

## Product description & assembly instruction

TurbFly® – snow and sand protection with brushes

Valid from  
2017.01.01

Author  
Mats Wickström

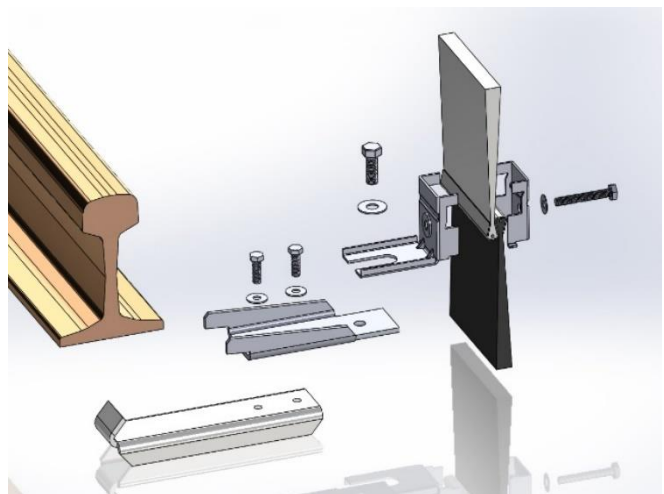
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### Snow and sand protection with brushes.





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## 1 System description TurbFly®

The product has been available on market since 2003, and in the early days named “SnowProtec” and has been installed at more than 1000 turnouts, so far mainly within Scandinavia. There is also a north American version of the system sold under the same brand, but then only on the American continent.

TurbFly® has the main function in its task to protect turnouts from drifting snow or sand (or other wind born disturbing materials), with the function secure high availability and functionality of the turnout.

The system works together with electrical- or gas- heated heaters for switches.

Snow protection in the form of wind shield for tongue and movable crossing helps to maintain heat from the switch heating and minimize drifting snow coming into the switch. With this solution minimize or completely avoid manual clearing from snow and ice. Snow protection and heating are completing each other in the task maintaining functionality of switches even in difficult weather conditions. Works very well in sandy conditions too.

All brushes have the same total height, 165 mm. Depending on desired length for supplies, different wooden boxes are available, most common is

- 2350 mm (delivered in EUR long pallet 800x2400x360)

The brush fasteners are rigidly designed, completely made from galvanized steel, completed with galvanized screw and washer, all is designed for several years' outdoor use.

Complementary fasteners have been developed and produced to meet different requirements for assembly situations. One example is the rail foot bracket that has been developed to make it possible to mount the protection system without being limited to the positions of the rail ties. The rail foot bracket can be placed where ever wanted between the ties and are gripping around the entire rail foot. All components are made from galvanized steel.

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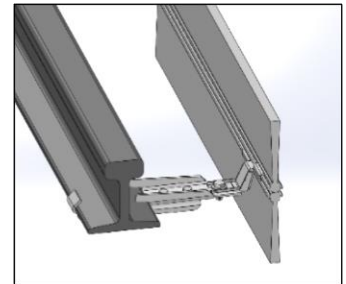
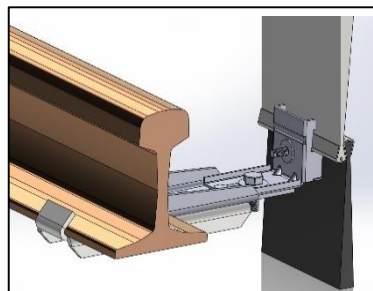
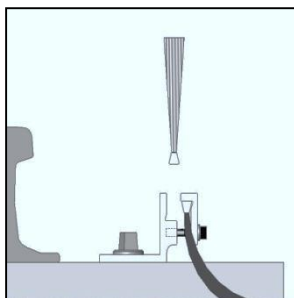
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## 1.1 Type of applications

Depending on where the TurbFly®-system would be mounted, there are different types of fasteners and brackets available as well as different types of brushes (brush with metal back or brush completely made out of plastic).

The different fastening methods are described in different chapters of this document.

Non electrified tracks or tracks with overhead power supply lines			Power supply with conductor rail (3:rd rail)
Mounting in tie bolts	Mounting with rail foot bracket		Mounting of full plastic brush system
<ul style="list-style-type: none"> <li>➤ The original way of mounting</li> <li>➤ Least number of needed components, therefore price vice the most cost effective option.</li> <li>➤ Limited choice of places for Fasteners, limitation to places where ties and tie bolts are available for fixation.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Gives much more flexibility for the assembly.</li> <li>➤ Easier and faster to decide and fit into optimized locations for fasteners.</li> <li>➤ Fixing of rail remains untouched and uninfluenced.</li> <li>➤ Price vice a higher purchase cost but much more rational during assembly work and maintenance.</li> </ul>		<ul style="list-style-type: none"> <li>➤ Designed to be used in applications with conductor rail, where long metal parts not are allowed for safety reasons.</li> <li>➤ Brush item (Strip) is completely made from plastic material, and then also fully electrically insulated. Only the “short” Fasteners are made of metal.</li> </ul>



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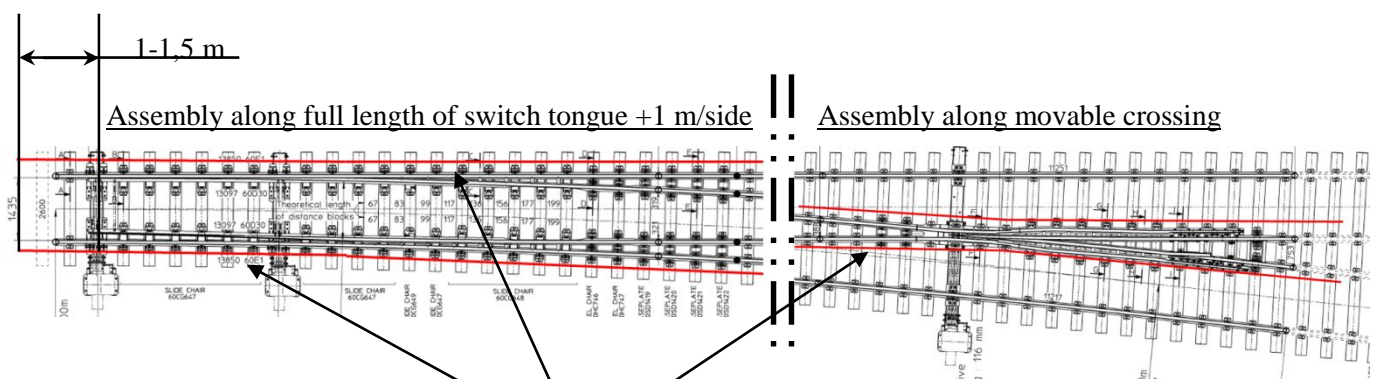
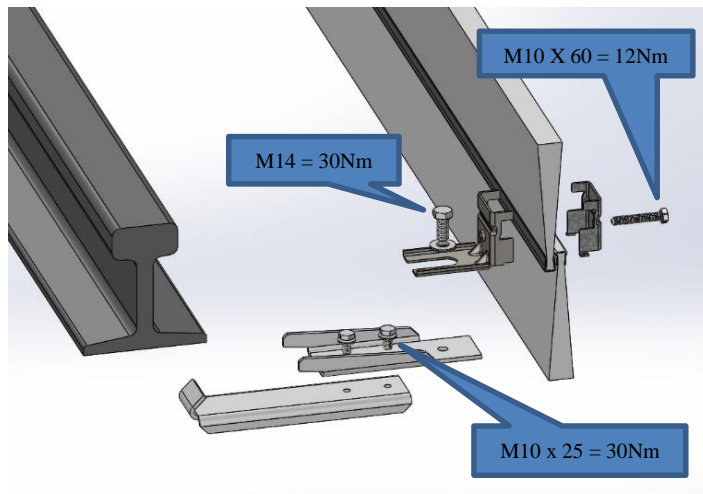
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## 2 Assembly

### 2.1 Introduction to assembly

Before starting the physical assembly, you start with arranging the components along the switch tongue to estimate where the brush sections fits the best and then where the fasteners will be positioned. When making the real assembly then all necessary components already are placed close by, to make the step fast and easy, without further walking needed to get more items for assembly.

When starting the positioning of the first brush section it should be placed where it's end goes beyond the end of the movable switch-tongue with approximately 1 to 1.5 meter. Distance between each tie (normally made of wood or concrete) is theoretically 600 mm, but can differ depending of switch-type. Exact positions are not possible to define, and that's the reason why common sense is needed to decide final position of the sections.



TurbFly brushes marked with red lines

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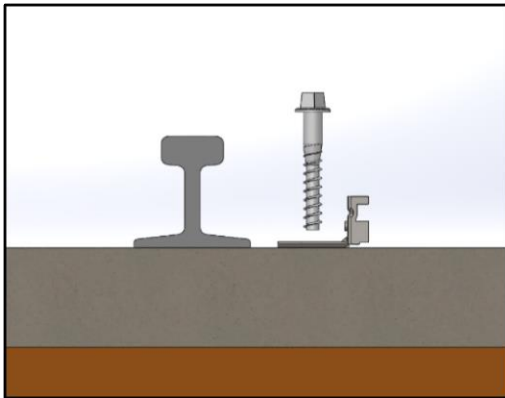
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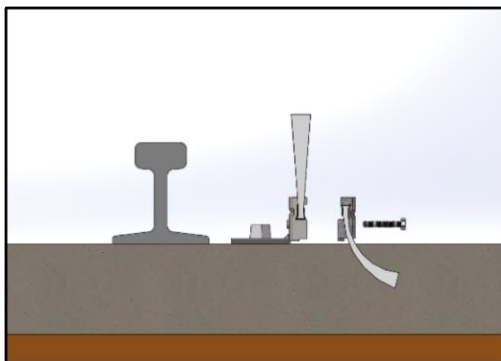
### 2.2 Assembly under tie bolts, Fastener galvanized steel

For assembly under existing tie bolts, after having defined the positions for the brush-sections, one has to loosen every second bolt (at distance cc 1200 mm). The fasteners consisting of two pieces can preferably be preassembled and put on each predestined position.

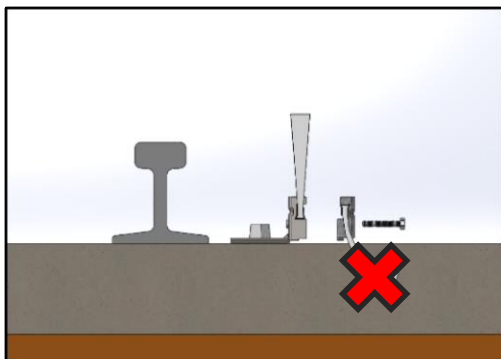


Loosen bolt and fix the fork piece between tie bolt and baseplate.

Continue to assemble all fasteners fork pieces. It's important to make the assembly and fixing in line with the rail.

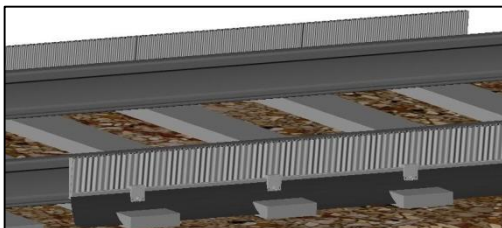


Place the upper white brush into the fork piece, assemble the U-shaped holder into the fork-piece, mount the washer and the screw, turn the screw firm – preferably with an electric screwdriver.



Push down the lower black brush behind the upper white brush and tighten the screw.

***When used in installation protecting from sandy conditions, only the upper part is used.***



Brushes should always be assembled along the whole extent of the tongue and also pass further beyond where the tongue ends with approximately 1 meter (~3 feet) on both sides to give the best protection.

Fasteners made of galvanized steel are fully compatible and exchangeable with the fasteners made from

aluminum. Nevertheless, it is preferable to use the same kind of fasteners within the very same assembly, either version1 or version2.

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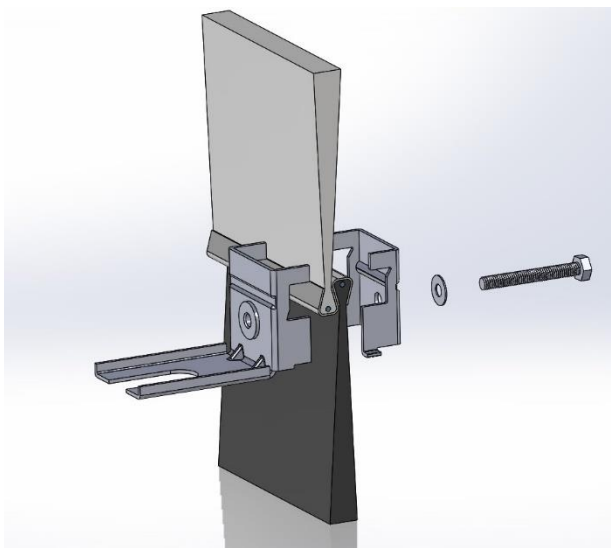
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Then install the downward black brush and fit into the outer fitting part, fit the through bolt and tighten the fitting with the through M10 screw (wrench 17 mm).

When installing with steel fasteners there is also possible to do splicing of brushes inside the brackets pinch points (optimally aligned with the position of screw).



The beginning and end of the complete brush-section is done with brushes that pass through the whole bracket with about 10-20 mm.

If through pass is greater than 250 mm end brackets should be assembled (itemno. 59255), see chapter 2:7.

For each brush with length  $\geq 2000$  mm it should be mounted with 3 fixing points. Shorter brushes is enough with 2 fixing points.



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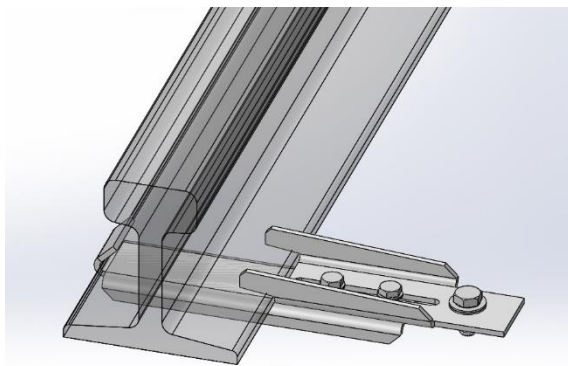
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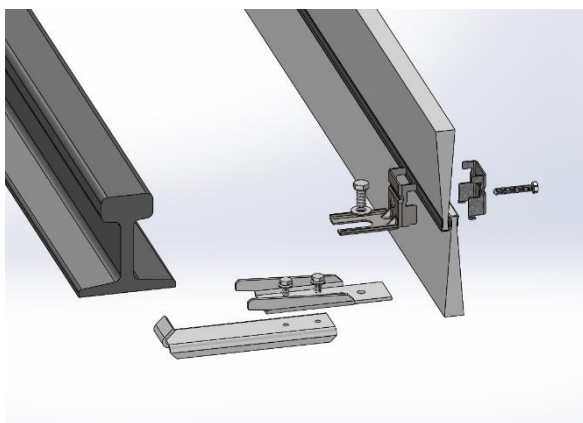
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### 2.3 Assembly with RailFootBracket, sets of type xxRF (item no. 129785)

If you choose not to install in the ties bolt, you can instead use Rail Foot Brackets. The bracket gives great freedom of choice in the placement of attachment points. The bracket consists of two parts and they can when mounting be pre-placed next to switch with a distance of cc 1200 mm. For each brush section is needed three brackets (at the brushes of length 2350 mm - 3 x “no of brushes”)



Before Brush assembly (Section 2:2 / 2:3) is performed the Rail Foot Brackets, that grips the entire underside of the rail, must be mounted. Select the position of holes for fastening screws depending on the rail foot width. Bracket is mounted on the rail foot without being fully dragged down, in that way you can move the bracket sideways to be aligned to the final placement during installation.



When all Rail Foot Brackets is seated, continue the assembly as normal under Section 2:2 / 2:3.

Tighten M14 bolt (22mm wrench/socket) in the Rail Foot Brackets.

Finally tighten all the M10 screws on all brackets (wrench/socket 17 mm).

Torques:

M14 x 30 = 30Nm

M10 x 25 = 30Nm

M10 x 60 = 12Nm



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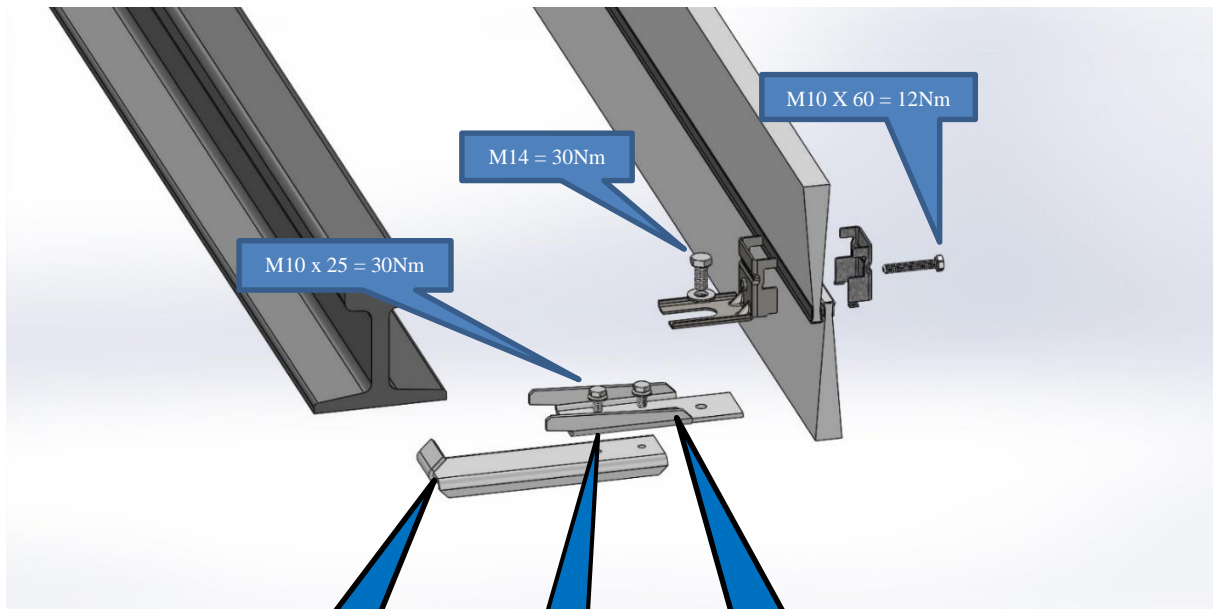
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1:  
Make sure that the bracket  
sits in on the rail correct.

2:  
After that the bracket and the top part  
are in correct position, tighten the bolts but  
leave a play of 2-3 mm.

3:  
Put pressure on the top part with your thumb  
at the end of it, before you tighten the screws. By  
doing so, the bracket will be slightly tilted and  
thereby grabs the rail better. A power tool is  
recommended to use here.

4:  
After that the installation of the bracket is finished,  
control that the bracket can't be moved in any direction.  
If so, redo as described above.

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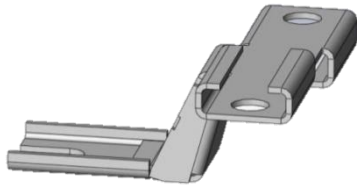
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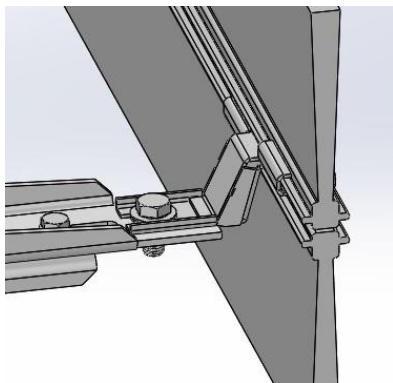
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## 2.4 Assembly of full plastic brush system (item 595xx)

TurbFly® with brush completely made of plastic are used primarily in connection with applications where there are so-called conductor rail or 3: rd rail. The brush is made of plastic in order not to be a leader, because otherwise there is a large short circuit risk with risk for personal injury.



The installation is done with brushes of length 1150 mm. The upward standing brush is blue and the downward directed brush is of soft white material for the flexible seal against the ballast-filled ground.



Start by placing brush sections along the length of the switch tongue. Mount RailFootBracket (described in section 2.3) at appropriate positions. The distance between each bracket will be about 800 mm. At the transition between sections double Fasteners will be applied to allow easy assembly and disassembly of entire brush sections.

Each brush section is to be preassembled with 2 brackets that are pushed on from the side. Both blue and white brush is mounted in the 2 mounting brackets.

At joints double brackets will come next to each other.



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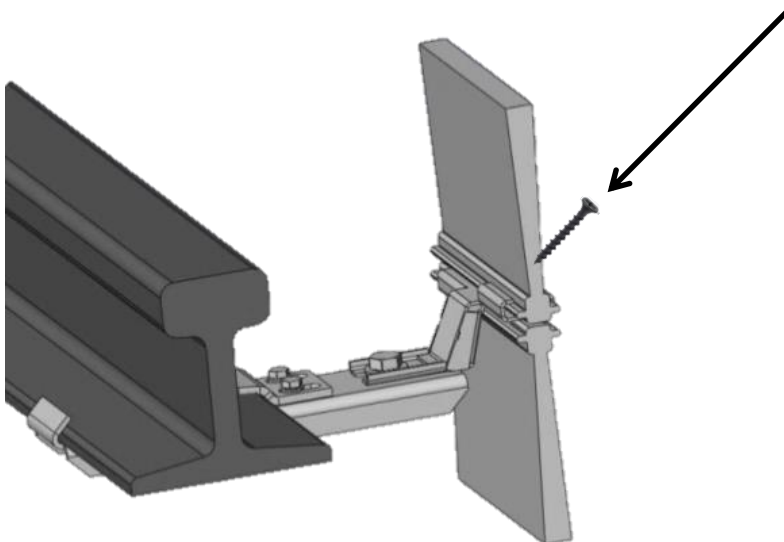
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After the complete brush package has been secured in place at the rail, and all brackets are tightened, the assembly ends by mounting 1-2 self-tapping screws (item 59245) which are screwed down through the plastic body and the screw tip should meet in a hole through the fitting. The screw is mounted to lock the brush in the longitudinal direction.



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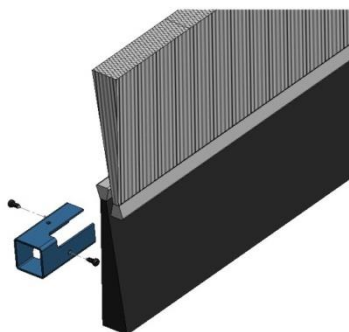
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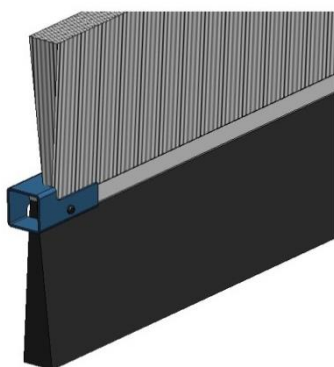
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### 2.5 Installation of End Fittings (item 59255-1), all switch types



Push on end fitting on the two assembled brushes.  
There are four end fittings in the kit and they must be used at the beginning and end of brush assembly.  
The end fitting must be pressed firmly to be exactly fitted towards the brush.



Then screw the 2 screws (2 pieces for each end fitting) from the side.

NOTE! NEVER screw the screws from under or from above. This leads the screw to press the brush bristles out from the backing tape and damage the brush.

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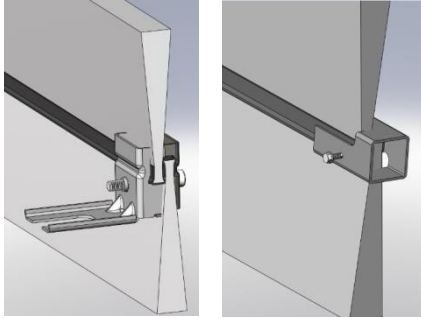
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### 2.6 Installations by activator units, or other" Special" cases

The End Fitting (item 59255-1) or Fastener (item 59235-1) is useful for making various types of special assemblies. For example, to pass through switch activators, etc. that you want to pass with the brushes, but still be able to open or access without dismantling the entire brush package.



The End Fitting is fastened into the brush end and bolted to the base or the door with the help of the height-adjustable angle bracket.

In very low mounting cases, even the lower brush could be cut with a suitable profile cut for easier mounting



Example of early assembly case



When cutting off brush you should always let ends be squeezed together in a vice or similar to secure the internal tying thread of the brush is kept in place.

Remember that the free ends, always shall be covered with end fittings. Complete mounting set, are sold under the article number 59950 and ordered separately.

Mounting set 59950 consist of:

4 pcs angle bracket (item no. 59235)

8 pcs end fitting (itemno.59255)

2 pcs brush, 600 mm (white, item no. 59222)

2 pcs brush, 600 mm (black, item no. 59212)

**Complete** with 25 mm long M10 screws and washers for assembly on metal sheets.

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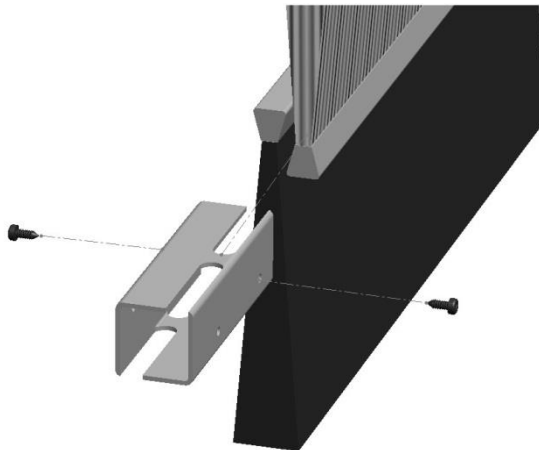
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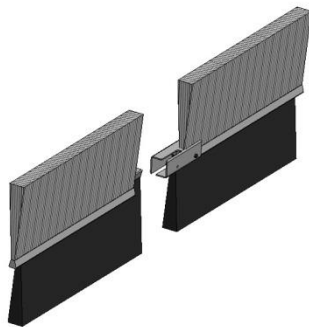
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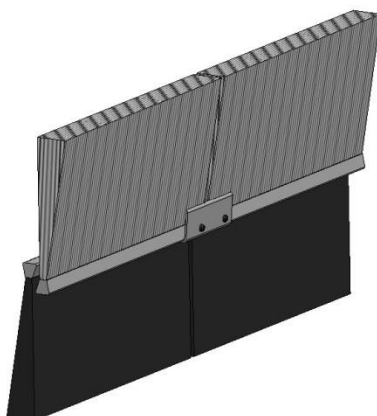
### 2.7 Installation of joint fittings



Push on the joint fitting on the two assembled brushes. The joint fitting must be pressed firmly to be exactly mounted towards the brush.



Then slide on the second pair of brushes. These need not be exactly fit into the joint fitting, it is important that the brushes are the same length at the end and beginning to really fit against the end fitting.



Then screw the screws (4 pieces for each joint fitting).



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### 2.8 Sets with brush length 2350 mm

Complete sets (fastening towards ties), Brush length 2350 mm							
Switch model	Tot brush length (m)	OSBORN Item no	Brush (white)	Brush (black)	Fasteners (vers2)	End fitt-ing*	Joint fitt-ing*
EV-60E1-225/190-1:9 EV-BV50-225/190-1:9 EV-BV50-225/480-1:12 EV-SJ50-11-1:9	9,4	59340	8	8	24	4	4
EV-60E1-300-1:9 EV-UIC60-300-1:9 EV-BV50-300-1:9 EV-SJ50-12-1:12/1:13/1:15	11,7	59310	10	10	30	4	4
BSI-300-1:9/1:12 BSI-300-1:9-483/185 BSI-350-1:11-207/130 R65-300-1:11 EW-300-ÖBB	14,1	59312	12	12	36	4	2
EV-60E1-500-1:12 EV-60E1-600-1:15 EV-UIC60-500-1:12 EV-BV50-600-1:15 EV-BV50-600/365-1:12	16,4	59315	14	14	42	4	4
EV-60E1-600-1:13 EV-60E1-760-1:14 / 1:15 EV-UIC60-760-1:14 / 1:15 EV-BV50-600-1:13	18,8	59320	16	16	48	4	4
EV-60E1-1200-1:18,5 EV-UIC60-1200-1:18,5 EV-SJ50-20,667-1:18,5	21,1	59330	18	18	54	4	4
EV-60E1-1200-1:24 Locations of Brush 1000   2350 * 10	24,5	59332	20 +2	20 +2	64	4	4
EV-60E1-2600/1200-1:24 Locations of Brush 1350   2350+1350x2   2350+1350x2   2350+1350x2   2350x8	36,6	59335	38	38	98	4	4
EV-60E1-600-1:13 EV-60E1-760-1:14/1:15 EV-UIC60-760-1:14/1:15 EV-BV50-600-1:13	18,8	59370	16	16	48	8	8
EVR-60E1-760-1:14 / 1:15 EVR-UIC60-760-1:14 / 1:15	28,2	59380	24	24	72	8	8
EVR-60E1-2500-1:26,5/1:27,5 EVR-UIC60-2500-1:26,5/1:27,5	42,3	59325	36	36	108	8	8





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\*To be used when needed

Complete sets (fastening with Rail Foot Bracket), Brush length 2350 mm									
Switch model	Tot brush- length (m)	OSBORN Item no	Brush (white)	Brush (black)	Fasteners	Rail Foot bracket	End fitting*	Joint fitting*	
EV-60E1-225/190-1:9 EV-BV50-225/190-1:9 EV-BV50-225/480-1:12 EV-SJ50-11-1:9	9,4	59340RF	8	8	24	24	2	2	
EV-60E1-300-1:9 EV-UIC60-300-1:9 EV-BV50-300-1:9 EV-SJ50-12-1:12/1:13/1:15	11,7	59310RF	10	10	30	30	2	2	
BSI-300-1:9/1:12 BSI-300-1:9-483/185 BSI-350-1:11-207/130 R65-300-1:11	14,1	59312RF	12	12	36	36	4	2	
EV-60E1-500-1:12 EV-60E1-600-1:15 EV-UIC60-500-1:12 EV-BV50-600-1:15 EV-BV50-600/365-1:12	16,4	59315RF	14	14	42	42	2	2	
EV-60E1-600-1:13 EV-60E1-760-1:14 / 1:15 EV-UIC60-760-1:14 / 1:15 EV-BV50-600-1:13	18,8	59320RF	16	16	42	42	2	2	
EVR-300-1:9 Vid rörlig korsning sätts borst inne SAMT vid yttre räil!	18,8	59370RF	22	22	66	66	4	4	
EV-60E1-1600-1:25 EV-54E2-1600-1:25	30,6	59345RF	26	26	78	78	2	2	
EV-60E1-2500-1:26,5/27,5 EV-UIC60-2500-1:26,5/27,5	32,9	59350RF	28	28	84	84	2	2	
EV-60E1-2600/1200-1:24	35,3	59335RF	36	36	94	94	2	2	
EV-60E1-1200-1:18,5 EV-UIC60-1200-1:18,5 EV-SJ50-20,667-1:18,5	21,1	59330RF	18	18	54	54	2	2	
EVR-60E1-760-1:14 / 1:15 EVR-UIC60-760-1:14 / 1:15	28,2	59380RF	32	32	86	86	4	4	
EVR-60E1-1200-1:18,5 EVR-UIC60-1200-1:18,5 Vid rörlig korsning sätts borst inne SAMT vid yttre räil!	30,6	59385RF	34	34	92	92	4	4	
EVR-60E1-2500-1:26,5/1:27,5 EVR-UIC60-2500-1:26,5/1:27,5	42,3	59325RF	44	44	132	132	4	4	

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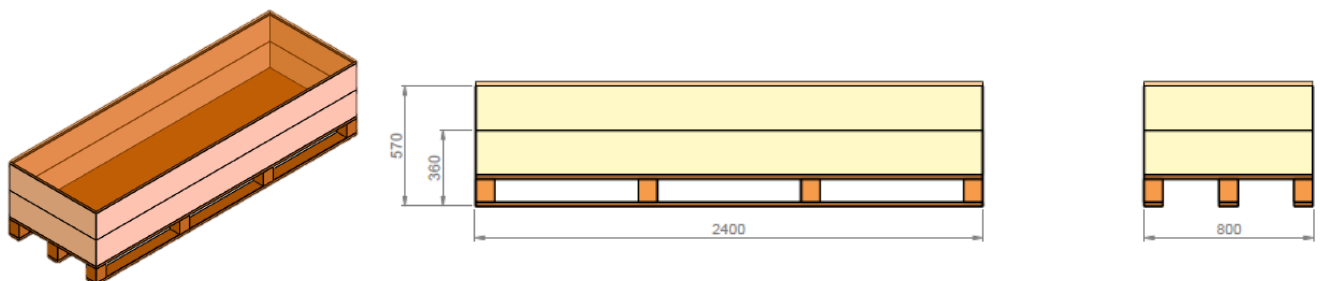
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### 2.9 Sets FULL PLASTIC BRUSHES with brush length 1150 mm

Complete sets, full plastic brushes (fastening with rail foot clamps), brush length 1150 mm							
Switch model	Tot brush-length (m)	OSBORN Item no	Brush (blue, up)	Brush (white, down)	Fasteners	Rail foot clamp	
EV-60E1-225/190-1:9 EV-BV50-225/190-1:9 EV-BV50-225/480-1:12 EV-SJ50-11-1:9	9,4	59540RF	8	8	32	32	
EV-60E1-300-1:9 EV-UIC60-300-1:9 EV-BV50-300-1:9 EV-SJ50-12-1:12/1:13/1:15	11,7	59510RF	10	10	40	40	
EV-60E1-500-1:12 EV-60E1-600-1:15 EV-UIC60-500-1:12 EV-BV50-600-1:15 EV-BV50-600/365-1:12	16,4	59515RF	14	14	56	56	
EV-60E1-600-1:13 EV-60E1-760-1:14 / 1:15 EV-UIC60-760-1:14 / 1:15 EV-BV50-600-1:13	18,8	59520RF	16	16	64	64	

Complete sets brush length 2350mm: 2400 x 800 x 570 (shown below).

Complete sets brush length 1150mm: 1200 x 800 x 570.





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### 2.10 Components, bulk packed (no sets) / spare parts

<b>Components</b> (only delivered as below)			
<b>Item description</b>	<b>OSBORN Item no</b>	<b>Spare part</b>	<b>Bulk pack</b>
Brush (white), length 600 mm	59222	1	50
Brush (black), length 600 mm	59212	1	50
Brush (white), length 700mm	269979-71	1	50
Brush (black), length 700mm	269979-72	1	50
Brush (white), length 900mm	269977-82	1	50
Brush (black), length 900mm	269977-83	1	50
Brush (black), length 1000mm	269720-47	1	50
Brush (white), length 1000mm	269720-48	1	50
Brush (white), length 1100mm	269977-86	1	50
Brush (black), length 1100mm	269977-87	1	50
Brush (black), length 1200mm	269976-03	1	50
Brush (white), length 1200mm	269976-04	1	50
Brush (white), length 1350mm	269977-92	1	50
Brush (black), length 1350mm	269977-93	1	50
Brush (white), length 1400mm	269977-96	1	50
Brush (black), length 1400mm	269977-97	1	50
Brush (white), length 1500mm	269978-01	1	50
Brush (black), length 1500mm	269978-02	1	50
Brush (white), length 1700mm	269979-04	1	50
Brush (black), length 1700mm	269979-05	1	50
Brush (white), length 1850mm	269979-06	1	50
Brush (black), length 1850mm	269979-07	1	50
Brush (white), length 2000mm	269978-05	1	50
Brush (black), length 2000mm	269978-06	1	50
Brush (white), length 2300mm	269978-07	1	50
Brush (black), length 2300mm	269978-08	1	50
Brush (black), length 2350mm	59211	1	50
Brush (white), length 2350mm	59221	1	50
Brush (white), length 2550mm	269978-13	1	50
Brush (black), length 2550mm	269978-14	1	50
Brush (white), length 2700mm	269978-15	1	50
Brush (black), length 2700mm	269978-16	1	50
Brush (white), length 2900mm	269978-19	1	50
Brush (black), length 2900mm	269978-20	1	50
Brush (black), length 3000mm	269720-130	1	50
Brush (white), length 3000mm	269720-35	1	50
Brush (white), length 3000 mm	59220	1	50
Brush (black), length 3000 mm	59210	1	50
Brush (blue), PLASTIC, length 1150 mm	59241	1	50
Brush (white), PLASTIC, length 1150 mm	59242	1	50



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Fastener galvanized ( <u>without</u> screw and washer)	59235	1	36
Fastener Plastic brush	59245	1	32
End fitting ( <u>without</u> screw)	59255	1	50
Joint fitting ( <u>without</u> screw)	59250	1	50
Rail Foot Bracket complete	129785	1	36
Screw for Fastener Galvanized (Item. 59235)	M26045	25	25
Nordlock-washer for Fastener (Item. 59230)	M26050	200	200
Screw for End-/Joint fitting (Item. 59255 / 59250)	M26880	1000	1000
Nut, M10 for R.F.Clamp (Item. 59900)	M26905	500	500
Spring-washer, M10 for R.F.Clamp (Item. 59900)	M26910	250	250
Chamf. washer 36/13x6 for R.F.Clamp (Item. 59900)	M26920	100	100
Screw, selfcut.30x2,3 for Fastener Plastic br. (Item 59245)	M26925	250	250
Fastener galv. (compl. w. screw + washer)	59235-1	1	1
End fitting (compl. w. screw) (earlier Ö0684)	59255-1	1	1
Joint fitting (compl. w. screw) (earlier Ö0677)	59250-1	1	1
Rail Foot Bracket complete	129785	1	1
Tube-key for R.F.Clamp	59905	1	1
Mounting set Activator units, length 600 mm	59950	1	1

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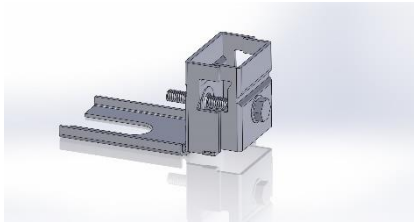
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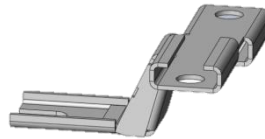
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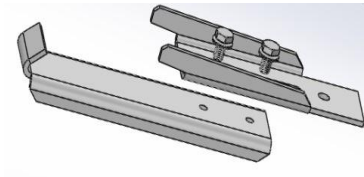
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Fastener Galvanized Complete (59235)



Fastener Plastic brush (59245)



Rail Foot Bracket Complete (129785)



End Fitting Complete (59255-1)



Joint Fitting (59250)

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