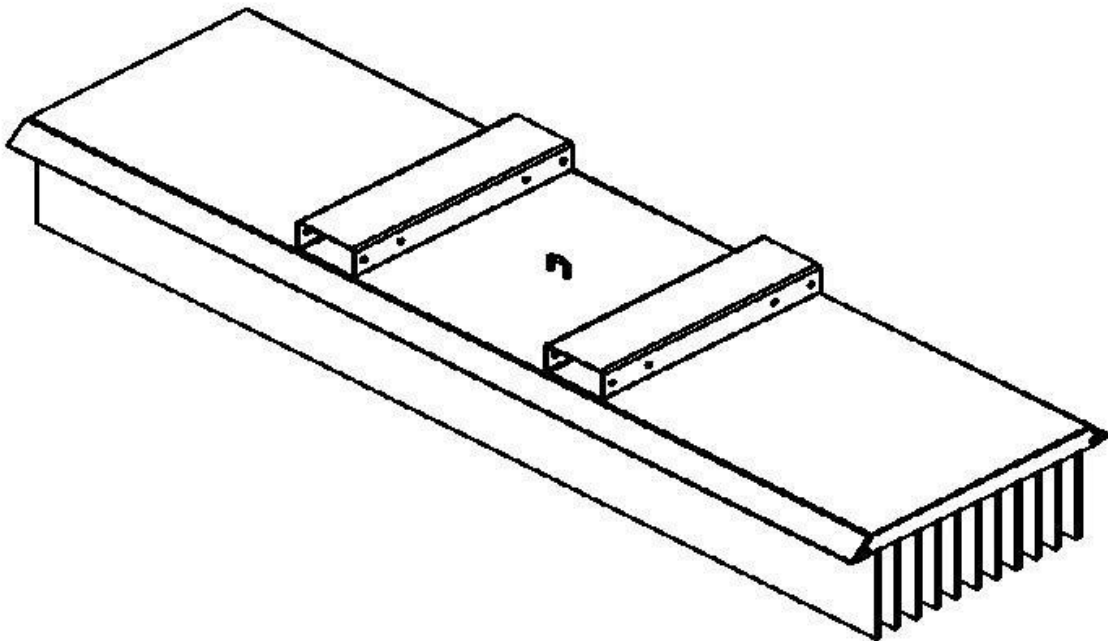


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# Solo Push Broom

## Operating Manual





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## Preface

Dear Customer,

With the Solo push broom, you have purchased a product that was produced in accordance with the highest quality standard.

This operating manual contains information and notes that are necessary, important and useful for the operational safety, reliability and maintenance of value of your Solo push broom.



Read the operating manual and adhere to the safety notices before start-up.

Its contents familiarise with the use of the machine and its service and maintenance. The manual also helps you to avoid dangers and damage.

We wish you optimum results with your Solo push broom.

Tuchel Maschinenbau GmbH

This operating manual is current as of September 2013

**NOTE**

Our continuous efforts towards an improvement of the Solo push broom may lead to changes in detail. The introduction of improvements does not, however, oblige us to carry out these improvements on Solo push brooms already delivered.

**NOTE**

If the improvements lead to minor changes, they are not covered by the operating manual. Thus, no claims may be derived from this manual.

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# **1. General**

## **1.1 Purpose**

The Solo push broom is intended to be adapted to tractors. Because of its robust construction and the various operating widths, this push broom is suitable for permanent use on streets and large surfaces.

The Solo push broom is attached by means of additional adapters for wheel loaders or telescopic loaders.

The Solo push broom is an open sweeping machine and thus suitable for cleaning large, firm surfaces.

## **1.2 Product specifications**

### **1.2.1 General**

This operating manual applies to the Solo push broom series.

### **1.2.2 Manufacturing address**

Tuchel Maschinenbau GmbH

Holsterfeld 15

48499 Salzbergen

Phone 0 59 71 / 96 75 - 0

Fax 0 59 71 / 96 75 - 30 E-mail

[info@tuchel.com](mailto:info@tuchel.com)

Spare parts: [service@tuchel.com](mailto:service@tuchel.com)

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### 1.2.3 Labelling

This information is found on the type label.

Enter the data of your Solo push broom here to have the details ready at all times.

Model: \_\_\_\_\_

Serial no.: \_\_\_\_\_

of construction / order no.: \_\_\_\_\_

Own weight [kg]: \_\_\_\_\_

The entire labelling (type label, safety label, etc.) constitutes a certificate and must not be altered or made illegible; replace if damaged or missing.

Model / TYP	_____	
Serien-Nr.	_____	
Baujahr / Auftrags-Nr.	_____	
max. Betriebsdruck [bar]	_____	
max. Ölstrom [l/h]	_____	
Eigengewicht [kg]	_____	
Tragfähigkeit des Flurförderfahrzeugs beachten!		

### 1.2.4 Declaration of conformity

The compliance of this push broom with the "basic safety and health requirements" of the machine directive 98/37 EEC entitles it to bear the CE label. During the development of the push broom, the harmonised European standards DIN EN 292 1+2, DIN EN 982, DIN pr EN 1553, and DIN EN 474 1+2 were also applied. This is documented in the EU declaration of conformity.

### 1.2.5 Specifications for enquiries and orders

When ordering spare parts or accessories, please specify the type label, serial number and the year of construction of the Solo push broom.

Original accessories /original spare parts and accessories / spare parts authorised by the manufacturer must be used for purposes of safety.

The use of other accessories/spare parts invalidates the liability for the consequences thereof.

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### **1.2.6 Energy consumption**

Type of drive: /  
For further details on energy consumption,  
refer to Chapter 1.2.8 Technical data

### **1.2.7 Intended usage**

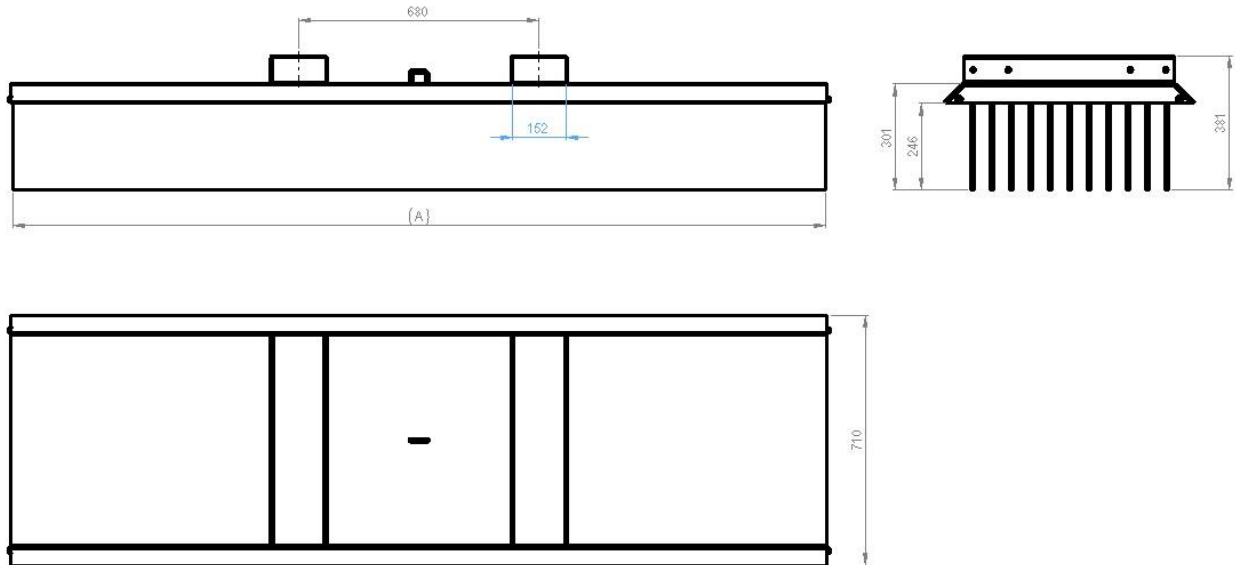
The Solo push broom is a machine that is set in motion through the attachment to a suitable carrier vehicle.

Its purpose is to clean firm surfaces with normal dirt build-up.

If the machine is used for a purpose different from the one above, we, as the manufacturer, do not take any responsibility for the safety; the risk in this respect rests entirely with the user.

Proper usage includes observance of the operating, maintenance and service conditions that we prescribe as well as relevant specifications.

## 1.2.8 Technical data sheet



Technical data of the Solo push broom, standard version.  
With fork arm receptacle.

Technical data	1500	1900	2300	2800
Operating width (A)mm	1500	1900	2300	2800
Machine depth mm	710	710	710	710
Row of brushes Unit	11	11	11	11
Weight kg	110	133	156	185

Poly-brush segments are long-lasting and rugged, and can easily and quickly be replaced with a minimum of down time. As standard, the Solo push broom is supplied with the fork arm receptacle. Use the weights to check compliance with the maximum allowed axle load of the carrier vehicle!Weights are approximate values and vary depending on the machine configuration, receptacle is excluded.

We reserve the right to incorporate changes resulting from further technical development.



---

## 2. Safety

This operating manual contains fundamental instructions that must be observed during the attachment, operation and maintenance. Thus, the personnel must read this operating manual under all circumstances before operation and commissioning. The personnel must always have access to the manual.

Safety notices that must be followed include not only the general safety notices in this section on safety, but also the specific safety notices that are included in other sections.

### 2.1 Labelling of notices in the operating manual

The safety notices in this operating manual whose non-observance is hazardous for persons are marked with the general danger symbol:

Safety symbol according to DIN ISO 9244



When warning about injuries resulting from squashing



When warning about injuries resulting from cuts



Safety notices whose non-observance is hazardous for the machine and its functions, have the word **ATTENTION** attached.

Notes are labelled as follows: **NOTE**

Safety signs that are directly attached to the machine must definitely be adhered to and must be kept in a fully legible state.

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## **2.2 Qualification and –training of personnel**

The Solo push broom must only be used, serviced and maintained by persons that are familiar with the machine and are informed about its dangers.

The area of responsibility, competence and the supervision of the personnel must be directed in detail by the operator. If the personnel does not have the necessary knowledge, it must be trained and instructed.

Furthermore, the operator must ensure that the personnel fully understands the contents of the operating manual.

Maintenance work that is not described in this operating manual must only be conducted by authorised, qualified workshops.

## **2.3 Dangers in the case of non-observance of the safety notices**

The non-observance of the safety notes results in hazards to both persons as well as to the environment and the machine. Non-observance of the safety notices results in the loss of any claims for damage whatsoever.

In detail, non-observance, for example, leads to the following hazards:

- hazards to persons due to non-secured work areas
- Failure of important machine functions
- failure of prescribed methods for service and maintenance
- hazards to persons due to mechanical and chemical influences
- hazards to the environment due to leakage of hydraulic oil

---

## **2.4 Working in a safety-oriented manner**

The safety notices listed in this operating manual, current national accident avoidance regulations as well as company-internal regulations governing work, operation, and safety that apply must be followed.

The accident insurance regulations governing safety at work and accident avoidance are binding.

Observe the safety notes of the vehicle manufacturer.

When operating on public roads, the appropriate legal regulations (in the Federal Republic of Germany the StVZO and StVO) must be complied with. Furthermore, the permitted axle loads of the respective vehicle manufacturer must be observed.

## **2.5 Safety notes for the operator/user**

- Before starting work, familiarise yourself with all equipment, operating elements and their functions.
- The clothing of the operators must fit tightly. Avoid loose clothing.
- Observe permitted axle load, gross weight, and transport dimensions.

---

## **2.6 Safety notes for carrying out service, inspection and installation work**

The operator must ensure that all service, inspection and assembly work is carried out by authorised and qualified personnel that has sufficiently informed itself through detailed study of the operating manual.

Work on the machine must, in principle, only be performed while at a standstill. The machine's halting procedure described in the operating manual must absolutely be observed.

When carrying out maintenance on the lifted device, always secure it with suitable supports.

Use suitable tools and gloves when exchanging the sweeping rail.

Lawfully dispose of oil and grease.

Directly after finishing work, all protection equipment must be reattached.

Before restarting, the points listed in the sections on "start-up" must be adhered to.

## **2.7 Unauthorised conversion and spare parts manufacturing**

Conversion of or changes to the machine are only permitted after consultation with the manufacturer. Original spare parts and accessories authorised by the manufacturer provide safety. The use of other parts invalidates the liability for the consequences thereof.

## **2.8 Modes of operation that are not permitted**

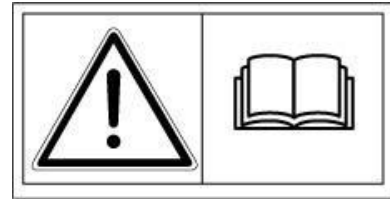
The operational safety of the machine is only guaranteed if used as intended according to the operating manual (see Chapter 1). The limits specified in the data sheets must not be exceeded under any circumstances.

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## 2.9 Warning images on the machine according to ISO 11684

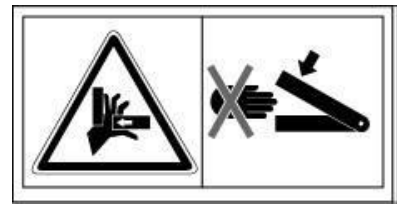
Read the operating manual and adhere to the safety notices before start-up.

Article no 40000340



Never reach into the squashing hazard area as long as parts may move.

Article no 40000338



Do not touch any moving machine parts. Wait until they have come to a complete standstill.

Article no 40000341



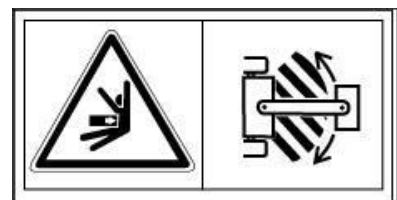
When lowering the Solo push broom, keep sufficient distance.

Article no 40000342



Do not stand in the rotation area during operation.

Article no 40000343



**NOTE**

Keep all labels clean at all times. Missing or damaged labels must be replaced.

---

## 3 Solo push broom

### 3.1 Description of the product and accessories

The Solo push broom enables open sweeping.

The frame is made of a robust and torsion-free welded construction.

The brushes are made of 100% PP Beeline as standard, and have a height of 261 mm.

The Solo push broom is equipped with a fork arm receptacle as a standard feature, which is used to adapt for use with a tractor. Additionally, an adapter for wheel loaders or telescopic loaders can be attached in order to expand the possible areas of use.

### 3.2 Storage

#### NOTE

Chapter 3.5 Deinstallation must be accomplished before this chapter.



Park Solo push broom on a firm and level surface in a dry, clean place.

#### ATTENTION

Accident hazard! Ensure that the Solo push broom is securely positioned.

Take the push broom's net weight into account!

- If necessary, clean the Solo push broom thoroughly. Dirt attracts humidity and leads to the formation of rust.
- If necessary, repair paint damage.

---

### 3.3 Attachment



The Solo push broom must be attached to the intended carrier vehicle using the supplied attachment device.



The attachment version itself must not be changed or modified.



The permitted support loads, axle relief, axle loads, gross weight and transport dimensions must be taken from the manufacturer's information about the carrier vehicle and must be checked before start-up.



If a ballast weight is required, attach it as prescribed to the intended attachment points of the carrier vehicle before attaching the sweeping machine.



During attachment, special caution must be exercised.



Follow the operating manual of the carrier vehicle!



Only perform maintenance, repair and conversion work on the Solo push broom if the carrier vehicle is switched off!  
Secure against unintended start-up and movement!



Verify the correct attachment and its safeguards.

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### 3.3.1 Initial attachment



When initially attaching the Solo push broom to the carrier vehicle, please observe the following!

### 3.3.2 Quick change receptacle



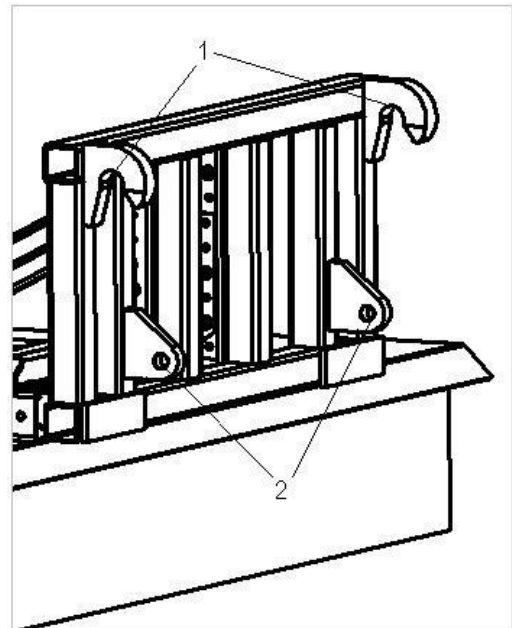
The safety instructions from Chapter 3.3 apply.



Carry out work on the Solo push broom only if the motor is switched off. Pull the ignition key and secure the carrier vehicle against unintended start-up and movement.

**NOTE**

Check the receptacle for soiling. Clean if necessary.



- Drive the carrier vehicle to within 300 mm of the Solo push broom.
- Lower the receptacle bolt of the carrier vehicle until below the receptacle openings (1) of the quick change receptacle.
- Approach with the carrier vehicle and raise the lifting gear.
- Insert the locking bolts into the drill holes (2).  
Check the receptacle bolt and the locking bolts for proper seating.
- Lift the Solo push broom and carry out a functionality check.



### 3.3.3 Three-point linkage



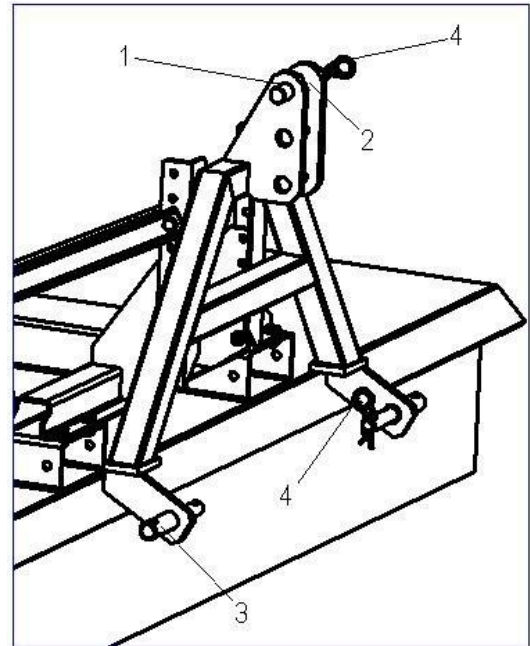
The safety instructions from Chapter 3.3 apply.



Carry out work on the Solo push broom only if the motor is switched off. Pull the ignition key and secure the carrier vehicle against unintended start-up and movement.

**NOTE**

Check the receptacle for soiling. Clean if necessary.



- Drive the carrier vehicle to within 300 mm of the Solo push broom.
- Fasten bolt diameter (1) or (2) according to the attachment category of the vehicle manufacturer and secure with spring plug (4).
- Secure bolt (3) with spring plug (4).
- Hook the upper hook and secure according to the specifications of the vehicle manufacturer.

**NOTE**

The upper hook is to be set so that the attachment receptacle is perpendicular to the ground.

**ATTENTION** Verify the correct seating of the attachment receptacle.

- Lift the Solo push broom and carry out a functionality check.

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### 3.3.4 Bucket receptacle



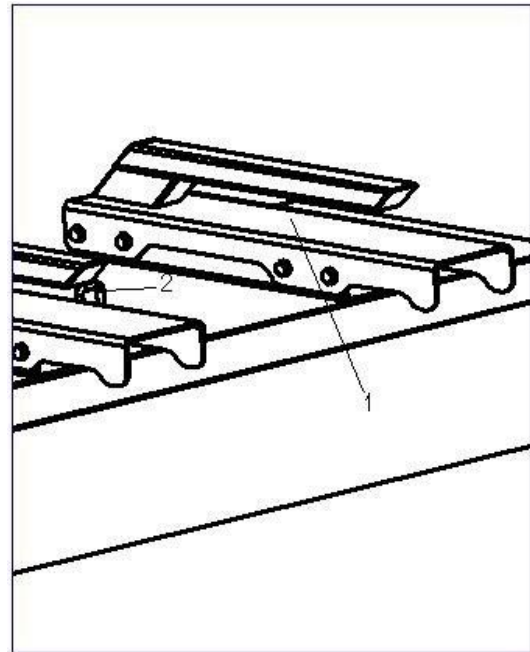
The safety instructions from Chapter 3.3 apply.



Carry out work on the Solo push broom only if the motor is switched off. Pull the ignition key and secure the carrier vehicle against unintended start-up and movement.

**NOTE**

Check the receptacle for soiling. Clean if necessary.



- Drive the carrier vehicle to within 300 mm of the Solo push broom.
- With the bucket, drive into the bucket receptacle (1).
- Secure with the chain on the chain hook (2).

**NOTE**

The safeguarding with the safety chain should be done in such a manner that the attachment receptacle does not inadvertently slip off.

**ATTENTION**

Verify the correct seating of the attachment receptacle.

- Lift the Solo push broom and carry out a functionality check.

---

## 3.4 Operation

- No passengers may be carried on the machine during operation.
- Never leave the driving seat during driving.
- The driving speed must be adapted to suit the respective road and traffic conditions. Avoid sudden turns during uphill and downhill driving and when driving parallel to a slope.
- Be aware of how the attached Solo push broom affects the driving behaviour and the steering and braking ability.

### 3.4.1 Transport trips

- Check and attach transport equipment - such as illumination, warning equipment and any safety equipment.
- If lighting that is part of the standard carrier vehicle is obscured in the transport position, additional illumination devices must be attached.
- No passengers may be carried on the machine during transport trips.
- Never leave the driving seat during driving.
- The driving speed must be adapted to suit the respective road and traffic conditions. Avoid sudden turns during uphill and downhill driving and when driving parallel to a slope.
- Be aware of how the attached Solo push broom affects the driving behaviour and the steering and braking ability.

---

### **3.4.2 Start-up**

- Depending on the attachment type, the attachment receptacle and its interlocking mechanisms must be checked for tight fit and possible damage prior to start-up.
- During detachment, the supports must be put into their respective position.
- Check the immediate area before starting to drive and before start-up (e.g. for children). Ensure that there is sufficient visibility.
- No person may be present in the area of operation.
- Only operate the Solo push broom if all protection equipment is attached (receptacle and push broom).

---

### 3.5 Deinstallation



The safety instructions from Chapter 3.3 apply.



Carry out work on the Solo push broom only if the motor is switched off. Pull the ignition key and secure the carrier vehicle against unintended start-up and movement.



Park the Solo push broom on a firm and level surface in a dry and clean place.



Accident hazard!  
Ensure that the Solo push broom is securely positioned.

**ATTENTION** Check the receptacle for soiling. Clean if necessary.

**NOTE** Check the receptacle for soiling. Clean if necessary.

- After switching off the device there is danger due to the continued movement of the centrifugal mass. Do not approach the machine during this time period. Wait until it has come to a complete standstill.
- Before leaving the carrier vehicle, lower the Solo push broom to the ground. Pull the ignition key and secure the carrier vehicle against unintended restart and movement!
- During deinstallation, the supports must be put into their respective position.

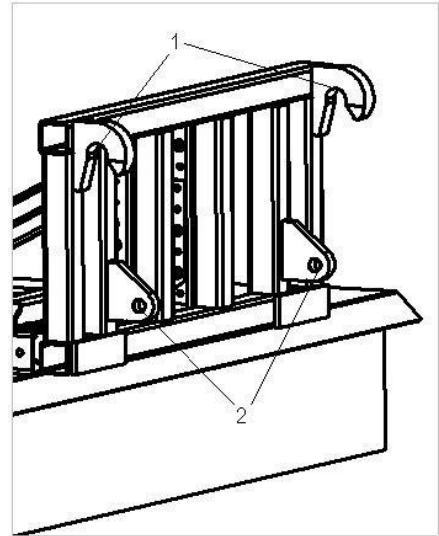
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### 3.5.1 Quick change receptacle



The safety instructions from Chapter 3.3 apply.

- Initiate mechanical locking (2) of the receptacle by removing of the corresponding locking bolt.
- Lower lifting gear until the receptacle bolt is located beneath the receptacle openings (1).
- Ensure that the path is clear for driving backward.
- Drive vehicle backwards.

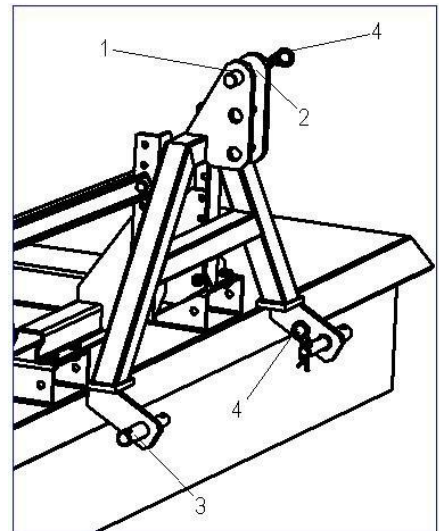


### 3.5.2 Three-point mount



The safety instructions from Chapter 3.3 apply.

- Unlock the upper hook and draft link hook according to the vehicle manufacturer's specifications. Refer to the operating manual of the carrier vehicle.
- Lower the upper hook and draft link hook until they completely unhook and release the receptacle bolts.
- Ensure that the path is clear for driving backward.
- Drive the carrier vehicle backward away from the Solo push broom.



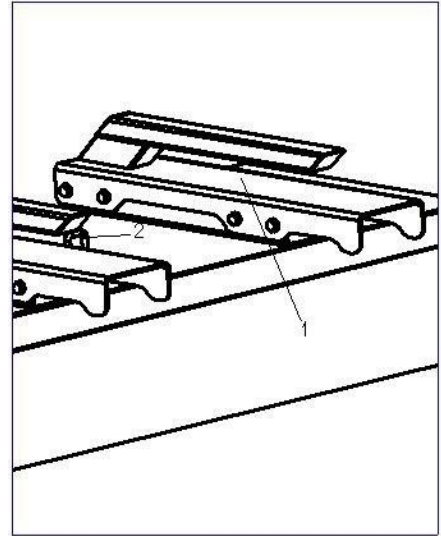
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### 3.5.2 Bucket receptacle



The safety instructions from Chapter 3.3 apply.

- Carefully place the Solo push broom on a suitable location.  
Make sure there is enough clearance between the bucket and bucket receptacle.
- Remove the safety chain from the bucket.
- Ensure that the path is clear for driving backward.
- Drive the carrier vehicle backward away from the Solo push broom.



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## Service and maintenance

### 4 Service and maintenance

#### 4.1 General

Only perform maintenance, repair and conversion work on the Solo push broom if the hydraulic operation is switched off.  
Secure the carrier vehicle against unintended start-up and movement!

Check screws and nuts for firm seating after the first 5 operating hours and then at regular intervals (about every 50 operating hours), and tighten if necessary.

A = thread size (property class visible on screw head)

A ø	3.6	5.6	6.8	8.8	10.9	12.9
	M <sub>A</sub> (Nm)					
<b>M 6</b>	3.43	4.51	8.73	10.3	14.71	17.65
<b>M 7</b>	5.59	7.45	14.22	17.16	24.52	28.44
<b>M 8</b>	8.24	10.79	21.57	25.50	35.30	42.17
<b>M 10</b>	16.67	21.57	42.17	50.01	70.61	85.32
<b>M 12</b>	28.44	38.25	73.55	87.28	122.58	147.10
<b>M 14</b>	45.11	60.8	116.7	135.27	194.17	235.36
<b>M 16</b>	69.63	93.16	178.46	210.84	299.1	357.94
<b>M 18</b>	95.13	127.40	245.17	289.3	411.88	490.34
<b>M 20</b>	135.33	180.44	348.14	411.88	576.50	669.26
<b>M 22</b>	162.4	245.17	470.72	558.98	784.45	941.44
<b>M 24</b>	230.46	308.91	598.21	710.99	1000.28	1196.42

All torques M<sub>A</sub> are guide values for standard metric threads acc. to DIN 13. Friction coefficient 0.14 (unlubricated new screw). These values have been recommended as approximate values by various screw manufacturers. We can not accept liability for their application.

Replace self-locking nuts after each unscrewing.



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## 4.2 Brush replacement



Only perform maintenance, repair and conversion work on the Solo push broom if the hydraulic operation is switched off. Secure the carrier vehicle against unintended start-up, movement and sinking!

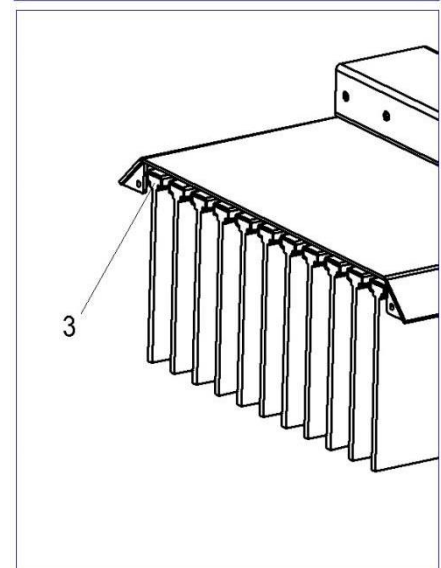
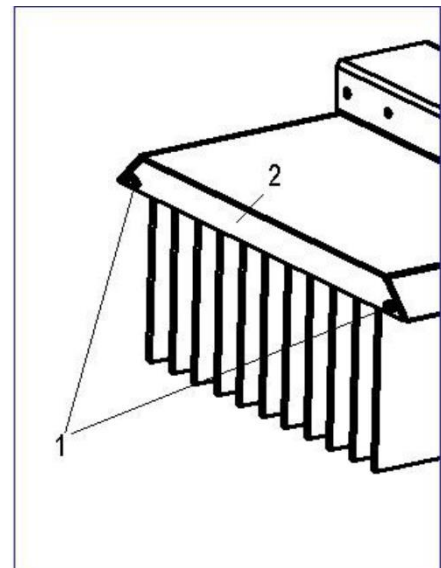
Do not go beneath or work under a raised machine.

Only replace brushes when the Solo push broom is attached to the carrier vehicle.

- Lift the Solo push broom (approx. 200 mm)
- Secure the Solo push broom and carrier vehicle against unintended restart, sagging and movement!
- Loosen the fastening nuts (1) of the lateral cover (2) and remove them.
- Replace worn-out brushes (3). (For the quantity of brushes, see the list of spare parts. Brush set, Solo push broom):
- Before assembly, clean all parts.

Refer to the list of spare parts for the article number of the component; for the address, see the reverse side this manual or via e-mail at [service@tuchel.com](mailto:service@tuchel.com)

- The assembly of the brushes is carried out in the opposite order of the deinstallation.



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Notes:

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