TITGEMEYER GTO

Fastening Technology

Riveting Tool MS 100

Operating Manual

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Guiding instructions

Instruction

The legislator prescribes that the user must be well trained for using compressor-driven riveting tools. If desired, the training programme can be conducted at TITGEMEYER in Osnabrück or directly at the client's place.

Technological level

This riveting tool is as per the latest technological standards.
Professional and safety conscious operation is a must for the riveting tool to function safely.

Reading the guiding instructions

Before using the riveting tool for the first time, read the guiding instructions carefully.

Procedures

All the procedures necessary for the operation have been described in these guiding instructions. You may carry out only those procedures, which have been described here.

Obstructions

In case of obstructions, you may repair only those obstructions, which have been marked with an O (Operator).

Illustrations and position-codes

All the illustrations and position-codes in the individual diagrams take reference from the list of parts in the last pages.

Table for torque values

You find a table with the torque values for all screw and thread sizes on Page 33.

Cautions and instructions in the operating manual

Please follow the instructions and safety informations.

In this operating manual, some sections have been further illustrated through diagrams.
Please acquaint yourself well with these diagrams and their meanings:

Caution Hazard of injury! This marking indicates a potential hazard.

Attention Material damage! This marking points at a procedure, which may cause damage to the riveting tool or the work-piece.

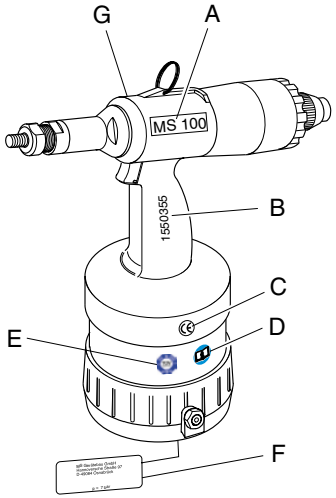
Note This marking indicates useful information

- This point (•) marks every paragraph, which requires you to act by yourself.

Attention Environmental hazard! This marking indicates a potential environmental hazard.

Markings on the riveting tool

This pictogram indicates that you must read the operating manual before using the riveting tool.



A Marking of the type

B Serial number

C CE-marking

D Instruction for reading the operating manual

E TÜV-Mark (safety checked)

F Name of the manufacturer as well as the value of the maximum operating pressure

G Supplier

Safety instructions

Application as per the purpose

The riveting too has solely been foreseen for the insertion of blind rivet studs. The riveting tool MS 100 is designed to process blind rivet nuts of the sizes M8 to M16. If desired, the mandrels can also be supplied with other thread sizes, e.g. UNC/ UNF.
This riveting tool must be used only as a hand-held device!
The client is fully responsible for any modifications to the riveting tool!

Improper use

Never throw away or drop the riveting tool!

Clean and dry compressed air

Please take care that only clean and dry compressed air is let into the riveting tool. Moisture and dirt can damage the riveting tool. Use only such compressed air, which falls into class 2 of air quality as per ISO 8573-1.

Caution Hazard of injury because of explosion! Never use the riveting tool in an atmosphere prone to explosions. Ensure that the workplace is well lit and clean.
Hazard of injury due to the openly moving compressed air hose. Connect and lay the compressed air hose properly.
Hazard of injury due to tripping over! Lay the compressed air hose in such a way that nobody should trip over it.

Attention Material damage! The maximum operating pressure is 7 bar. For increasing the durability of the riveting tool, it is recommended to fit a compressed air-maintenance unit in the compressed air hose.

Basic requirements while dealing with the riveting tool

Caution Follow the prevalent guidelines for the prevention of accidents in the respective country.

Use only those fittings and hoses, which have been approved for the operating pressure.

Disconnect the compressed air supply from the riveting tool at the time of installation or maintenance.

Wear personal safety gear (safety glasses and safety helmet).

Attention Heed the details on the blind rivet nut packaging.

Use the riveting tool only at operating temperatures above 5°C and 45°C.

Use the prescribed mandrels and nose pieces for each thread size.

Do not throw away the riveting tool.

Maintenance and servicing

The operator may only carry out the maintenance and repair work described in this operating manual

Service instructions

Maintenance and service work not described in this operating manual may only be carried out by trained specialists following instruction by TITGEMEYER on the basis of the service instructions which also exist. See the address on page 42 for more information on service instructions and training.

→ **Note** The manufacturer accepts no liability for damage resulting from incorrect repairs or the use of spare parts from other sources

At the time of leaving the workplace, do not leave the riveting tool with pressure on.

Guarantee

A guarantee is void, if any repair work carried out on the riveting tool has lead to any damage of the riveting tool.

Declaration of conformity

The riveting tool MS 100 has been checked and manufactured according to European guidelines. The declaration of conformity can be found on the second last page.

GS-checked

The riveting tool was additionally tested by TÜV Product Service GmbH Hanover and certified (TÜV/ Technical Control Board mark) and issued with the GS sign.

Noise and vibration levels of the MS 100

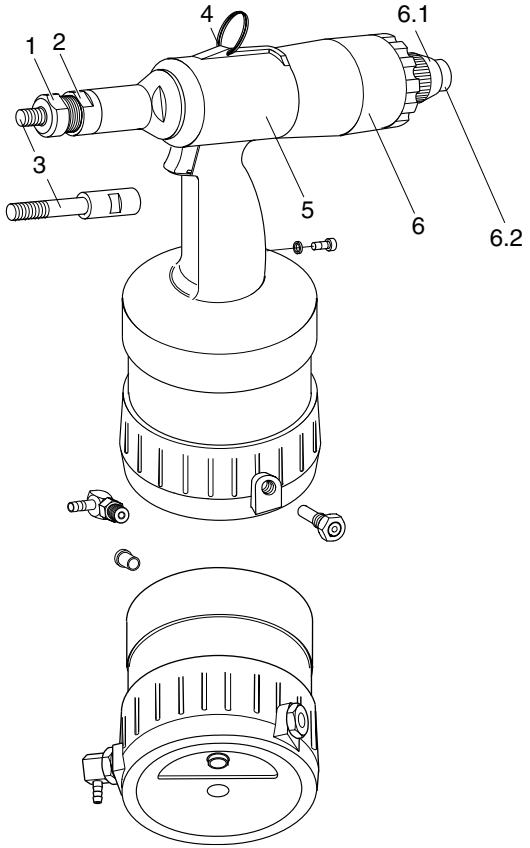
Noise level

The emission sound pressure level at a workplace is L_{PAI} = 86dB(A) according to ISO 10843 and DIN EN ISO 3744.
The main noise is generated by the air motor. Through correct use, the air motor can be switched off between times, and therefore the noise level can be lastingly reduced.

→ **Note** For safety reasons, however, we recommend the wearing of ear protection

Vibration level

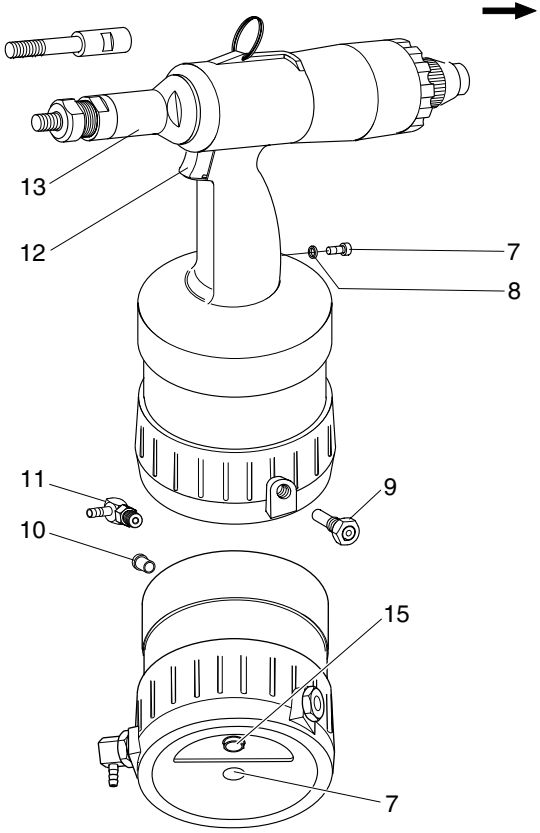
The effective value measured on acceleration with the handle, as per ISO/ FDIS 8662-11, is $a_{hw} < 2.5 m/s^2$.



Description of the riveting tool

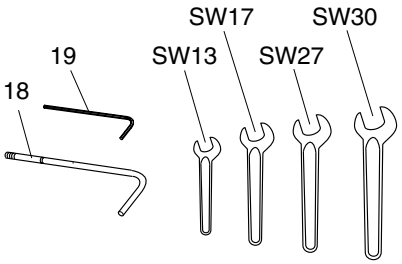
The riveting tool MS 100 is pneumatically - hydraulically actuated and has an air motor.
It consists of the following operation-related components:

1	Nose piece	for threads M8, M10, M12 and M16
2	Lock nut	for fixing the nose pieces
3	Mandrel	for threads M8, M10, M12 and M16 of blind rivet nuts
4	Hang-up eyelet	for hanging up on a hook whenever stationary
5	Hydraulic housing	the pneumatic and the hydraulic units are located in the hydraulic housing
6	End cap	is a complete unit enabling the switching of the rotation of the air motor to left-handed rotation
6.1	Adjustment screw	is used for adjusting the end stop for the automatic switching to the left-handed rotation
6.2	Button	manually release the left-handed rotation



Note The socket head screw (7) and the O-ring (8) are screwed tightly into the grip. The socket head screw (7) must not be loosened, else the hydraulic oil will leak.

7	Socket head screw	locking for the hydraulic oil system Opening serves as an oil inlet
8	O-Ring	Sealing of the hydraulic oil system
9	Safety valve	(Brass) In case of very high pressures approx. 8 bar or more), it opens, and lets the air out.
10	Plug	serves the purpose of protection of the thread and also against dirt
11	Swivel-joint	serves as the connection for compressed air hoses (operating pressure 6 bar)
12	Trigger	— starts right-handed rotation — triggers a riveting action — stops left-handed rotation
13	Nose cap	covered mandrel
15	Stroke adjustment screw	is used to adjust the stroke
7	Socket head screw in device floor	closes the opening to pull back the pneumatic rod



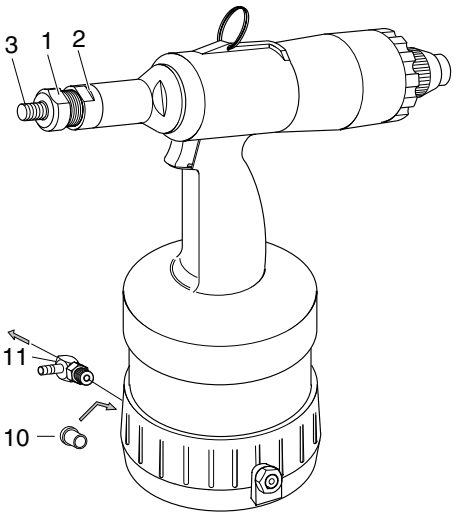
Required tools

You will require the following tools for all installation, servicing and maintenance work.

Tools

— Crank (18)	
— Wrench[1]	SW13, SW17, SW27, SW30
— Internal hex key (19)	SW4

[1] No delivery possibility

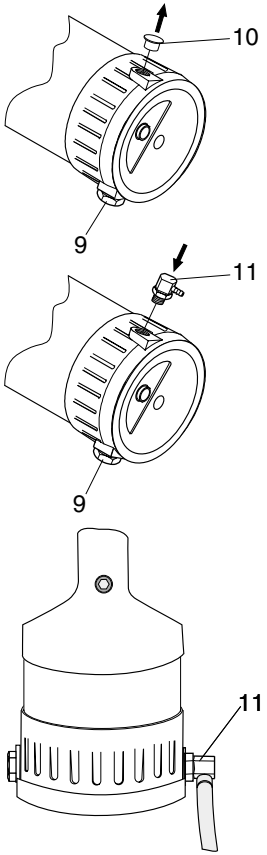


Storing the riveting tool

Until first use
If you do not use the riveting tool immediately, store it inside the original packing, dry and dust-free.

Long term storage after usage
Clean nose piece (1), lock nut (2), mandrel (3) and lubricate with acid-free grease. Screw out the swivel joint (11) and close the opening with a plug (10). If possible, store all pieces in the original packing.

After long-term storage
After long-term storage (about 3 years), change the hydraulic oil before re-use.
A hydraulic oil change may only be carried out by trained specialist with the help of the service instructions. For further information regarding service instructions and training, please see the address on page 42.



Preparing the riveting tool

Package insert

The components ordered by you are marked as per the checklist found inside the packing.

→ **Note** Please check the contents of the packing, for completeness of the checklist

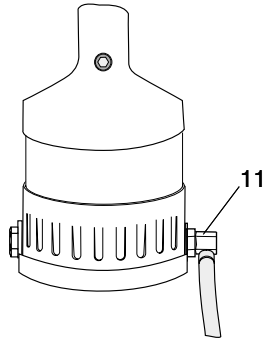
In every case, please carry out a visual check of the riveting tool before starting any work:
— for external damages,
— for oil leakage from the riveting tool.

• Remove the plug (10) from the connection port and store in the original packing.

→ **Note** The swivel joint (11) and the safety valve (9) can be alternatively fitted on both the sides of the hydraulic housing. The diagram below shows the arrangement for a right-hander.

→ **Note** In case of all screw-fittings, observe the table for torque values in the chapter “Maintaining the riveting tool”

• Screw on the swivel joint (11) and tighten using the wrench SW17 (see page 33 “Table for torque values”).

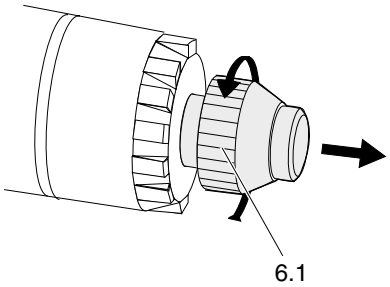


→ **Note** Depending on the type of compressed air supply, it may be necessary to connect a fitting different from the one provided, to the riveting tool. For this, you need to have a fitting having a 1/4” Withworth-pipe-thread as per ISO 228.

Caution Danger of injury by running riveting tool. In this event, lightly touch the trigger to stop the riveting tool.

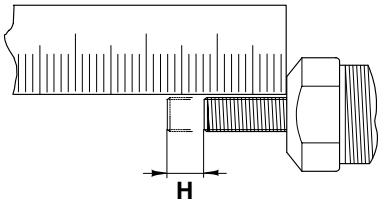
Attention Material damage by compressed air!
As per norm ISO 8573-1, class 2, compressed air must be dry and clean. We recommend that you fit a compressed air-maintenance unit to the riveting tool.

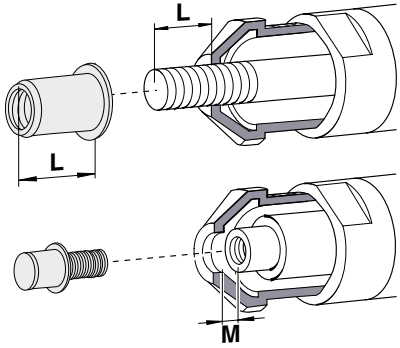
- Compressed air hose should be connected to the swivel joint (11), as prescribed.

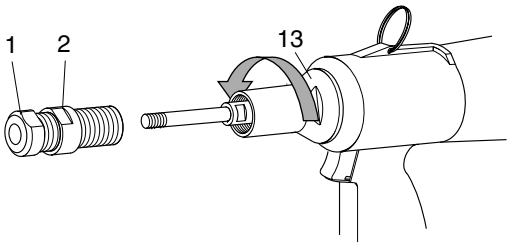


Attention Too narrow clearance can cause damage to material. If you do not know the stroke setting, unscrew the adjustment screw (6.1) for the automatic switching into the left-handed rotation a few turns (ca. 5 mm). You thus make sure that the rod does not strike the rear and the riveting tool is not damaged.

→ **Note** The operating pressure must be between a minimum of 5 and a maximum of 7 bar!







Adjusting the riveting tool

Note The standard fitting of the riveting tool is a mandrel M10. Align the riveting tool to your conditions by replacing the mandrel and/ or adjusting the stroke (H).

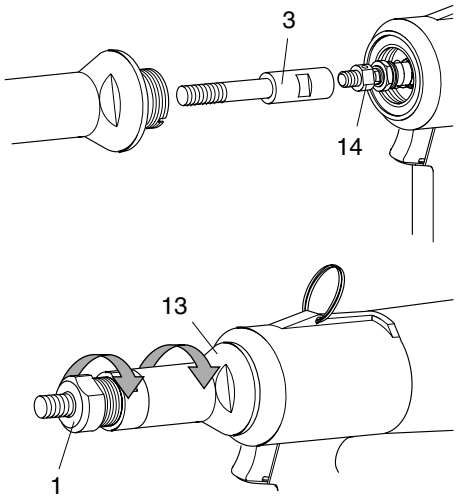
Changing the mandrel

Caution Risk of injury by crushing and shearing due to an accidental working stroke! Always disconnect the compressed air supply before unscrewing the nose cap (13).

Attention Material damage! You have to readjust the length L (mandrel) and the operating stroke (H) after every change. In addition to this, the adjustment screw for the automatic switch over into left-handed rotation (6.1) needs to be adjusted to the new stroke.

- Select the corresponding mandrel and lubricate.
- Unscrew lock nut (2) with open wrench SW27.
- Unscrew nose piece (1).
- Loosen nose cap (13) with open wrench SW30 and screw off.

Adjusting the riveting tool

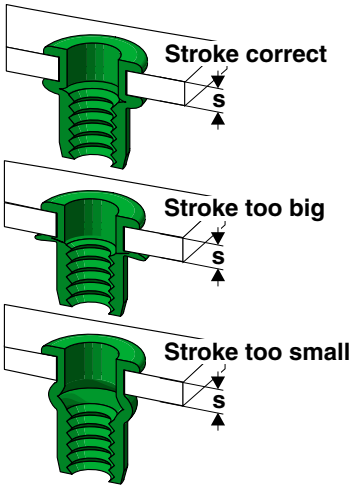


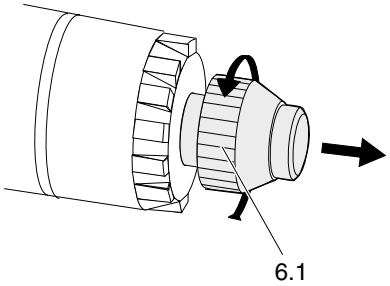
- Place open wrench SW13 on mandrel (3).
- Hold up locknut (14) to loosen mandrel and screw out.

→ **Note** Apply a little acid-free grease to the new mandrel.
Follow the table for tightening torques in the Chapter “Maintaining the riveting tool”.

- Screw on new mandrel (3) (at least 6 turns) and tighten while holding up the lock nut (14) (see page 33 “Table for torque values”).
- Screw on nose cap (13) and tighten with open wrench SW30 (see page 33 “Table for torque values”).
- Screw in appropriate nose piece (1).

→ **Note** Now first adjust the stroke. Then adjust the length L of the mandrel (compare illustration on Page 17).





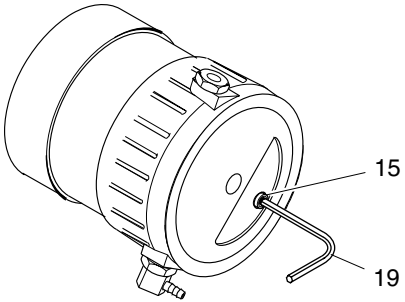
Adjusting stroke (H)

Note The correct stroke (H) depends on the type of blind rivet nut, the thread size and material thickness (s). You will standard values for the stroke in the table “Stroke adjustment dependent on grip range” on page 23-24. The values given in the table apply for blind rivet nuts that are sold by TITGEMEYER. If you use blind rivet nuts of other manufacturers, get information from the manufacturer if you do not have the applicable specifications.

If the strength of the material deviates from the values, you must adjust the stroke (H) accordingly:
— thinner material requires a larger stroke,
— thicker material requires a smaller stroke.

Attention Too narrow clearance can cause damage to material. If you do not know the stroke setting, unscrew the adjustment screw (6.1) for the automatic switching into the left-handed rotation a few turns (ca. 5 mm). You thus make sure that the rod does not strike the rear and the riveting tool is not damaged.

Attention Material damage! Carry out test riveting after every adjustment and check the deformation of the blind rivet nut. In the above picture you can see the correct setting of a riveting, taking a blind rivet nut as an example.

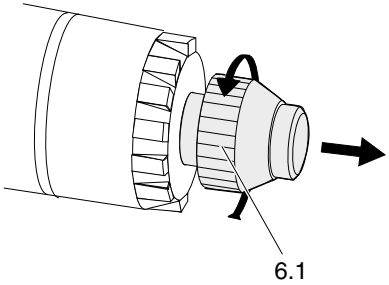


The adjustment to another working stroke follows on the underside of the riveting tool. For this you need the spanner for internal hex key SW4 (19).

→ **Note** The stroke is approx. 9.0 mm when the stroke adjustment screw (15) has been screwed out to the limit by left-handed rotations

• Check if the compressed air hose is connected. If not, connect the compressed air supply.

Using the spanner for hexagon nuts SW4 (19) turn the stroke adjustment screw (15) in the relevant direction:
— right “-” reduce the stroke
— left “+” increase the stroke

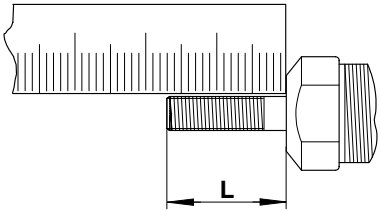


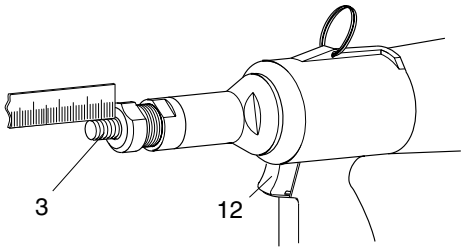
→ **Note** Four turns of the stroke adjustment screw (15) correspond to a stroke adjustment of 1 mm

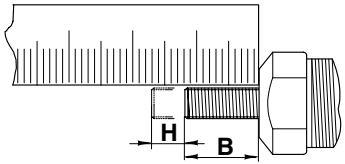
Attention Material damage! If you do not know the stroke setting, unscrew the adjustment screw (6.1) a few turns (ca. 5 mm) for the automatic switch over to the left-handed rotation. This is to ensure that the piston will not hit the back and the riveting tool will not be damaged.

You must now measure the stroke (H) (see page 21).

Measuring stroke (H)







Attention Material damage! If you do not know the stroke setting, unscrew the adjustment screw (6.1) a few turns (ca. 5 mm) for the automatic switch over to the left-handed rotation. This is to ensure that the piston will not hit the back and the riveting tool will not be damaged.

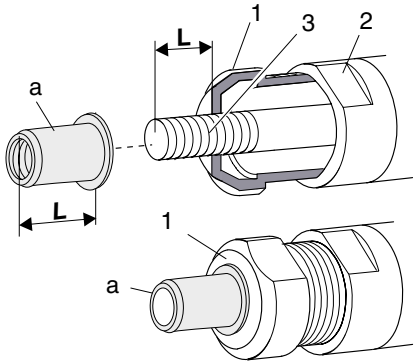
- Establish an air supply (max. 7 bar).
- Measure protruding length L of the mandrel (3).
- Press the trigger (12) right through and hold.
- Measure remaining length B of the mandrel (3).
- Release the trigger (12).
- Strike trigger (12) gently (left-handed rotation stops).

Length L minus length B gives the actual stroke H (L-B=H).

- If necessary correct the stroke (H) (see “Adjusting stroke H” on page 19).
- Adjust the adjustment screw (6.1) (no illustration).

Attention Material damage! Readjust the length L of the mandrel after every stroke adjustment (see page 22). Perform a sample riveting to check if sound riveting is possible (see page 19).

Note Check the stroke adjustment every 300 rivetings or after 25 operating hours



Adjusting length L of the mandrel

Note The mandrel (3) must cover the whole length L of the blind rivet nut (a). The head of the blind rivet nut must be adjacent to the nose piece (1).

- Loosen the lock nut (2) with the open wrench SW27.
- Unscrew the blind rivet nut (a) so that the whole length L of the blind rivet nut is exposed. It may become necessary to screw the nose cap a little into the nose piece.
- Turn the nose piece (1), so that the head of the blind rivet nut (a) lies adjacent to the nose piece.
- Firmly tighten the blind rivet nut (2) (see page 33 “Table for torque values”).

Attention Material damage! Perform a sample riveting to check if sound riveting is possible (see illustration on page 19).

Table stroke adjustment dependent on the grip range

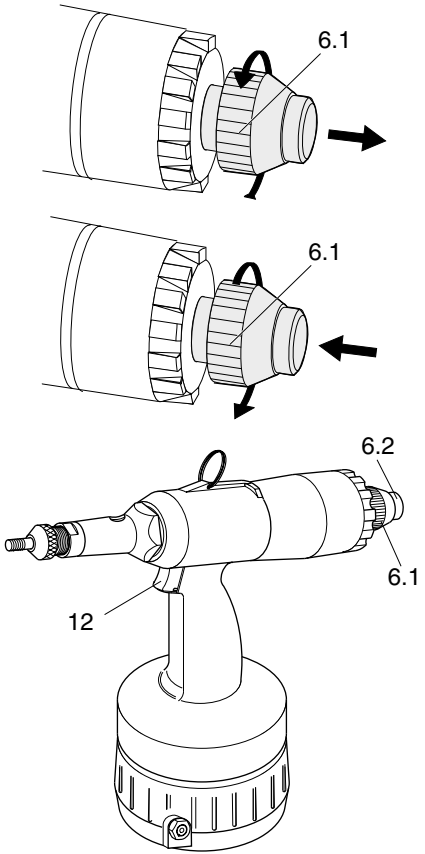
Type	Grip range (mm)	Aluminium Stroke (mm)	Steel Stroke (mm)	Special Steel Stroke (mm)
M8	1.0 3.0	3.0 2.0	4.0 2.5	4.0 2.5
	3.0 5.5	4.0 2.0	4.0 2.5	—
	5.5 8.0	4.0 2.0	4.0 2.5	—
M10	1.0 3.0	—	—	3.5 2.5
	1.0 3.5	4.0 2.5	4.5 2.5	—
	3.5 6.0	5.0 3.0	4.0 2.5	—
	1.0 3.5	—	4.5 2.5	—
	3.5 6.0	—	5.5 3.0	—
M12	1.0 4.0	—	5.5 4.0	—
	4.0 7.0	—	5.5 4.0	—

In this table you find the standard values to pre-select the stroke on the riveting tool for blind rivet nuts of the company TITGEMEYER

If you use blind rivet nuts of other manufacturers you need the respective values.

Table stroke adjustment dependent on the grip range

Type	Grip range (mm)	Aluminium Stroke (mm)	Steel Stroke (mm)	Special Steel Stroke (mm)
M16	0.5 3.5	—	7.0 6.0	—
	3.5 6.0	—	6.0 4.0	—
	6.0 8.5	—	4.0 3.0	—
	8.5 11.0	—	3.0 2.5	—

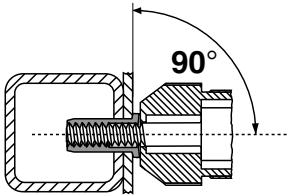


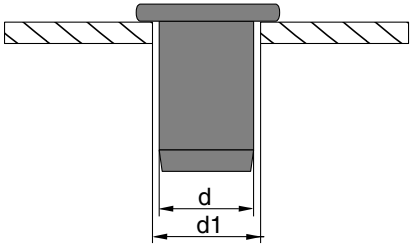
Operating the riveting tool

Check function

Attention Too narrow clearance can cause damage to material. If you do not know the stroke setting, unscrew the adjustment screw (6.1) for the automatic switching into the left-handed rotation a few turns (ca. 5 mm). You thus make sure that the rod does not strike the rear and the riveting tool is not damaged.

- Connect the air supply to the riveting tool.
- Push the trigger (12) through and hold.
- Gently screw in the adjustment screw (6.1) as far as it can go: The automatic switch over to left-handed rotation is now set.
- Release the trigger (12).
- Gently push down the trigger (12) (first level): The air motor is rotating in a right-handed direction.
- Release the trigger (12): the air motor stops.
- Again press the trigger (12) down to the first level: The air motor rotates in a right-handed direction.
- Push the trigger (12) right through and hold (second level): The mandrel is pulled to the rear; the air motor stops.
- Release the trigger (12): the air motor rotates to the left; the mandrel moves forward.
- Gently tap the trigger (12): The air motor stops.
- Push button (6.2): The air motor rotates towards the left.
- Gently tap the trigger (12): The air motor stops.





Setting blind rivet nut

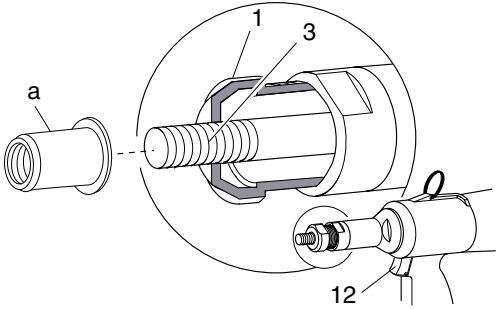
Attention Material damage! Under no circumstance may the blind rivet nuts be riveted several times (re-riveting). This could damage the riveting tool and the work piece.

Attention Material damage! Always position the riveting tool at right angles (90°) on the work piece to be riveted. Inclined bedding leads to erroneous riveting or damage to the mandrel.

Note Use bore size (ød1) in the catalogue information of the manufacturer or calculate it according to the following formula:

ød1= ød+(0.1-0.2)mm

Attention Material damage! If the diameter of the bore is too large of if the bore is oval, faulty rivetings will result.

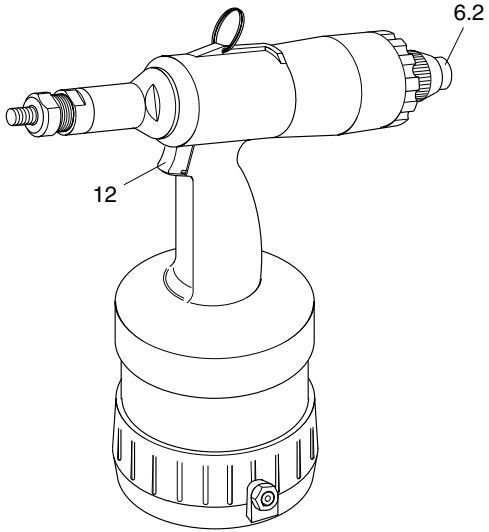


→ **Note** Apply a little acid-free oil to mandrel (3) so the blind rivet nut can be screwed on and off smoothly

- Place the blind rivet nut (a) on mandrel (3).
- Gently press the trigger (12) down and hold (first level): Blind rivet nut screwed on automatically by right-handed rotation of the air motor.

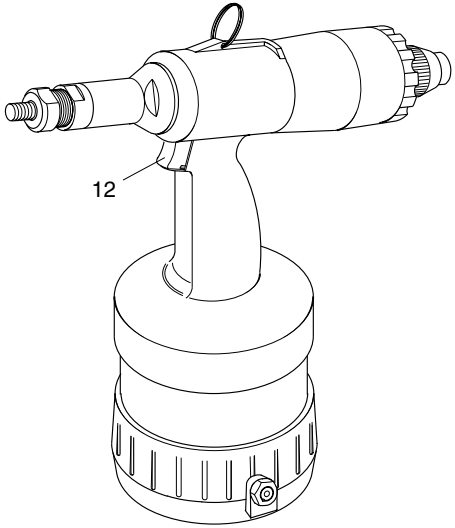
→ **Note** The right-handed rotation stops automatically when the head of the blind rivet nut (a) lies on the nose piece (1)

- Insert the screwed on blind rivet nut (a) into the prepared bore (not illustrated).
- Push the trigger (12) through as far as possible and hold; the rivet shaft is upset thereby fastening the blind rivet nut.
- Release the trigger (12): The device goes into left-handed rotation automatically; the mandrel is screwed out of the blind rivet nut.
- Tap the trigger (12): The left-handed rotation stops.



Trigger left-handed rotation manually

- Connect the air supply.
- Push the button (6.2):
  The air motor rotates in the left-handed direction.
- Quickly touch the trigger (12):
  The air motor stops.



Maintaining the riveting tool

Caution Hazard of injury if handled in an improper manner! Servicing, maintenance and repairs of the riveting tools must be carried out professionally. On completing this work, there should not be any more hazard to the operator, if used as per the regulations. The operator may only carry out the operations mentioned here.

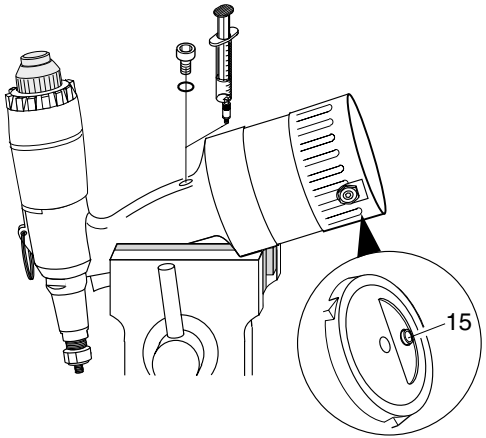
Bleeding the hydraulic section

It is necessary to bleed the hydraulic section or to refill the hydraulic oil when:

— oil is leaking from defective O-rings,
— after an oil-change at the time of an overhaul
(either after a maximum of 3 years, or after 2000 working hours).

Attention Material damage!Immediately replace defective sealings. Maintenance and service work not described in this operating manual may only be carried out by trained specialists following instruction by TITGEMEYER on the basis of the service instructions which also exist. See the address on page 42 for more information on service instructions and training.

- Detach the compressed air connection.
- Tap trigger (12): You will bleed the inside of the compressed air systems; pistons are in a neutral position.



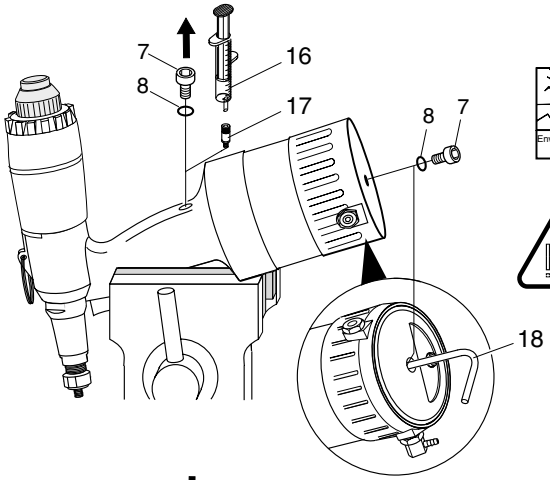
→ **Note** Before you fill up the hydraulic oil you must bleed the hydraulic section (see “Bleeding the hydraulic section” on page 29)

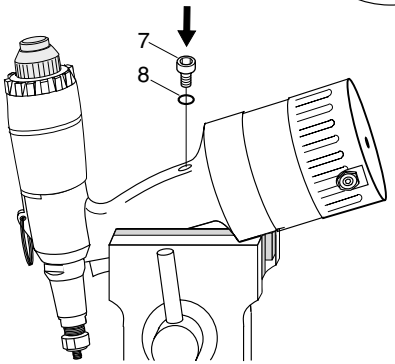
→ **Note** If you clamp the riveting tool into a vice, then insert a soft material in-between (Alu/ wood)

- Tilt the riveting tool forwards and secure it, e.g. in a vice (see illustration).

This position is critical, where the trapped air can escape when necessary (bleeding the hydraulic section).

- Adjust operating stroke to maximum stroke turn stroke adjustment screw (15) out in direction + all the way to the limit stop) (see Page 19 “Adjusting stroke (H)”).





Refilling hydraulic oil

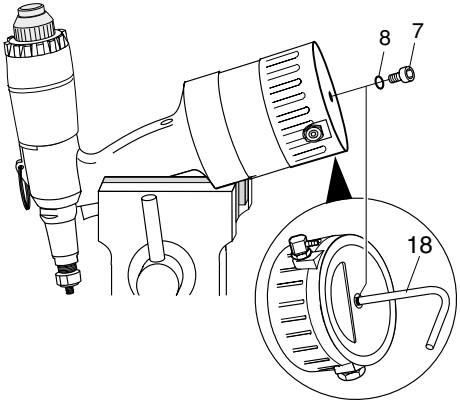
Attention Environmental hazard! Always use a large bowl for collecting oil. Please observe all the environmental regulations prevalent in the respective area.

Attention Material damage! Do not let the O-ring (8) be damaged. If the O-ring gets damaged, then replace immediately.

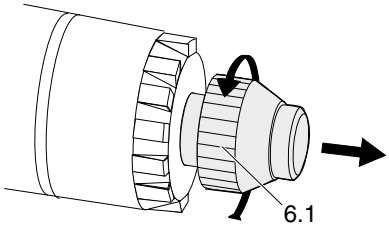
- Unscrew the socket head screw (7) in the hydraulic housing carefully, using the internal hex key SW4 (19).
- Screw the oil refill adapter screw (17) into the free opening.
- Set the filled oil gun (16).
- Screw socket head screw (7) out of the device floor with the internal hex key SW4 (19).
- Insert the crank (18) into the free opening and screw up to the limit.
- Pull crank (18) out until the marking is flush with the floor plate.

Note By this piston movement hydraulic oil (e.g. ELFOLNA 46 or equivalent) is drained into the hydraulic area from the plugged in oil gun

- Press oil gun (16) remove and screw out oil refill adapter screw (17).
- Screw socket head screw (7) with O-ring (8) into hydraulic housing and tighten with internal hex key SW4 (19) (see page 33 “Table for torque values”).

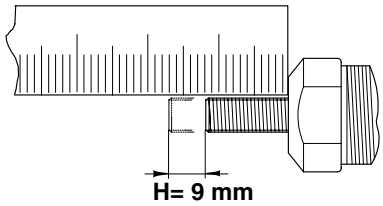


- Screw crank (18) out.
- Screw socket head screw (7) with O-ring (8) into device floor and tighten with internal hex key SW4 (19) (see page 33 “Table for torque values”).
- Rub the riveting tool dry.
- Adjust operating stroke corresponding to application (see pages 23/ 24 “Table stroke adjustment dependent on the grip range”).



Attention Too narrow clearance can cause damage to material If you do not know the stroke setting, unscrew the adjustment screw (6.1) a few turns (ca. 6 mm).

Note The maximum working stroke may only vary between ± 0.2 mm. If the maximum working stroke is too narrow, you must fill up the hydraulic oil.



- Reconnect the air supply.

- Carry out work cycle without blind rivet nut.
  The maximum working stroke (ca. 9 mm) must be available.

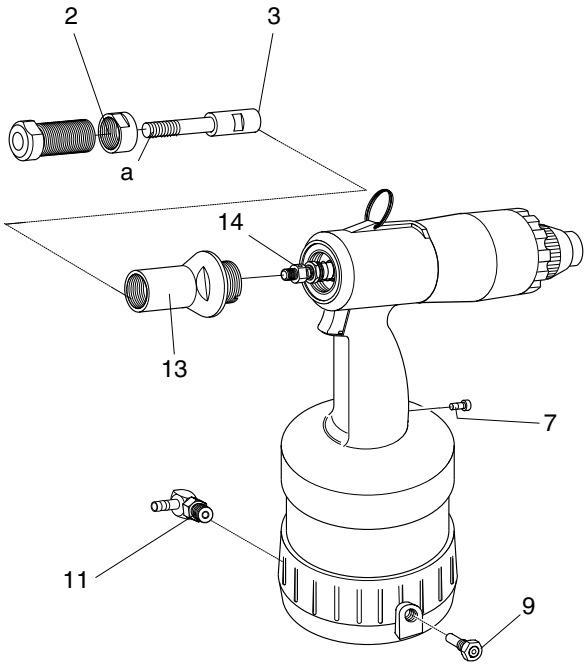


Table for torque values

In the following table, you will find torque values, which you are required to adhere to while tightening the screws/ nuts.

Pos.	Name	Threading	Torque value MA in Nm
2	Lock nut	Metrical M18	10
3	Mandrel	Metrical M8	7
7	Socket head screw (also in the device floor)	Metrical M6	4
9	Safety valve	Withworth-pipe-thread 1/4”	20
11	Swivel joint	Withworth-pipe-thread 1/4”	20
13	Nose cap	Metrical M27	20
14	Lock nut	Metrical M8	7

a = thread without instructions for a tightening torque

Servicing and cleaning the riveting tool

Caution Hazard of injury if handled in an improper manner! On completing this work, there should not be any more hazard to the operator, if used as per the regulations. The operator may only carry out the operations mentioned here. Maintenance and service work not described in this operating manual may only be carried out by trained specialists following instruction by TITGEMEYER on the basis of the service instructions which also exist. See the address on page 42 for more information on service instructions and training.
Hazard of injury if the riveting tool falls down! The hydaulic housing must always be kept dry, clean and oil- and fat-free.

Attention Material damage due to corrosion! Do not use any highly active cleaning agents or combustible liquids for cleaning purpose!

The following routine is recommended:
Grease the mandrels with a drop of non-corrosive oil at regular intervals (see page 35 “Maintenance Intervals”).
The riveting tool must be cleaned and checked for mechanical defects as per the respective application type.
After the riveting tool has been cleaned and when it is to be stored for a longer period of time, lightly grease all metal outside components with non-corrosive grease.

Maintenance Intervals

Intervall	Activity	How?	Who?	Remark
Daily before use	Check nose piece and mandrel for wear and tear	Visual check	Operator	—
Daily before use	Check the riveting tool for wear	Visual check/ Functional check	Operator	Replace nose piece, mandrel respectively, if necessary
Daily before use	Check the air discharged from the tool	Visual check, remove dirt	Operator	Only specialists should change the worn parts
Daily before use	Check for oil leaks from the riveting tool	Visual check, if necessary refill the oil, bleed the hydraulic system	Operator	Do maintenance work when required
Daily after use	Oil mandrel thread	Grease the thread with a drop of non-corrosive oil	Operator	—
Daily after use	Clean riveting tool	With a rag	Operator	—
Daily after use	Oil moving parts (not Trigger (12))	With acid-free oil e.g. ELFOLNA 46	Operator	—
Every 300 rivetings/ 25 operating hours	Check the stroke setting	Measuring stroke (H)	Operator	Readjust the nose piece after every stroke adjustment
Every 5-10 000 rivetings/ 500 operating hours	Change the hydraulic oil	With acid-free oil e.g. ELFOLNA 46	Professional	Oil changes should only be carried out by specialists

Trouble shooting

Operations, which may be carried out by the operator, are marked with the letter **O**.
Work which may only be carried out by a specialist is identified with the letter **P**.

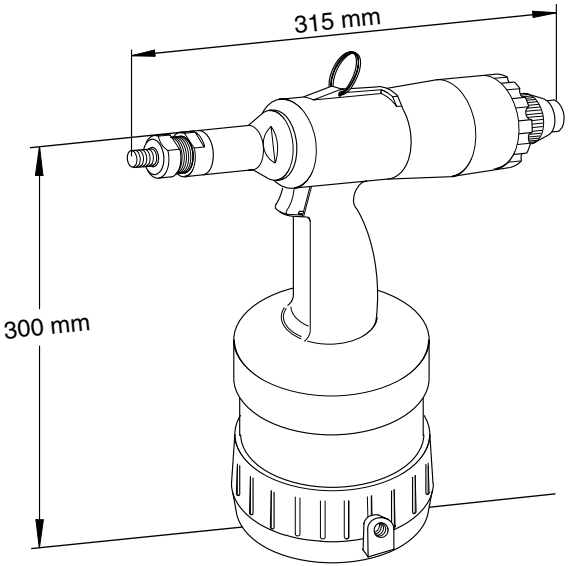
Caution Hazard of injury! In any case, keep the compressed air supply detached till the source of the problem is eliminated.

Attention Material damage! The work marked by the letter **O** should only be carried out by trained specialists with the aid of the service instructions. Alternatively the tool should be sent for overhauling.
Any replacement of original spare parts may be carried out only by well-trained experts.

Note After every instance of problem-removal, a thorough functional check must be carried out

Problems	Cause	Solution
Blind rivet nut is not, respectively not correctly riveted	Supply of compressed air is too rare	(**O**) Check compressed air supply (**O**) Set the air at the maintenance level of 6 bar (**P**) If the operating pressure is o.k., send the riveting tool for overhauling
	Stroke (H) is not correct	(**O**) Readjust Stroke (H) (see page 19)
	Oil deficiency	(**O**) Fill up the oil (see page 29)
Safety valve gets blown off	Compressed air pressure is too high	(**O**) Check and adjust compressed air setting
	Valve is defective	(**O**) Replace safety valve
Excessive loss of oil from riveting tool	Leaking and worn joints	(**P**) Have trained specialists repair the riveting tool or send it for overhauling
Air bubbles in the hydraulic system	O-ring is leaking Not correctly vented/ bled	(**O**) Bleed the hydraulic section (see page 29 “Maintaining the riveting tool”) (**P**) Detect leakage (refer to corrective maintenance)
Loss of hydraulic oil due to leakage	Defective O-rings in the riveting tool	(**O**) Detect leakage (**O**) Change O-ring (8) (**P**) Send the riveting tool for overhauling

Problems	Cause	Solution
Air motor does not rotate to the left.	Supply of compressed air is too rare	(**O**) Check the air supply (**O**) Set the air at the maintenance level of a maximum of 7 bar
	Falsely adjusted adjustment screw (6.1)	(**O**) Readjust the adjustment screw (6.1)
	Oil deficiency	(**O**) Refill the oil (see page 31)
Air motor does not rotate to the right	Supply of compressed air is too rare	(**O**) Check the air supply (**O**) Set the air at the maintenance level of a maximum of 7 bar
	Valve thread worn or O-ring defect.	(**P**) Test the parts and change them if necessary, or send the riveting tool to be overhauled.
	Unclean air, pollution of the air flow in the valve slide	(**P**) Remove the valve slide and clean or send the riveting tool for overhauling



Disposing of the riveting tool

Ensure that the hydraulic oil is inside the riveting tool. Dispose it off in an environmentally friendly manner.
Send the riveting tool back to the manufacturer in it's original packing, if still available.

Technical data

Type of riveting tool:	MS 100
Height:	300 mm
Width:	315 mm
Weight:	2.9 kg
Operating pressure:	6 bar
Compressed air supply	
Nominal diameter:	DN 6
Power output (at 6 bar):	ca. 24.4 kN
Operating stroke:	ca. 9.0 mm
Air consumption per riveting:	7.0 l
Engine air consumption:	23.3 l/min.
Field of work	
Blind rivet nuts:	M8...M16
Sound emission level	
in the workplace:	L_{PAI}=86dB(A)
Vibration level:	a_{hw}<2.5m/s^2.

Guarantee

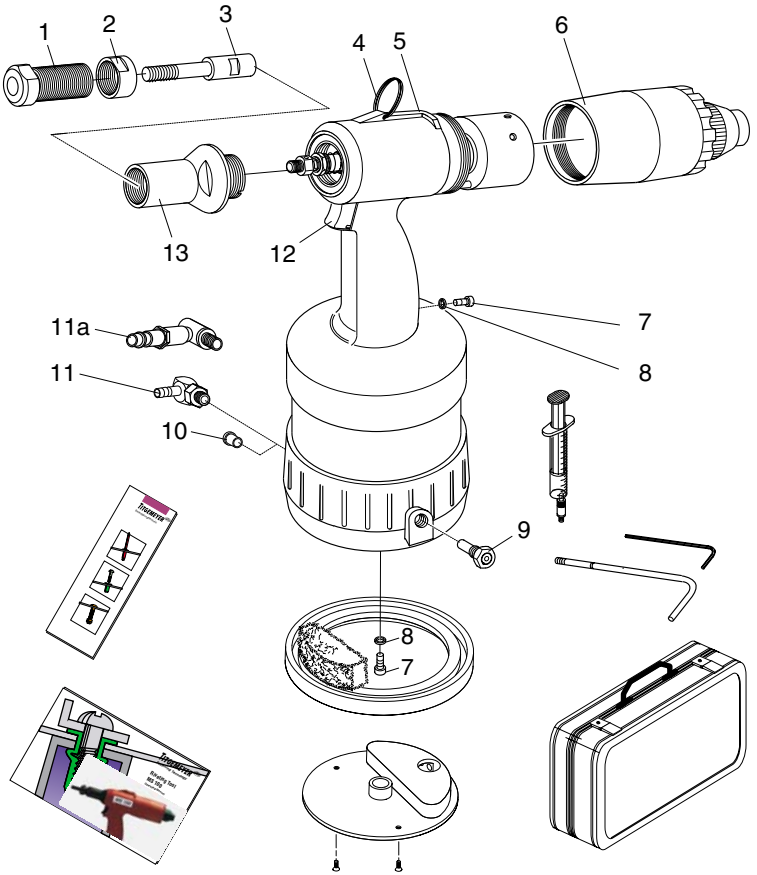
Other than the official guarantee (6 months), the company TITGEMEYER also offers a guarantee of an additional 6 months from the date of purchase (The bill being the proof thereof).
The following working parts are excluded from the guarantee agreement:
— Mandrel (3)
— Nose piece (1)
— Socket head screw (7) with O-ring (8)

List of parts

Note Please mention the name and the GFB code at the time of ordering

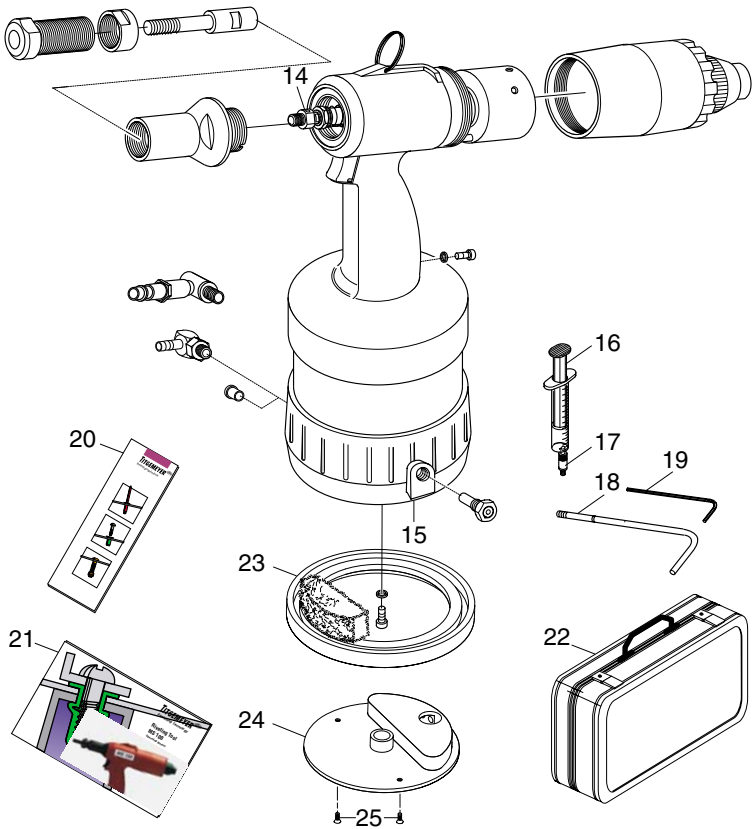
Pos.	Qty.	Name	GFB-Code
		Complete riveting tool	348 300
1.1	1	Nose piece M8	348 318
1.2	1	Nose piece M10	348 320
1.3	1	Nose piece M12	348 322
1.4	1	Nose piece M16	348 326
2	1	Lock nut (will be supplied as a set with the nose piece)	
3.1	1	Mandrel M8	348 308
3.2	1	Mandrel M10	348 310
3.3	1	Mandrel M12	348 312
3.4	1	Mandrel M16	348 316
4	1	Hang-up eyelet	348 237
5	1	Hydraulik housing complete	
6	1	End cap complete	348 337
7	2	Socket head screw M6x6 DIN 7984	348 248
8	2	O-Ring 5x2	348 249
9	1	Safety valve, complete	348 281
10	1	Plug	934 126
11	1	Swivel joint	431 536
11a	1	same with rapid coupling [1]	348 280
12	1	Trigger, complete	
13	1	Nose cap	348 232

[1] If desired, swivel joint with rapid action coupling can be supplied as a special attachment.



List of parts

Pos.	Qty.	Name	GFB-Code
14	1	Lock nut	348 233
15	1	Stroke adjustment screw	
16	1	Oil gun	348 349
17	1	Oil refill adapter screw	348 346
18	1	Crank	348 347
19	1	Internal hex key SW4	348 296
22	1	Hang-up eyelet	348 237
20	1	Info. Brochure Tb 1293	934 110
21	1	Operating manual MS 100 Tb 1308	934 130
22	1	Metal box	934 001 500
23	1	Protection rubber sheet with absorber	385 030
24	1	Cover plate	348 408
25	2	Countersunk head screws	431 589



If you have any problems, if you want to order spare parts or if you require information on service instructions and training:
Gebr. TITGEMEYER GmbH & Co. KG
Hannoversche Straße 97
49084 Osnabrück
Telefon: +49 5 41 5822-0
Telefax: +49 5 41 5822-491
E-Mail: vertrieb-gfb@titgemeyer.com

MS *Gerätebau GmbH*

EC-Conformity Declaration

in accordance with Machine Guidelines
98/37/EG

Make of the machine

Type of tool	**Pneumatic-hydraulic riveting tool**
Model No.	**MS 100**

Has been developed, designed and manufactured
in accordance with the guidelines mentioned herein,
with sole responsibility, by:

MS Gerätebau GmbH
Hannoversche Str. 97
49048 Osnabrück - Germany

The following harmonized norms have been adherred to	pr EN 792-14 (0895)
EC-Guideline	98/37/EG
We, as manufacturers, declare	The products mentioned aboe comply with the requirements of the said guidelines and norms.

In addition to this, the manufacturing process is
also subject to a certified quality-management
system as per DIN EN ISO 901.

Osnabrück, 12.01.2000

G. Chr. Titgemeyer
Proprietor

TITGEMEYER Tb1308GB(0102)1

TITGEMEYER GTO

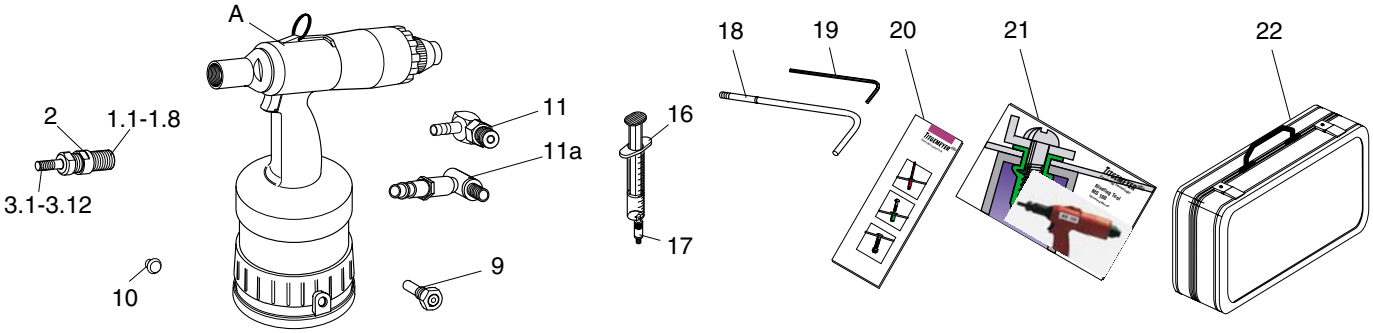
Fastening Technology

Gesellschaft für Befestigungstechnik
GEBR. TITGEMEYER GmbH & Co. KG
Hannoversche Straße 97 · 49084 Osnabrück
Postfach 43 09 · 49033 Osnabrück
Tel. +49 (0)5 41/58 22-0 · Fax +49 (0)5 41/58 22-491
E-Mail: vertrieb-gfb@titgemeyer.com · Web: www.titgemeyer.com

TÜV CERT ISO 9001

Checklist of the MS 100

Please check if all the contents mentioned below are there in the package. All the parts indicated with an arrow must be present in the quantity mentioned.



Note The diagram shows the possible contents

GFB-No.	Pos.	Name	Qty.	available
348 300	A	Compl. Riveting Tool	.....	❑
348 318	1.1	Nose piece M8	.....	❑
348 320	1.2	Nose piece M10	.....	❑
348 322	1.3	Nose piece M12	.....	❑
348 326	1.4	Nose piece M16	.....	❑
		Optional parts nose pieces:		
348 369	1.5	UNC 5/16”-18/ UNF 5/16”-24	.....	❑
348 370	1.6	UNC 3/8”-16/ UNF 3/8”-24	.....	❑
348 371	1.7	UNC 7/16”-14/ UNF 7/16”-20	.....	❑
348 372	1.8	UNC 1/2”-13/ UNF 1/2”-20	.....	❑
	2	Lock nut (will be supplied as a set with the nose piece)	.....	❑
348 308	3.1	Mandrel M8	.....	❑
348 310	3.2	Mandrel M10	.....	❑
348 312	3.3	Mandrel M12	.....	❑
348 316	3.4	Mandrel M16	.....	❑
		Optional parts mandrels:		
348 373	3.5	UNC 5/16”-18	.....	❑
348 374	3.6	UNC 3/8”-16	.....	❑
348 375	3.7	UNC 7/16”-14	.....	❑
348 376	3.8	UNC 1/2”-13	.....	❑
348 377	3.9	UNF 5/16”-24	.....	❑
348 378	3.10	UNF 3/8”-24	.....	❑
348 301	3.11	UNF 7/16”-20	.....	❑
348 379	3.12	UNF 1/2”-20	.....	❑
348 281	9	Compl. safety valve	.....	❑
934 126	10	Plug	.....	❑
348 280	11	Swivel joint	.....	❑
431 536	11a	Swivel joint	.....	❑
348 349	16	Oil gun	.....	❑
348 346	17	Oil refill adapter screw	.....	❑
348 347	18	Crank	.....	❑
348 296	19	Internal hex key SW4	.....	❑
934 110	20	Info. brochure Tb 1293	.....	❑
932 130	21	Oper. Manual MS 100 Tb 1308		
934 109 000		german	.....	❑
		.....	.....	❑
934 001 500	22	Metal box	.....	❑

Special parts such as:
- extended nose pieces
- extended mandrels

can be supplied upon request.