



the don light

DON-light installation manual - January 2024 - Version 1



Five steps
to safety

-
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1. Introduction

Thank you for purchasing this Marelko product: The DON-light.

This document is a concise installation manual to ensure proper and safe operation of this product. It is important that this product is installed by a capable person with knowledge of vehicle and electrical engineering. In addition to the installation instructions of the DON-light, the instructions of the vehicle manufacturer must always be followed. When using the DON-light, you must comply with the legislation in your country. In the Netherlands, this is the legislation "*Optische en geluidssignalen 2009*".

The DON-light is an innovative lighting solution with the following possible functions and specifications:

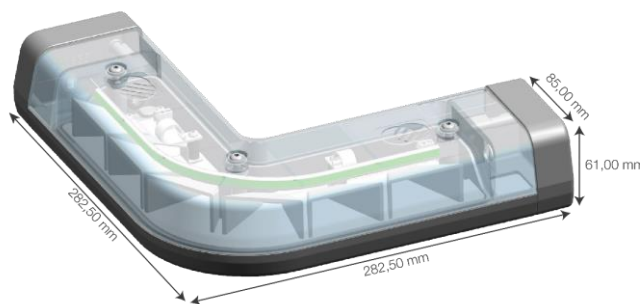
- / LED
- / ECE65 class 2 approved in amber, blue and red
- / White LED as a work light
- / Work light angle of 15°
- / Green for leading duty officer
- / 10 V to 30 V
- / Integrated amber turn signals, ECE R6 certified
- / EMC R10 certified
- / CE certified
- / IP67
- / GORE-TEX® membrane
- / Impact-resistant Lexan LS1 / Poly Carbonate housing
- / Modular applicable
- / Fixed mounting
- / Vehicle-specific spoiler mounting
- / Vehicle-specific mounting options
- / Arrowbar function
- / Built-in spotlights
- / Built-in SOS access

For more information, please contact Marelko B.V.

2. Product specifications

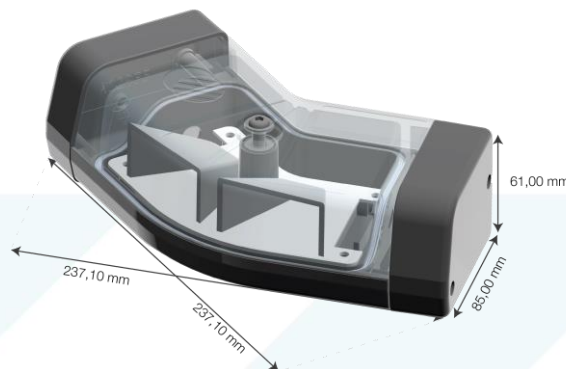
DON-light 90° corner module

- / 90° Corner module 282,50mm x 85mm x 61mm
- / Integrated E-approved turn signals, amber
- / 5.10 A peak consumption per module
- / 10 V tot 30 V



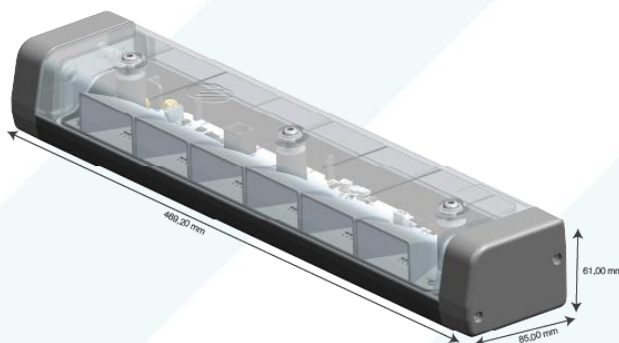
DON-light 45° corner module

- / 45° Corner module 237,10mm x 85mm x 61mm
- / 1,70 A peak consumption per module
- / 10 V tot 30 V



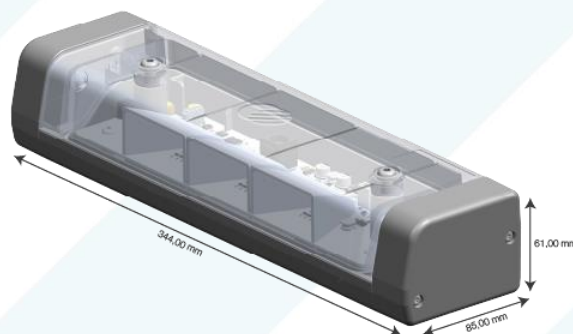
DON-light straight long module

- / Straight long module 469,2mm x 85mm x 61mm
- / 5,10 A peak consumption per module
- / 10 V tot 30 V



DON-light straight short module

- / Straight short module 344mm x 85mm x 61mm
- / 2,55 A peak consumption per module
- / 10 V tot 30 V



3. Electrical installation

Power Consumption and cable Regulations

The specifications of the power cable should be chosen taking into account the following parameters:

- / Power consumption of the entire system (see table below)
- / Power consumption of each individual set of the system (all modules connected via cable under one set) (see table below)
- / The length and dimension of the cable (see Appendix A for the cable regulations)

Taking into account the power consumption, it is preferred to use the following cable: LAPP Benelux MRL00039 Power Cable 2x 2.5MM ÖLFLEX CLASSIC.

Module	peak consumption [A]
DON-light 90° corner module	5.10
DON-light 45° corner module	1.70
DON-light straight long module	5.10
DON-light straight short module	2.55

To calculate the (peak) consumption of a DON-light LED-based set, add up the peak consumption (see table) per module in the set.

Note: Cables must be provided with strain relief.

Components within the system

Modules

The following must be taken into account for the installation of the DON-light modules:

- / The position on the vehicle

At the bottom of the module is indicated where the module should be located on the vehicle

- / The order of the modules within the set

The set consists of all modules on one of the same cables within a system. A resistor is placed on the last module within a set. It is important that this module is located on the longest cable within a system. Modules that are branched off from the cable, do not contain an resistance, but are closed with a blind cap.

Break-out-Box (BOB)

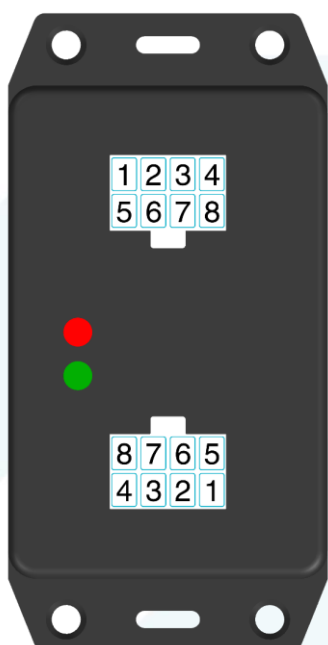
The Break-out-Box (BOB) is used to control the CAN-bus system analogously. The use of other CAN-bus control systems or a combination of another control system and the BOB, is also possible. Please contact Marelko for more information.

With regard to the BOB, the following should be taken into account:

- / Two wiring harnesses are installed in the BOB

Note: Be aware of which wiring harness belongs in the upper or lower terminal of the BOB.

- / Connect the cables of the wiring harness to the appropriate circuit (see table below)
- / Cables from the wiring harness that are not used in the system, need to be shielded with heat shrink tubing



	Nr.	Color cable	Function	Connect to
Connector 1 (upper)	1	Brown/White	Work light E & F ¹	Positive signal
	2	Yellow/Black	Right turn signal	Positive signal
	3	Brown	CAN High	CAN High DON-light
	4	White	CAN Low	CAN Low DON-light
	5	Purple/White	Night mode	Positive signal
	6	Yellow	Left turn Signal	Positive signal
	7	Black	Ground -31	Ground
	8	Red	Power BOB	Power +30
Connector 2 (lower)	1	Grey	Work light A & B ²	Positive signal
	2	White/Orange	Work light C & D ³	Positive signal
	3	White/Yellow	Work light G & H ⁴	Positive signal
	4	Dark Green	Green LED's	Positive signal
	5	Orange/White	Amber front	Positive signal
	6	Orange	Amber rear	Positive signal
	7	Blue	Blue front	Positive signal
	8	Blue/White	Blue rear	Positive signal

CAN-bus cables

The CAN-bus cables send the signals from the BOB to the modules. These cables need to be connected via connectors. These cables are supplied by Marelko.

Advise: Battery protector

It is advised to add a battery protector to the system (as shown in the connection diagrams) when the modules are connected to the starter battery. An alternative option would be to use a relay.

See Appendix C:

¹ Work light rear

² Work light front

³ Work light right

⁴ Work light left

Connecting Modules

The diagrams below are used for connecting the DON-light modules for the following combinations:

1. Two corner modules: the front of the vehicle
2. Four corner modules: front and rear of the vehicle
3. Example: module combination

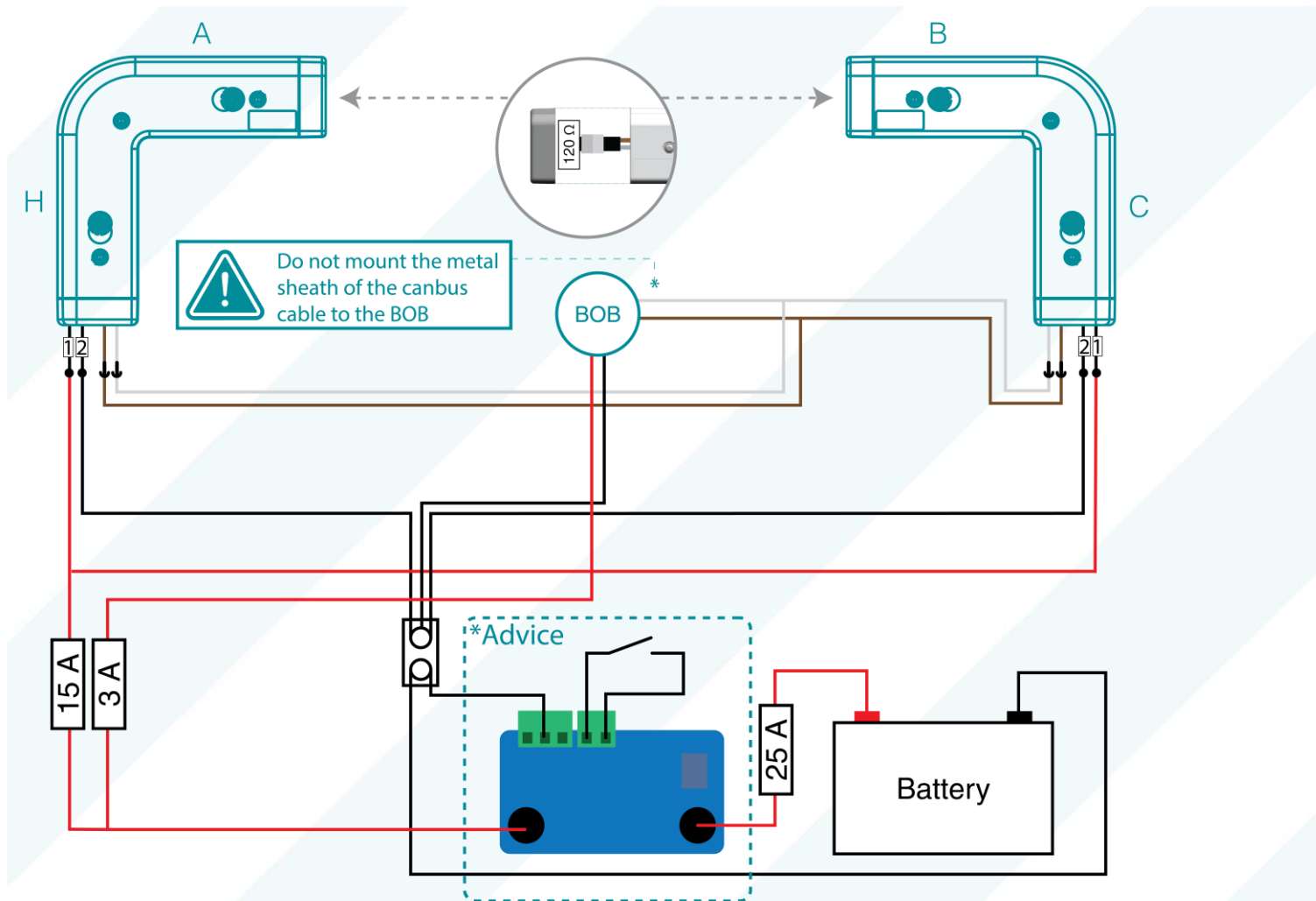
For the use of other modules or a different combination, please contact Marelko.

During the installation of the DON-light module(s), please note the following:

- / To connect the CAN-bus system, use the supplied CAN-bus cables
- / Review the cable regulations of Appendix A for the installation of the power supply
- / Make sure that the positive power supply is attached to the end with the number "1" and that the ground is connected to cable "2".

Two corner modules: the front of the vehicle

When connecting two modules, there is a resistor on both modules. This creates two separate sets (the modules are not controlled with the same cable).

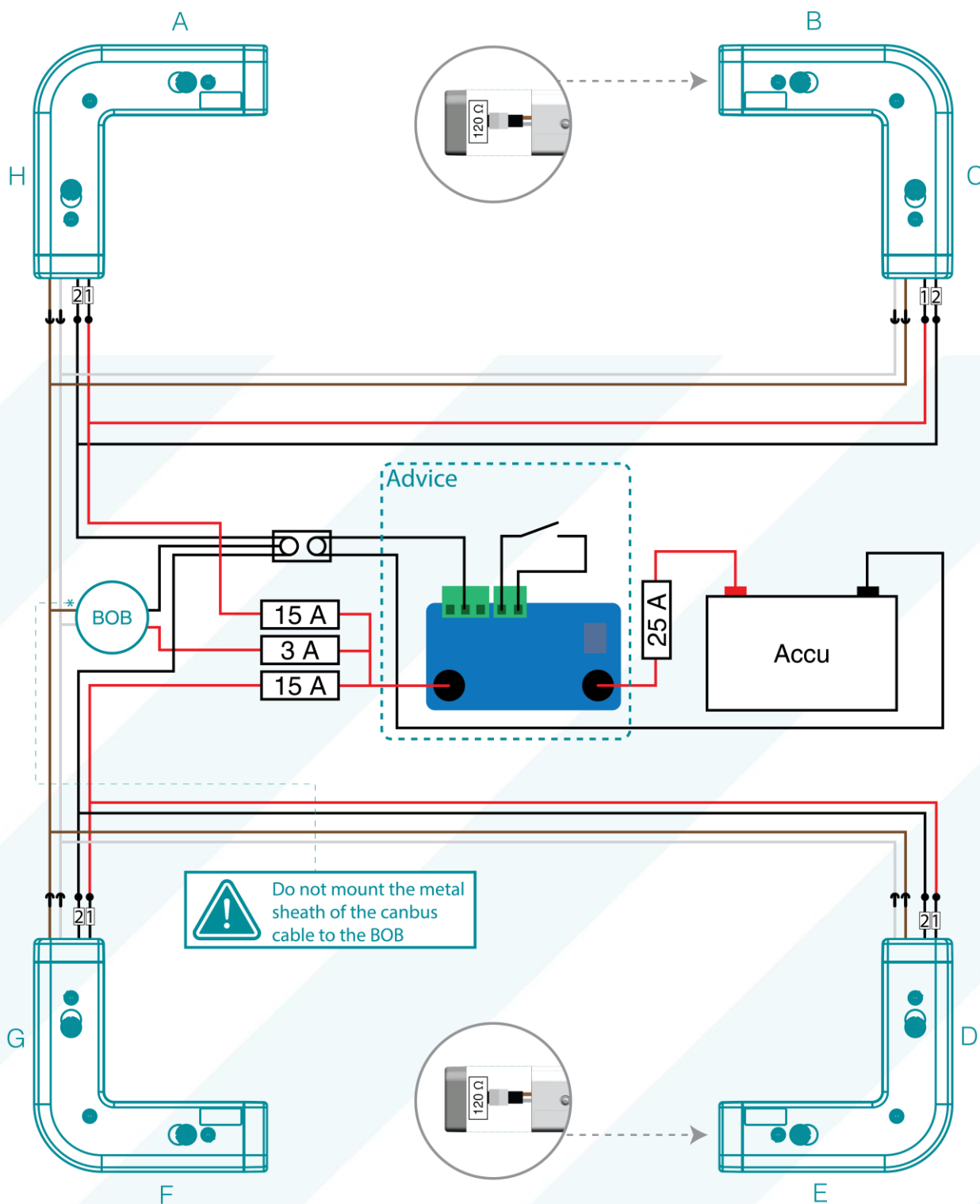


*It is advised to add a battery protector to the system

Four corner modules: Front and rear of the vehicle

When connecting 4 corner modules, there are two sets on the vehicle. Each set contains two modules:

- / one to the longest cable with a resistance of 120 Ohms
- / one to the shortest cable with no resistance on the module

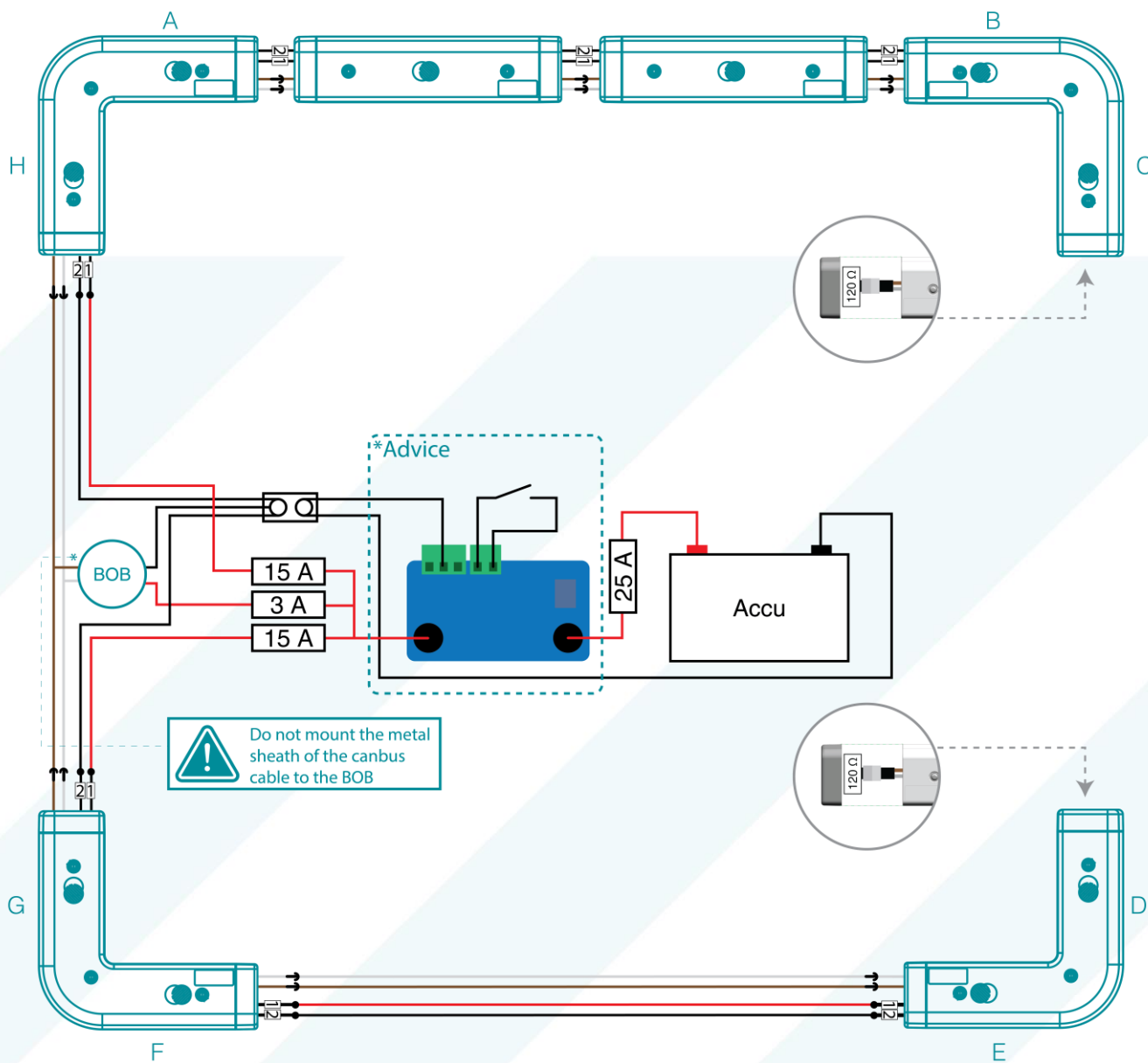


*It is advised to add a battery protector to the system

Example: Module combinations

The modular design of the DON-light modules makes it possible to combine several modules of different types on the same vehicle. An example where different modules are installed is shown below. If your configuration is not listed, please contact Marelko.

The overview contains two corner modules at the rear and four modules at the front of the vehicle (two corner modules with two straight modules in between).



4. Mounting instructions

Mounting of the DON-light modules is possible with mounting sets. Please consider the Electrical installation (Chapter 3), cable transfer (Appendix B) and the positioning (Appendix C) when mounting the modules. The following mounting sets can be used:

DON-light module	Mounting set	Description
90° corner	ST0162	Mounting per 3 mounting plates and 3 rubber feet
	ST0181	Mounting per mounting plate and foam rubber washer
	ST0197	Mounting per mounting plate and 3 rubber feet
Straight long	ST0271	Mounting per 3 mounting plates and 3 rubber feet
Straight short	ST0272	Mounting per 2 mounting plates and 2 rubber feet
45° corner	DON45	Mounting per mounting plate and rubber foot

Please note:

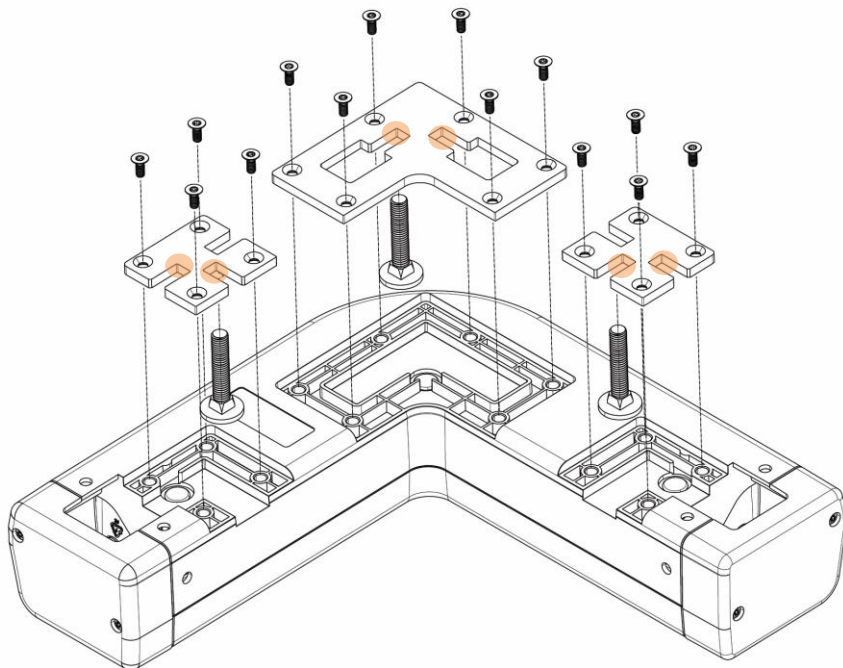
Holes drilled in the roof must be in the right place. For this purpose, you can use the supplied drilling template. An explanation of this template can be found in Appendix D.

DON-light 90° corner module mounting sets

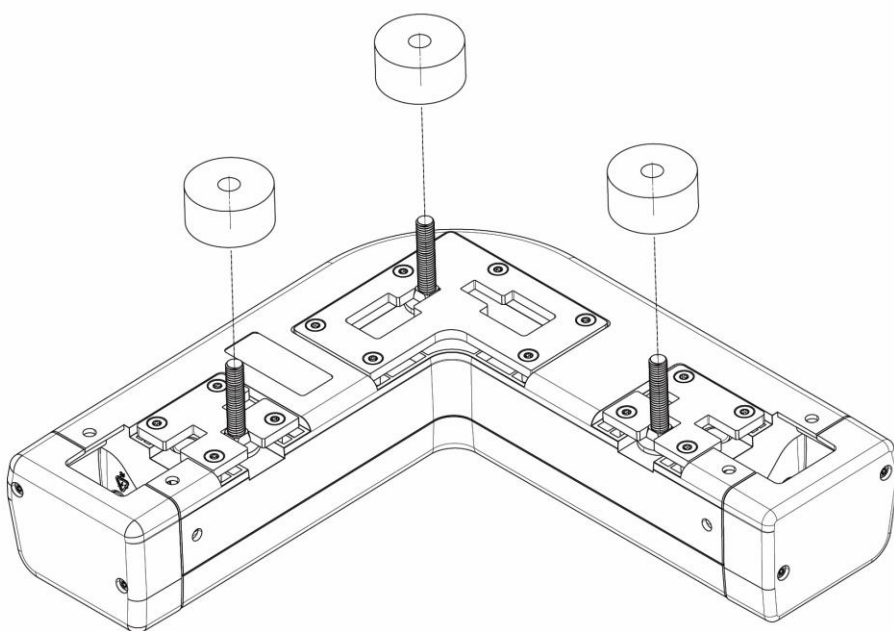
ST0162

Step 1: Install the mounting plates on the bottom of the DON-light 90° corner module

- / Each mounting plate is attached to the module with M4 screws (four screws for the mounting plates at the ends of the module and six screws for the middle mounting plate)
- / Between each mounting plate and the module is one M8 carriage bolt in place as shown below. It is also possible to mount the carriage bolt between a slot other than the option indicated. The optional slots are highlighted in yellow. Pay attention to this when drilling the holes in the roof

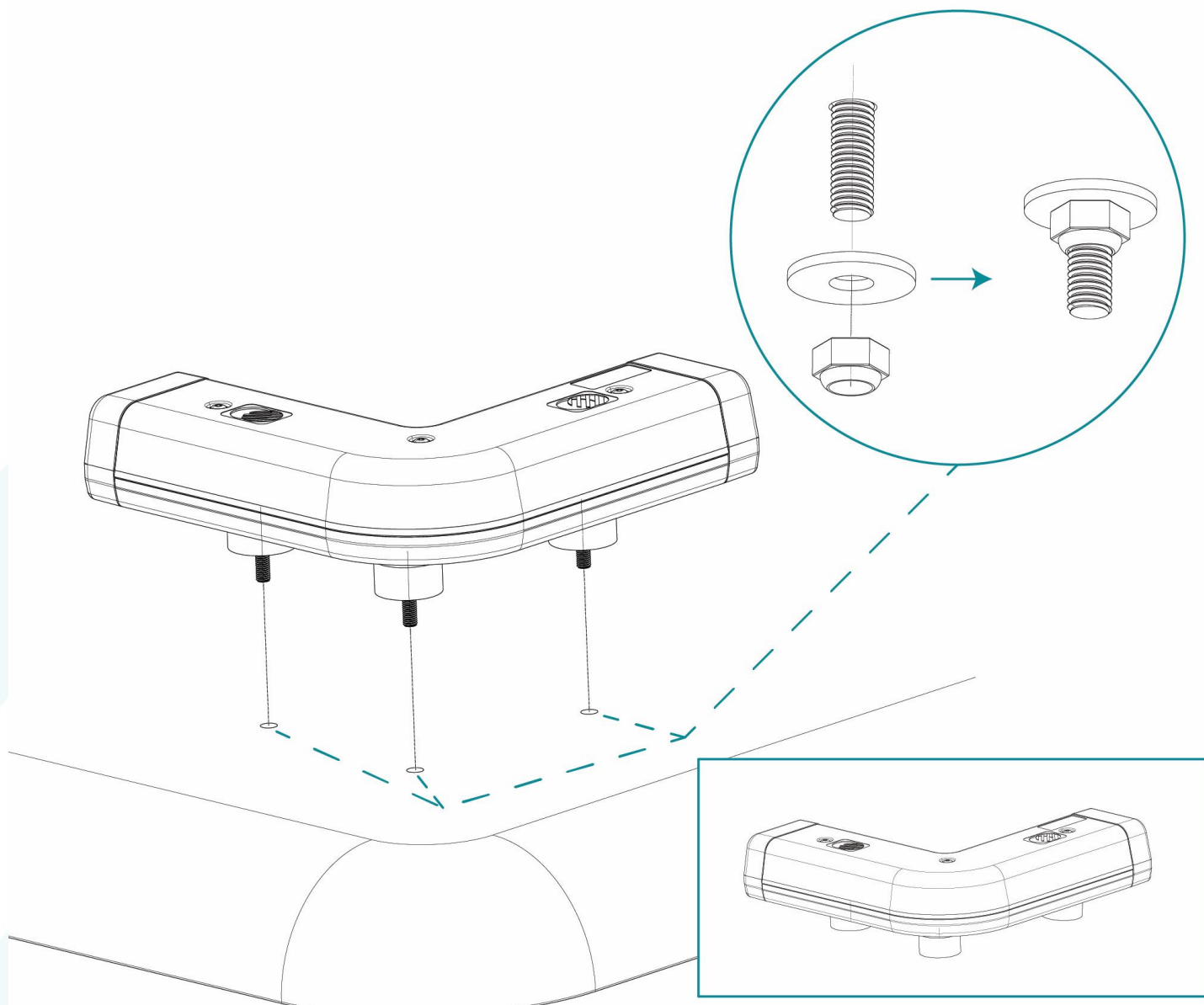


Step 2: Slide a rubber foot over the bolt per M8 carriage bolt



Step 3: Mount the DON-light 90° corner module on the roof

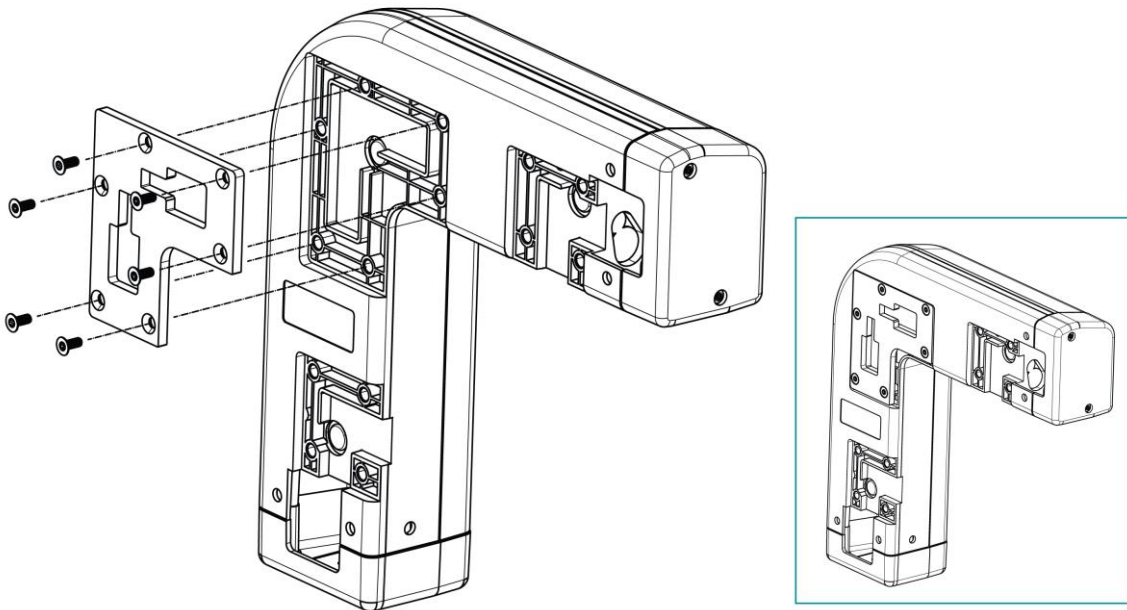
- / Insert the bolts into the holes of the roof
- / Make sure by means of sealant or liquid gasket, that a watertight seal is guaranteed (e.g. Bernese Liquid Gasket 343963)
- / Secure the carriage bolts inside the vehicle with an M8 flat washer and an M8 6-sided lock nut with seal



ST0181

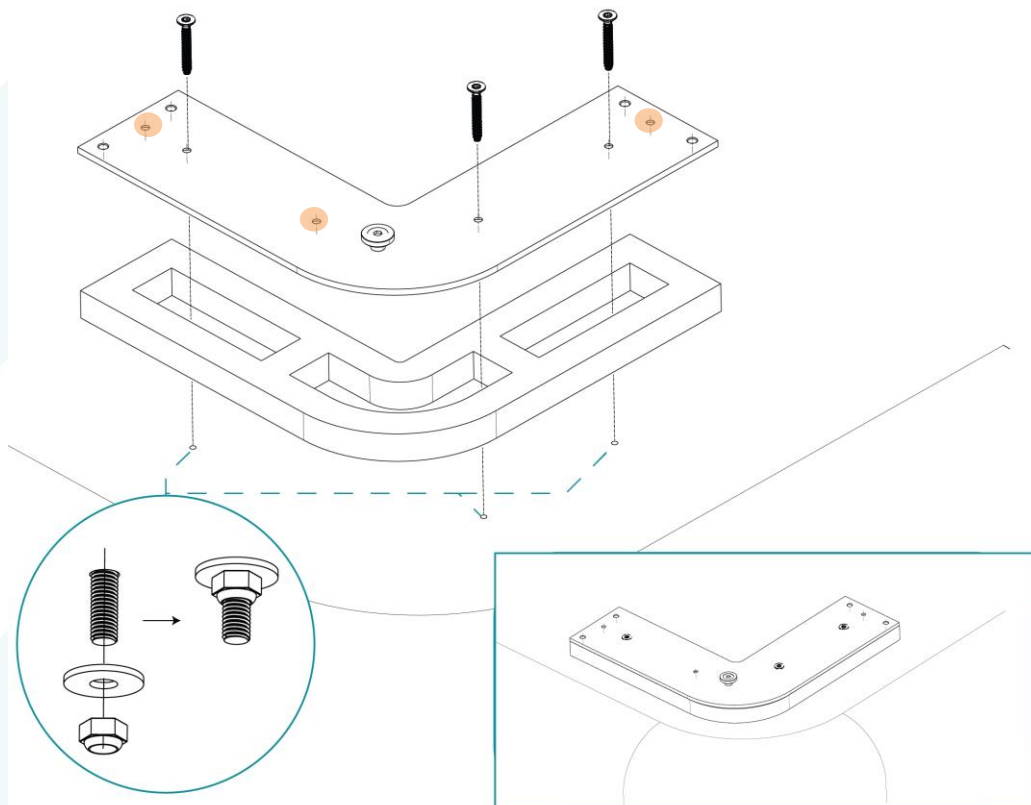
Step 1: Install the mounting plate on the underside of the DON-light 90° corner module

- / The mounting plate is attached to the module with six M4 screws

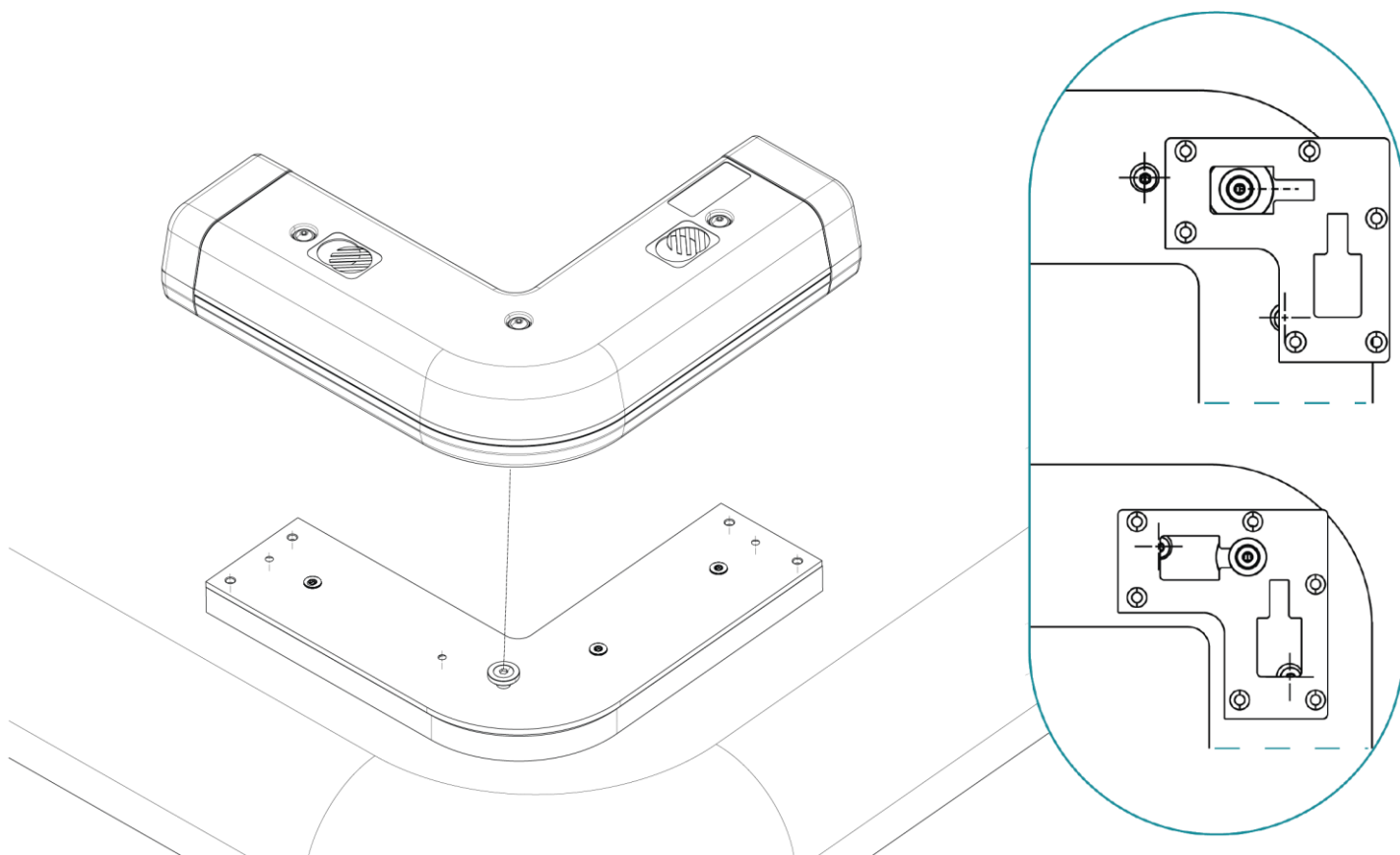


Step 2: Attach the DON-light mounting plate to the roof of the vehicle

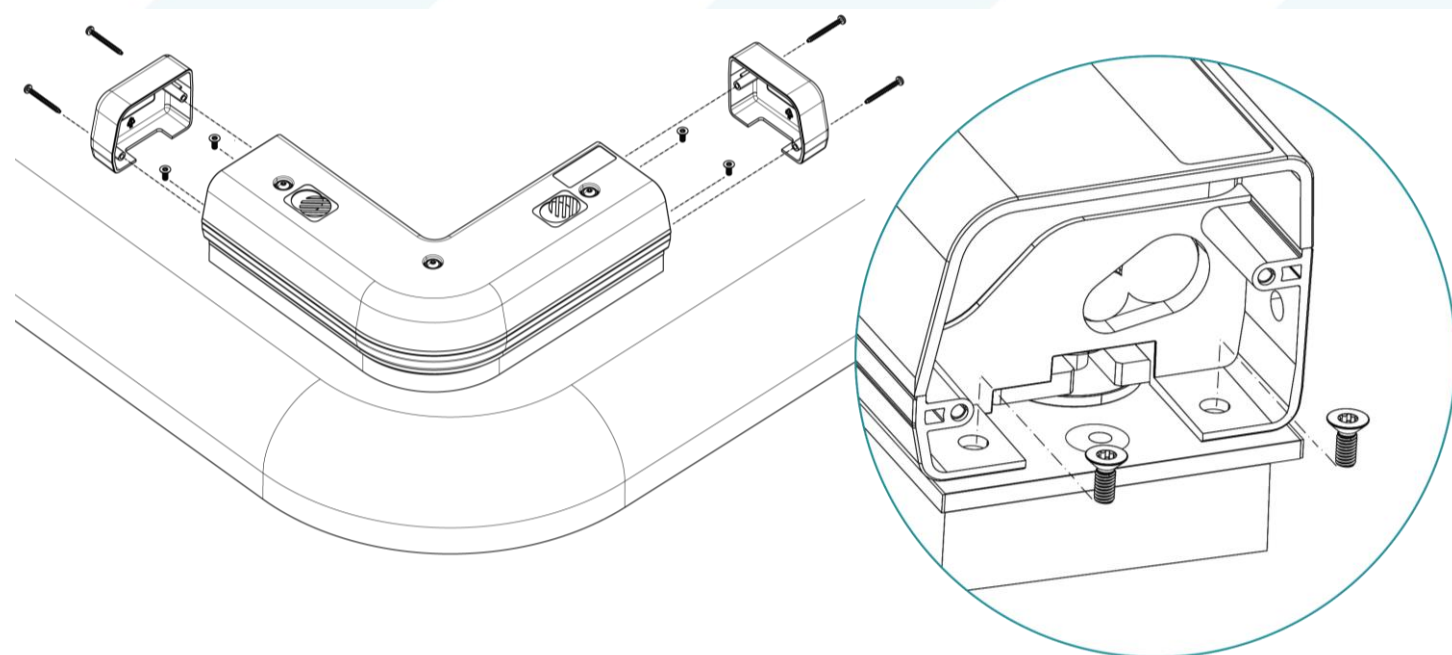
- / Place the foam rubber washer between the roof and the mounting plate.
- / Secure the mounting plate with M6 Allen screws (three bolts is enough). The location of the bolts may differ from the drawing below. Other options for bolt placement are highlighted in yellow. Pay attention to this when drilling the holes in the roof
- / Make sure by means of sealant or liquid gasket, that a watertight seal is guaranteed (e.g. Berner Liquid Gasket 343963)
- / Secure the bolts inside the vehicle with an M6 washer and an M6 6-sided lock nut with seal inox



- Step 3:** Slide the DON-light 90° corner module onto the mounting plate
- / Place the mounting plate indent on the DON-light over the knob located on the plate
 - / Secure the knob by sliding it into the slot of the mounting plate



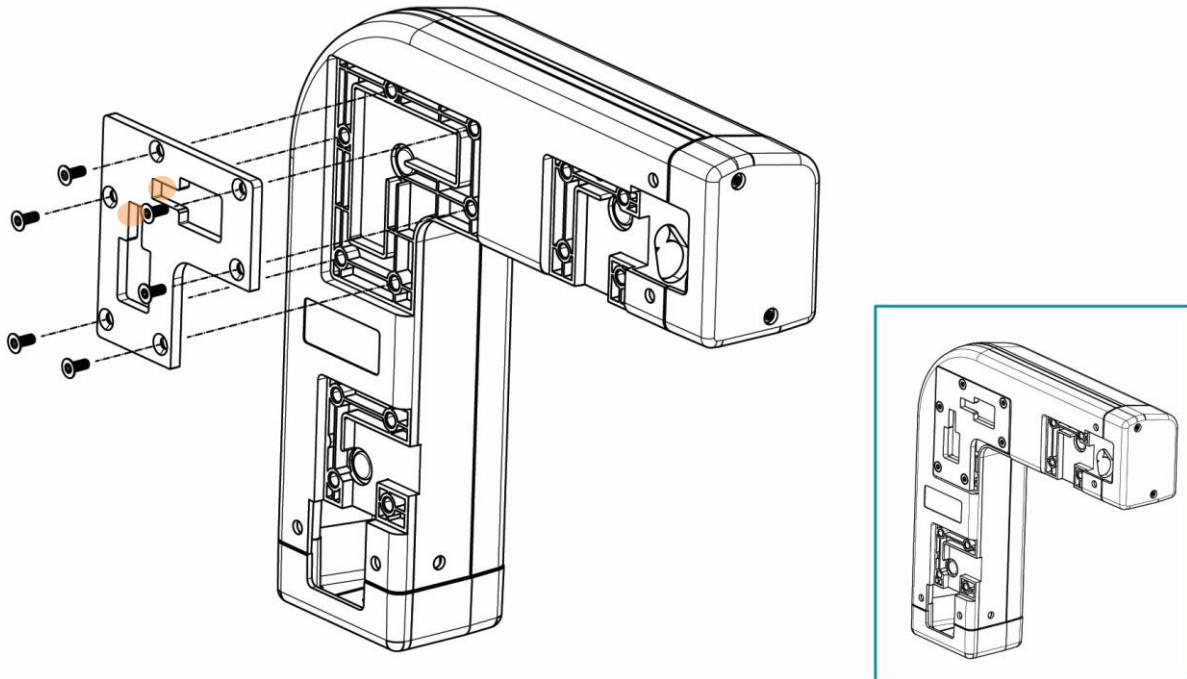
- Step4:** Secure the DON-light 90° corner module to the mounting plate
- / Secure the DON-light on both ends of the module with two M6 metal screws
 - / Reattach the blind cap of the DON-light



ST0197

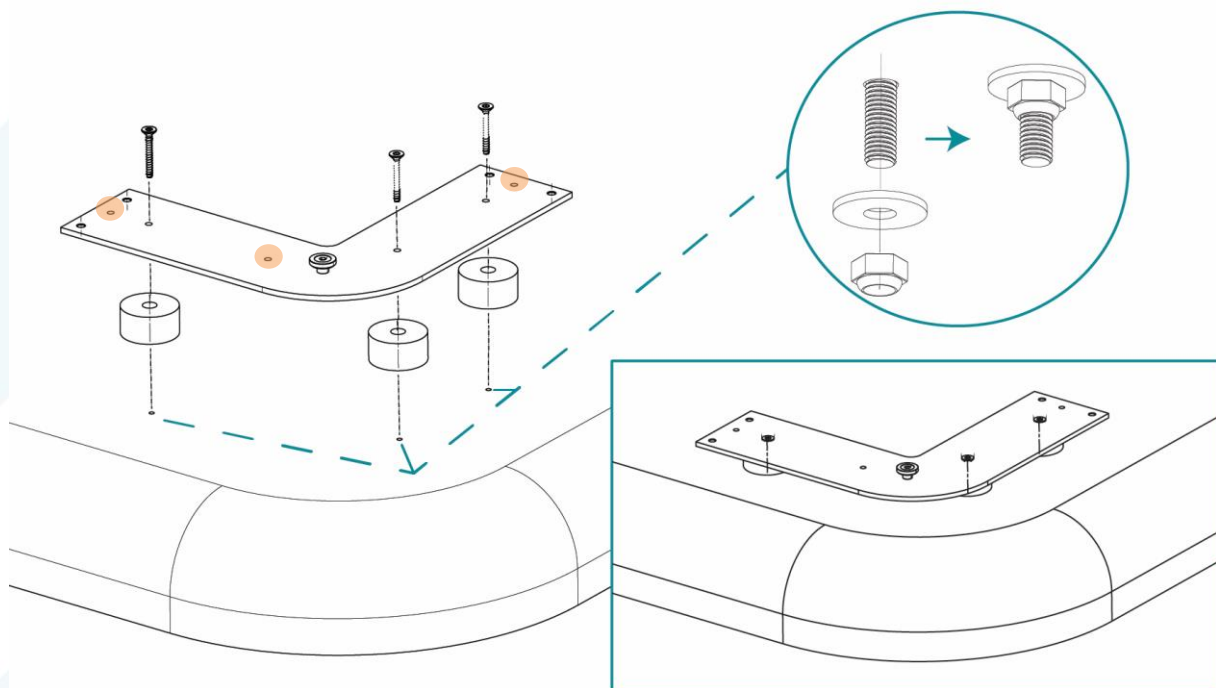
Step 1: Install the mounting plate on the underside of the DON-light 90° corner module

- / The mounting plate is attached to the module using six M4 screws

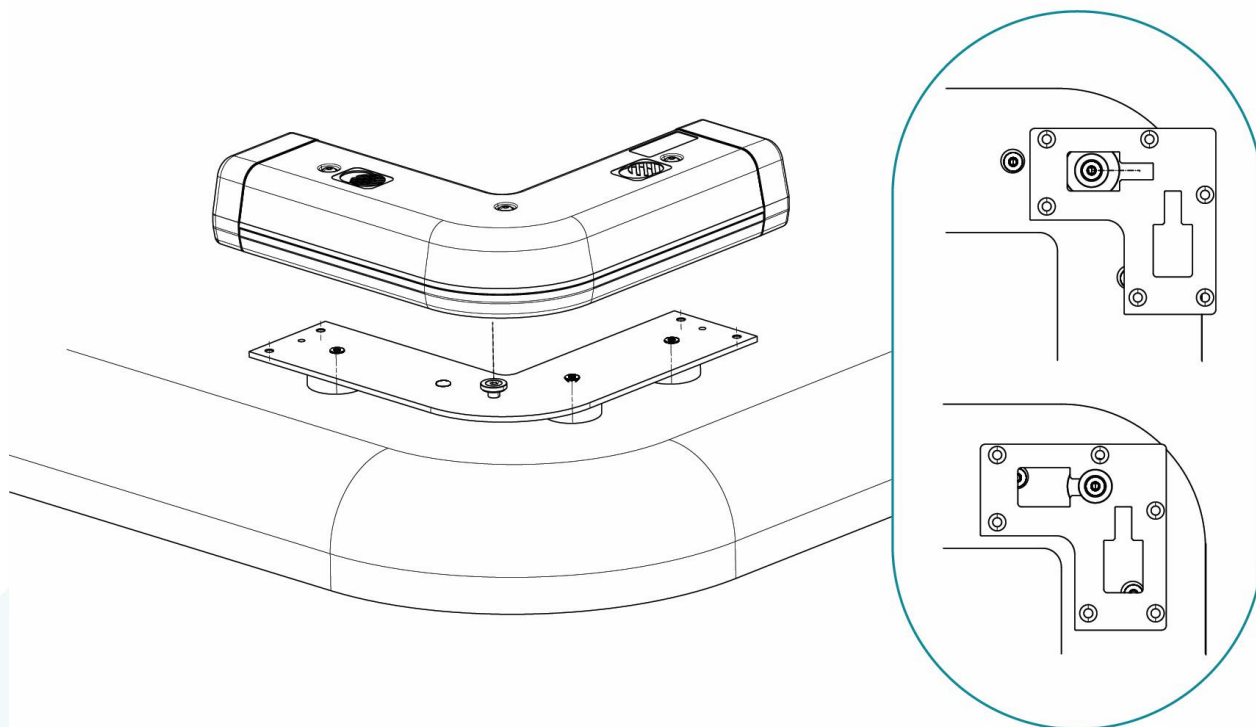


Step 2: Mount the DON-light mounting plate to the roof of the vehicle

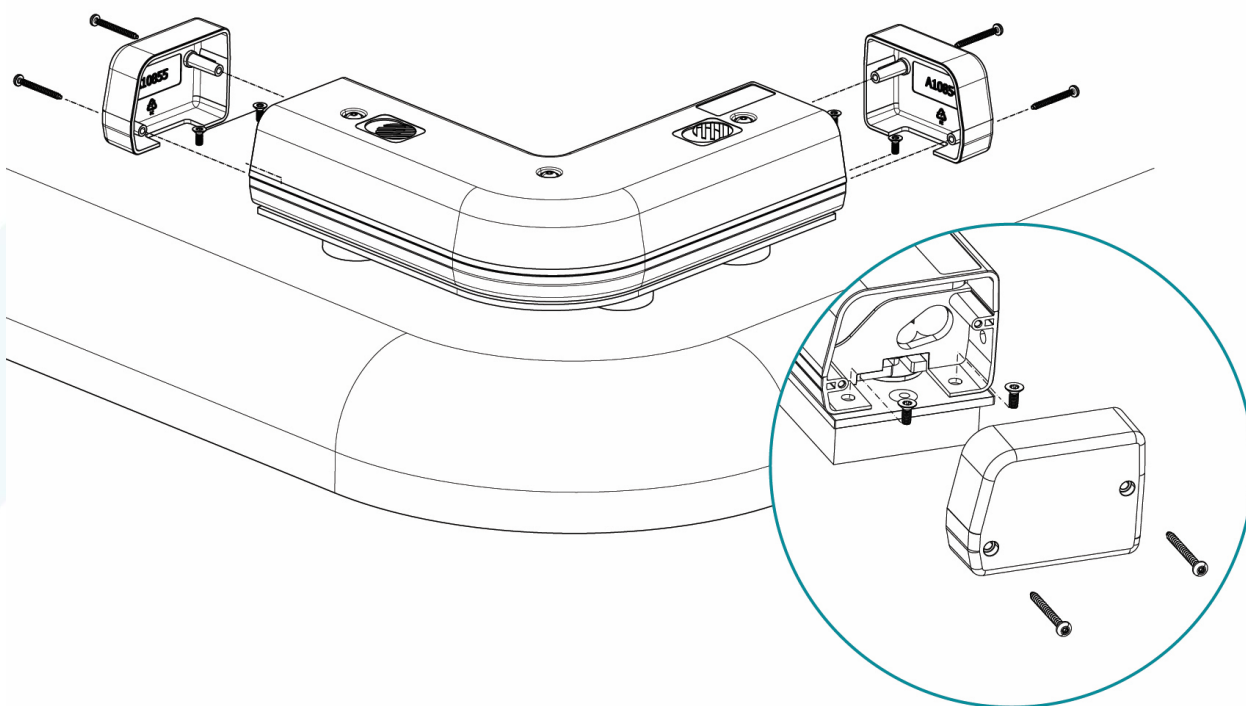
- / Secure the mounting plate with M6 screws (three bolts is enough). The location of the bolts may differ from the drawing below. Other options for bolt placement are shaded in yellow. Pay attention to this when drilling the holes in the roof
- / Place the three rubber feet over the M6 screws
- / Make sure by means of sealant or liquid gasket, that a watertight seal is guaranteed (e.g. BernerLiquid Gasket 343963)
- / Secure the bolts inside the vehicle with an M6 washer and an M6 6-sided lock nut with seal inox



- Step 3:** Slide the DON-light 90° corner module onto the mounting plate
- / Place the mounting plate opening on the DON over the knob located on the plate
 - / Secure the knob by sliding it into the slot of the mounting plate



- Step 4:** Secure the DON-light 90° corner module to the mounting plate
- / Secure the DON-light on both ends of the module with two M6 metal screws
 - / Reattach the blind cap of the DON-light

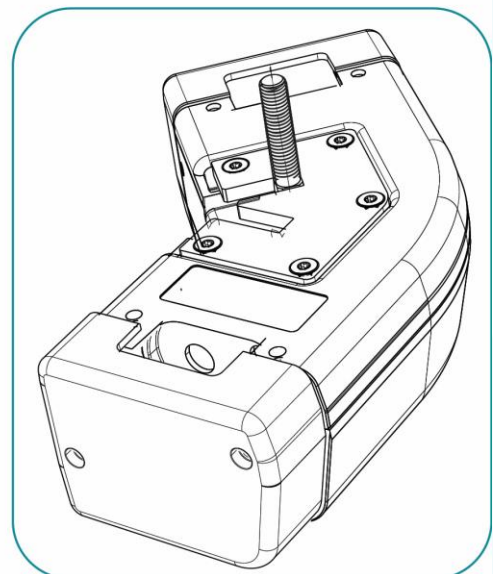
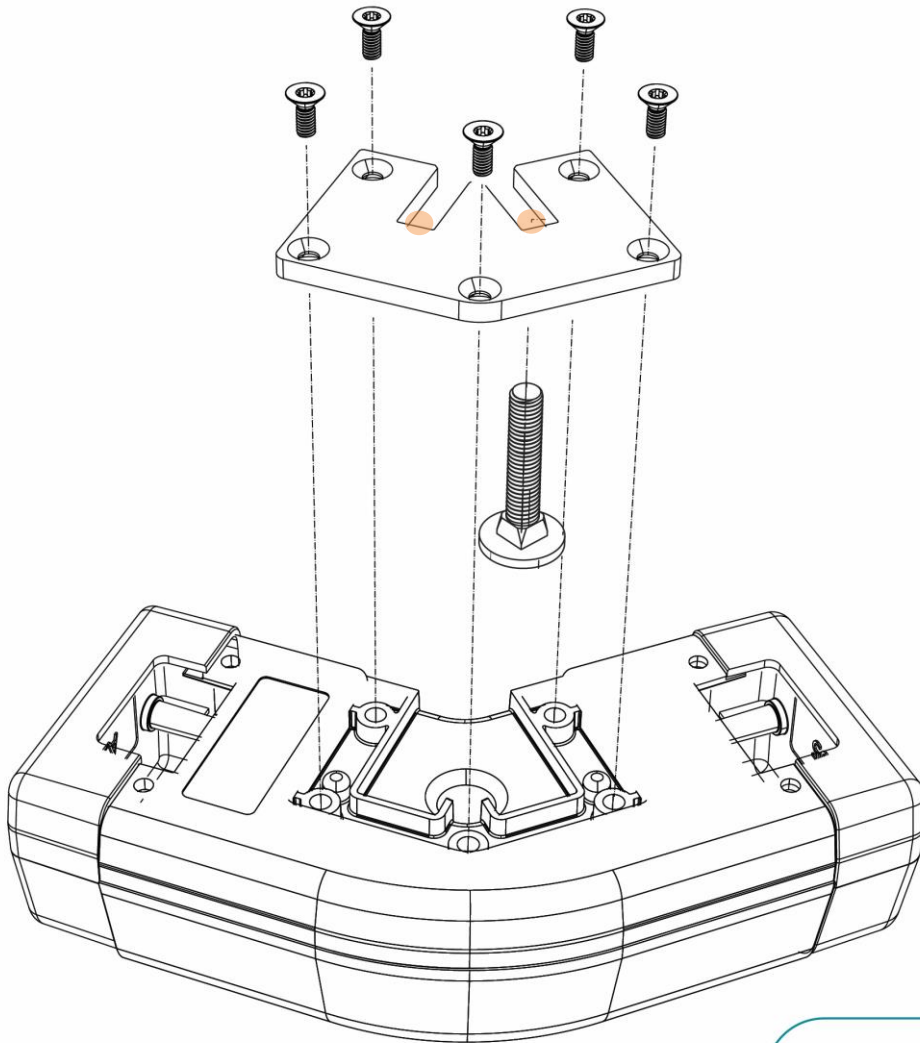


DON-light 45° corner module mounting set

DON45

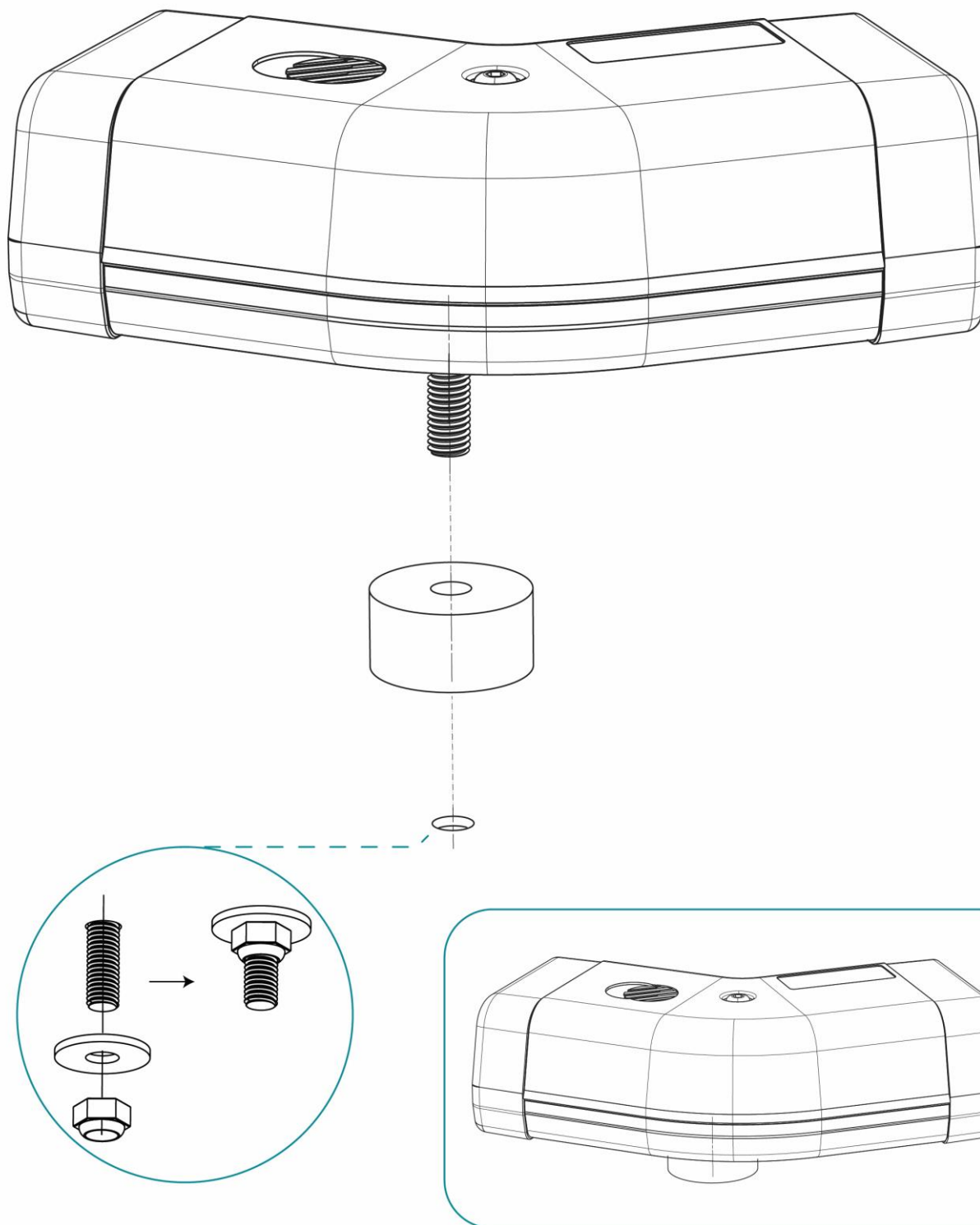
Step 1: Attach the mounting plate at the underside of the DON-light 45° corner module

- / The mounting plate is attached to the module with five M4 screws
- / Between the mounting plate and the module is an M8 carriage bolt placed as shown below. It is also possible to mount the carriage bolt between a slot other than the option indicated. The optional slots are highlighted yellow, pay attention to this when drilling the holes in the roof



Step 2: Mount the DON-light 45° corner module on the roof

- / Slide a rubber foot over the bolt per M8 carriage bolt
- / Insert the bolt into the hole
- / Make sure by means of sealant or liquid gasket, that a watertight seal is guaranteed (e.g. Bernese Liquid Gasket 343963)
- / Secure the carriage bolts inside the vehicle with an M8 flat washer and an M8 6-sided lock nut with seal inox

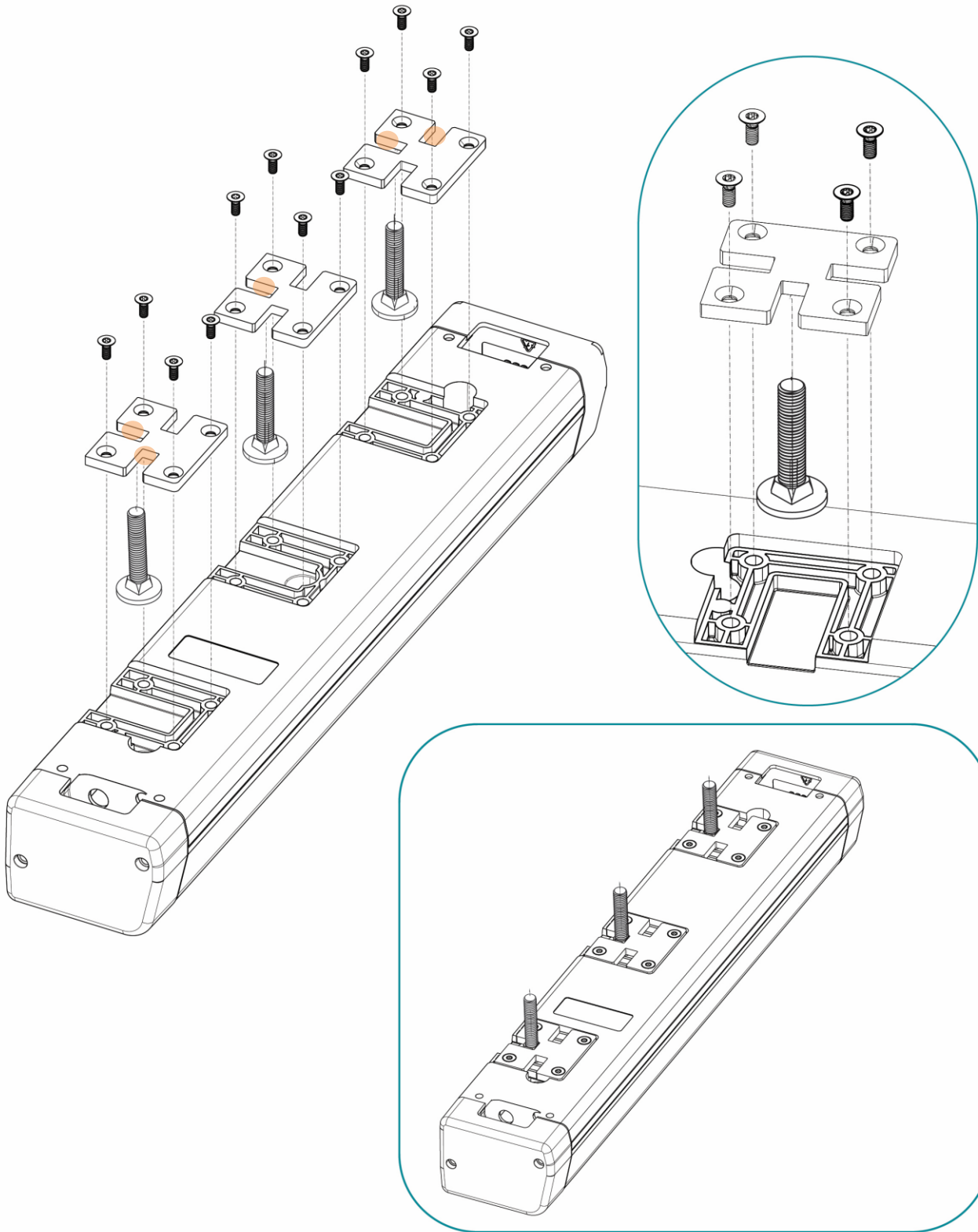


DON-light straight long module mounting set

ST0271

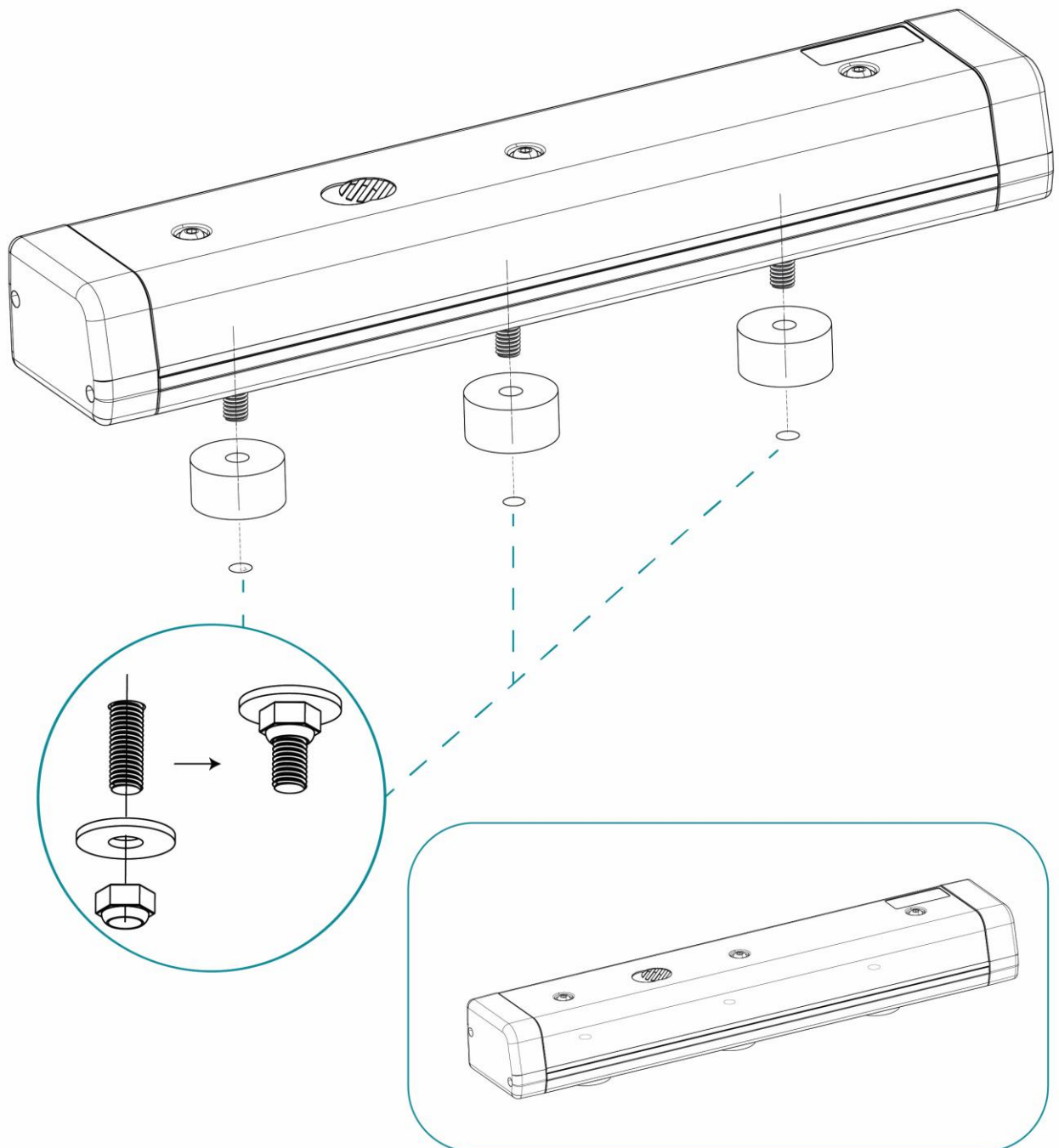
Step 1: Install the mounting plates on the underside of the DON-light straight long module

- / Each mounting plate is attached to the module with four M4 screws
- / Between the mounting plate and the module is an M8 carriage bolt is placed as shown below. Pay attention to this when drilling the holes in the roof



Step 2: Mount the DON-light straight long module on the roof

- / Slide a rubber foot over the bolt per M8 carriage bolt
- / Insert the bolts into the holes
- / Make sure by means of sealant or liquid gasket, that a watertight seal is guaranteed (e.g. Berner Liquid Gasket 343963)
- / Secure the carriage bolts inside the vehicle with an M8 flat washer and an M8 6-sided lock nut with seal inox

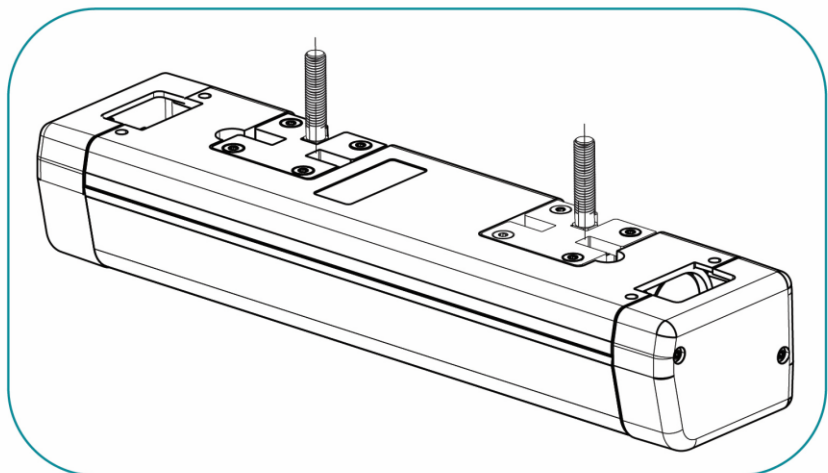
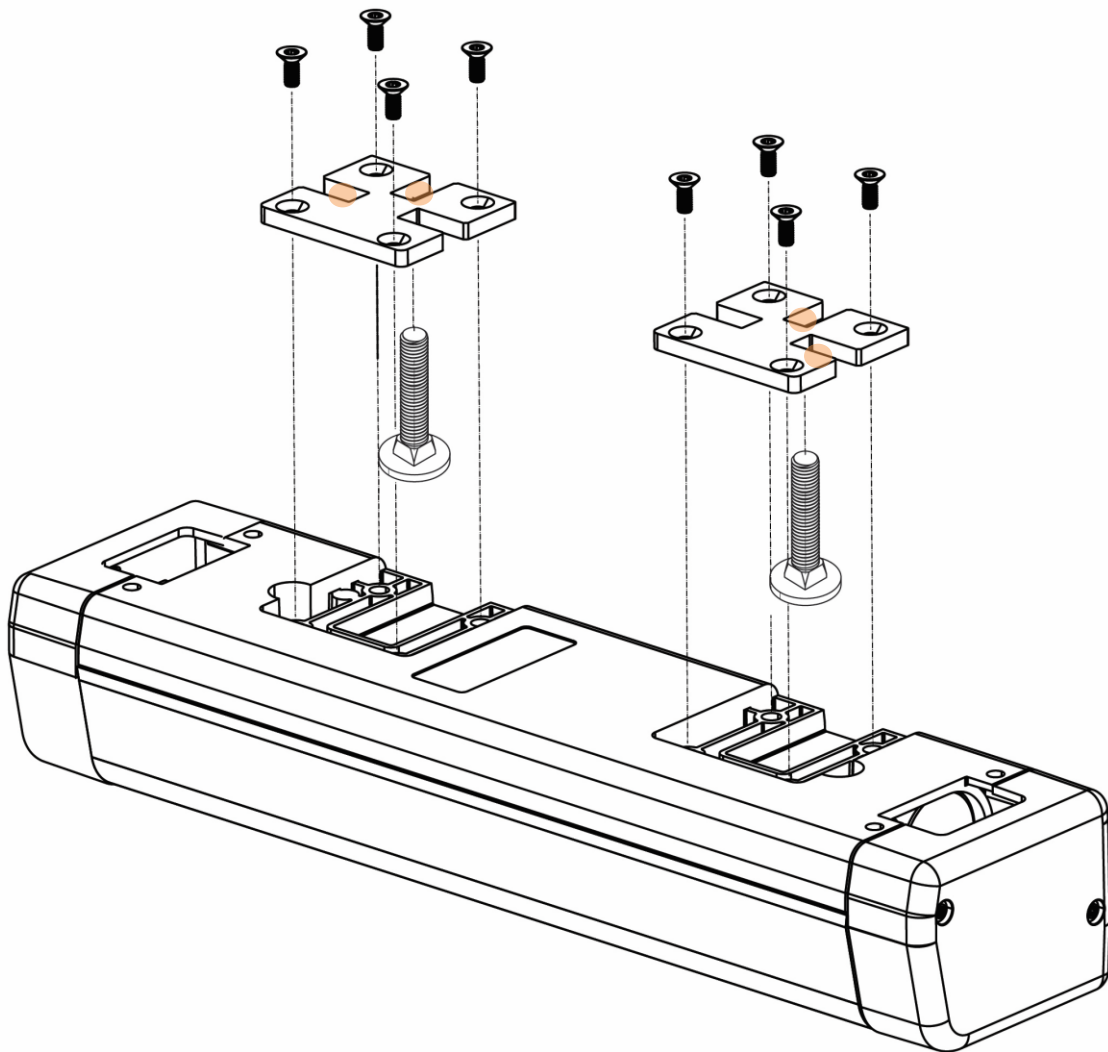


DON-light straight short module mounting set

ST0272

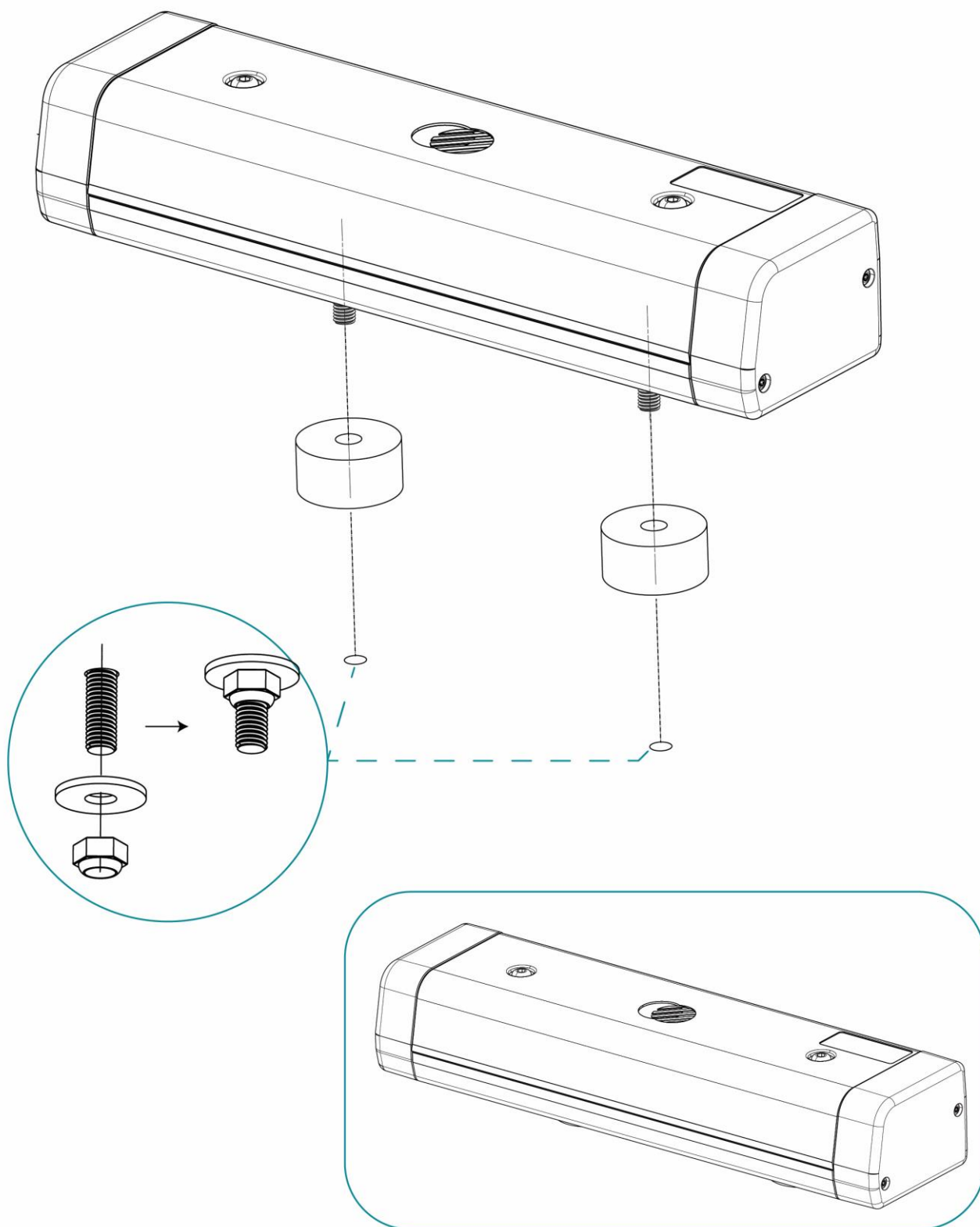
Step 1: Install the mounting plates at the underside of the DON-light straight short module.

- / Each mounting plate is attached to the module with four M4 screws
- / Between the mounting plate and the module is an M8 carriage bolt is placed as shown below. Pay attention to this when drilling the holes in the roof



Step 2: Mount the DON-light straight short module on the roof.

- / Slide a rubber foot over the bolt per M8 carriage bolt
- / Insert the bolts into the holes
- / Make sure by means of sealant or liquid gasket that a watertight seal is guaranteed (e.g. Berner Liquid Gasket 343963)
- / Secure the carriage bolts inside the vehicle with an M8 flat washer and an M8 6-sided lock nut with seal inox



5. Trouble shooting

nr.	Title	Problem	Solution(s)
[1]	Power supply	All modules in the system do not turn on	/ Check the voltage of the battery / Check the voltage at the battery protector / Check the voltage at the BOB / Check the voltage at the module / Check that the power supply is not reversed: power cable [1] is the positive and power cable [2] is the negative
[2]	Resistance	The module does not respond to the given signals	/ Check the resistance on the system at the BOB: the resistance on the CAN-bus line should be around 60 Ω
[3]	CAN-bus	(All) modules in the system do not turn on	/ Check that the CAN high and the CAN low are not reversed: the brown cable is the CAN high and the white cable is the CAN low / Check if the CAN-bus connectors are properly connected If one or more modules do turn on, first check the CAN-bus connection between the working module and the next non-working module
[4]	Positioning	The function is performed by another module (e.g.: left turn signal is turned on, but right turns on the turn signal)	/ Check that the positions of the modules are correct: at the bottom of the module there is a label with the correct positioning on the vehicle

6. Warranty

A warranty period of 60 months from date of purchase is maintained on this product (on function and material of the product). If the product shows defects in function or material within this warranty period, Marelko will repair, replace or refurbish the product with due observance of the following points:

1. The warranty is void if use, installation and maintenance are not carried out in accordance with the product's manual
2. The product must be returned after consultation with Marelko with original invoice, product details and delivery date of the product. If the original invoice is missing or incorrect, warranty may be refused
3. This warranty does not reimburse for damage or injury resulting from misuse of the product
4. Regulations and safety standards for the use and installation of the product that are in force nationally, must be respected
5. Warranty is void if the batch number and/or warranty seal are not present or are broken.
6. The following points are not covered by warranty
 - a. Periodic maintenance and replacement of parts during normal use
 - b. Transportation costs, call-out charges, installation fees, removal fees, and administration fees (if applicable)
 - c. Problems or defects of the system on which the product is installed

7. Care & Maintenance

Mounting

Do not mount the DON-light to the plastic housing, but use one of the mounting kits (see chapter 4).

Clean

- / Do not use abrasive or solvent-based cleaners
- / Do not clean the metal enclosure with alloy cleaners
- / Do not use powerful jet cleaners to clean the DON-light

Where a module is frequently exposed to environments with salt water or large amounts of dust, it is advisable to clean the DON-light as often as possible in accordance with the above guidelines.

Recycling

The DON-light is made of sustainable materials. Parts such as the circuit board, cables, and polycarbonate parts are all reusable.

In addition, it is possible to change the modules from one vehicle to another due to its modular structure.

Appendix

A.Cable Regulations

The dimension and material of the wires used, must ensure that the voltage drop between the battery and all sets of the system, at the time of maximum consumption (peak consumption), is in the worst case less than 10%. Ideally, it should be the exact same voltage, as any voltage drop in the wires is dissipated as heat by the wires themselves.

Keep in mind:

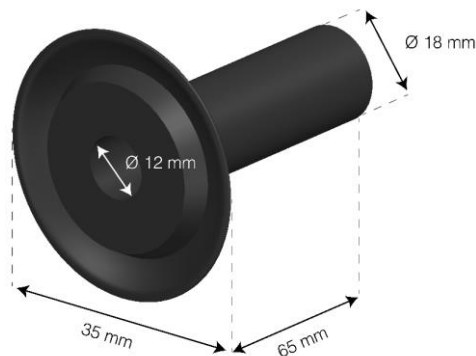
- / The power consumption of the modules in this set
- / The length and thickness of the cable to the first corner or straight module.
- / The cable used inside the DON-light modules is 2.5mm² for +30 and 2.5mm² for -31.

For example: with four corners installed, the peak consumption is 20.4 A. This means that there is A maximum of approx. 2.6 meters of cable with a dimension of 2.5mm² may be used. See below table.

Properties		Maximum allowable current					
[mm ²]	AWG	5A		10A		15A	
		Length [m]	Length [Feet]	Length [m]	Length [Feet]	Length [m]	Length [Feet]
0,34	22	1,8	6	0,9	3	x	x
0,5	20	2,9	9,5	1,5	5	0,9	3
0,75	18	4,5	15	2,2	7,5	1,5	5
1,5	16	7,5	24,5	3,5	12	2,4	8
2,5	14	12	39	6	19,5	4	13
4	12	20	62	9,5	31	6	20,5
6	10	30	98	15	49	10	32,5
10	8	48	156	24	78	16	52
16	6	75	248	37	124	25	82,5
25	4	120	395	60	197	40	131
35	2	190	629	95	314	63	209

B. Cable grommet roof

A cable grommet (see illustration below) is used to route the power and CAN-bus cables from the DON-light module through the roof of the vehicle.



To install the cable grommet, follow the step-by-step plan:

1. Determine the position of the cable grommet on the roof of the vehicle. Keep the following in mind:
 - / The location where the cables of the DON-light module go through the roof of the vehicle
 - / The space available for the grommet in relation to the position of the DON-light module on the roof (see Appendix D)
2. Make an 18mm diameter hole (it is advised to use a punch 18 for this)
3. Place the cable grommet through the hole in the roof so that it looks like the images below:
 - / Make sure by means of sealant or liquid gasket, that a watertight seal is guaranteed (e.g. Berner Liquid Gasket 343963)

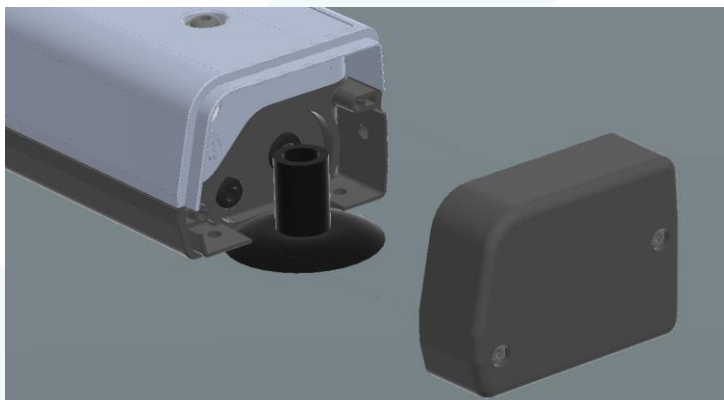


Cable grommet on the roof of the vehicle



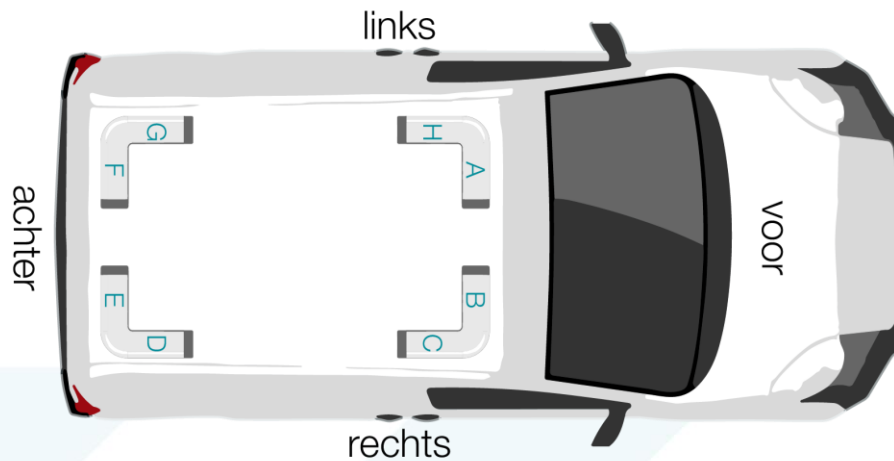
Cable grommet in the vehicle

4. Place the cables through the roof grommet. The space available between the module and end cap is shown in the image below:



Note: Make sure you leave enough space for the cables. Loop them once under the hood of the DON-light module before they go through the roof duct thule.

C. Positioning on the vehicle



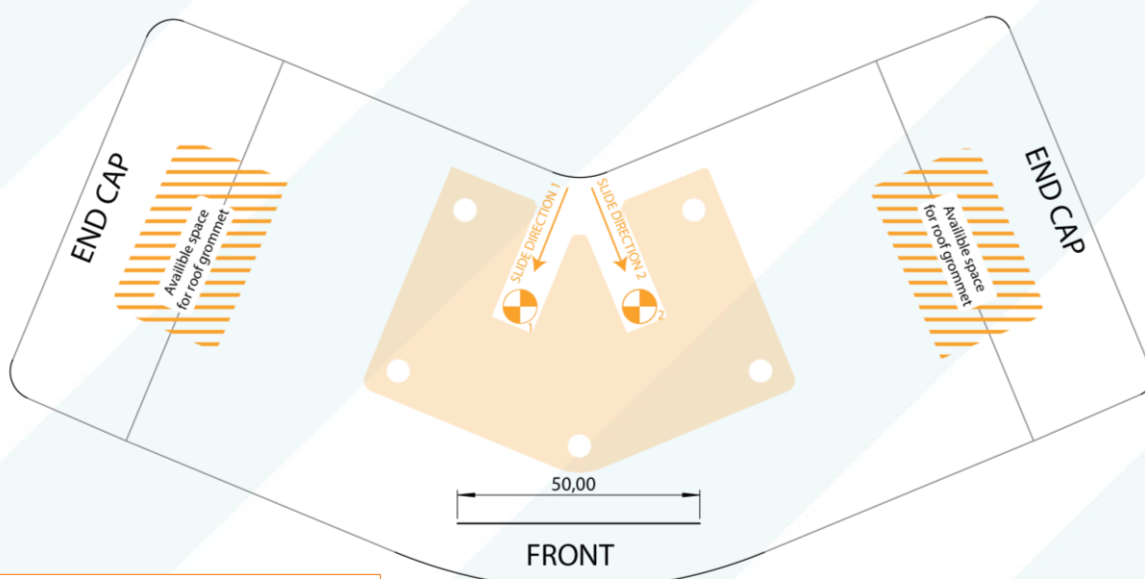
D. The drilling template

The in the box enclosed template can be placed on the vehicle to get a clear overview of the positioning of the module on the roof. This appendix contains an explanation of the template for each module.

DON-light 45° corner module

To mount the DON-light 45° corner module, one bolt is pushed into a slot in the mounting plate of the DON-light. The sliding direction is indicated in the figures below.

Note: The module is fixed at one point. There are two options for placing the bolt. The options to choose from are indicated by "1" or "2".



Note: This image is not to scale

DON-light 90 ° corner module

For use of mounting set ST0162, use the orange holes.

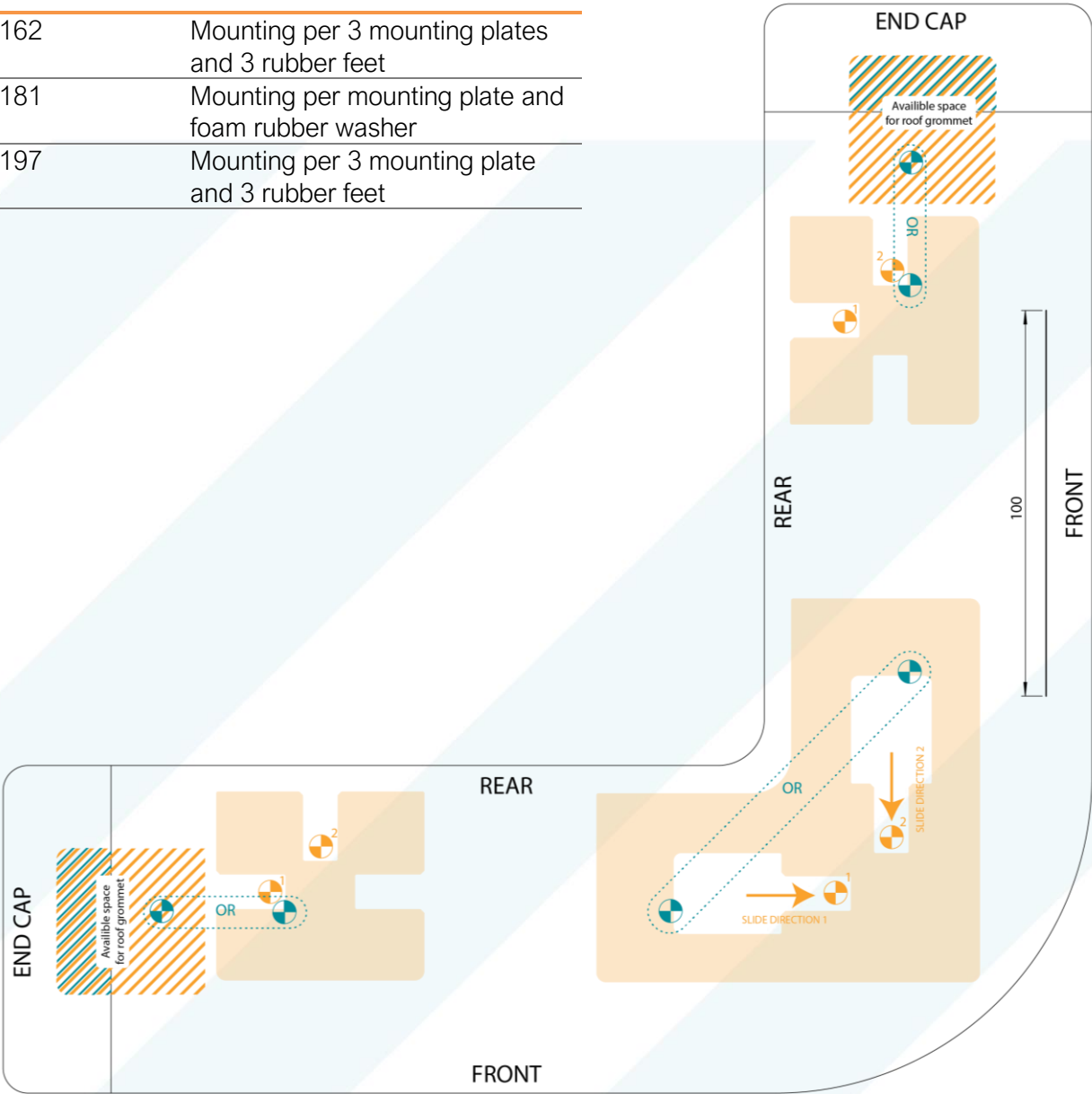
Here, the bolts are pushed into slots in the mounting plates of the DON-light. Two sliding directions are possible for this, indicated by the two yellow levels in the figure below.

Note: If a direction (direction 1 or 2) is chosen, the other bolts will also have to be placed in the corresponding place. These spots are marked with a "1" or "2".

For mounting with a mounting plate (ST0181 and ST0197), use the blue holes in the figure below.

Note: The module is fixed at three points. There are two options for placing the bolt per point. The options to choose from are indicated by "OR".

ST0162	Mounting per 3 mounting plates and 3 rubber feet
ST0181	Mounting per mounting plate and foam rubber washer
ST0197	Mounting per 3 mounting plate and 3 rubber feet

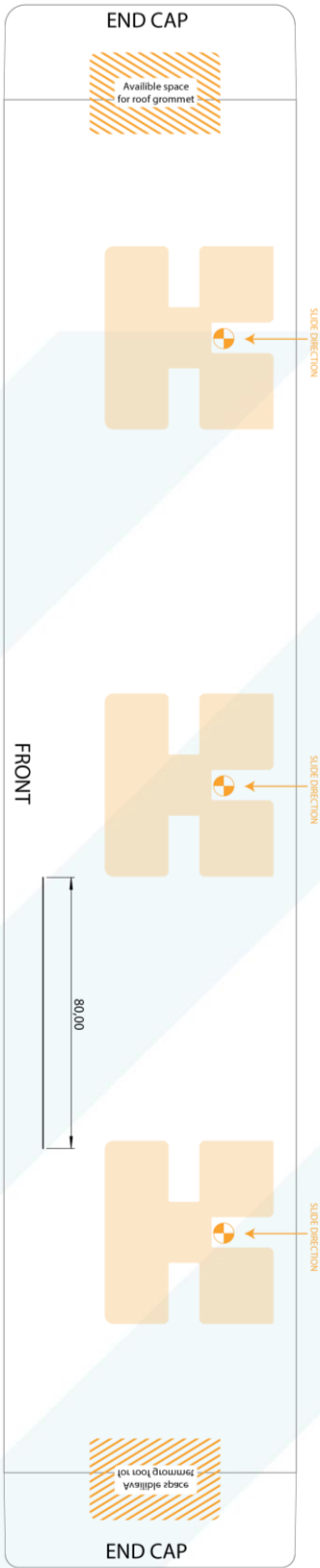


Note: This image is not to scale

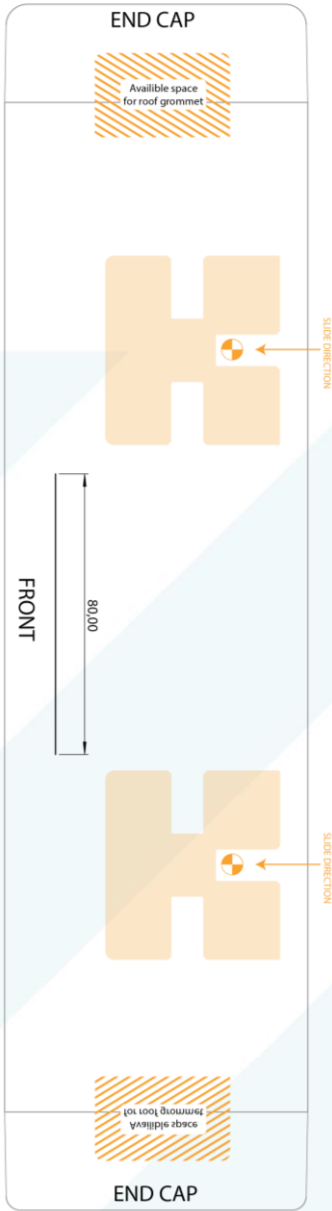
DON-light straight modules

To mount the DON-light straight modules, the bolts are slid into slots in the mounting plates of the DON-light. The sliding direction is indicated in the figures below.

DON-light straight long module:
ST0271



DON-light straight short module:
ST0272



Note: These images are not to scale

E.Parts in the mounting sets

	Code	Part	#
ST0162	ST0175	DON-light mounting plate 49mm x 54mm MRL00007 base with 4 x screw MRL00013 M4 x 10 BZK	2
	A10924	MRL00007 Carriage bolt plate W=49,0 x H=54,0 mm	1
	A10927	MRL00013 M4x 10 BZK Screw pvk RVS A2 TYPE 7991 - ISO10642	4
	ST0176	DON-light Mounting Plate 99,5mm x 99,5mm MRL00008 Base with 6 x screw MRL00013 M4 x 10 BZK	1
	A10925	MRL00008 Carriage bolt plate W=99,5 x H=99,5 mm	1
	A10927	MRL00013 M4x 10 BZK screw pvk RVS A2 TYPE 7991 - ISO10642	6
	A10819	M8 6-sided nut RVS A2 Seal inox	3
	A11161	M8 flat washer RVS A2 TYPE 9021/A2	3
	A10918	M8 x 40 Carriage bolt for mounting on vehicle	3
	A03732	Rubber foot black to mount signalling on the roof of the vehicle	3
ST0181	ST0176	DON-light Mounting Plate 99,5mm x 99,5mm MRL00008 Base with 6 x screw MRL00013 M4 x 10 BZK	1
	A10925	MRL00008 Carriage bolt plate W=99,5 x H=99,5 mm	1
	A10927	MRL00013 M4x 10 BZK screw pvk RVS A2 TYPE 7991 - ISO10642	6
	A12113	M6 6-sided locking nut RVS A2 Seal inox DIN985	4
	A04306	M6 plain washer RVS A2 TYPE 9021/A2	4
	A12270	M6 Countersunk hexagon socket screw RVS A2 DIN 7991	4
	A12271	M6 Metal Screw RVS A2 DIN 7985 cylinder head	4
	A11791	MRL00063 foam rubber washer DON-light corner module, Celrubber EPDM 18mm afm: 246 x 246mm	1
ST0197	A12504	MRL00132 universal DON-light Corner bracket RVS 4.0mm Wire tapping and countersinking included	1
	ST0176	DON-light Mounting Plate 99,5mm x 99,5mm MRL00008 basis met 6 x screw MRL00013 M4 x 10 BZK	1
	A10925	MRL00008 Carriage bolt plate W=99,5 x H=99,5 mm	1
	A10927	MRL00013 M4x 10 BZK screw pvk RVS A2 TYPE 7991 - ISO10642	6
	A12113	M6 6-sided locking nut RVS A2 Seal inox DIN985	3
	A04306	M6 plain washer RVS A2 TYPE 9021/A2	3
	A12270	M6 Countersunk hexagon socket screw RVS A2 DIN 7991	3
	A12271	M6 Metal Screw RVS A2 DIN 7985 cilinder head	4
	A03732	Rubber foot black to mount signalling on the roof of the vehicle	3
ST0271	A12504	MRL00132 universal DON-light Corner bracket RVS 4.0mm including wire tapping and countersinking	1
	ST0175	DON-light mounting plate 49mm x 54mm MRL00007 Base with 4 x screw MRL00013 M4 x 10 BZK	3
	A10924	MRL00007 Carriage bolt plate W=49,0 x H=54,0 mm	3
	A10927	MRL00013 M4x 10 BZK screw pvk RVS A2 TYPE 7991 - ISO10642	12
	A10819	M8 6-sided lock nut stainless steel A2 Seal in	3
	A11161	M8 flat washer RVS A2 TYPE 9021/A2	3
	A10918	M8 x 40 Carriage bolt for mounting on vehicle	3
	A03732	Mounting rubber foot rubber black	3

ST0272	ST0175	DON-light mounting plate 49mm x 54mm MRL00007 Base with 4 x screw MRL00013 M4 x 10 BZK	2
	A10924	MRL00007 Carriage bolt plate W=49,0 x H=54,0 mm	2
	A10927	MRL00013 M4x 10 BZK screw pvk RVS A2 TYPE 7991 - ISO10642	8
	A10819	M8 6-sided lock nut stainless steel A2 Seal in	2
	A11161	M8 flat washer RVS A2 TYPE 9021/A2	2
	A10918	M8 x 40 Carriage bolt for mounting signalling on vehicle	2
	A03732	Mounting rubber foot rubber black	2





Five steps
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