

# Operator's manual



## TruTool TF 350 (1A5) Recharger CLi

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English

**TRUMPF**



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**Guarantee**

**Spare parts list**

**Addresses**

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# 1. Safety

## 1.1 General safety information

- Read the operator's manual and the safety information (Order No. 125699) in their entirety before starting up the machine. Closely follow the instructions given.
- Adhere to the safety regulations in accordance with DIN VDE, CEE, AFNOR and to the specific regulations of the country of operation.



**Danger**

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### **Risk of fatal injury from electric shock.**

- Do not touch the electrical contacts on the recharger or on the rechargeable battery.
- 



**Warning**

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### **Risk of injury from the rechargeable battery.**

- Always remove the rechargeable battery from the machine prior to maintenance work.
  - Check the machine and the rechargeable battery for damage each time before use.
  - Keep the machine dry and do not operate it in damp rooms.
  - Charge the exchangeable battery of the Li-Ion Energy 28 V system only with the recharger of the Li-Ion Energy 28 V system.
  - Do not attempt to open the exchangeable batteries or the recharger.
  - Do not dispose of the exchangeable batteries in fires or household waste.
- 



**Warning**

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### **Risk of injury due to improper handling.**

- Wear safety glasses, hearing protection, protective gloves and work shoes when working at the machine.
- 



**Caution**

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### **Damage to property due to improper handling.**

#### **The machine will be damaged or destroyed.**

- Have servicing and inspections of hand-held electric tools and recharger carried out by a qualified specialist. Only use original TRUMPF accessories.
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## 1.2 Specific safety information



**Warning**

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### **Risk of injury due to improper handling.**

- Make sure the machine is always in a stable position when operating it.
  - Never touch the tool while the machine is running.
  - Always operate the machine away from your body.
- 



**Warning**

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### **Risk of injury to hands.**

- Do not reach into the processing line with your hands.
  - Use both hands to hold the machine.
- 



**Warning**

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### **Risk of injury from falling machinery.**

**The entire weight of the machine must be taken up after processing of the work workpiece.**

- Use slewing ring (optional) with balancer.
- 



**Warning**

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### **Damage to property due to improper handling.**

**Machine will be damaged.**

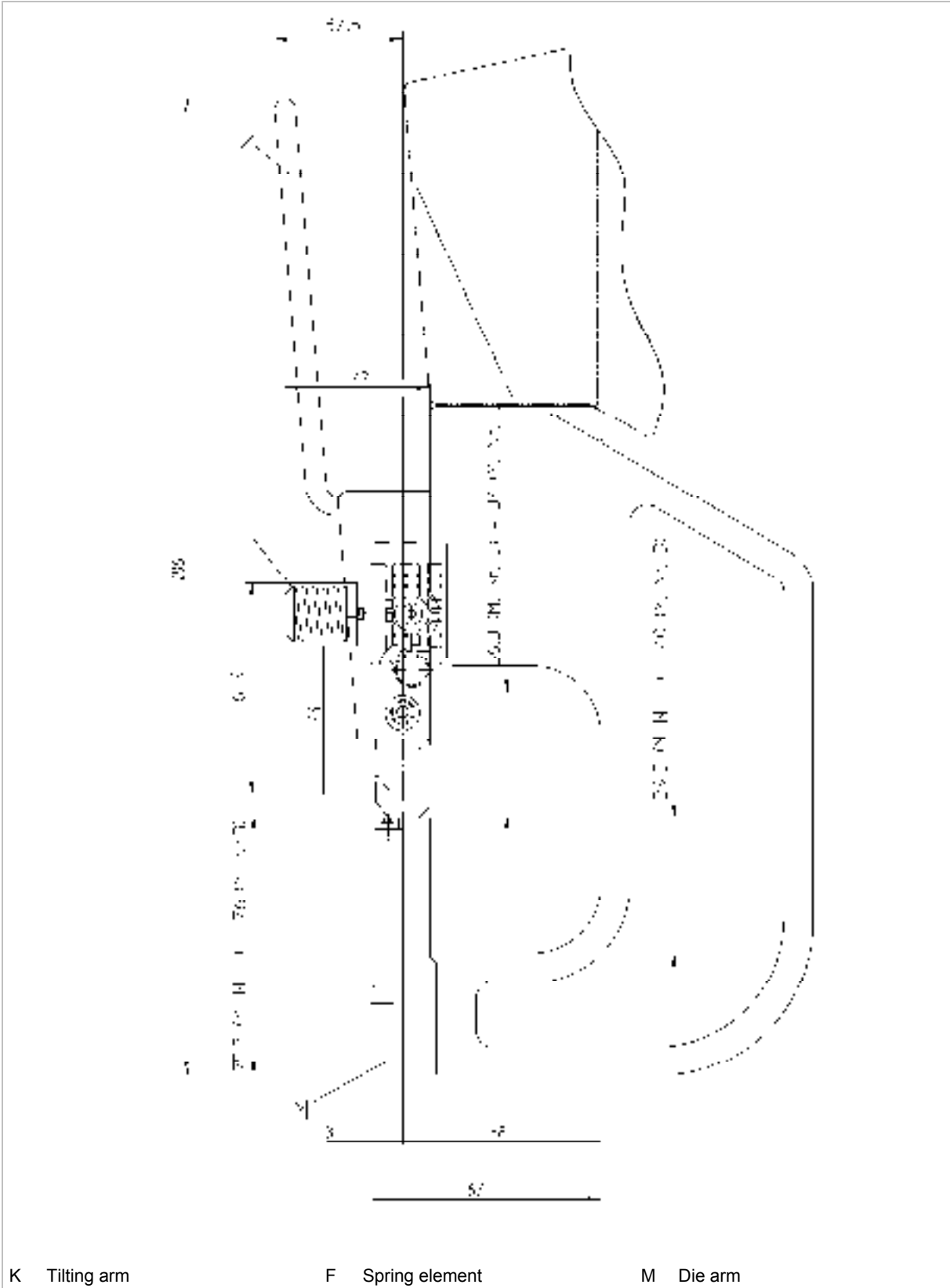
- Before joining, stand the swivel arm up vertically.
  - Align the punch and die the same (both lengthwise or both crosswise).
-

## 2. Description



Jointing press TruTool TF 350 with recharger

Fig. 53305



TruTool TF 350, dimensions on the tool carrier

Fig. 13208

## 2.1 Intended use



**Warning**

### Can cause injury or damage to health.

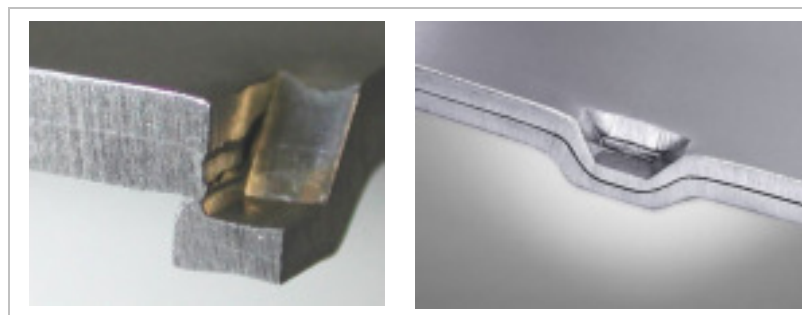
- Only use the machine for work and materials described in "Intended use".
- Do not process materials containing asbestos.

The TRUMPF jointing press TruTool TF 350 is an electric hand tool used for the following applications:

- Connecting sheet metal parts in overlapping alignment by means of a cold forming process.
- This process involved with this mechanical sheet joining technique is the "displacement jointing" (DIN 8593) manufacturing method.

### Characteristics

- The joint arises during an uninterrupted ram stroke.
- A movable punch and a fixed die together make up the set of tools for this "one-step displacement jointing".
- The die consists of the fixed anvil, on which two lateral spring-loaded non-rigid cutting segments are aligned.
- A positive locking connection is created by this process (without additional connection elements such as screws or rivets), by means of a combined forming and shearing sequence with a subsequent cold extrusion procedure.
- Jointing of both uncoated and coated workpieces.
- Jointing without application of heat.
- No zinc vapors with galvanized sheets.
- Jointing of parts made of different sheet materials is possible.
- Jointing of two or three workpieces is possible.
- No preliminary roughing or finishing.
- Work also possible in upside-down position.



Cross-section of the joint

Fig. 51517, 51518

The CLi recharger charges exchangeable batteries of the Li-Ion Energy 28 V system.



## 2.2 Technical data

	Other countries	USA
	Values	Values
<b>Voltage</b>	28 V	28 V
<b>Max. total material thickness: Material stability 400 N/mm<sup>2</sup> Material stability 600 N/mm<sup>2</sup> Aluminum 250 N/mm<sup>2</sup></b>	3.5 mm 2.5 mm 4.0 mm	0.318 in 0.1 in 0.16 in
<b>Min. total material thickness</b>	0.8 mm	0.031 in
<b>Max. jointing force</b>	25 kN	5600 lbf
<b>Stroke cycle</b>	2/s	2/s
<b>Max. height of flange with flanged material</b>	36 mm	1.42 in
<b>Weight with rechargeable battery</b>	8.7 kg	19.3 lbs
<b>Weight without rechargeable battery</b>	7.7 kg	17.1 lbs
<b>Min. edge spacing</b>	8 mm	0.315 in
<b>Max. edge spacing</b>	58 mm	2.28 in

Technical data of TruTool TF 350

Table 1

<b>Voltage</b>	28 V
<b>Loading time at 28 V</b>	approximately 1 h
<b>Weight without power cord</b>	700 g

Technical data CLi recharger

Table 2

<b>Vibration</b>	<b>Specifications in accordance with EN 12096 Measured values in accordance with EN ISO 8662-10</b>
Vibration value at the handle a	1.2 m/s <sup>2</sup>
Uncertainty K	1.5 m/s <sup>2</sup>

Measured values were measured while machining sheet steel 400 N/mm<sup>2</sup> with max. material thickness.

Table 3

<b>Noise emissions</b>	<b>Specifications in accordance with EN ISO 4871 Measured values in accordance with EN ISO 15744</b>
A-rated sound level L <sub>WA</sub>	96 dB
A-rated acoustic power level at the work place L <sub>PA</sub>	85 dB

Table 4

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The noise emission values given are the sum of the measured values and the corresponding uncertainties. They represent an upper value limit which can emerge during measurements.

### **3. Setting work**

#### **3.1 Selecting the tool**

The TruTool TF 350 jointing press can be equipped with tools in various ways depending on the particular application.

Five different types of dies are available to make it possible to utilize tools corresponding to different types of materials and material thicknesses.

A special tool holder belongs with each type of die (= fixed arm or tilting arm), which is used as a receptacle for the die.

The following example help for the selection of the tools.

### Example 1

	Max. total material thickness [mm]				
	0.8-1.5	1.6-2.0	2.1-2.5	2.6-3.0	3.0-3.5
Steel up to 400 N/mm <sup>2</sup>	0.8-1.5	1.6-2.0	2.1-2.5	2.6-3.0	3.0-3.5
Steel up to 600 N/mm <sup>2</sup>	0.8-1.5	1.6-2.0	2.1-2.5		
Non-ferrous heavy metal to 250 N/mm <sup>2</sup>	0.8-1.0	1.1-2.0	2.1-3.0	3.1-4.0	
Die arm label	1		2		3
Die no. (order no.)	1 (0111969)	2 (0111968)	2+ (0122272)	3- (0053875)	3 (0111967)
Tilting arm to die, cpl. no. (order no.)	1 (0128792)	2 (0128793)	2+ (0129723)	3- (0129724)	3 (0128794)
Die arm, fixed, cpl. no. (order no.)	1 (0118130)	2 (0118131)	2+ (0129763)	3- (0129764)	3 (0118132)
Stamp arm, fixed (order no.)	(0118129)				

Table 5

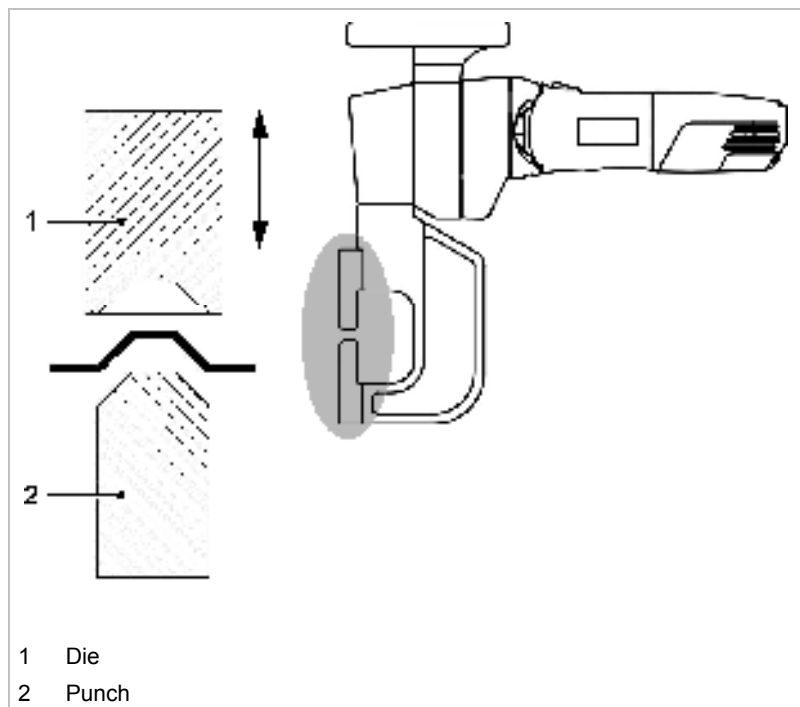


Fig. 50433

1. Select material and total material thickness.
2. Find out which die is the right one from the table (see Table 5, p. 11).
3. Select the die with fixed arm or with tilting arm.
4. Select fixed stamp arm (here standard).

## Example 2

	Max. total material thickness [mm]				
	0.8-1.5	1.6-2.0	2.1-2.5	2.6-3.0	3.0-3.5
Steel up to 400 N/mm <sup>2</sup>	0.8-1.5	1.6-2.0	2.1-2.5	2.6-3.0	3.0-3.5
Steel up to 600 N/mm <sup>2</sup>	0.8-1.5	1.6-2.0	2.1-2.5		
Non-ferrous heavy metal to 250 N/mm <sup>2</sup>	0.8-1.0	1.1-2.0	2.1-3.0	3.1-4.0	
Die arm label	1	2		3	
Die no. (order no.)	1 (0111969)	2 (0111968)	2+ (0122272)	3- (0053875)	3 (0111967)
Die arm, fixed, cpl. no. (order no.)	1 (0118130)	2 (0118131)	2+ (0129763)	3- (0129764)	3 (0118132)
Stamp arm, fixed (order no.)	(0118129)				
Tilting arm for punch (order no.)	(0128748)				

Table 6

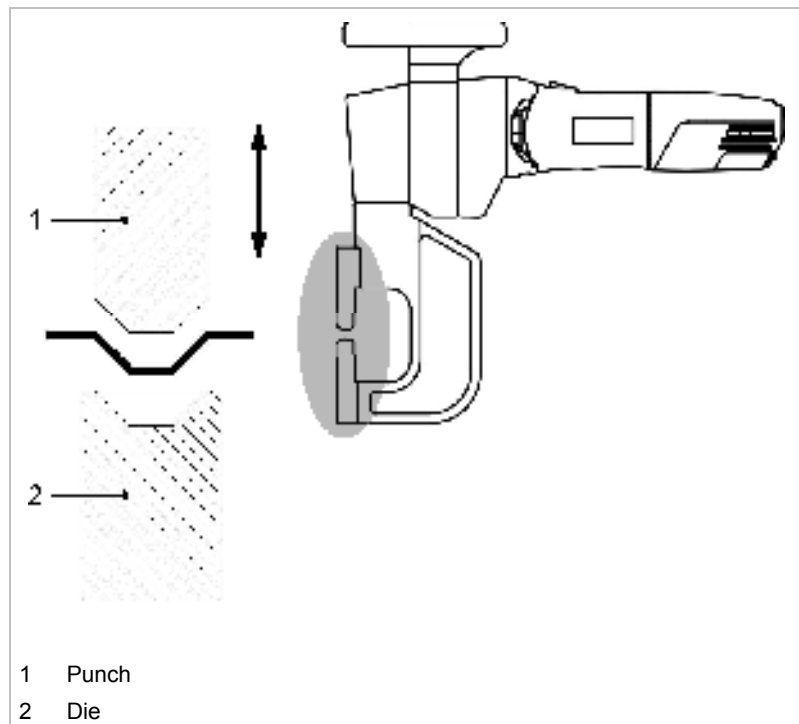


Fig. 50435

1. Select material and total material thickness.
2. Find out which die is the right one from the table (see Table 6, p. 12).
3. Select the die with fixed arm (here standard).
4. Select the punch with fixed arm or tilting arm.

### 3.2 Selecting tools for ventilation duct construction

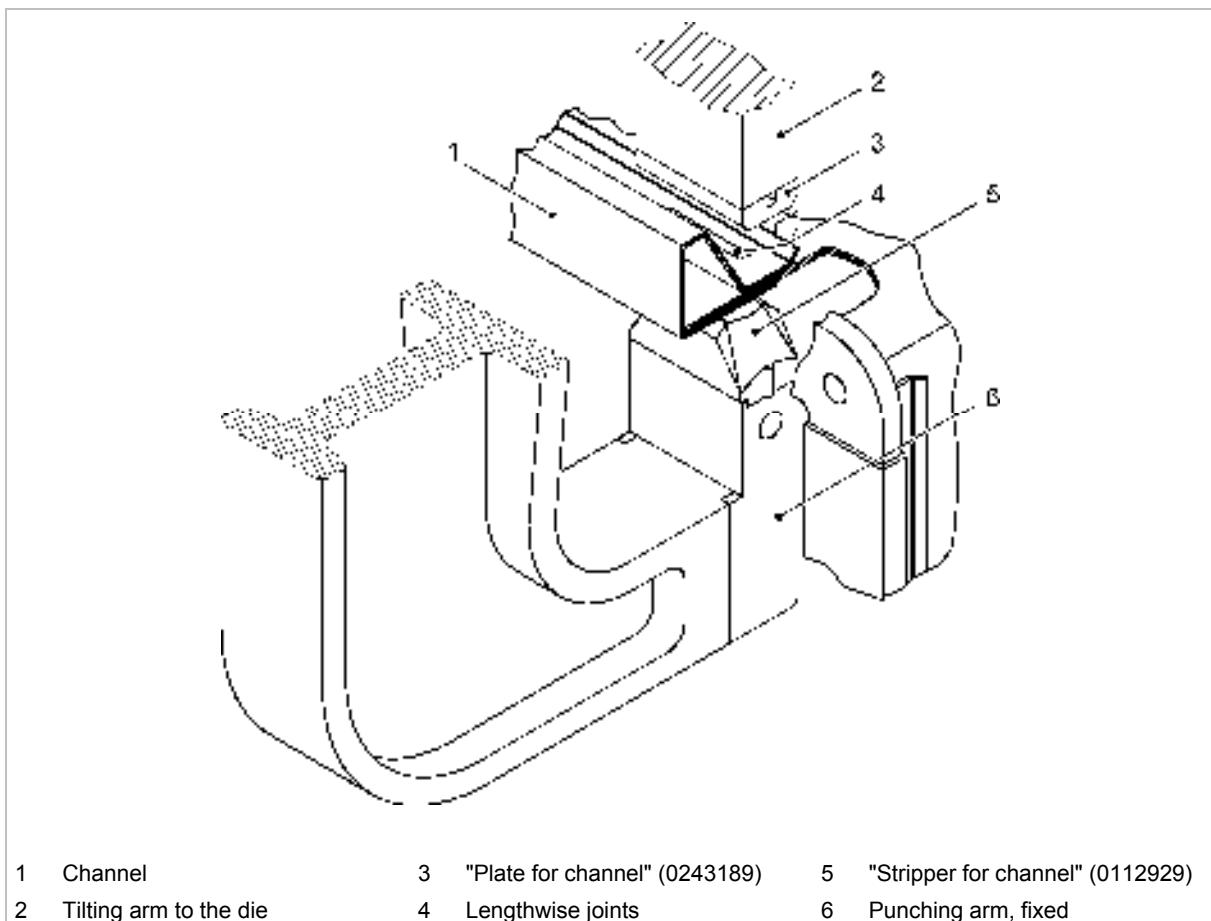
Whether or not the joint faces inwards (optical reasons) or outwards (fluidic reasons) depends on the respective tool set selected for application.

The "Plate for channel" makes it possible to have the jointing on the flange profiles. When doing this, joints are possible in the depressions of the flange profiles.

#### Note

The joints with "Plate for channel" are only possible in the longitudinal direction.

The "Stripper for channel" makes working across the corners easier.



Tools for ventilation duct construction

Fig. 50436

### 3.3 Loading the rechargeable battery



**Danger**

**Risk of fatal injury from electric shock.**

**Line voltage is present at the battery terminals.**

- Do not touch the electrical contacts (battery terminals) on the recharger.

The rechargeable battery is partially charged (50%) at the time the rechargeable battery electric tool is delivered.

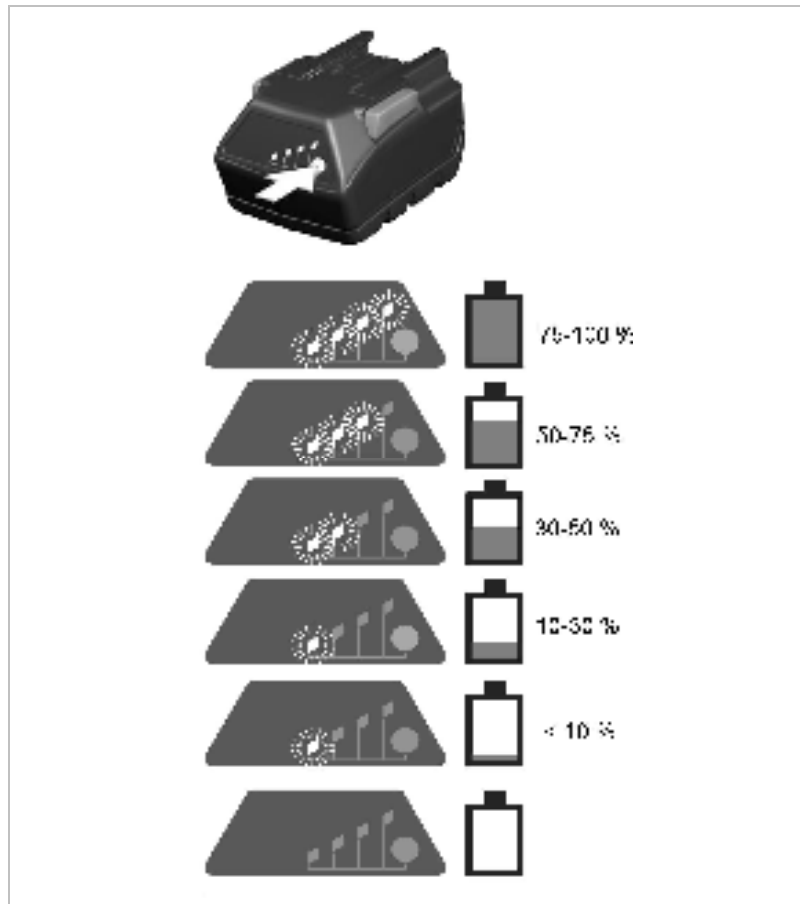
#### Checking loading status

##### Prerequisites

- The electric tool has been switched off for at least 1 minute.

- Press the key on the rechargeable battery.

The LEDs on the rechargeable battery show the charging status.



Check charging status on the rechargeable battery

Fig. 53299

**Loading the rechargeable battery**

Before using the cordless electric tool, a new exchangeable battery or one that has not been used for a long time needs to be charged.

**Note**

The full capacity is reached after 2-10 charging cycles.



Fig. 53300

- Insert the exchangeable battery into the insertion well on the recharger.

The loading time is between 1 min and 60 min, depending on how far the rechargeable battery had been discharged beforehand. The rechargeable battery is completely charged after 60 min.

The maximum charging current flows when the temperature of the rechargeable battery is between 0° and 66°C. If a rechargeable battery is inserted into the recharger that is too cold or too warm (red LED flashes), then the charging process will begin automatically as soon as the rechargeable battery has reached the correct charging temperature (-10°C to +66°C).

## Status display on the recharger



Recharger CLi

Fig. 53306

Display	Function
Red continuous	Loading
Green continuous	Rechargeable battery is full
Red, flashing	Rechargeable battery too warm/cold
Flashing red and green	Error in the rechargeable battery

Table 7



### 3.4 Changing the battery

#### Removing the exchangeable battery

- Press the locking mechanism (1) together and pull the exchangeable battery out and upwards.

#### Inserting the exchangeable battery

- Slide the exchangeable battery into the machine holder from above until the battery locks into place.

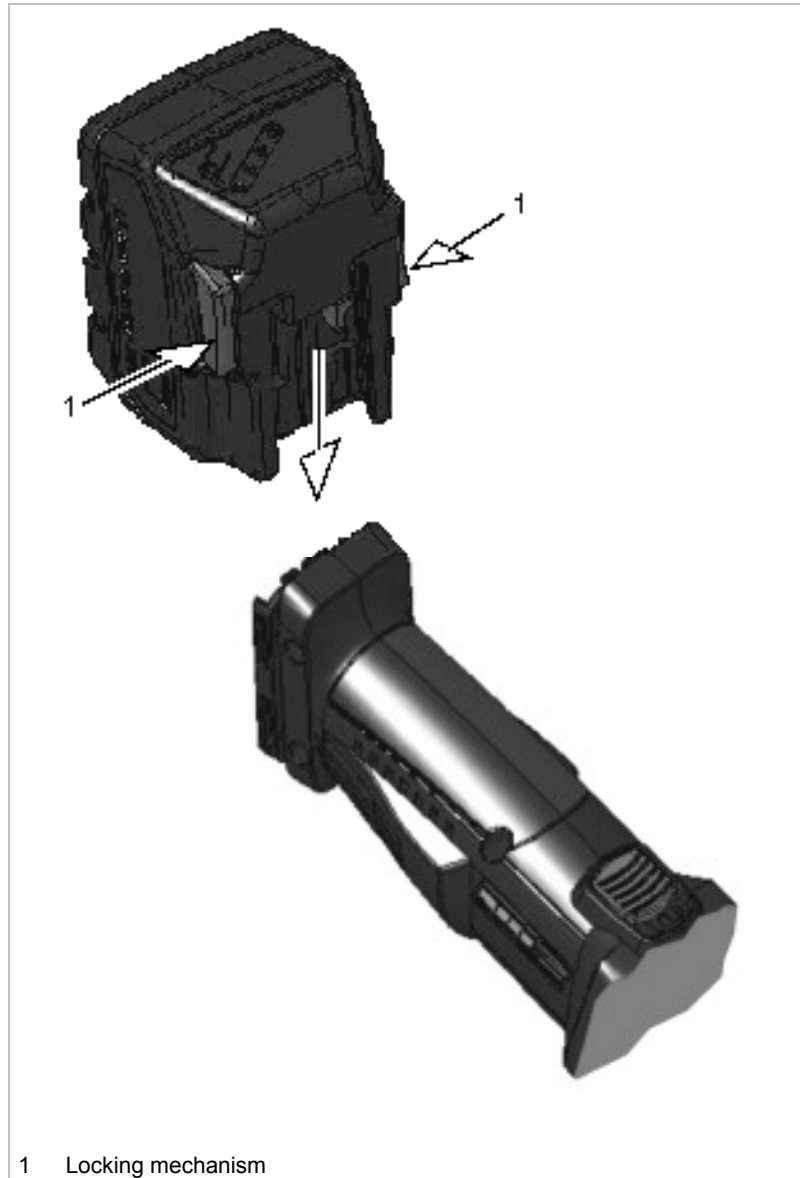


Fig. 53321

## 4. Operation



**Warning**

### Risk of injury due to improper handling.

- Make sure the machine is always in a stable position when operating it.
- Wear safety glasses, hearing protection, protective gloves and work shoes when working at the machine.
- Never touch the tool while the machine is running.
- Always operate the machine away from your body.



**Warning**

### Damage to property due to improper handling.

#### Machine will be damaged.

- Before joining, stand the swivel arm up vertically.
- Align the punch and die the same (both lengthwise or both crosswise).

### Motor overload protection

The motor shuts off with excess load.

- Allow the machine to run in idle until it has cooled down.

The machine can be operated again normally after it has cooled down.

### Note

Coat the seam point with oil before machining steel, chromium steel, and aluminum or aluminum alloys. In this way:

- The joining quality is improved.
- The service life of the punch is increased.

Material	Oil
Steel, chromium steel	Punching and nibbling oil (0.5 l, order no. 103387)
Aluminum	Akamin oil (1 l, order no. 125874)

Table 8



**Note**

If the electric tool does not work after being switched on, stick the rechargeable battery on the recharger and check the charging status.



1 Charging status

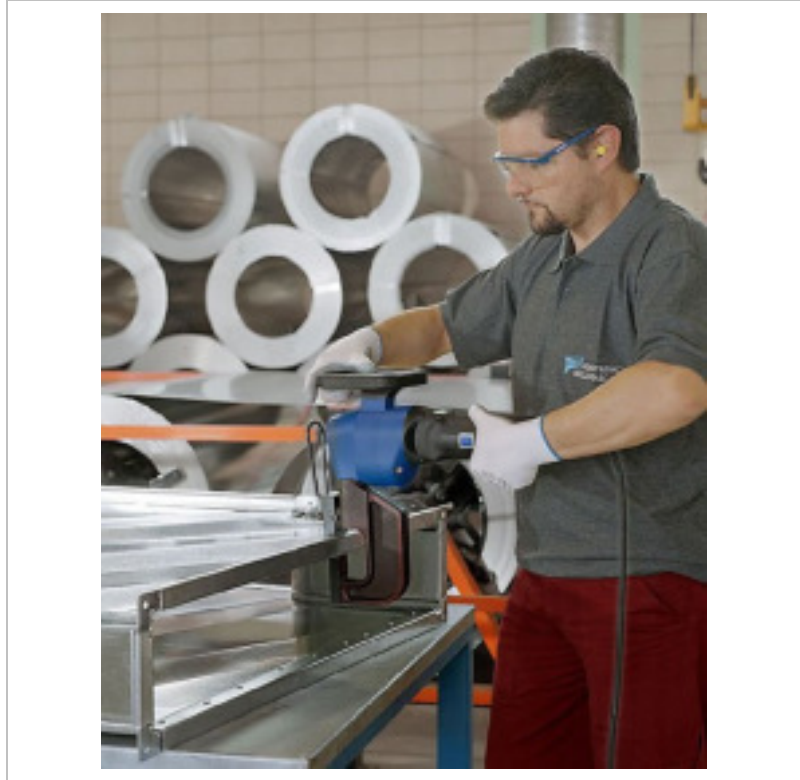
Rechargeable battery Li-Ion Energy 28 V

Fig. 53294

**Working with the  
TruTool TF 350**

Triggering the stroke:

- Actuate the button (2) which is located inside the handle (3).
- If full revolution speed has been reached, trigger the stroke.

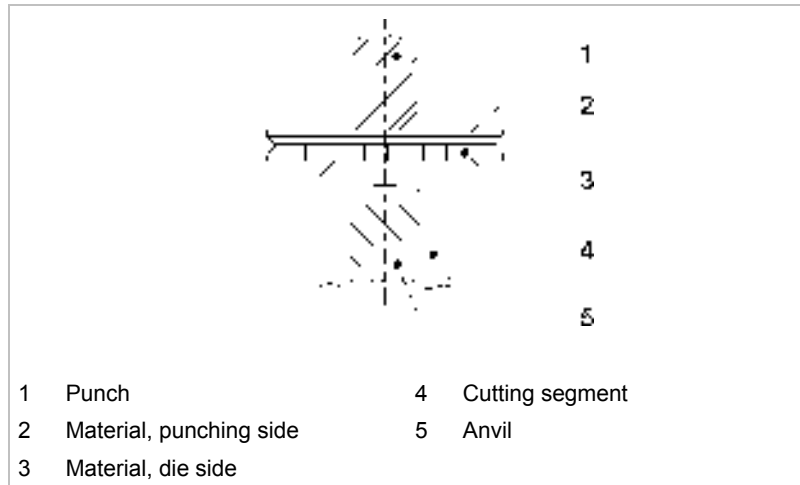


Correct holding of the machine

Fig. 10049

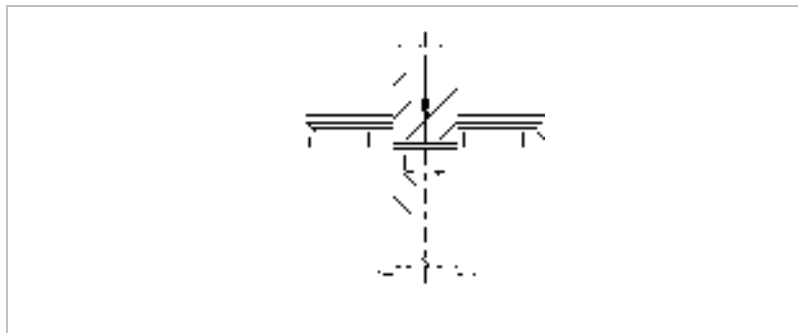
- Switching off** ➤ Move the On/Off switch (1) to the rear.

## 4.2 Joining materials



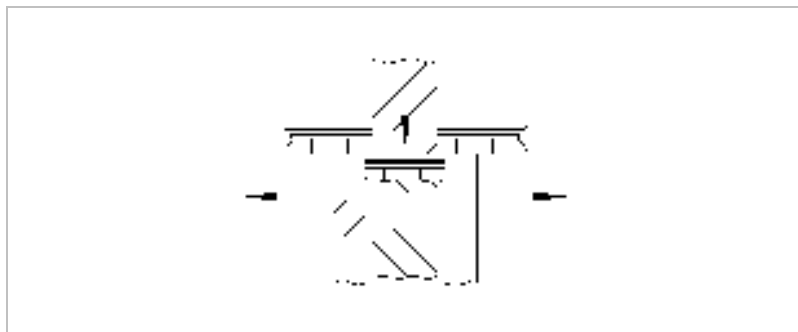
Tool and workpiece arrangement

Fig. 10043



Cutting

Fig. 10044



Forming

Fig. 10045

### Note

Additional cutting and extruding merge together seamlessly during the course of the stroke movement.

## Information concerning the workpiece and the joint

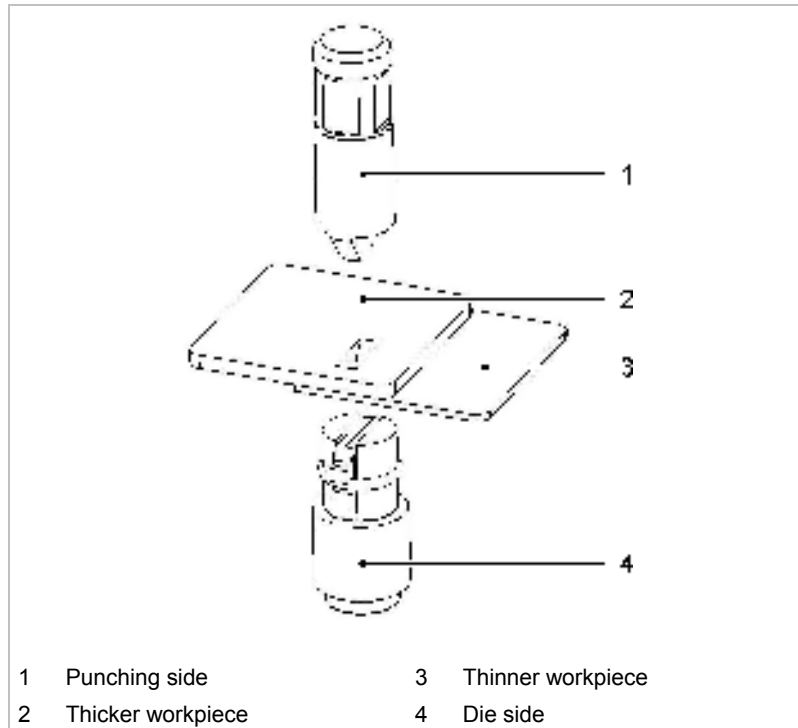


Fig. 50427

1. Adjust the set of tools to match the material thickness actually present.
2. In case of different material thicknesses, the thinner workpiece has to be on the die side. Joints can be achieved with material thickness differences of up to ratios of approximately 1:2.
3. The thinner workpiece determines the maximum shear strength of the component.
  - Work with lubricants when processing aluminum and V2A (increases service life).
4. The direction of the joint can be rotated by 90° (not possible if "Plate for channel" (order no. 0243189) is used). For this, the die is mounted in the desired position and the punch is aligned accordingly.

### Note

The total material thickness measured counts as the recommended value for selecting the die arm. It is also possible to connect more than two workpieces with each other. In general, the more workpieces that are joined together, the less the holding force of the joint/bond will be.

**Joint**

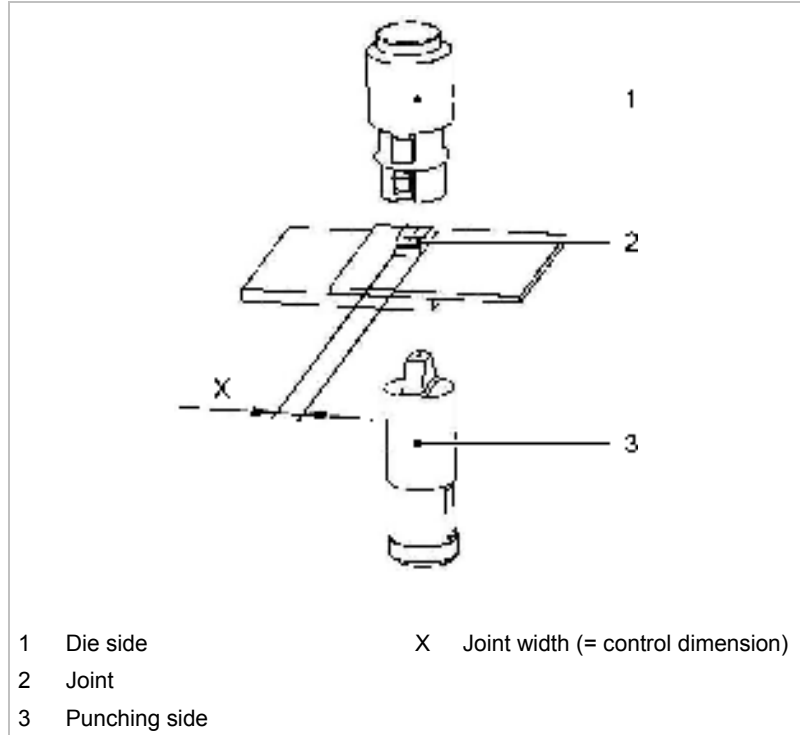
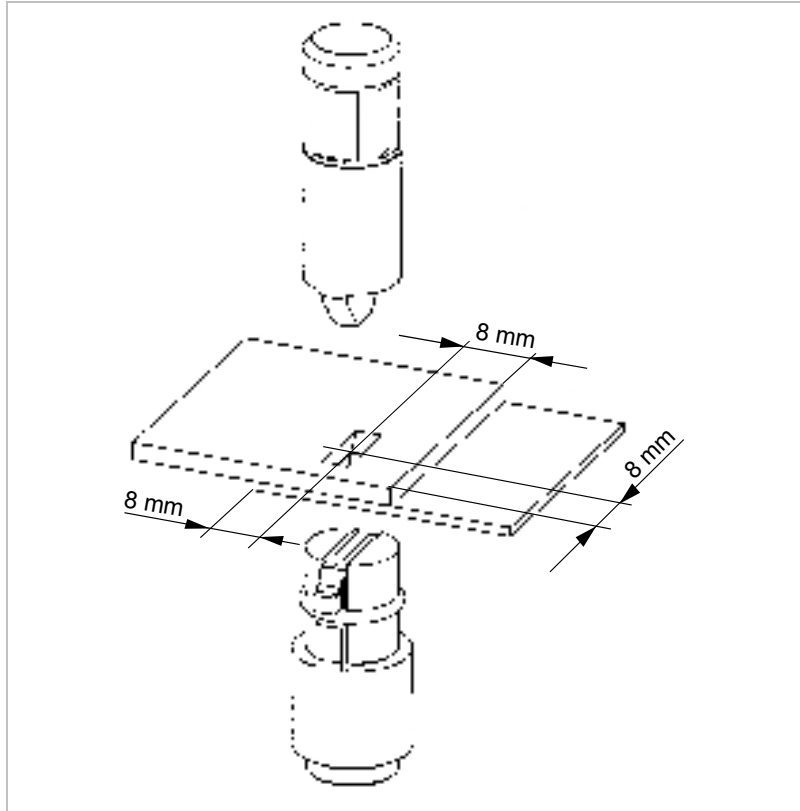


Fig. 50428

Total material thickness	Control dimension X
1.0 - 2.5 mm	3.3 - 4.5 mm
2.6 - 3.5 mm	3.8 - 4.5 mm

Table 9



**Distance of the joints from  
the edge of the material**

Minimum edge spacing of the joint

Fig. 50429

The middle of the joint has to be at least 8 mm from the edge of the material. Otherwise, a joint of lesser quality will be created.

### 4.3 Selecting processing strategy

Die and punch can be arranged in two different directions.

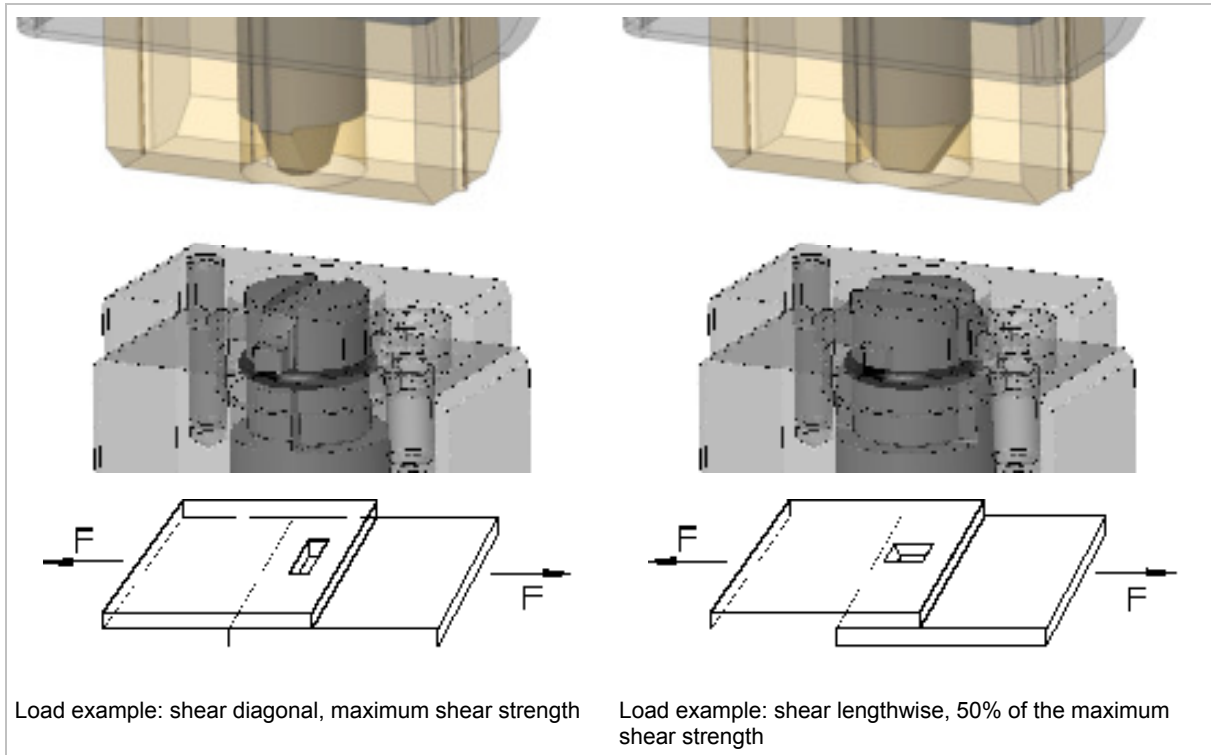
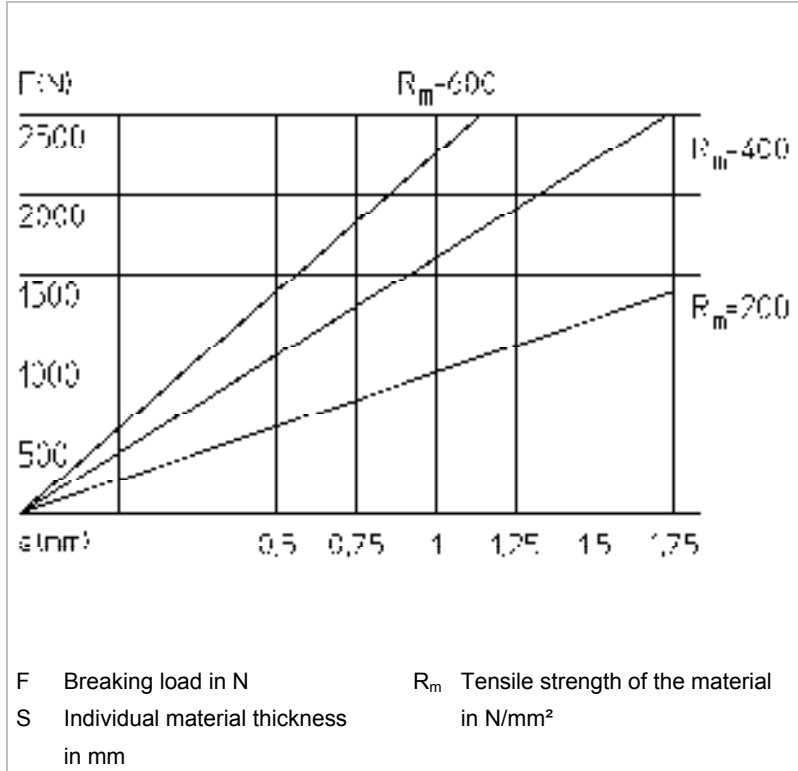


Fig. 50431, 50432, 10051, 10052

**Maximum transferable shear force**



Max. shear force that can be transferred depending on the material thickness and the tensile strength of the material

Fig. 50430

A maximum shear strength is achieved from bonding two materials which each have:

- The same material stability.
- The same material thickness.

## 4.4 Slewing ring (optional)

The machine can be swiveled into any processing position desired with the help of the auxiliary "slewing ring" (order no. 0976671) device. The use of the slewing ring makes the work of the machine operator easier.

### Installing the slewing ring



TruTool TF 305 with installed slewing ring

Fig. 50438

1. Align the machine in the plate (1) over the centering hole.
2. Clamp the machine on the tool carrier (4) in the clamping bracket (3) and tighten the screw (2).

The suspension of the slewing ring is done over an eyelet (total weight of the machine TruTool TF 350 with slewing ring is 15 kg). A balancer is used to provide optimal handling.

## 4.5 STAND TruTool TF 350 (optional)

The joining station (order no. 1224803) is used for the stationary operation of the TruTool TF 350 jointing press. This allows small workpieces to be joined quickly and easier.



TruTool TF 350 with joining station

Fig. 50439

## 5. Maintenance



**Warning**

### Risk of injury from the rechargeable battery.

- Remove rechargeable battery when changing tools and before performing any maintenance work on the machine.



**Warning**

### Risk of injury due to incorrect repair work.

#### Machine does not work properly.

- Repair work may only be carried out by a qualified technician.



**Caution**

### Damage to property caused by blunt tools.

#### Machine overload

- Check tools regularly for wear. Sharp multi-edge cutters ensure good cutting quality and protect the machine. Rotate or replace multi-edge cutters in a timely fashion.

Maintenance point	Procedure and interval	Recommended lubricant	Lubricant order no.
Gearbox and gear head	After 300 operating hours, arrange for a trained technician to lubricate or to replace the lubricating grease	Lubricating grease "G1"	0139440
Tool carrier	Clean as required	-	-
Punch	Replace as needed	-	-
Die	Replace as needed	-	-
Ram	Relubricate after 20 operating hours	Lubricating grease "G1"	0139440
Coupling	Relubricate after 20 operating hours	Lubricating grease "G1"	0139440
Rechargeable battery	Replace as needed	-	-

Maintenance positions and maintenance intervals

Table 10

## 5.1 Replacing the tool

If the punch and/or the die are blunt, then they must be replaced.

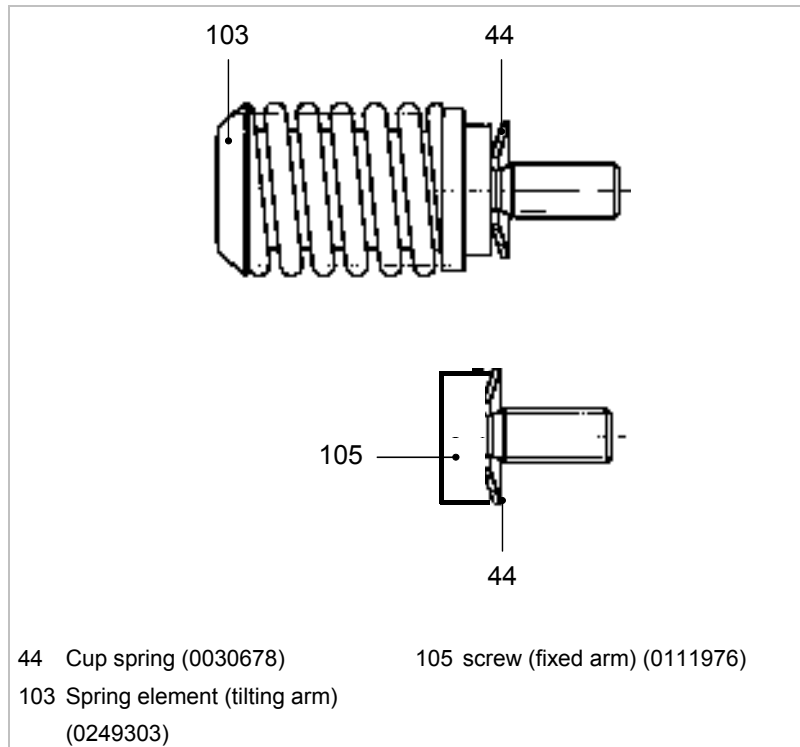
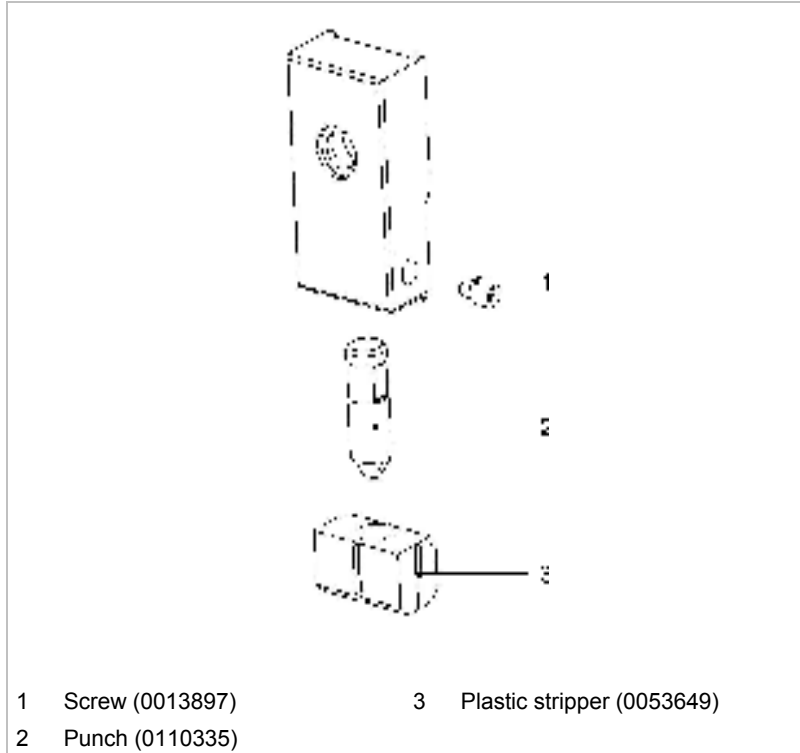


Fig. 13212

### Mounting the workpiece on the machine

1. Clean the tool adapter.
2. Check for damage.
3. Lubricate location bolt with lubricating grease "G1" (order no. 344969).
4. Mount the cup spring (44) on the screw (105) / the spring element (103) as shown in the illustration.
5. Mount the tool arm on bolts.
6. Tighten screw (105) / spring element (103) firmly.

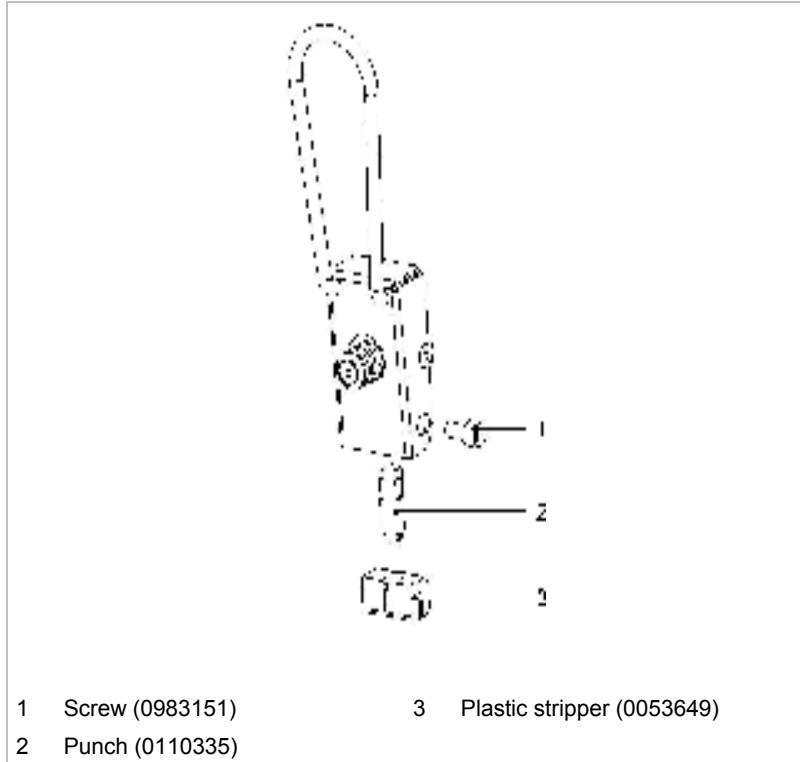
**Replace punch arm**

Fixed punch arm

Fig. 50440

1. Remove the complete punch arm from the machine.
2. Remove the stripper (3).
3. Undo the screw (1).
4. Pull out punch (2).
5. Install new punch.
6. Align punch (2).
7. Tighten screw (1) firmly



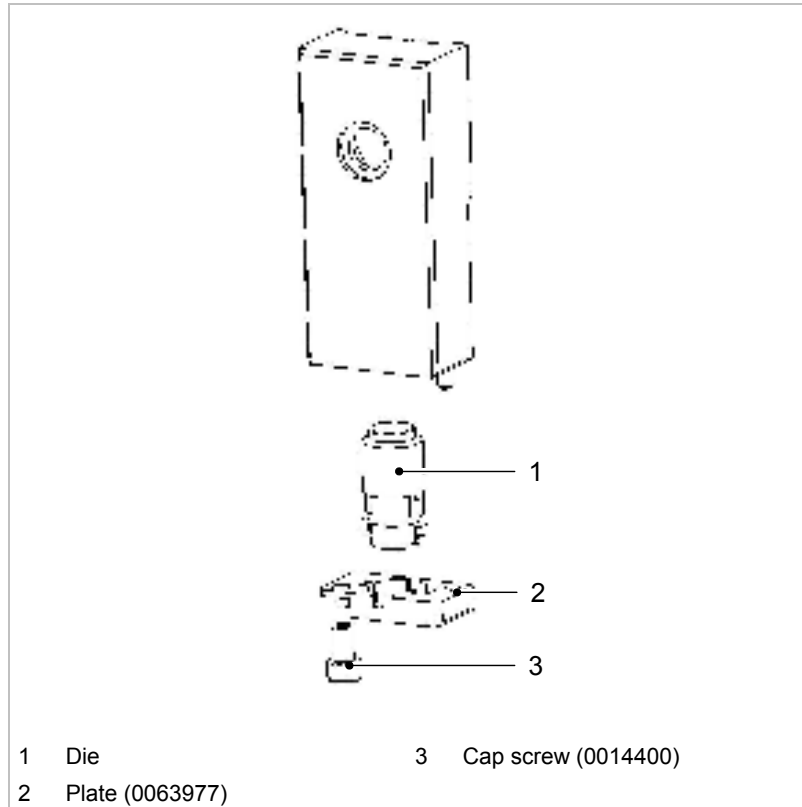


Tilting arm to punch

Fig. 50441

1. Pull the bracket towards the front and swivel the whole tilting arm so that the screw (1) can be accessed.
2. Remove the stripper (3).
3. Undo the screw (1).
4. Pull out punch (2).
5. Install new punch.
6. Align punch (2).
7. Tighten screw (1) firmly.

## Replace die arm



Fixed die arm

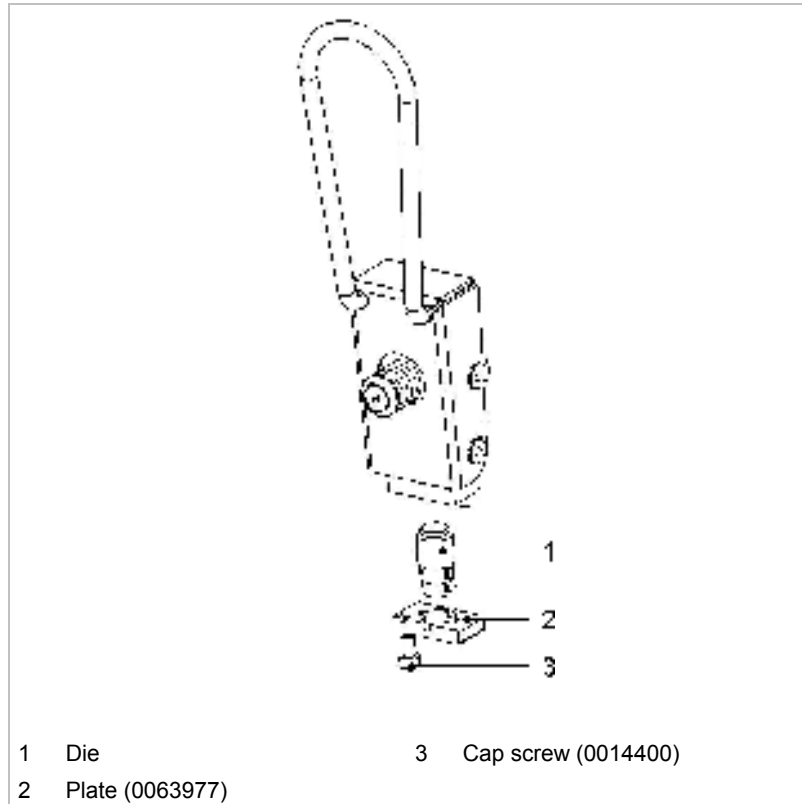
Fig. 50442

1. Remove the complete fixed die arm from the machine.
2. Loosen the cap screw (3).
3. Remove the plate (2).
4. Remove the die (1).
5. Install new die (be sure that the cutting segments fit closely to the anvil, see Fig. 50444, p. 36). (Die selection see Table 5, p. 11 and Table 6, p. 12.)

### Note

Do not install the cutting segment backwards.

6. Install the plate (2).
7. Tighten screw (3) firmly.



Tilting arm for die

Fig. 50443

1. Pull the bracket towards the front and swivel the whole fir arm so that the cap screw (3) can be accessed.
2. Loosen cap screw (3).
3. Remove the plate (2).
4. Remove the die (1).
5. Install new die (be sure that the cutting segments fit closely to the anvil, see Fig. 50444, p. 36). (Die selection see Table 5, p. 11 and Table 6, p. 12.)

**Note**

Do not install the cutting segment backwards.

6. Install the plate (2).
7. Tighten screw (3) firmly.

**Cutting segment installed  
with a close fit**

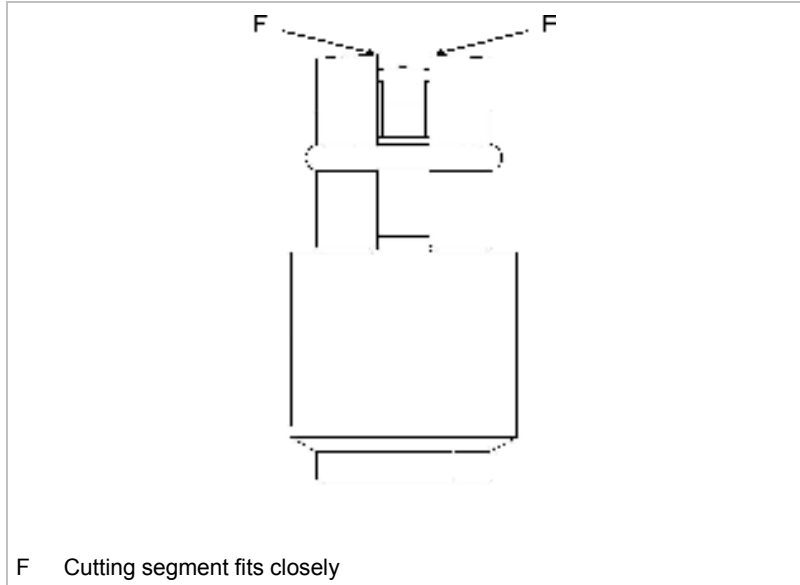


Fig. 50444

**Cutting segment incorrectly  
installed**

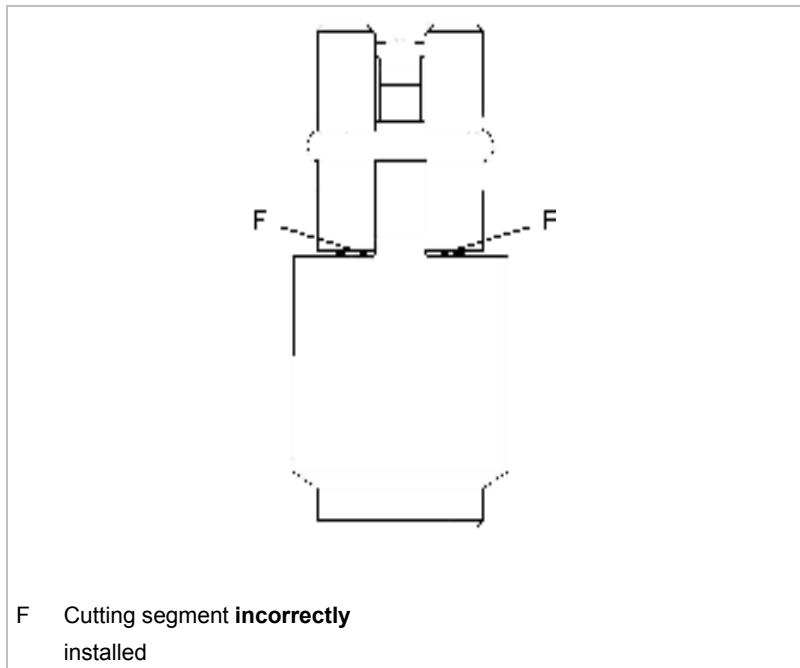


Fig. 50445

## 5.2 Lubricating the ram



53 Grease nipple

Fig. 50446

The tool ram must be lubricated through the grease nipple (53) every 20 operating hours with a grease gun.

### 5.3 Lubricating the coupling

Lubrication interval: every 20 operating hours.

1. Pull the rechargeable battery off the machine.
2. Unscrew the screw plug (1).



Fig. 50449

3. Press and hold the button for stroke triggering (2) and rotate the eccentric shaft (3) clockwise (see arrow at the machine's face end) until the lubrication port becomes visible.

**or**

- Put the grease gun through the bore hole in the end sign and rotate the eccentric shaft clockwise until the grease gun engages in the lubrication port.

**Note**

Remove the screwdriver again from the eccentric shaft.

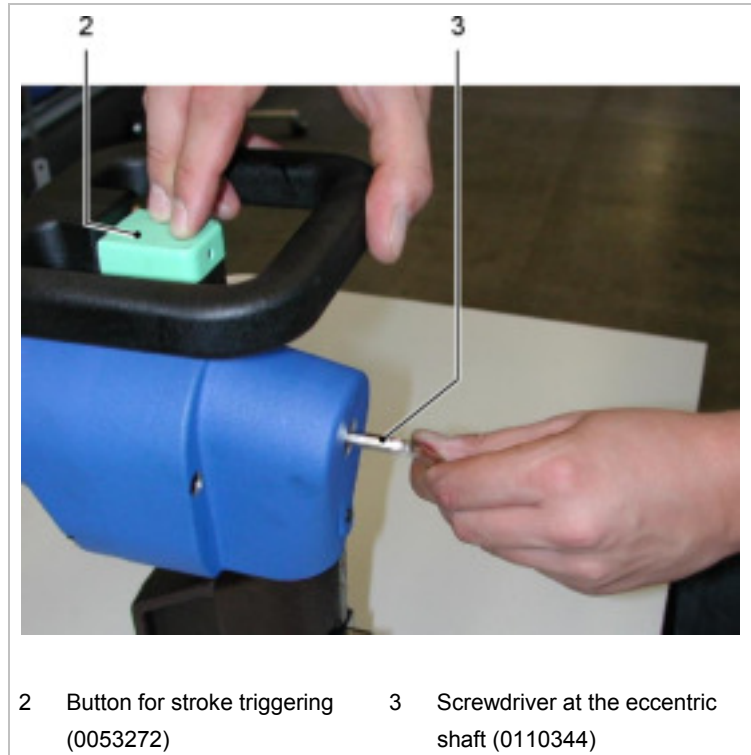


Fig. 50448

4. Relubricate the coupling with the grease gun (4) through the lubrication port (5) (one stroke).

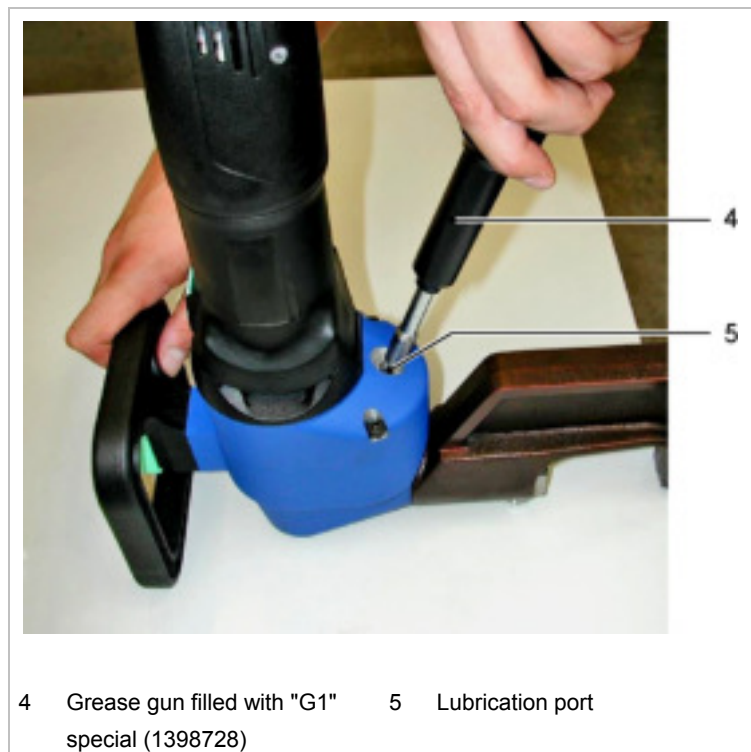


Fig. 50447

5. Screw in the screw plug again.

6. Put the machine in a safe position.
7. Insert the rechargeable battery.
8. Switch on the motor.  
The machine completes the stroke which was manually started.
9. Press the button for stroke triggering and trigger a test stroke.





## 6. Original accessories and wearing parts

Description	Supplied original accessories	Wearing parts	Options	Order no.
Operator's manual	+			1467629
Safety information (red document)	+			0125699
Grease gun filled with "G1" special	+			1398728
Stripper for flat materials	+	+		0053649
Stripper for channels	+	+		0112929
Punch	+	+		0110335
Die no. 1		+		0111969
Die no. 2		+		0111968
Die no. 2+		+		0122272
Die no. 3-		+		053875
Die no. 3		+		0111967
Die arm fixed (complete) No. 1 No. 2 No. 2+ No. 3- No. 3			+ + + + +	0118130 0118131 0129763 0129764 0118132
Tilting arm to the die (complete) No. 1 No. 2 No. 2+ No. 3- No. 3			+ + + + +	0128792 0128793 0129723 0129724 0128794
Punch arm fixed (complete)			+	0118129
Tilting arm to the punch (complete)			+	0128748
Plate for channels			+	0243189
Punching and nibbling oil for steel (0.5 l)			+	0103387
Punching and nibbling oil for aluminum (1 l)			+	0125874
Slewing ring TruTool TF 350			+	0976671
STAND TruTool TF 350			+	1224803
Rechargeable battery 28 V	+			1464697
Recharger CLi 220-240 V	+			1464702
Recharger CLi 120 V	+			1464703
Case	+			1470131
Screwdriver SW6	+			67865
Screwdriver SW5 28x80	+			67857

Description	Supplied original accessories	Wearing parts	Options	Order no.
Screwdriver SW3	+			67830
Box for small parts	+			353966

Table 11

**Ordering wearing parts** To ensure the correct and fast delivery of original parts and wearing parts:

1. Specify the order number.
2. Enter further order data:
  - Voltage data.
  - Quantity
  - Machine type.
3. Specify the complete shipping information:
  - Correct address.
  - Desired delivery type (e.g. air mail, courier, express mail, ordinary freight, parcel post).
4. Send the order to the TRUMPF representative office. For TRUMPF service addresses, see [www.trumpf-powertools.com](http://www.trumpf-powertools.com).