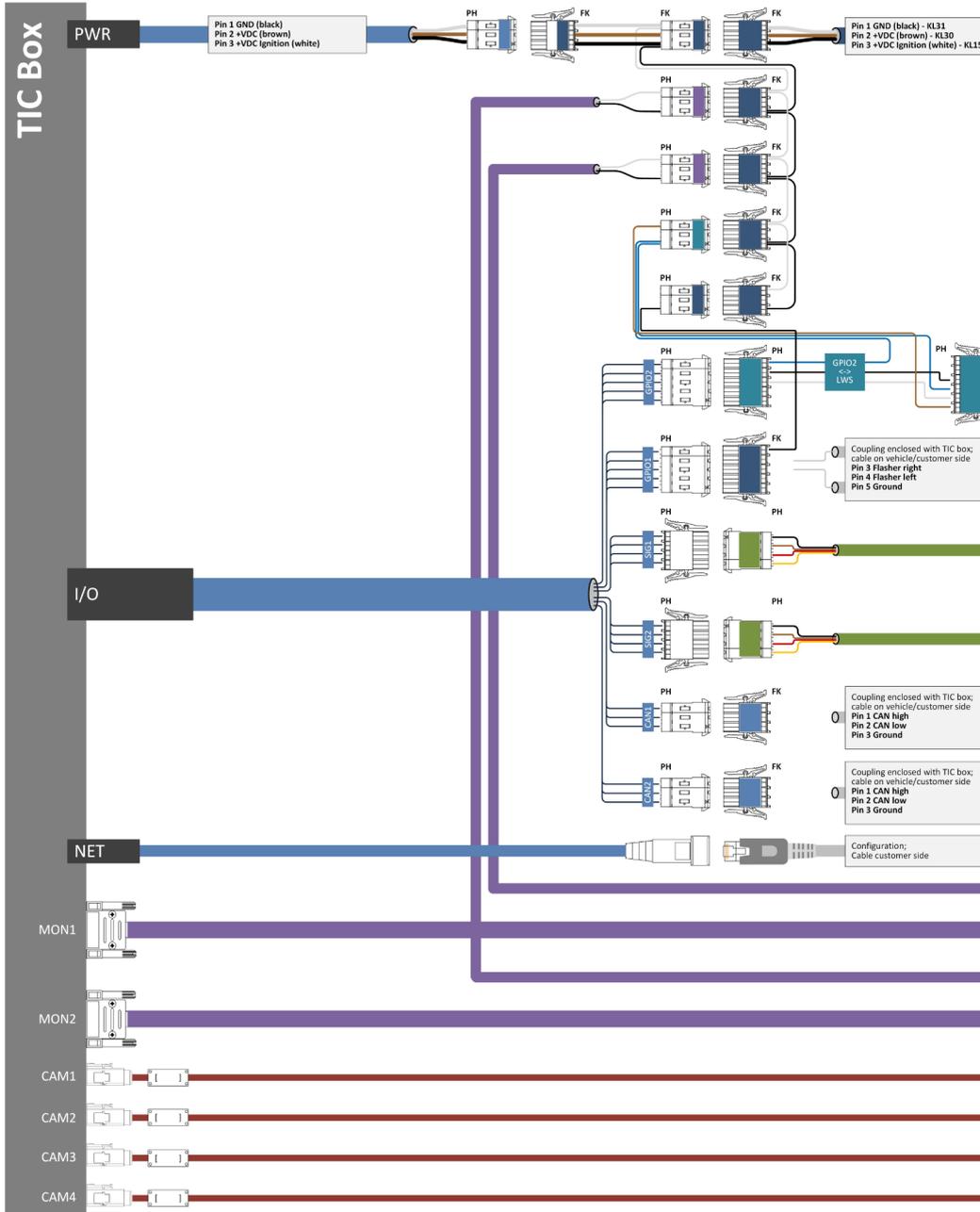
■ Components - Steering angle sensor

TECHNICAL DATA

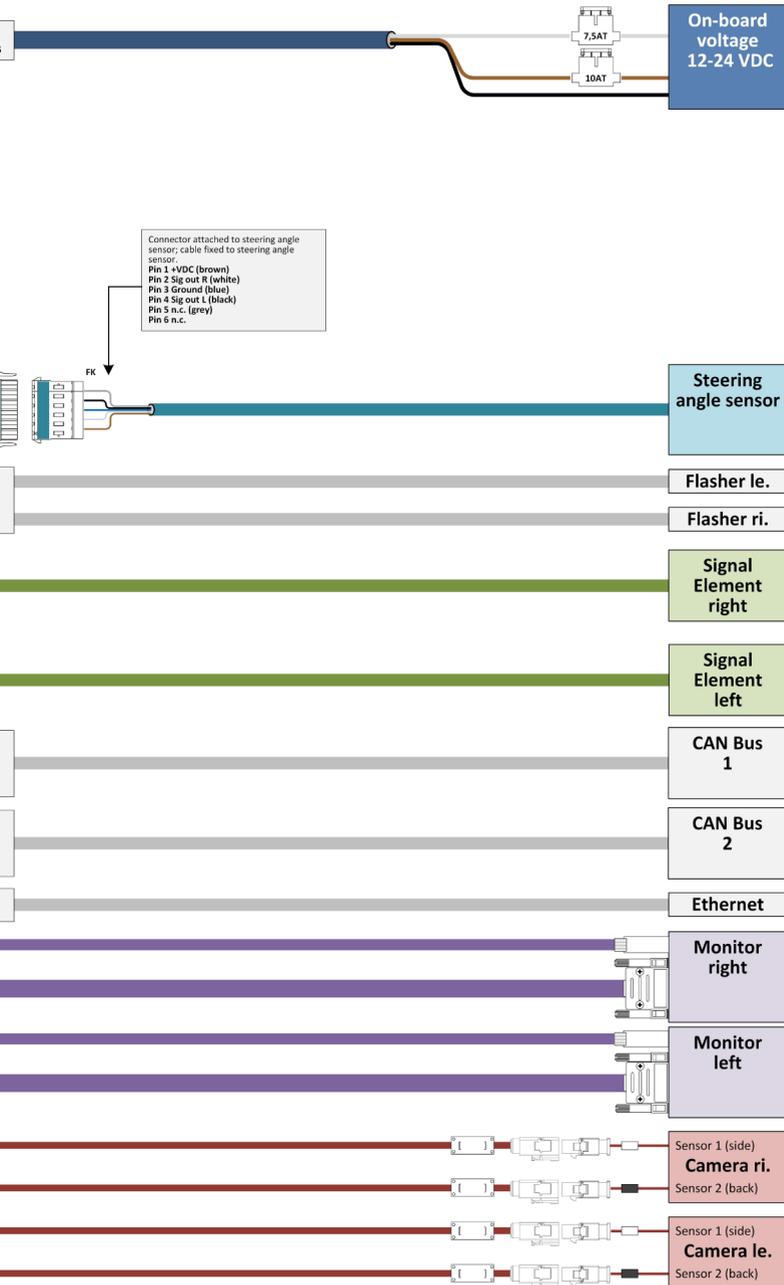


Description	TASEN001-0001
Power Supply	12 up to 24 VDC Nominal voltage
Current consumption	<25 mA in idle mode
Environmental conditions	-40°C up to +85°C
Protection class	IP68/IP69K
Dimensions	44 x 65 x 37 mm (H x B x T), without cable outlet and mounting bracket
Weight	240 g, Without mounting bracket
E1 Type approval	10R-04

CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR



CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR



LEGEND

- Scope of delivery TIC Box
- Scope of delivery cable set TIC Box
- Scope of delivery cameras
- Scope of delivery Cordsets Cameras
- Scope of delivery steering angle sensor
- Scope of delivery signal elements
- Scope of delivery monitors
- Scope of delivery Cordsets Monitors
- not included in delivery

CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ INSTALLATION - STEERING ANGLE SENSOR

MOUNTING ON THE STEERING COLUMN LEVER

The TASEN steering angle sensor is intended for mounting on the steering column lever of the vehicle which moves in the vertical plane. It is not possible to use it on a component that moves in a horizontal plane, such as a steering or track rod. The manufacturer requires clarification with the specialist workshop.

The "Steering angle sensor" set consists of the following parts:

- the steering angle sensor with mounting bracket and fixed cable, which can be shortened if necessary,
- the adapter cable with enclosed mating connector.

The steering angle sensor must be mounted so that the cable outlet runs along the steering column lever, the buttons and display elements must be visible from the outside (see illustration).

Fix the supplied bracket of the steering angle sensor with 2 cable ties or hose clamps suitable for the environmental conditions (outdoor, temperature fluctuations, salt).

The selection of a suitable mounting is the responsibility of the workshop. Guide the cable supply line secured in suitable corrugated tubes or similar to the TIC box. **Fix the supply line accordingly after the calibration process at the latest. During the calibration process, it is advantageous not to fix the TASEN in the holder yet.**



Make sure that the steering angle sensor and its mounting do not collide with other parts. It must not bump anywhere over the entire steering range.

The steering angle sensor on the pitman arm must not slip. Appropriate measures must be taken, especially for tapered steering column levers.

When laying the cable, make sure to provide sufficient excess length and maneuvering areas so that the cable is not strained or loops are created even when the steering is in full lock.

CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

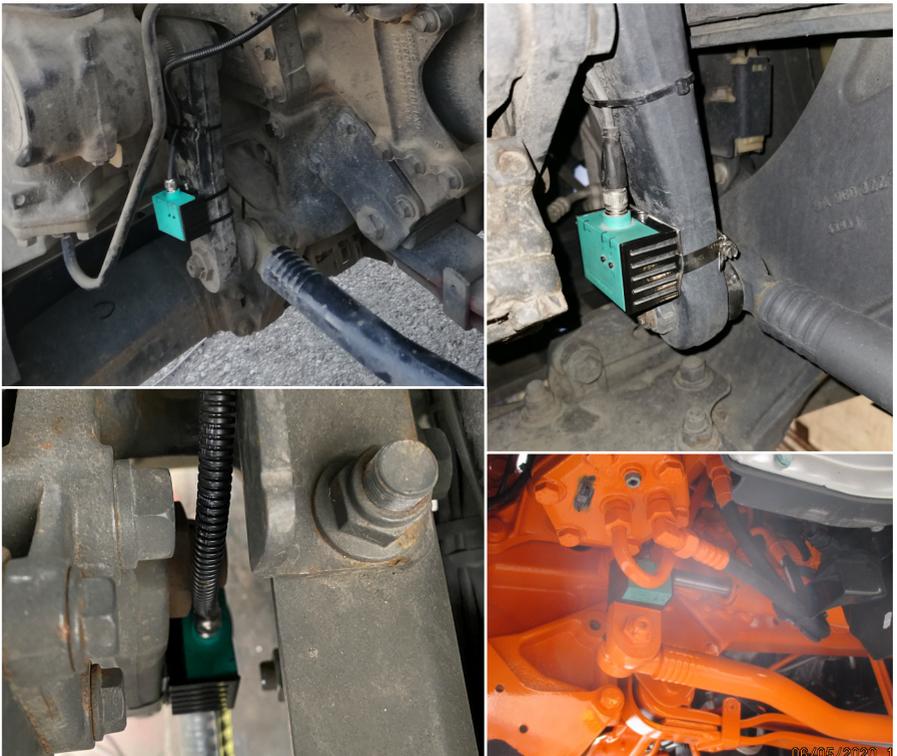
■ Installation - Steering wheel sensor

MOUNTING ON THE STEERING COLUMN LEVER



The cable at the moving points must be free to move, but without being too loose. It must not be able to get caught or hooked, or be taut or under tension. If necessary, shorten the cable to the required length.

The following illustrations show examples of correct assembly.



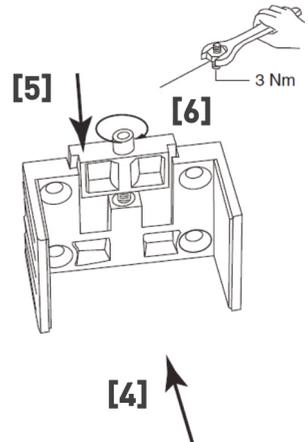
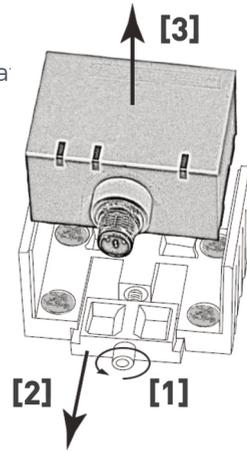
CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ Installation - Steering angle sensor

MOUNTING IN THE BRACKET

The sensor consists of the sensor module and the enclosed mounting bracket. Proceed as follows for mounting:

- Loosen the central screw below the sensor housing [1],
- Push the clamping element back so far that the sensor module [2],
- Now remove the sensor module from the mounting bracket [3],
- Mount the mounting bracket at the intended location,
- reinsert the sensor module [4],
- push the clamping element flush into the mounting bracket [5],
- perform the following step only after calibration, see "Initial calibration": retighten the central screw [6].



Make sure that you can still loosen or tighten the fastening screw on the bracket of the steering angle sensor after mounting the bracket and the steering angle sensor including cable.

The mounting bracket can also be rotated by 180° for this purpose.

CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ ELECTRICAL CONNECTION

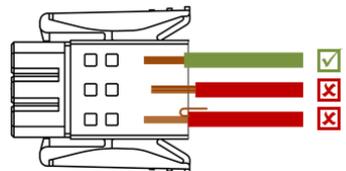
GENERAL

- Most cable sets are preconfigured and provided with permanently mounted connectors, do not shorten them:
 - Cable set signal element, an extension cable is optionally available for this,
 - Cable set monitor,
 - Cable set camera.
- The following cable sets can be shortened to the required length:
 - Cable set voltage supply, shortening on the side of the open end,
 - Cable set steering angle sensor, shortening on the side of the open end. The plug connection with spring clips for self-assembly is enclosed.
- The following cable connections must be made during installation; no cable sets are supplied for this purpose:
 - Turn signal if this is not available via the CAN bus. The plug connection with spring terminals is pre-mounted on the side of the TIC box.
 - CAN bus, the plug-in connections with spring terminals for self-assembly are included.



When using the spring terminals, make sure that no strands or wires protrude from the body of the connector and that the insulation extends into the connector. Do NOT use wire end ferrules!

The enclosed connectors with spring clamps allow easy assembly without tools. They are designed for a conductor **cross-section of 0.2 to 0.5 mm²**.



CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ Electrical connection

POWER SUPPLY - PWR

- Connect the steady plus, the ignition plus and the ground to the terminals provided for this purpose, but ensure that the voltage is not present at the start of assembly and do not establish the voltage supply until the assembly activities have been completed.
- Ensure the supply voltage range with a nominal voltage of 12 VDC to 24 VDC.
- Use the enclosed fuse holders and fuses if no fused circuits are available.
The continuous positive must be fused with 10 AT, the ignition positive must be fused with 7.5 AT.



Make sure that the connection to the on-board power supply is correct; if the polarity is reversed, the entire system can be damaged.

The "TATIC cable set" is available for the power supply. This consists of

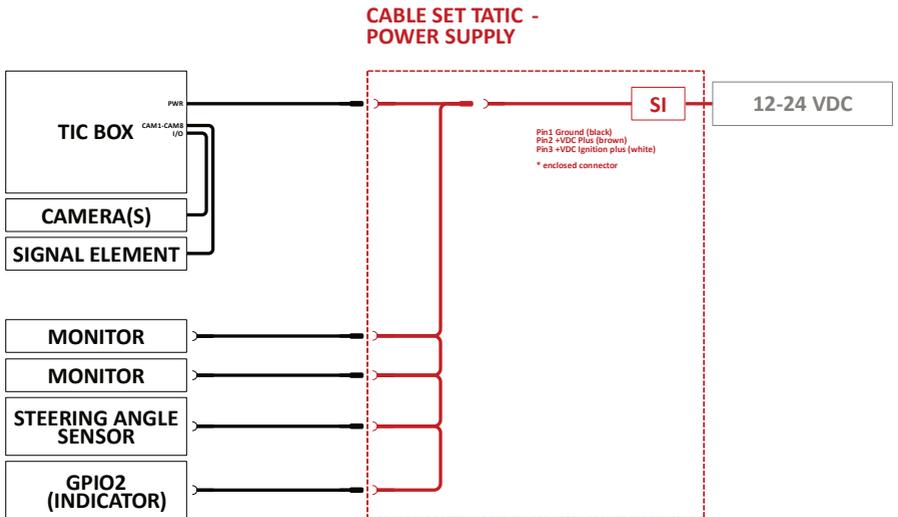
- the cable set standard incl. fuse holder and fuses
- the distribution cable, which provides a plug connection for the TIC box, the monitors and the steering angle sensor
- the adapter cable for connecting the two turn signals, if this criterion is not provided via the CAN bus.



CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ Electrical connection

POWER SUPPLY - PWR



CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

Electrical connection

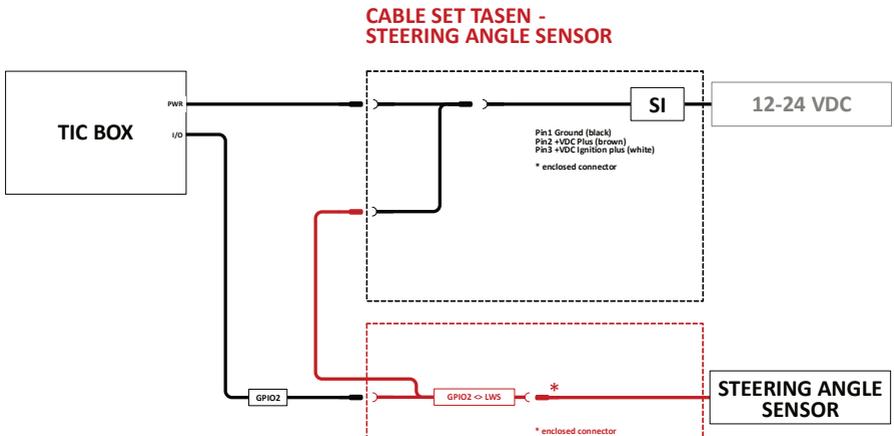
STEERING ANGLE SENSOR

- The cable of the steering angle sensor can be shortened. After shortening, mount the 6-pin connector. The spring clamps enable easy mounting without tools.

PIN	DESCRIPTION	COLOR CONNECTOR LWS
1	+12 bis 24 VDC	brown
2	Signal out right	white
3	Ground	blue
4	Signal out left	black
5	Not used	grey
6	nc	Not connected



- Connect the steering angle sensor to the "LWS" side of the "GPIO2<->LWS" cable. Connect the "GPIO2" side of the cable to the "GPIO2" interface of the TIC box. Connect the green connector to the power supply cable from the cable set of the TIC box.
- Make sure that the plug connections are firmly engaged.



CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ Electrical connections

IMPORTANT NOTES



The CAREYE® SAFETY ANGLE system or its components must be installed and wired in such a way that they start up automatically when the ignition is switched on. Under no circumstances may the entire system or parts of it be switched off or implemented.



Only use the cables supplied, special lengths are available if required.

Do not shorten or extend any cables with the exception of the cable for the power supply and the steering angle sensor.

Make sure that the cables are secured against pulling, if necessary tie them together with cable ties to provide strain relief.

Avoid drilling holes with sharp burrs and make sure that the cables do not rub against sharp edges.

When laying the cables, take care not to crush or otherwise damage them.

Protect the cables from sharp edges and corners and do not lay them over them.

Observe the minimum bending radius of the cables and do not go below 7.5 times the outer diameter of each cable.

Do not expose the cabling to heat or aggressive substances such as oils or fuels. Replace defective, damaged or kinked cables immediately.

Operate only the intended and supplied components and devices in the CAREYE® SAFETY ANGLE system.

CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ INITIAL COMMISSIONING

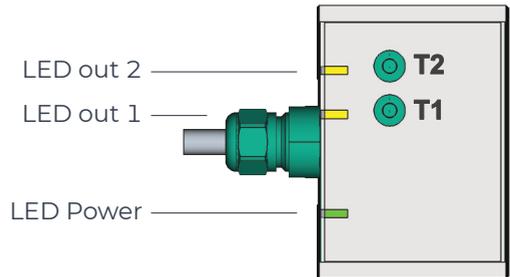
GENERAL NOTES

Display and reset

The green Power LED lights up continuously during normal operation, but does not light up during the calibration process; it flashes in the event of undervoltage.

To reset to the factory settings, press the **T1** and **T2** keys simultaneously for >10s.

- After approx. 2s, the **Power LED** goes out, the **LED out 1** and the **LED out 2** start flashing.
- After approx. 10s, the **LED out 1** goes out, the **LED out 2** and the **Power LED** flashes. The reset is then complete.
- The sensor then returns to the normal state, the **Power LED** lights up continuously.



CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ Initial commisioning

GENERAL NOTES - CALIBRATION

Calibration

After proper installation and electrical connection, the steering angle sensor must be calibrated.

Depending on the mounting position of the steering angle sensor - on the **steering column lever outside** (steering angle sensor buttons point to the left side of the vehicle) or on the **steering column lever inside** (steering angle sensor buttons point to the right side of the vehicle) - please perform the calibration procedures described below.

- When **mounting** the steering angle sensor on the **outside** of the pitman arm, follow the steps for calibration in the subchapter **CALIBRATION - MOUNTING ON THE OUTSIDE OF THE STEERING COLUMN LEVER.**
- When **mounting** the steering angle sensor on the **inside** of the pitman arm, follow the steps for calibration in the subchapter **CALIBRATION - MOUNTING ON THE INSIDE OF THE STEERING COLUMN LEVER.**
- The **calibration check** is the same for **both sides** and is described in the subchapters **CHECKING THE CALIBRATION - LEFT CURVE or RIGHT CURVE.**



In any case - i.e. also only when using the turn assistant for the right - the calibration for the left turn **and** right turn must be performed.

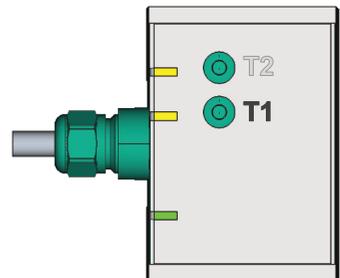
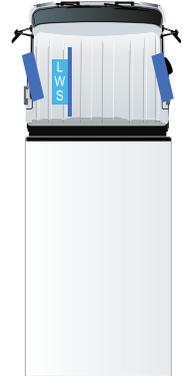
CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ Initial commissioning

CALIBRATION - MOUNTING ON THE STEERING COLUMN LEVER OUTSIDE

Calibration of the left curve

- Put the steering of the vehicle in **neutral position**,
- press the **T1 key** for > 2 seconds,
- Turn the **steering** to the **right as far as it will go**,
- Remove the steering angle sensor from the holder and rotate the sensor further by 45 degrees along the imaginary line,
- then briefly press the **T1 key**,
- To confirm, **LED out 1** lights up for about 1.5 seconds, then flashes again,
- reinsert the steering angle sensor into the holder,
- bring the steering of the vehicle into **neutral position**,
- Turn the **steering wheel approx. one (1) turn to the left**.
The curve radius thus described must not be less than 10 meters!
- Then briefly press the **T1 key**,
- to confirm, the **LED out 1** lights up for about 1.5 seconds, then it changes to normal operation (lights up outside the curve radius, does not light up inside the curve radius).



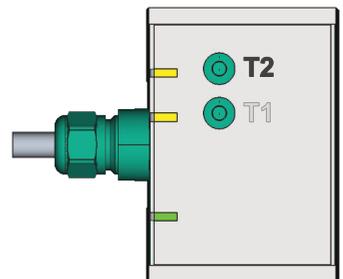
CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ Initial commisioning

CALIBRATION - MOUNTING ON THE STEERING COLUMN LEVER OUTSIDE

Calibration of the right curve

- Put the steering of the vehicle in **neutral position**,
- press the **T2 key** for > 2 seconds,
- Turn the **steering wheel approx. one (1) turn to the right**. The curve radius thus described must not be less than 10 meters!
- Then briefly press the **T2 key**,
- To confirm, the **LED out 2** lights up for about 1.5 seconds, then it flashes again
- bring the steering of the vehicle into **neutral position**,
- Turn the **steering** to the **left as far as it will go**,
- Remove the steering angle sensor from the holder and rotate the sensor further by 45 degrees along the imaginary line,
- then briefly press the **T2 key**,
- to confirm, the **LED out 2** lights up for about 1.5 seconds, then it changes to normal operation (lights up outside the curve radius, does not light up within curve radius),
- reinsert the steering angle sensor into the holder.



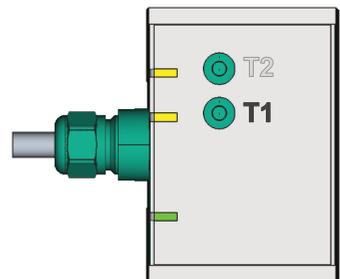
CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ Initial commissioning

CALIBRATION - MOUNTING ON THE STEERING COLUMN LEVER INSIDE

Calibration of the left curve

- Put the steering of the vehicle in **neutral position**,
- press the **T1 key** for > 2 seconds,
- Turn the **steering wheel approx. one (1) turn to the left**. The curve radius thus described must not be less than 10 meters!
- Then briefly press the **T1 key**,
- To confirm, the **LED out 1** lights up for about 1.5 seconds, then it flashes again
- bring the steering of the vehicle into **neutral position**,
- Turn the **steering** to the **right as far as it will go**,
- Remove the steering angle sensor from the holder and rotate the sensor further by 45 degrees along the imaginary line,
- then briefly press the **T1 key**,
- to confirm, the **LED out 1** lights up for about 1.5 seconds, then it changes to normal operation (lights up outside the curve radius, does not light up within curve radius),
- reinsert the steering angle sensor into the holder.



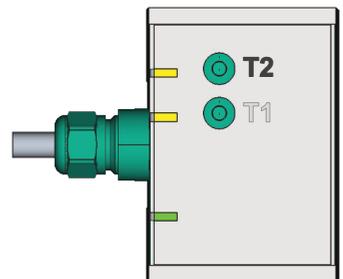
CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ Initial commisioning

CALIBRATION - MOUNTING ON THE STEERING COLUMN LEVER INSIDE

Calibration of the right curve

- Put the steering of the vehicle in **neutral position**,
- press the **T2 key** for > 2 seconds,
- Turn the **steering** to the **left as far as it will go**,
- Remove the steering angle sensor from the holder and rotate the sensor further by 45 degrees along the imaginary line,
- then briefly press the **T2 key**,
- To confirm, **LED out 2** lights up for about 1.5 seconds, then flashes again,
- reinsert the steering angle sensor into the holder,
- bring the steering of the vehicle into **neutral position**,
- Turn the **steering wheel approx. one (1) turn to the right**.
The curve radius thus described must not be less than 10 meters!
- Then briefly press the **T2 key**,
- to confirm, the **LED out 2** lights up for about 1.5 seconds, then it changes to normal operation (lights up outside the curve radius, does not light up inside the curve radius).

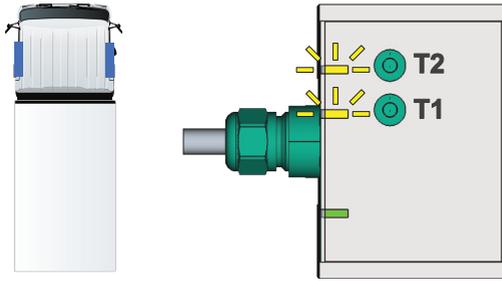


CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

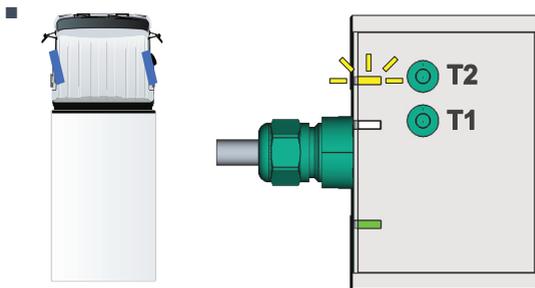
■ Initial commisioning

CHECKING THE CALIBRATION - LEFT CURVE

- Move the steering to the **neutral position**.
The **LED out 1** and **LED out 2** light up.



- Slowly turn the **steering to the left as far as it will go**.
- As the steering angle increases, the curve radius becomes smaller.
- The **LED out 1** must go out at the latest when the curve radius on the left falls below 10 meters.
- The **LED out 2** lights up continuously, even when the leftmost impact is reached.

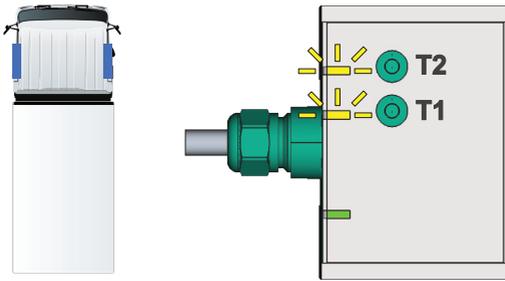


CAREYE® SAFETY ANGLE - ABBIEGEASSISTENT MONTAGEHANDBUCH LENKWINKELSENSOR

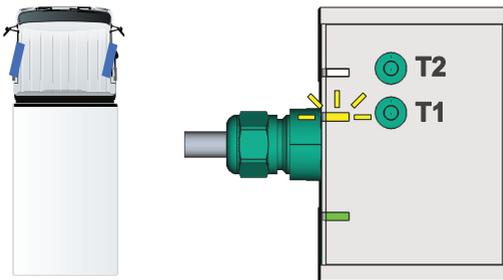
■ Initial commisioning

CHECKING THE CALIBRATION - RIGHT CURVE

- Move the steering to the **neutral position**.
The **LED out 1** and **LED out 2** light up.



- Slowly turn the **steering to the right as far as it will go**.
- As the steering angle increases, the curve radius becomes smaller.
- The **LED out 2** must go out at the latest when the curve radius on the right falls below 10 meters.
- The **LED out 1** lights up continuously, even when the rightmost impact is reached.



CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ COMPONENT OVERVIEW

STEERING ANGLE VIEW

ARTICLE-NR.	DESCRIPTION	FIGURE
CS-SET-0009x	Steering angle sensor TASEN001-0001-xx	
SP-TIC-0005x	Steering angle sensor with fixed cable 700 cm	
SP-TIC-0006x	Accessory bag with adapter cable and mating connector Steering angle sensor (1)	
BT-DOC-0024x	Installation manual Part L (1)	

CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ GENERAL INFORMATIONS

SYSTEM LIMITS

The turn-off assistant has been tested on the basis of legal requirements. Please bear in mind that, despite the sophisticated technology, this is an assistance system and must be used as such.

If visibility conditions are such that safe driving is not possible - for example fog, heavy rain or snowfall - this can affect the function of the system.

In addition, the cameras or the protective camera glass on them must be cleaned of dirt.

Objects outside the field of view cannot be detected by the system. If there is extraneous glare, e.g. from a vehicle approaching from behind, object detection can be delayed or disturbed. In the case of very small or thin objects such as strings, ribbons or wires - especially with a color-like background - object detection may be delayed or the object may not be detected.

STORAGE AND DISPOSAL OF THE PACKAGING

Store the in the components only in the original and, if possible, closed boxes of the delivery.

The recommended storage temperature is between 19° and 23°C, humidity 45-65%.

Protect the components from liquids, shock-like temperature changes, intense sunlight, dust, aggressive atmosphere and mechanical impact. Do not store the components in the direct area of a heating fan.

Shelf life of corrugated cardboard is one (1) year under good environmental conditions. Avoid stacking the boxes during storage. **There is a danger of cutting at the edges of the corrugated board!**

The material of the packaging is recyclable, use the area-wide systems for disposal.

CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION MANUAL STEERING ANGLE SENSOR

■ General Informations

DISPOSAL

The correct collection of defective components enables valuable raw materials to be recycled. Therefore, observe the relevant and national regulations for the disposal of electronic waste; do not dispose of it in the residual waste under any circumstances.

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