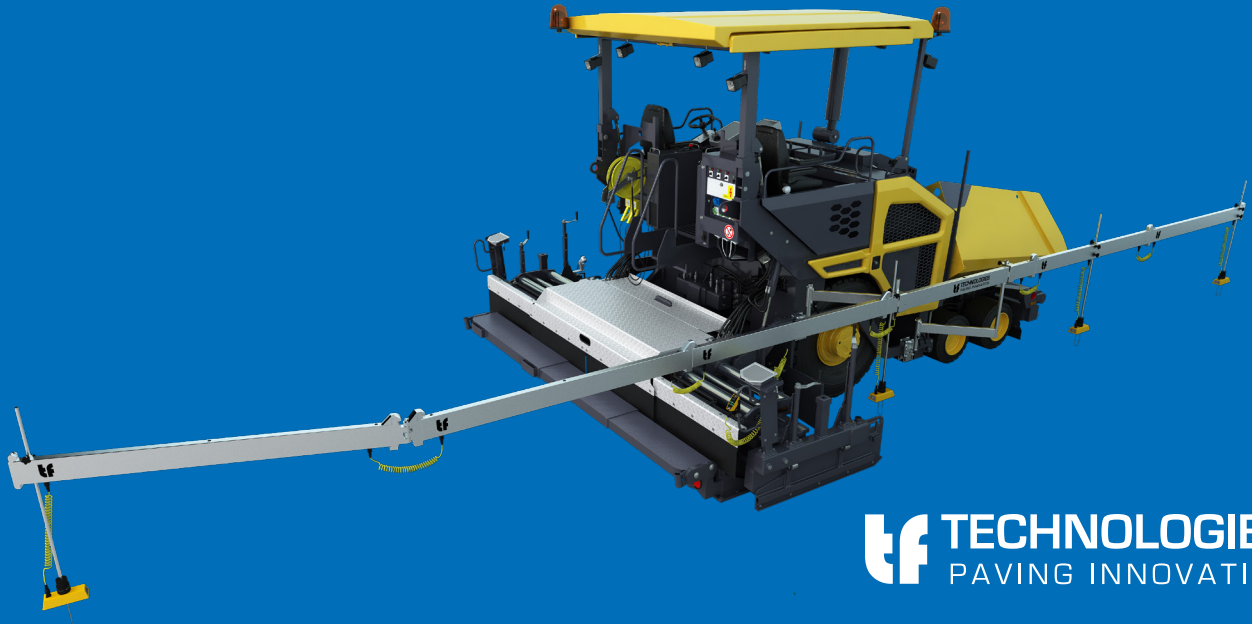


Mini-Line®

SUPER Averaging Beam

Installation Manual



tf TECHNOLOGIES
PAVING INNOVATION

SUPER Averaging Beam

Installation Manual



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About SUPER Averaging Beam installation manual

Content and structure

This installation manual has been developed for operators to provide the necessary information to install the Mini-Line® SUPER Averaging Beam, so that it can be used together with the Mini-Line® Grade and Slope Control System.

Safe use

Before starting to use the SUPER Averaging Beam, the operator should ensure that it is installed as described in this manual. The manual for the selected Mini-Line® controller should also be read through completely to ensure correct and safe operation of the Mini-Line® Grade and Slope Control System together with the SUPER Averaging Beam. Dangerous situations that can arise when using the SUPER Averaging Beam are summarised in the Important Safety Information section on p. 7.

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Symbol overview

This installation manual uses a range of symbols and warning notifications to make the operator aware of important safety measures and information regarding operation.

The following symbols are used in this manual:



Warning!

Indicates important information the operator must be aware of to avoid dangerous situations that can result in death or serious personal injury



Caution!

Indicates important information the operator must be aware of to avoid dangerous situations that can result in material damages



Step-by-step instructions

Indicates a step-by-step instruction, where a particular order of actions is required or recommended

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Important Safety Information



The installation of the SUPER Averaging Beam must never prevent the free movement of the tow arm and screed



If welding on the paver or SUPER Averaging Beam or Mountings, remove all electrical equipment and disconnect the negative terminal of battery of the paver. Place the negative electrode close to the welding point



Make sure the screed rests solidly on the ground before performing work on the system



Read and understand the manual for the controller used



Position grade sensors within their working range and so that there is at least:

- 50 cm / 20" between two sensors
- 50cm / 20" between a sensor and a heat source, e.g. exhaust or joint heater
- 25cm / 10" between a sensor and reflecting surfaces



Remove all Extension Sections for transport, as the SUPER Averaging Beam may otherwise bend out of shape



The greater the distance between the sensors, the greater the effect of the SUPER Averaging Beam



Remove all equipment, including the Sensor Beams before cleaning the asphalt paver



Introduction

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Introduction to SUPER Averaging Beam

The SUPER Averaging Beam in the Mini-Line® series is designed to ensure ultimate smoothness. The SUPER Averaging Beam must be used with a Mini-Line® Grade and Slope Control System with up to six Mini-Line® grade sensors, each supplying measurement results to a Mini-Line® controller. The Mini-Line® controller produces an average of the four to six measurements, so that a smoothening effect is achieved.

The SUPER Averaging Beam features a specialized aluminium profile for a very stable construction with low vibrations, and extends up to 13 m / 40 ft. The long sensing span ensures a large averaging effect, making it ideal for high profile paving jobs with extensive requirements for beam length and superior smoothness.

The SUPER Averaging Beam includes top-of-the-line features such as integrated lights and cabling, and a flexible hinge for placing the rear sensor over the paved mat.

All sensors are mounted with Snap Connectors, reducing the time and hassle required for setting up the sensors.

The beam structure is composed of sections and easy to mount, and it can be either bolted or clamped onto the tow arm.



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Overview of the SUPER Averaging Beam - 9m / 25ft (4 sections)



Overview of the SUPER Averaging Beam - 13m / 40ft (6 sections)

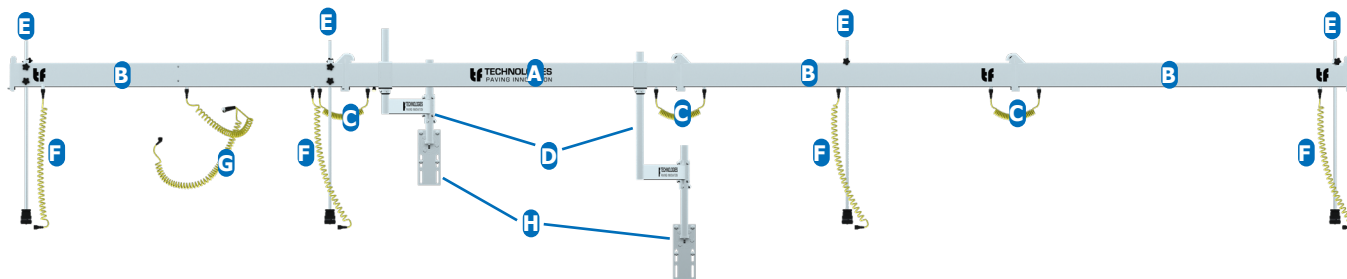




Parts

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Main Parts and Part Numbers SUPER Averaging Beam 9m / 25 ft



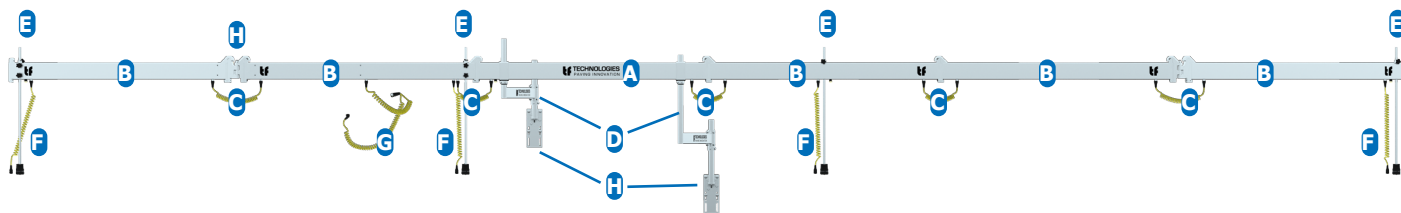
S-51650 SAB, 9m / 25ft (4 sections)

Ref.	p/n	Pcs.	Description
A	SP-51609	1	Main Section w/Clamp Brackets
B	SP-51610	3	Extension Section w/Bolt
C	S-51600/1,5	3	Connection Cable for Beam
D	SP-51607	1	Bolt Mountings for Tow Arm (2 pcs)
E	SP-51630	4	Sensor Mounting Rod w/Snap Connector
F	S-51601/1,5	4	Cable, Beam to Sensor
G	S-51604	1	V-Cable for SUPER Beam

Accessories

Ref.	p/n	Pcs.	Description
H	SP-51628	1	Clamping Plates Kit, Long (4 pcs w/nuts)
I	SP-51608	1	Hinge (not in picture)
J	SP-51612	1	Light Set - 4 pcs (not in picture)

Main Parts and Part Numbers, SUPER Averaging Beam 13m / 40 ft



S-51651 SAB, 13m / 40ft (4 sections)

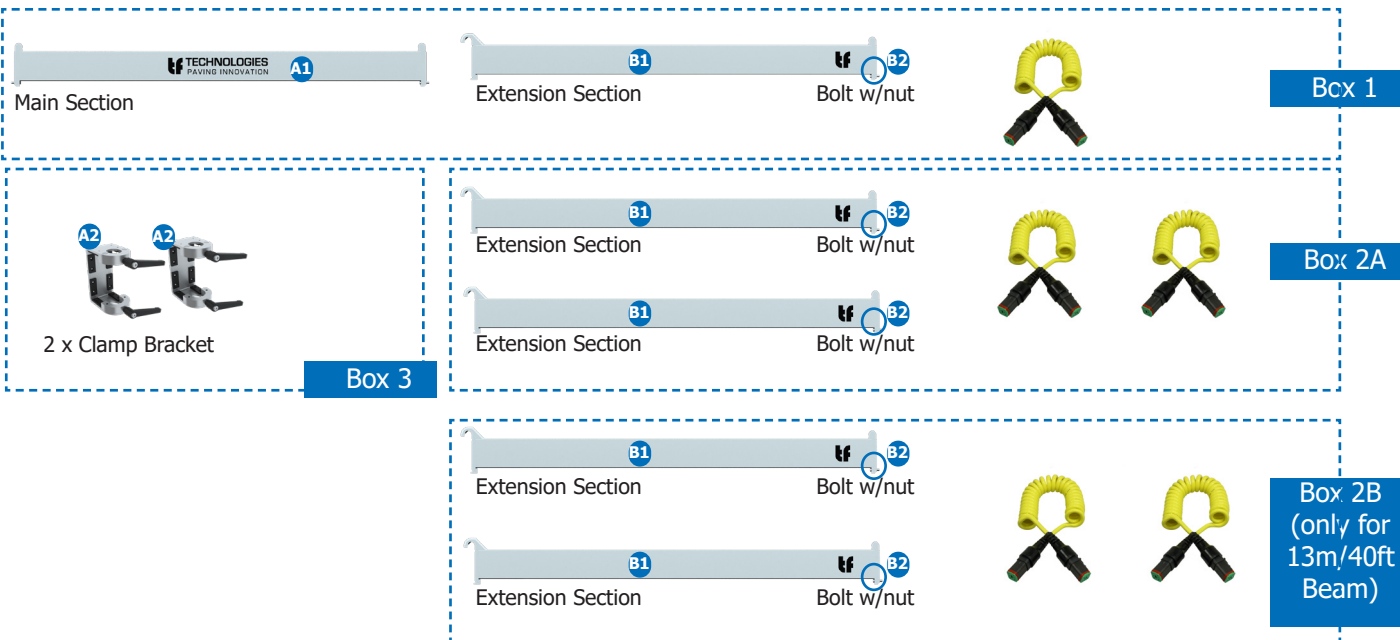
Ref.	p/n	Pcs.	Description
A	SP-51609	1	Main Section w/Clamp Brackets
B	SP-51610	5	Extension Section w/Bolt
C	S-51600/1,5	5	Connection Cable for Beam
D	SP-51607	1	Bolt Mountings for Tow Arm (2 pcs)
E	SP-51630	4	Sensor Mounting Rod w/Snap Connector
F	S-51601/1,5	4	Cable, Beam to Sensor
G	S-51604	1	V-Cable for SUPER Beam

Accessories

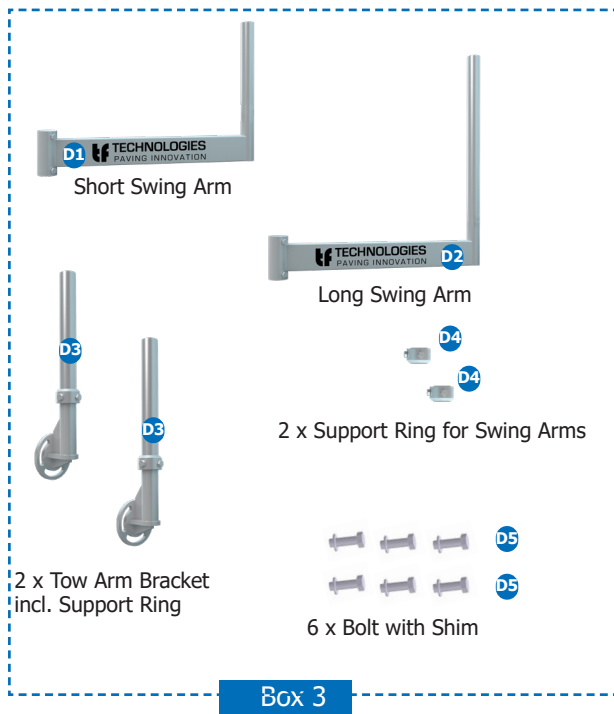
Ref.	p/n	Pcs.	Description
H	SP-51628	1	Clamping Plates Kit, Long (4 pcs w/nuts)
I	SP-51608	1	Hinge
J	SP-51612	1	Light Set - 4 pcs (not in picture)

Components

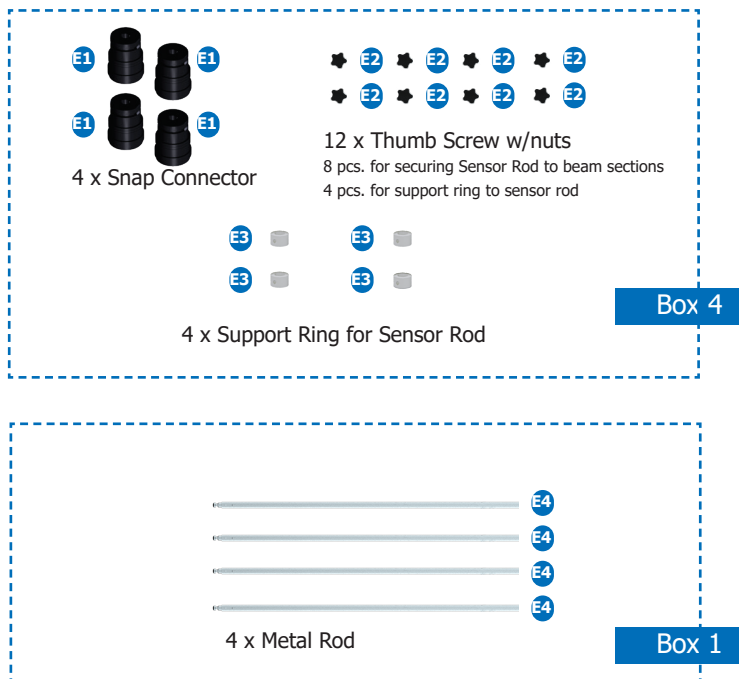
- A** SP-51609 Main Section w/Clamp Brackets
- B** SP-51610 Extension Section w/Bolt
3 x for 9m / 25ft beam
5 x for 13m / 40 ft beam
- C** S-51600/1,5 Connection Cable for Beam
3 x for 9m / 25ft beam
5 x for 13m / 40 ft beam



D SP-51607 Bolt Mountings for Tow Arm

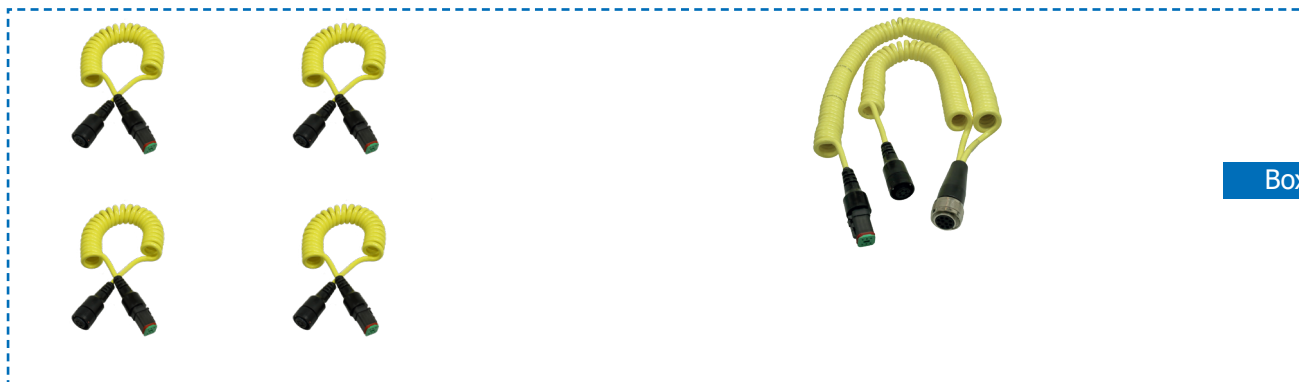


E SP-51630 Sensor Mounting Rod w/Snap Connector x 4



F S-51601/1,5 Cable, Beam to Sensor x 4

G S-51604 V-Cable for SUPER Beam



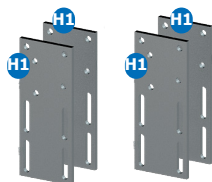
Box 4

Components - Accessories

H SP-51628 Clamping Plate Kit, Long

I SP-51608 Hinge

J SP-51612 Light Set



4 x Clamping Plate



Hinge



4 x Lights



Bolt w/nut



8 x Bolts with shim and nuts

Box 5

Tools Required (not included)

EU



19 mm



24 mm


Drilling Machine
with 14 mm drill

Diestock tool,
16 mm


4 mm

US



0.7 - 1.5"


Drilling Machine
with 7/32" drill

Diestock tool,
5/8"


3/8 - 16 UNC

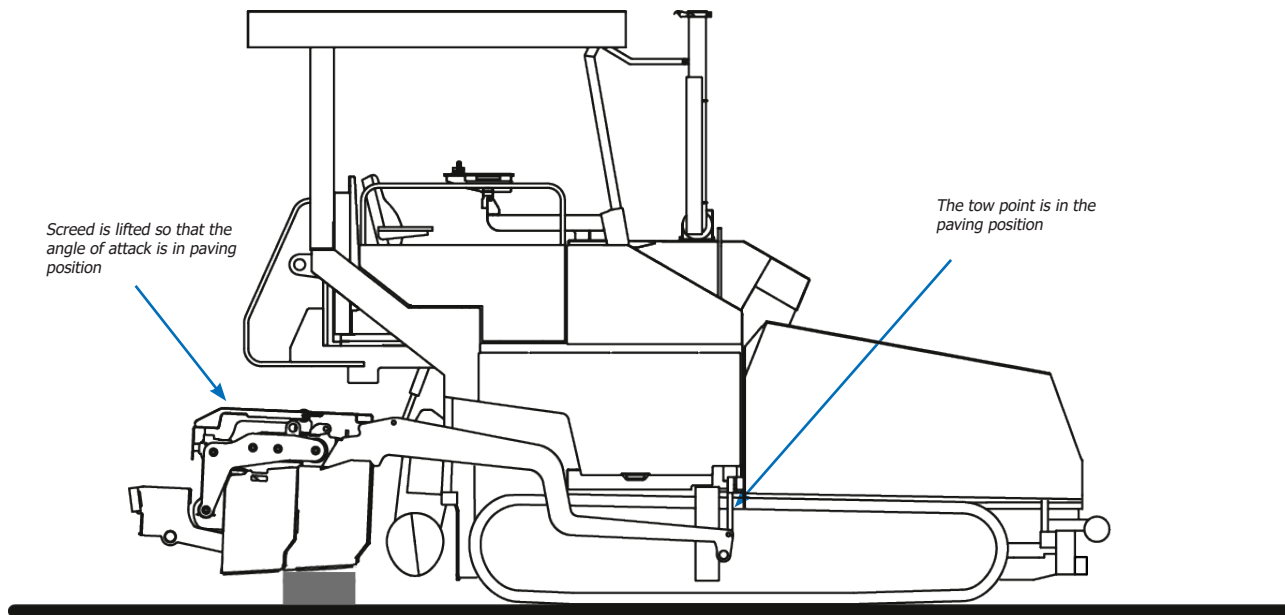


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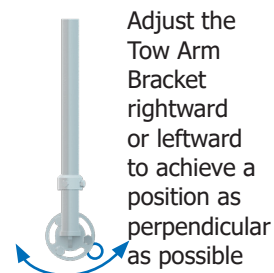
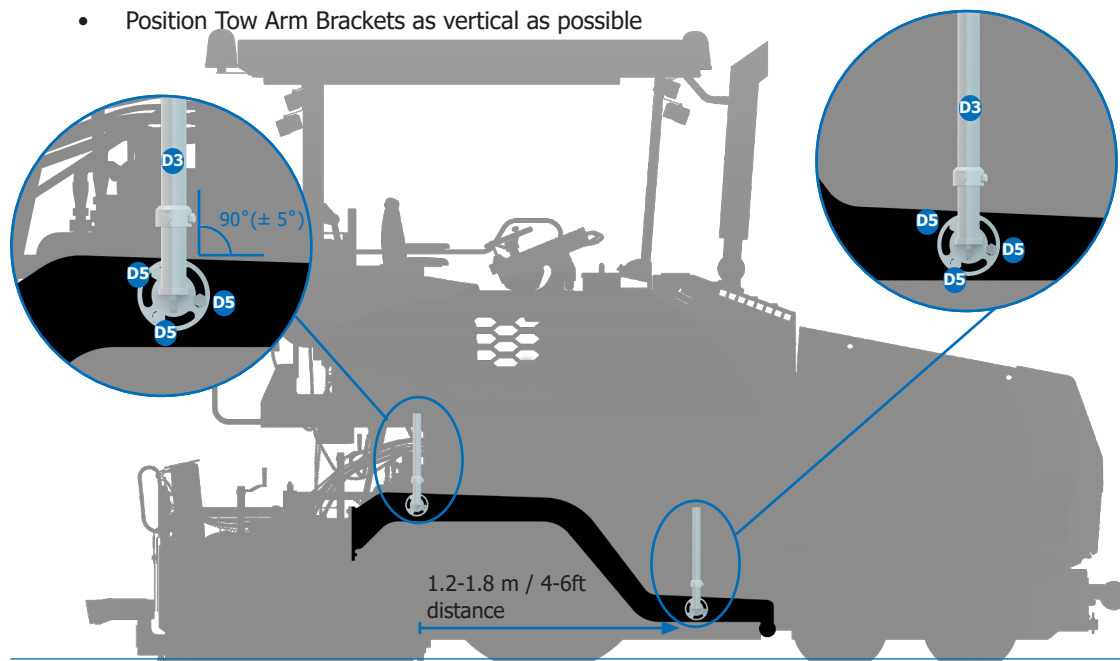
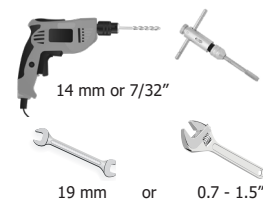
Getting Ready for Installation of the SUPER Averaging Beam

Position the tow point as when paving, lifting the screed to a typical paving height.



Installation of Tow Arm Brackets with bolts (standard)

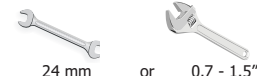
- 1** Mount the Tow Arm Brackets **D3** on the tow arm with the accompanying bolts **D5**.
 - Position the rear Tow Arm Bracket as far back on the tow arm as possible
 - Place the front Tow Arm Bracket a distance of 1.2-1.8 m / 4 - 6 ft from the rear Tow Arm Bracket.
 - Position Tow Arm Brackets as vertical as possible



Installation of Tow Arm Brackets with Clamping Plates (sold separately)

1 To prevent drilling holes in the tow arm, the Tow Arm Brackets can be mounted with a Clamping Plates Kit **H** (sold separately).

- Position the rear Clamping Plates **H1** as far back on the tow arm as possible
- Place the front Clamping Plates a distance of 1.2-1.18 m / 4 - 6 ft from the rear Clamping Plates
- Mount the Clamping Plates on the tow arm with the accompanying bolts **H2**



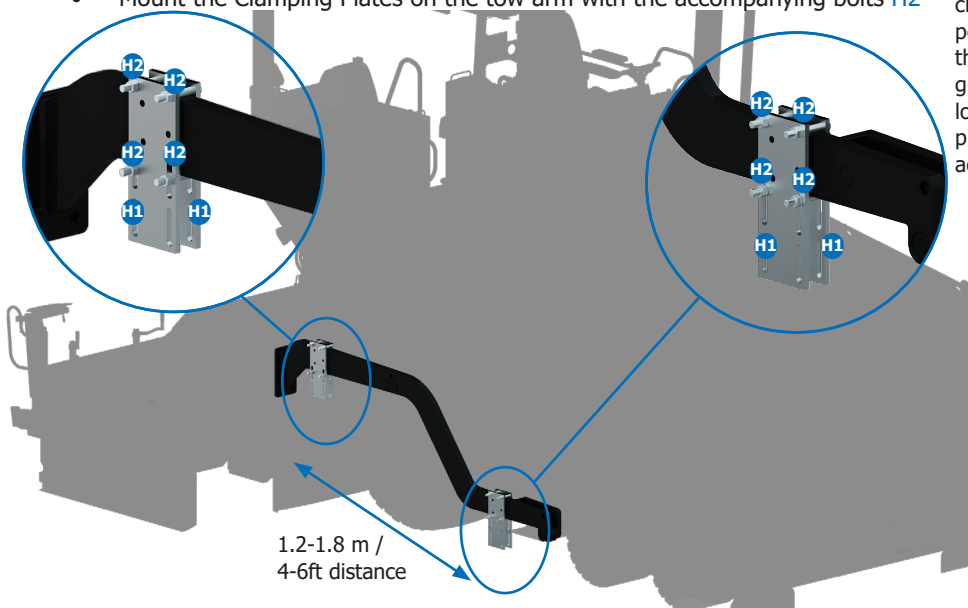
Position the bolts as close to the tow arm as possible, and ensure that the plates do not touch the ground when the screed is lowered. You can flip the plates any way required to achieve this



Clamping Plates are available in two different sizes. Measure the height of the Tow Arm, where the Clamping Plates will be mounted:

- Tow Arm height **< 22,6 cm/8,9"**
Use SP-40125 Clamping Plates, **Short** (2 plates incl. nuts)
- Tow Arm height **> 22,6 cm/8,9"**
Use SP-40126 Clamping Plates **Long** (2 plates incl. nuts)

You need a total of four Clamping Plates to mount your beam



- 2** Mount the Tow Arm Brackets **D3** on the Clamping Plates with the accompanying bolts **D5**
- Position the Tow Arm Brackets as vertical as possible

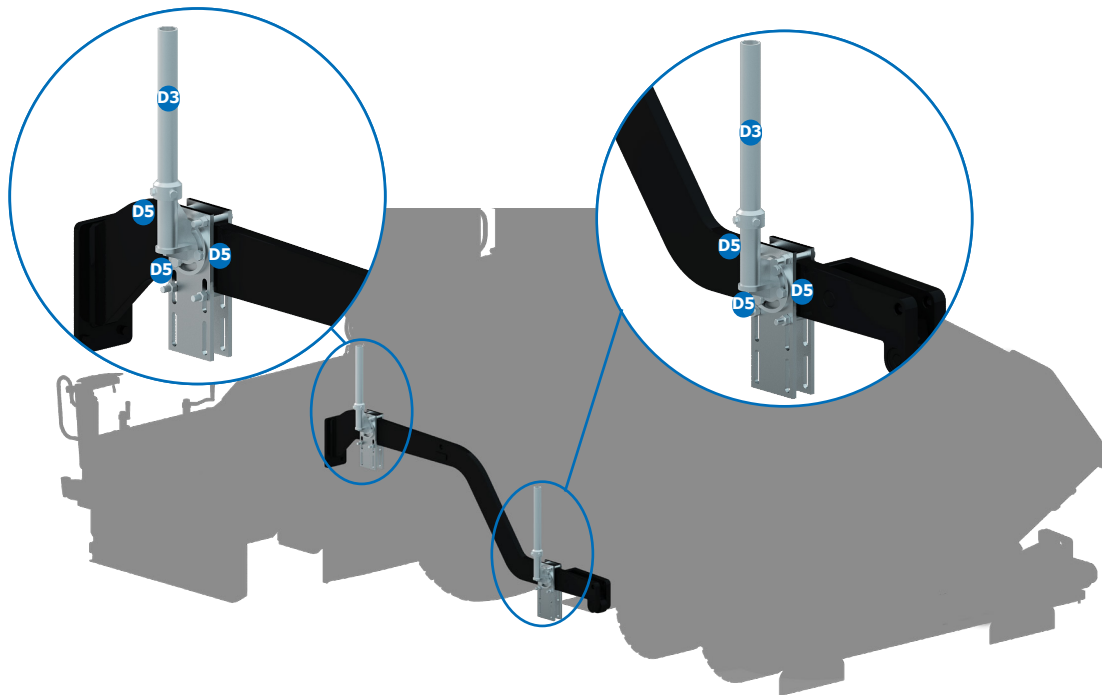


19 mm



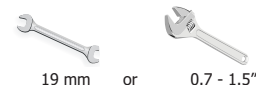
or

0.7 - 1.5"



Adjust the
Tow Arm
Bracket
rightward
or leftward
to achieve a
position as
perpendicular
as possible

Installation of Swing Arms

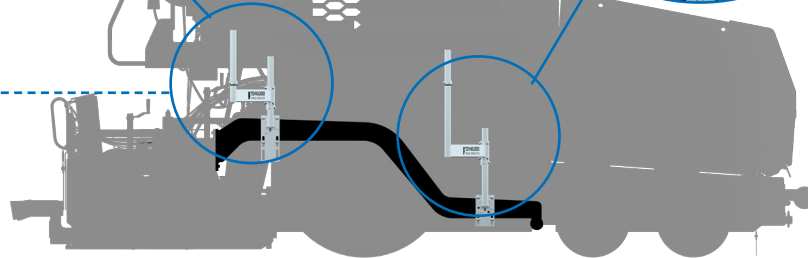
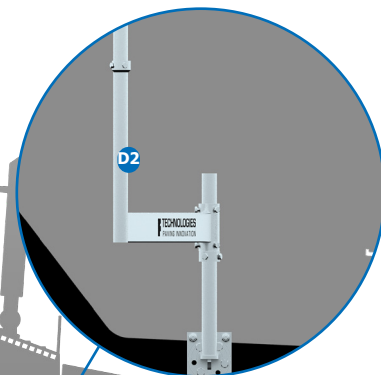
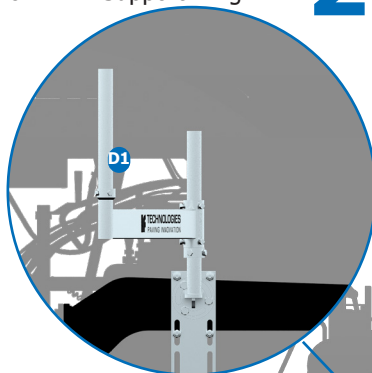
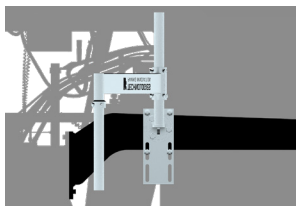


- 1 Place the Short Swing Arm **D1** on the rear Tow Arm Bracket, so that it rests on the Tow Arm Support Ring and secure the bolts.

- 2 Place the Long Swing Arm **D2** on the front Tow Arm Bracket, so that it rests on the Tow Arm Support Ring and secure the bolts.

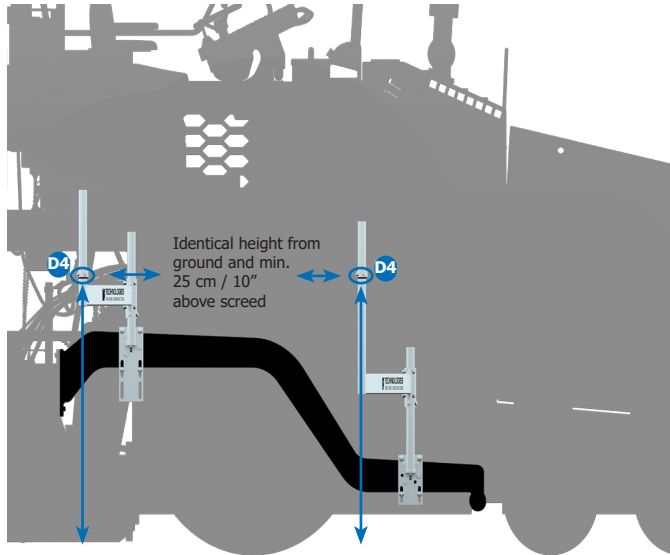


In case the tow arm is very low/screed very high preventing the correct mounting of the support rings (see next page), the Short Swing Arm can be mounted upside down.

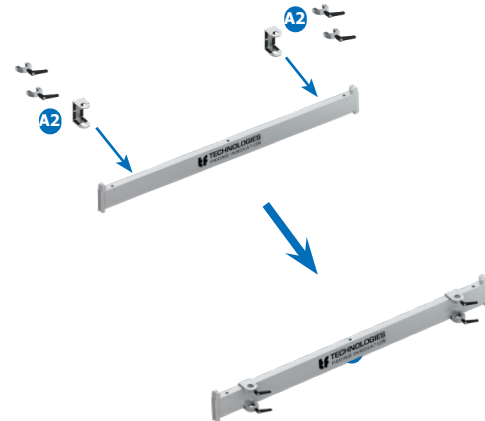


Installation of Main Section

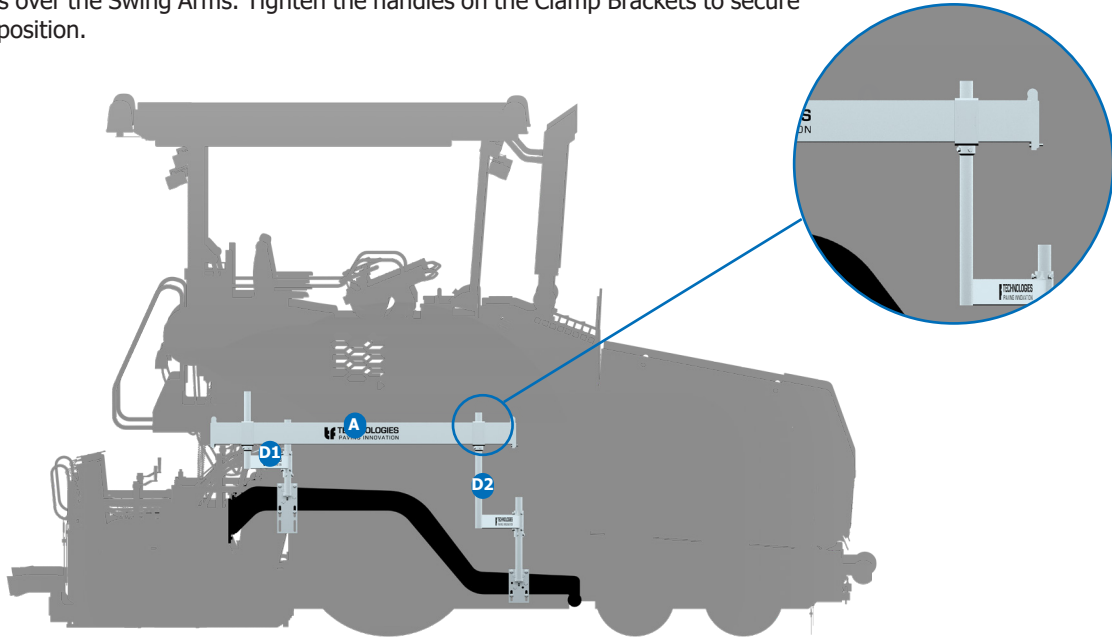
- 1** Mount the Support Rings for Swing Arms **D4** on the Swing Arms, and adjust their position, so that they have identical height from ground.



- 2** Mount the Clamp Brackets **A2** on the Main Section **A1**. To do this, unscrew the umbraco screw and loosen the two u-sections with handles to slide the Clamp Brackets on to the Main Section. Mount the U-sections on the Clamp Brackets again to secure the Clamp Brackets to the Main Section.



- 3** Mount the Main Section w/Clamp Brackets **A** on the Swing Arms **D1** and **D2** by sliding the Clamp Brackets over the Swing Arms. Tighten the handles on the Clamp Brackets to secure the section in position.





Installation of Extension Sections

1

Simply click on each of the Extension Sections **B1**. Secure the Extension Section with the Bolt w/nut **B2** in the bottom.

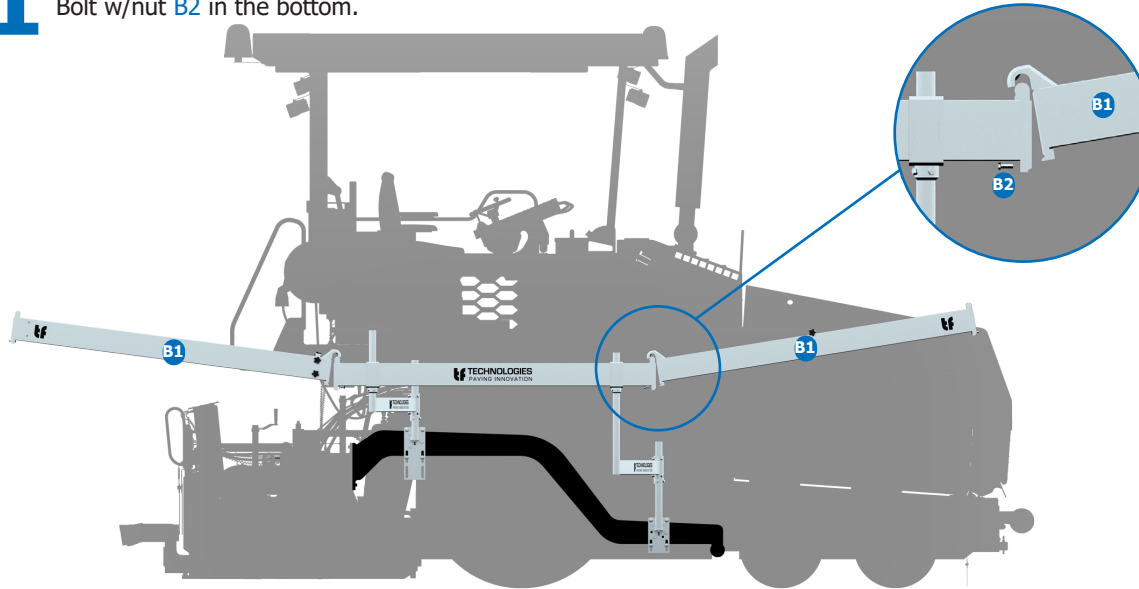


19 mm

or



0.7 - 1.5"





Setup

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Recommended Setup - 13m / 40ft (6 sections).....	34
Recommended Setup - 13m / 40ft (6 sections - 6 sensors).....	35
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Recommended Setup - 9m / 25ft (4 sections)

To ensure a perfect paving result, we recommend the following setup of Extension Sections and Sensor Rod positions. This setup is usually possible, when mounting the Super Averaging Beam on the outside of the side plate. If it is not possible to place the Sensor Rods in the specific options for positions shown due to the design of the paver, or the nature of your paving job, e.g. when the job requires the Super Averaging Beam to be mounted over the screed, you **MUST** use the Alternative Setup.



VERY IMPORTANT!

Re-arranging the position of Sensor Rods or Extension Sections can severely affect your paving result.

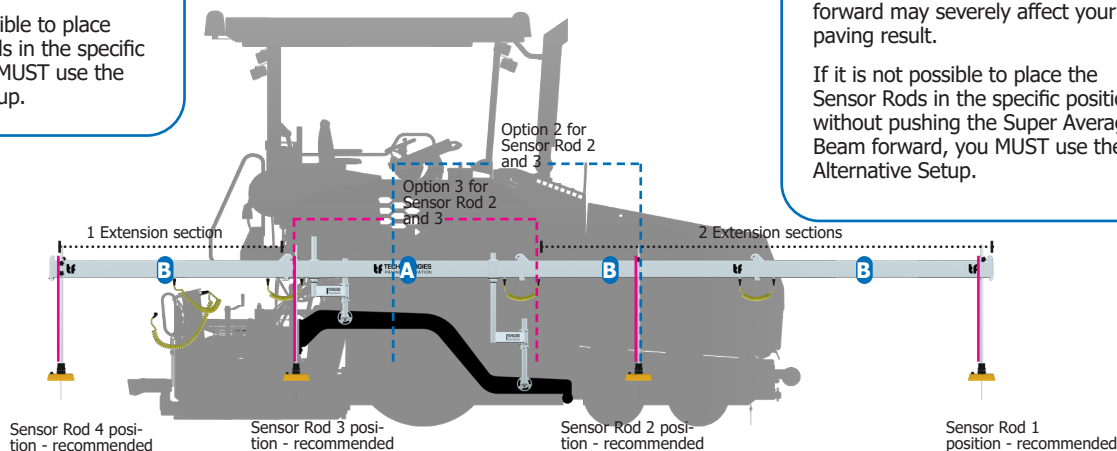
If it is not possible to place the Sensor Rods in the specific positions, you **MUST** use the Alternative Setup.



Make sure the total Super Averaging Beam is either pushed backwards on its mountings or protrude directly out from its mountings.

Pushing the Super Averaging Beam forward may severely affect your paving result.

If it is not possible to place the Sensor Rods in the specific positions, without pushing the Super Averaging Beam forward, you **MUST** use the Alternative Setup.



Recommended Setup - 13m / 40ft (6 sections)

To ensure a perfect paving result, we recommend the following setup of Extension Sections and Sensor Rod positions. This setup is usually possible, when mounting the Super Averaging Beam on the outside of the side plate. If it is not possible to place the Sensor Rods in the specific positions shown due to the design of the paver, or the nature of your paving job, e.g. when the job requires the Super Averaging Beam to be mounted over the screed, you **MUST** use the Alternative Setup.



VERY IMPORTANT!

Re-arranging the position of Sensor Rods or Extension Sections can severely affect your paving result.

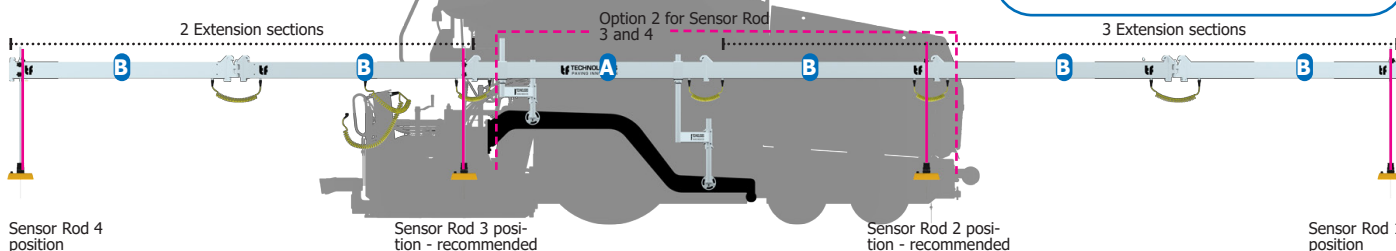
If it is not possible to place the Sensor Rods in the specific positions, you **MUST** use the Alternative Setup.



Make sure the total Super Averaging Beam is either pushed backwards on its mountings or protrude directly out from its mountings.

Pushing the Super Averaging Beam forward may severely affect your paving result.

If it is not possible to place the Sensor Rods in the specific positions, without pushing the Super Averaging Beam forward, you **MUST** use the Alternative Setup.



Recommended Setup - 13m / 40ft (6 sections - 6 sensors)

For an absolute superior paving result, it is possible to use the SUPER Averaging Beam with 6 sensors. The setup required is shown below. If it is not possible to place the Sensor Rods in the specific positions shown due to the design of the paver, or the nature of your paving job, you should use a setup with 4 sensors as described in this manual instead.



Make sure the total Super Averaging Beam is either pushed back-wards on its mountings or protrude directly out from its mountings.

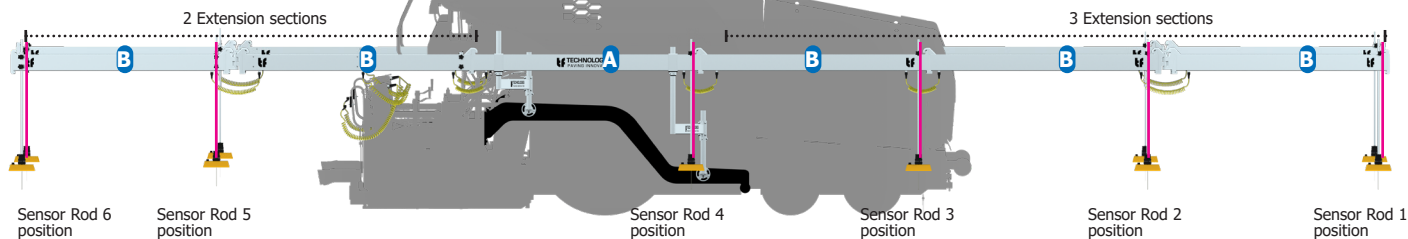
Pushing the Super Averaging Beam forward may affect your paving result negatively.



VERY IMPORTANT!

Re-arranging the position of Sensor Rods or Extension Sections can severely affect your paving result.

If it is not possible to place the Sensor Rods in the specific positions, you **MUST** use a 4 sensor setup instead.



Alternative Setup - 9m / 25ft (4 sections)

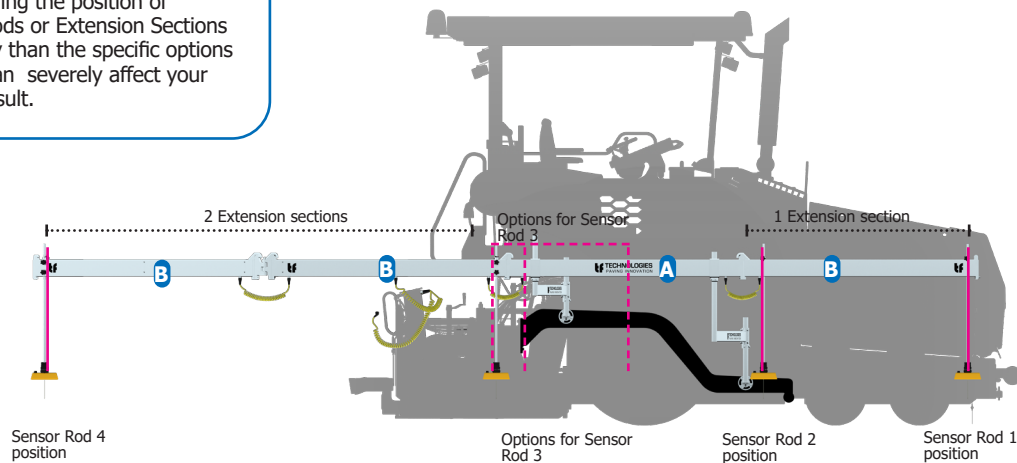
The design of some pavers or the nature of some paving jobs makes it difficult to use the Recommended Setup. Particularly when the Super Averaging Beam must be mounted over the screed, it can be difficult to place Sensor Rod 3 in the recommended position. In these cases, the Alternative Setup can be used.

For the best paving result possible, choose the position as far back as possible for Sensor Rod 3.



VERY IMPORTANT!

Re-arranging the position of Sensor Rods or Extension Sections differently than the specific options shown, can severely affect your paving result.



Alternative Setup - 13m / 40ft (6 sections)

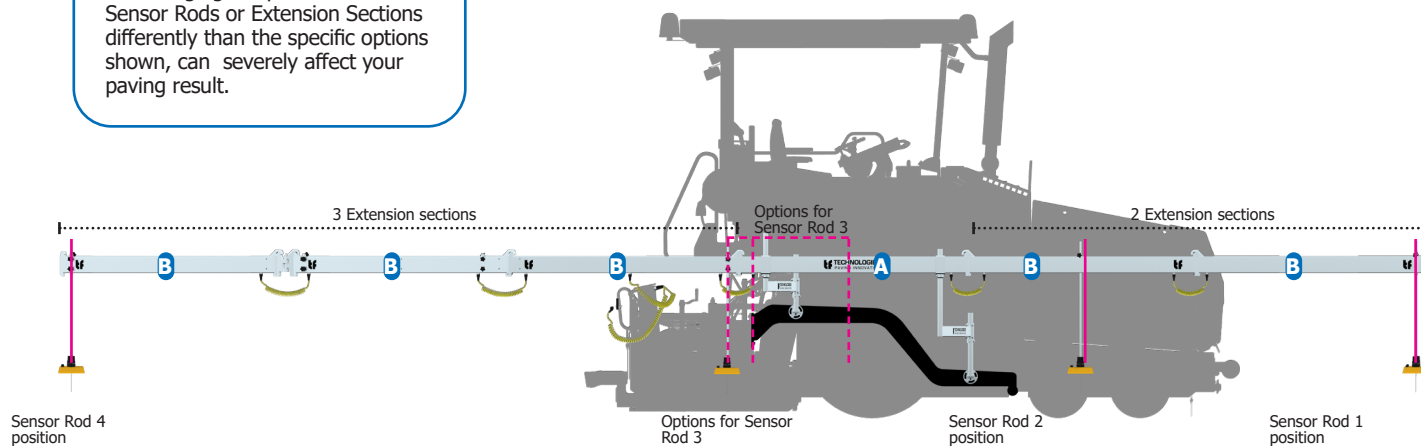
The design of some pavers or the nature of some paving jobs makes it difficult to use the Recommended Setup. Particularly when the Super Averaging Beam must be mounted over the screed, it can be difficult to place Sensor Rod 3 in the recommended position. In these cases, the Alternative Setup can be used.

For the best paving result possible, choose the position as far back as possible for Sensor Rod 3.



VERY IMPORTANT!

Re-arranging the position of Sensor Rods or Extension Sections differently than the specific options shown, can severely affect your paving result.



Installation of Hinge

- 1 Before the furthestmost back Extension Section, a Hinge **I1** can be installed to enable the placement of the back sensor over the paved mat. Insert the Hinge **I1** between two Extension Sections, and fasten with the accompanying Bolts **B2** in the bottom on each side.

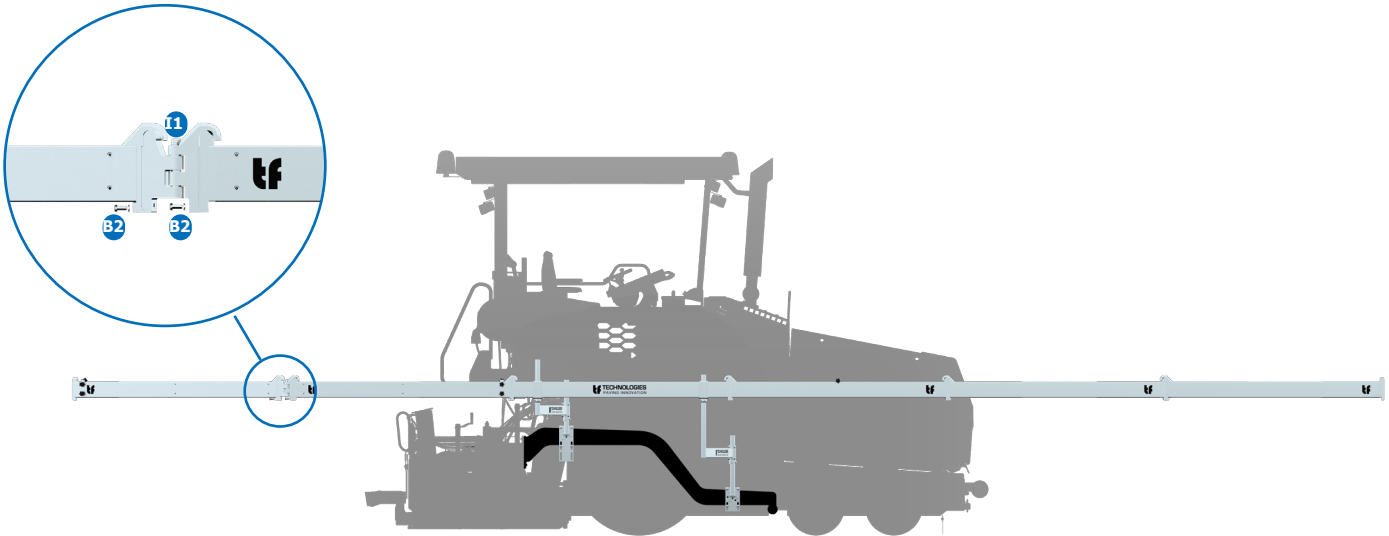


19 mm

or



0.7 - 1.5"

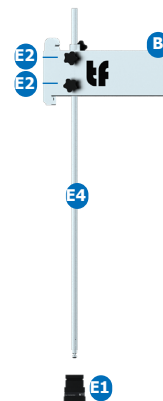


Installation of Sensor Rods with Snap Connector



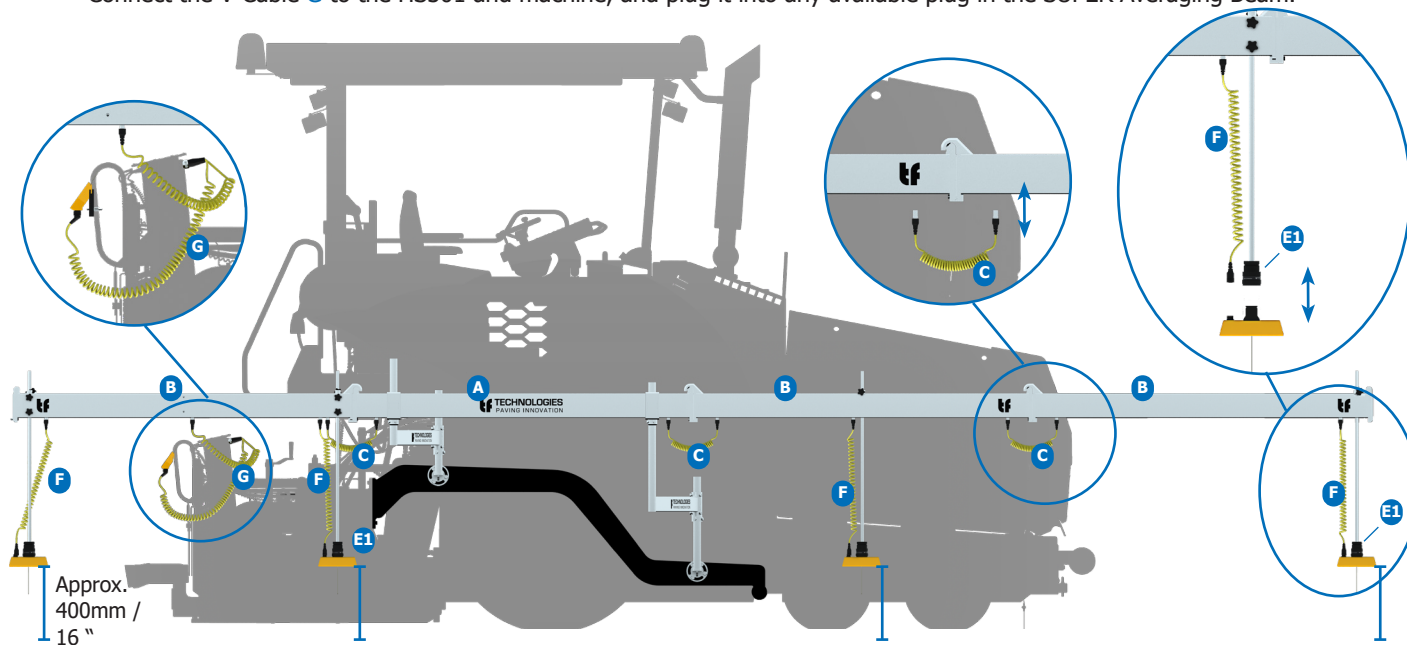
4 mm or 3/8-16 UNC

- 1** Fixate the Support Ring for Sensor Rod **E3** on the Metal Rod **E4** with the Thumb Screw w/nut **E2**
- 2** Slide the Metal Rod **E4** through the sensor rod hole in the Extension Section **B**.
- 3** Fixate the Metal Rod **E4** to the Extension Section **B** with two Thumb Screws w/ nut **E2**
- 4** Secure the Snap Connector **E1** to the Metal Rod **E4** with one of the screws in the Snap Connector (M8 or 3/8 UNC)



Wiring and system setup

- 1** Mount the Grade Sensors (not included) in the Snap Connectors **E1**. Adjust the Sensor Rods, so that the distance from the bottom of the Grade Sensor to the ground is approximately 400mm / 16". Attach Cables from Beam to Sensors **F**. Connect Main Section **A** and Extension Sections **B** with Connection Cables for Beam **C**. Connect the V-Cable **G** to the HS301 and machine, and plug it into any available plug in the SUPER Averaging Beam.

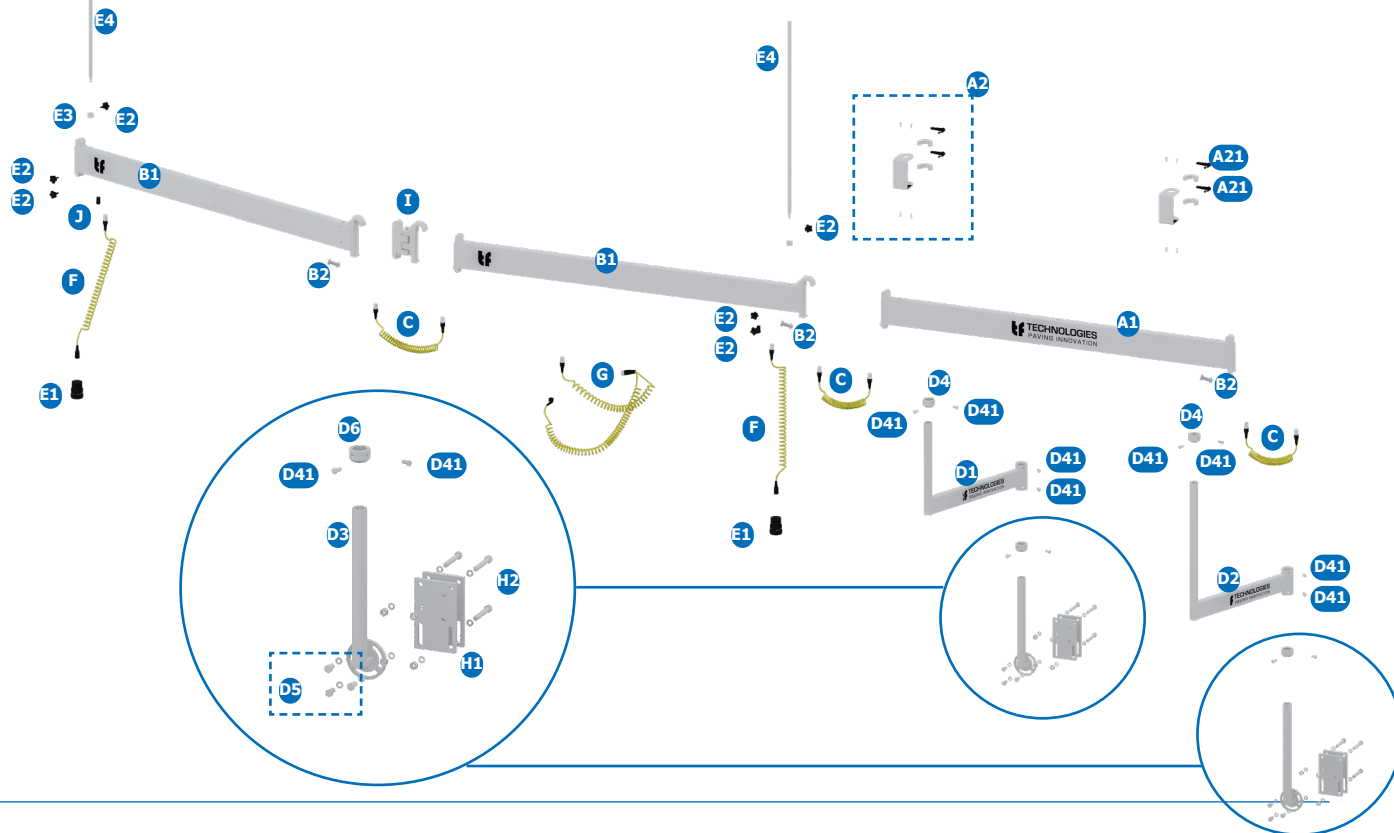


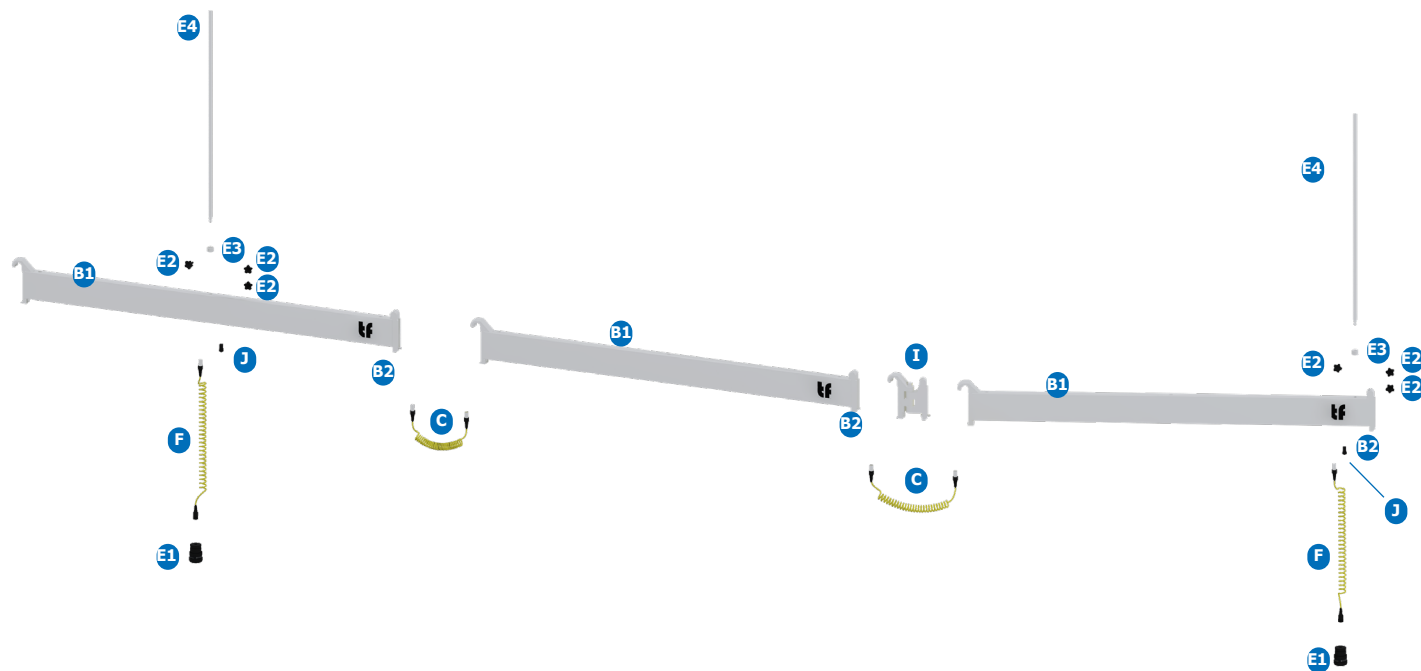


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Spare Parts





Spare Parts

A range of spare parts is available for the SUPER Averaging Beam.

Ref.	P/N	Item
A1	SP-40128	Main section w/o Clamp Bracket
A2	SP-51619	Clamp Bracket
A21	SP-51625	Thumb Screw w/handle for Clamp Bracket
B1	SP-51610	Extension section w/Bolt
B2	SP-40127	Section Bolt w/nut
C	S-51600/1.5	Connection Cable for Beam
D1	SP-51617	Short Swing Arm
D2	SP-51616	Long Swing Arm
D3	SP-40108	Tow Arm Bracket
D4	SP-40114	Support Ring for Swing Arms
D41	SP-40110	Bolt for Support Rings
D5	SP-40122	Bolts Kit for Tow Arm
D6	SP-40109	Support Ring for Tow Arm

E1	S-50531	Snap Connector
E2	SP-51622	Thumb Screw w/nut for Sensor Rod
E3	SP-51615	Support Ring for Sensor Rod
E4	SP-51611	Metal Rod
F	S-51601/1,5	Cable, Beam to Sensor
G	S-51604	V-Cable for SUPER Beam
H1	SP-51620	Clamping Plate (Long - 1 pcs)
H3	SP-40124	Clamping Plate (Short - 1 pcs)
H2	SP-40121	Bolts Kit for Clamping Plates
I	SP-51608	Hinge w/Bolt

SUPER Averaging Beam

Mini-Line®

The **SUPER** averaging beam enables the ability to average out the deviations of the existing pavement surface thereby obtaining a smoother road. It is designed to feature four - six sensors that take individual measurements across the entire length of the averaging beam, and the average of these measurements constitutes the base of grade regulation.

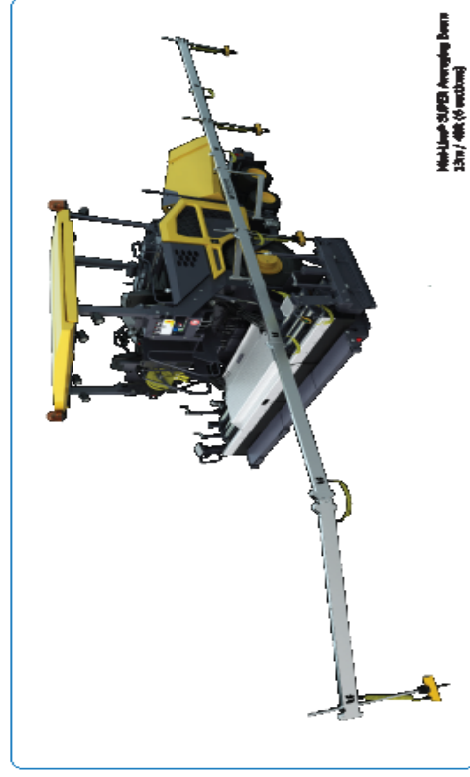
Rough spots in the existing foundation, which would normally affect the quality of the new road, are effectively smoothed out.

The **SUPER** Averaging Beam is a straight beam that consists of four to six sections, depending on the length required. The main section is mounted on the tow arm with Mountings clamped or bolted onto the tow arm, and each additional section is easily mounted with locking hinges. Each section features internal cabling and six plugs, which makes it easy to install and switch positions if up to six sensors. The plugs can also be used to connect lights (add-on), just as the Averaging Beam can be connected to the controller very flexibly from any available plug. The sensor mounting rods feature Snap Connections for easy sensor mounting, and can accommodate both GZ21 Ultrasonic Grade Sensors and GZ24 Multi-Sonic Sensors.

The beam profile provides for a very stable construction, and support rings locking all adjustable parts, marks the preferred settings and secure a fast mounting for the next job.

The flexible Hinge (add-on) enables the operator to place the sensor furthermore back over the paved road.

SUPER Averaging Beam Specifications	
Net Weight	6-2000 kg (13235 lb) 9-2000 (20,211 / 4510)
Application	Road grade With constant ground reading
Storage Temperature	-40°C to 60°C / -40°F to 140°F
Operating Temperature	-10°C to 70°C (50°F to 158°F)
Type	Straight beam



Mini-Line® SUPER Averaging Beam
13m / 40ft (6 sections)

TF Technologies reserved the right to make changes without notice.

1. 1800000-010

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