

# FROMM

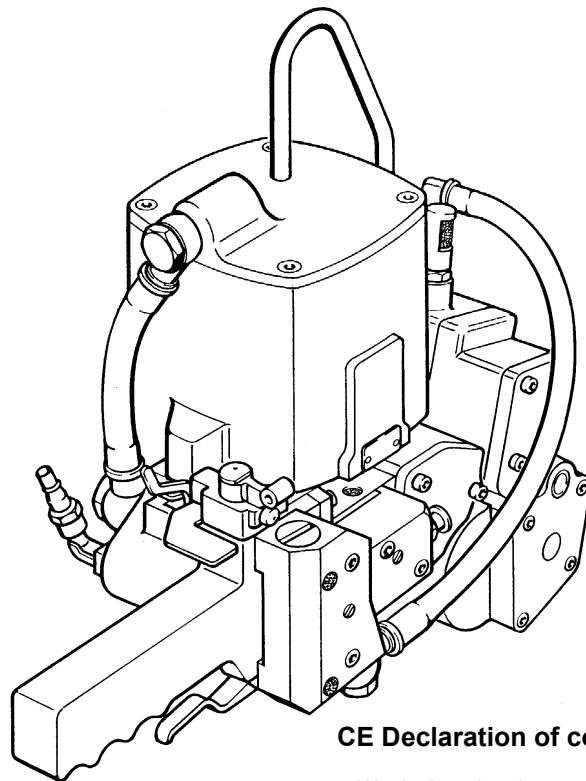
OPERATION MANUAL / SPARE PARTS LIST

## PNEUMATIC STEEL STRAPPING TOOL

**AUTOMATIC**

**MODEL A380.0003**

13.6285.01



### CE Declaration of conformity

We declare that the machine A380  
is in conformity with the following standard or  
standardised documents:

98/37/EEC

FROMM Holding AG  
Hinterbergstrasse 26  
CH - 6330 Cham  
13.07 2004

A handwritten signature in black ink, appearing to read 'R. Fromm'.

R.Fromm  
Director



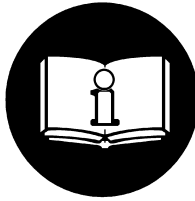
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# 1 SAFETY INSTRUCTIONS

Read these instructions carefully. Failure to follow these instructions can result in severe personal injury.



## Eye injury hazard

Failure to wear safety glasses with side shields can result in severe eye injury or blindness. Always wear safety glasses with side shields which conform to ANSI Standard Z87.1.



## Operation

Tool must not be used by persons not properly trained in their use. Before tensioning strap, read and understand the tool operating instructions. Failure to follow the operating instructions or improper load positioning could result in strap breakage. Become familiar with your tool and keep fingers away from areas that can pinch or cut.

## Joints

You are fully responsible to review the joints made by your tool. Become familiar with the seal control and seal adjustment described in this operation manual. Misformed joints may not secure the load and could cause serious injury. Never handle or ship any load with improperly formed joints.

## Dispensing strap

Only dispense strap from a dispenser specifically designed for strap. Tuck strap end back into dispenser when not in use.

## Protective gloves

When handling strap, always wear protective gloves.



## Strap warnings

Never use strap as a means of pulling or lifting loads. Failure to follow these warnings can result in severe personal injury.

## Strap breakage hazard

Improper operation of the tool, excessive tensioning, using strap not recommended for this tool or sharp corners on the load can result in a sudden loss of strap tension or in strap breakage during tensioning, which could result in the following:

- A sudden loss of balance causing you to fall.
- Both tool and strap flying violently towards your face.

Note as follows:

- If the load corners are sharp, use edge protectors.
- Place the strap correctly around a properly positioned load.
- Positioning yourself in-line with the strap, during tensioning and sealing, can result in severe personal injury from flying strap or tool. When tensioning or sealing, position yourself to one side of the strap and keep all bystanders away.
- Use the correct strap quality, strap width, strap gauge and strap tensile strength recommended in this manual for your tool. Using strap not recommended for this tool can result in strap breakage during tensioning.

## Cutting tensioned strap

When cutting strapping, use the proper strapping cutter and keep other personnel and yourself at a safe distance from the strap. Always stand to side of the strap, away from the direction the loosened strap end will fly. Use only cutters designed for strap and never hammers, pliers, hacksaws, axes, etc.

## Fall hazard

Keep your working area tidy. Untidiness of your working area may cause a risk of injury. Maintaining improper footing and/or balance when operating the tool can cause you to fall. Before tensioning and especially in elevated areas, always establish good balance. Both feet should be securely placed on a flat, solid surface, especially when working in elevated areas. Do not use the tool when you are in an awkward position.

Pay attention to the rules and regulations for preventions of accident which are valid for the work place.

## Tool hazards

A well maintained tool is a safe tool!

Check tool regularly for broken or worn parts. Do not operate a tool with broken or worn parts.

Never modify any tool. Modification can result in severe bodily injury.

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## 2 WARRANTY CONDITIONS AND LIABILITY

FROMM Holding AG warrants all its strapping tools and machine heads during a period of 90 days from the date of sale.

The warranty includes all deficiencies clearly resulting from poor manufacturing or faulty materials. Damage claims as a result of production shutdowns and claims for damage to persons and to property resulting from warranty deficiencies cannot be asserted by the customer.

The warranty excludes:

- wearing parts
- deficiencies resulting from improper installing, incorrect handling and maintaining the tool
- deficiencies resulting from using the tool without or with defective security- and safety devices
- disregard of directions in the operation manual
- arbitrary modifications of the tool
- deficient control of wearing parts
- deficient repair works of the tool
- Use of consumable products not recommended by FROMM Holding AG

We reserve the right to modify the product at any time in order to improve its quality.

## 3 APPROPRIATE USE

The tool model A380 has been designed to strap packages with steel strapping exclusively.

The warranty / liability excludes:

- non appropriate use of the tool,
- disregard of directions in the operation manual,
- disregard of control- and maintenance instructions.

## 4 CHART OF TYPES

### 4.1 A380.0003 (automatic)

Item-No.	Model	Strap width		Strap thickness Uniflex and Ultraflex		Tensioning force		Max. tensioning speed	
		mm	inch	mm	inch	N	lbs.	mm/s	inch/s
13.6275	A380/12.7/0.50-0.63/4.5/A	12.7 mm	1/2	0.50 - 0.63	.020 - .025	4500	1000	320	12.6
13.6276	A380/12.7/0.50-0.63/6.5/A	12.7 mm	1/2	0.50 - 0.63	.020 - .025	6500	1460	220	8.7
13.6285	A380/13/0.50-0.63/4.5/A	13 mm	--	0.50 - 0.63	.020 - .025	4500	1000	320	12.6
13.6286	A380/13/0.50-0.63/6.5/A	13 mm	--	0.50 - 0.63	.020 - .025	6500	1460	220	8.7
13.6296	A380/16/0.50-0.63/4.5/A	16 mm	5/8	0.50 - 0.63	.020 - .025	4500	1000	320	12.6
13.6297	A380/16/0.50-0.63/6.5/A	16 mm	5/8	0.50 - 0.63	.020 - .025	6500	1460	220	8.7
13.6298	A380/16/0.50-0.63/7.5/A	16 mm	5/8	0.50 - 0.63	.020 - .025	7500	1680	180	7.1
13.6324	A380/19/0.50-0.63/6.5/A	19 mm	3/4	0.50 - 0.63	.020 - .025	6500	1460	220	8.7
13.6325	A380/19/0.50-0.63/7.5/A	19 mm	3/4	0.50 - 0.63	.020 - .025	7500	1680	180	7.1
13.6336	A380/20/0.50-0.63/6.5/A	20 mm	--	0.50 - 0.63	.020 - .025	6500	1460	220	8.7
13.6337	A380/20/0.50-0.63/7.5/A	20 mm	--	0.50 - 0.63	.020 - .025	7500	1680	180	7.1

Uniflex = Strap with max. tensile strength of 850 N/mm<sup>2</sup> (123 000 psi)

Ultraflex = Strap with max. tensile strength of 1100 N/mm<sup>2</sup> (160 000 psi)

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## 4.2 Additional available tool types of Model A380

## A380.0002 (semi-automatic)

Item-No.	Model	Strap width		Strap thickness Uniflex and Ultraflex		Max. tensioning force		Max. tensioning speed	
		mm	inch	mm	inch	N	lbs.	mm/s	inch/s
13.6273	A380/12.7/0.50-0.63/4.5	12.7 mm	1/2	0.50 - 0.63	.020 - .025	4500	1000	320	12.6
13.6274	A380/12.7/0.50-0.63/6.5	12.7 mm	1/2	0.50 - 0.63	.020 - .025	6500	1460	220	8.7
13.6283	A380/13/0.50-0.63/4.5	13 mm	--	0.50 - 0.63	.020 - .025	4500	1000	320	12.6
13.6284	A380/13/0.50-0.63/6.5	13 mm	--	0.50 - 0.63	.020 - .025	6500	1460	220	8.7
13.6293	A380/16/0.50-0.63/4.5	16 mm	5/8	0.50 - 0.63	.020 - .025	4500	1000	320	12.6
13.6294	A380/16/0.50-0.63/6.5	16 mm	5/8	0.50 - 0.63	.020 - .025	6500	1460	220	8.7
13.6295	A380/16/0.50-0.63/7.5	16 mm	5/8	0.50 - 0.63	.020 - .025	7500	1680	180	7.1
13.6314	A380/19/0.50-0.63/6.5	19 mm	3/4	0.50 - 0.63	.020 - .025	6500	1460	220	8.7
13.6315	A380/19/0.50-0.63/7.5	19 mm	3/4	0.50 - 0.63	.020 - .025	7500	1680	180	7.1
13.6330	A380/20/0.50-0.63/6.5	20 mm	--	0.50 - 0.63	.020 - .025	6500	1460	220	8.7
13.6331	A380/20/0.50-0.63/7.5	20 mm	--	0.50 - 0.63	.020 - .025	7500	1680	180	7.1

## A380.0004 (semi-automatic)

Item-No.	Model	Strap width		Strap thickness				Tensioning force		Tensioning speed	
				Uniflex		Ultraflex					
		mm	inch	mm	inch	mm	inch	N	lbs.	mm/s	inch/s
13.6516	A380/19/0.70-0.80/7.5	19 mm	3/4	0.70 - 0.80	.028 - .031	0.70 - 0.80	.028 - .031	7500	1680	180	7.1
13.6517	A380/19/0.70-0.80/9.5	19 mm	3/4	0.70 - 0.80	.028 - .031	0.70 - 0.80	.028 - .031	9500	2130	150	5.9
13.6518	A380/19/0.90-1.00/UNI/7.5	19 mm	3/4	0.90 - 1.00	.035 - .040	--	--	7500	1680	180	7.1
13.6519	A380/19/0.90-1.00/UNI/9.5	19 mm	3/4	0.90 - 1.00	.035 - .040	--	--	9500	2130	150	5.9
13.6532	A380/20/0.70-0.80/7.5	20 mm	--	0.70 - 0.80	.028 - .031	0.70 - 0.80	.028 - .031	7500	1680	180	7.1
13.6533	A380/20/0.70-0.80/9.5	20 mm	--	0.70 - 0.80	.028 - .031	0.70 - 0.80	.028 - .031	9500	2130	150	5.9
13.6534	A380/20/0.90-1.00/UNI/7.5	20 mm	--	0.90 - 1.00	.035 - .040	--	--	7500	1680	180	7.1
13.6535	A380/20/0.90-1.00/UNI/9.5	20 mm	--	0.90 - 1.00	.035 - .040	--	--	9500	2130	150	5.9
13.6613	A380/25/0.70-0.80/7.5	25 mm	1	0.70 - 0.80	.028 - .031	0.70 - 0.80	.028 - .031	7500	1680	180	7.1
13.6614	A380/25/0.70-0.80/9.5	25 mm	1	0.70 - 0.80	.028 - .031	0.70 - 0.80	.028 - .031	9500	2130	150	5.9
13.6615	A380/25/0.90-1.00/UNI/7.5	25 mm	1	0.90 - 1.00	.035 - .040	--	--	7500	1680	180	7.1
13.6616	A380/25/0.90-1.00/UNI/9.5	25 mm	1	0.90 - 1.00	.035 - .040	--	--	9500	2130	150	5.9

## A380.0005 (automatic)

Item-No.	Model	Strap width		Strap thickness				Tensioning force		Tensioning speed	
				Uniflex		Ultraflex					
		mm	inch	mm	inch	mm	inch	N	lbs.	mm/s	inch/s
13.6526	A380/19/0.70-0.80/7.5/A	19 mm	3/4	0.70 - 0.80	.028 - .031	0.70 - 0.80	.028 - .031	7500	1680	180	7.1
13.6527	A380/19/0.70-0.80/9.5/A	19 mm	3/4	0.70 - 0.80	.028 - .031	0.70 - 0.80	.028 - .031	9500	2130	150	5.9
13.6528	A380/19/0.90-1.00/UNI/7.5/A	19 mm	3/4	0.90 - 1.00	.035 - .040	--	--	7500	1680	180	7.1
13.6529	A380/19/0.90-1.00/UNI/9.5/A	19 mm	3/4	0.90 - 1.00	.035 - .040	--	--	9500	2130	150	5.9
13.6538	A380/20/0.70-0.80/7.5/A	20 mm	--	0.70 - 0.80	.028 - .031	0.70 - 0.80	.028 - .031	7500	1680	180	7.1
13.6539	A380/20/0.70-0.80/9.5/A	20 mm	--	0.70 - 0.80	.028 - .031	0.70 - 0.80	.028 - .031	9500	2130	150	5.9
13.6540	A380/20/0.90-1.00/UNI/7.5/A	20 mm	--	0.90 - 1.00	.035 - .040	--	--	7500	1680	180	7.1
13.6541	A380/20/0.90-1.00/UNI/9.5/A	20 mm	--	0.90 - 1.00	.035 - .040	--	--	9500	2130	150	5.9
13.6617	A380/25/0.70-0.80/7.5/A	25 mm	1	0.70 - 0.80	.028 - .031	0.70 - 0.80	.028 - .031	7500	1680	180	7.1
13.6618	A380/25/0.70-0.80/9.5/A	25 mm	1	0.70 - 0.80	.028 - .031	0.70 - 0.80	.028 - .031	9500	2130	150	5.9
13.6619	A380/25/0.90-1.00/UNI/7.5/A	25 mm	1	0.90 - 1.00	.035 - .040	--	--	7500	1680	180	7.1
13.6620	A380/25/0.90-1.00/UNI/9.5/A	25 mm	1	0.90 - 1.00	.035 - .040	--	--	9500	2130	150	5.9

Uniflex = Strap with max. tensile strength of 850 N/mm<sup>2</sup> (123 000 psi)

Ultraflex = Strap with max. tensile strength of 1100 N/mm<sup>2</sup> (160 000 psi)

## 5 TECHNICAL DATA

### Dimensions without suspension bracket

	Tool	Package
Length:	420 mm / 16.5"	440 mm / 17.3"
Width:	170 mm / 6.5"	254 mm / 10"
Height:	300 mm / 11.8"	392 mm / 15.4"
Weight:	16.9 kg / 37.3 lbs	1.1 kg / 2.4 lbs

### Compressed air

Joining thread:	min. G 3/8"
Max. air pressure:	6 bar / 87 psi

### Air consumption

Tensioning:	ca. 20 NI / 0.70 cu.ft uncompressed air per second with air motor running
Sealing:	ca. 8.2 NI / 0.29 cu.ft uncompressed air per cycle.

### Steel strap

Width:	12.7 - 20 mm (see chart of types)
Thickness:	0.50 mm - 0.63 mm (see chart of types)
Quality:	Fundamentally the A380 allows the use of all current steel straps with tensile strengths ranging from 700 to 1100 N/mm <sup>2</sup> / 100 000 - 160 000 psi (see chart of types). Straps with a low breaking elongation are not suitable for the A380 tool.

### Joint strength

Approx. 80% of the strap's tensile strength

### Sound information

The A-weighted equivalent continuous sound level at the work place of the machine operator is typical 76 dB (A).  
This value was determined according to DIN 45 635 T3 (11.85).

### Vibration information

The weighted effective value of the acceleration typically amounts to less than 2,5m/s<sup>2</sup>.  
This value was determined according to DIN EN 28 662 T1 (01.93).

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## 6 INSTALLATION

### Compressed air connection

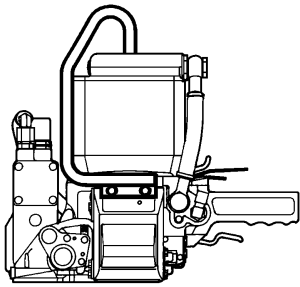
The compressed air should be connected to the tool preferably by a quick disconnecter.

It is very important to clean the compressed air with an air unit consisting of a separator for water and dirt, a pressure regulator with a manometer and a lubricator.

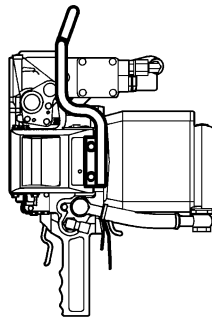
The maximum length of the air tube between air unit and tool has to be 5 m / 15 ft.

### Suspension of tool

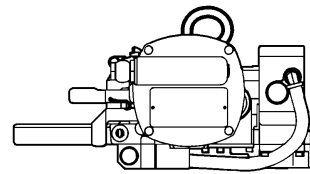
It is possible to suspend the tool on a balancer using one of the various suspension brackets available. Depending on the application of the tool the appropriate suspension bracket is mounted.



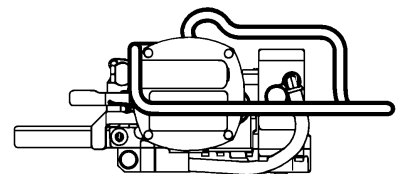
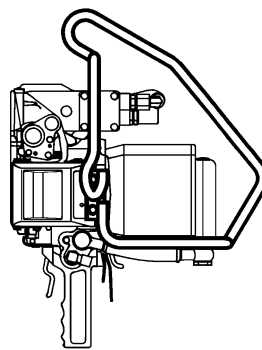
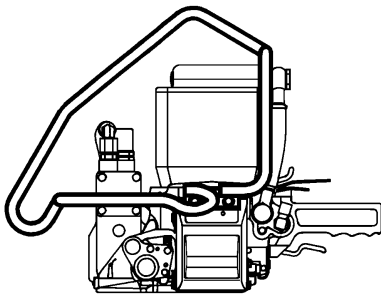
NORMAL  
A38.1431



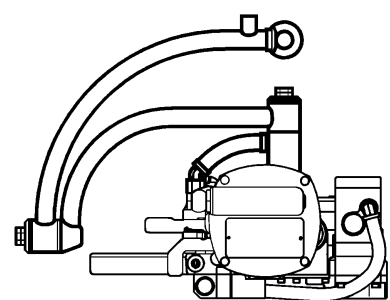
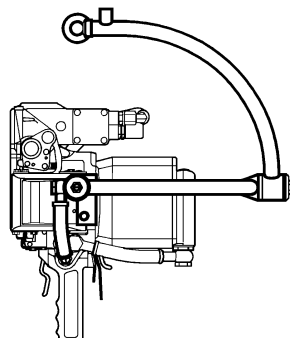
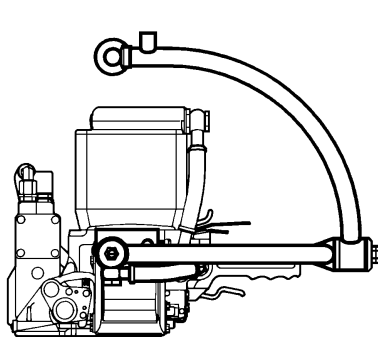
VERTICAL  
A38.1428



HORIZONTAL  
A38.1408



NORMAL, VERTICAL, HORIZONTAL  
A38.1434



NORMAL, VERTICAL, HORIZONTAL  
A38.1411 (incl. air supply)

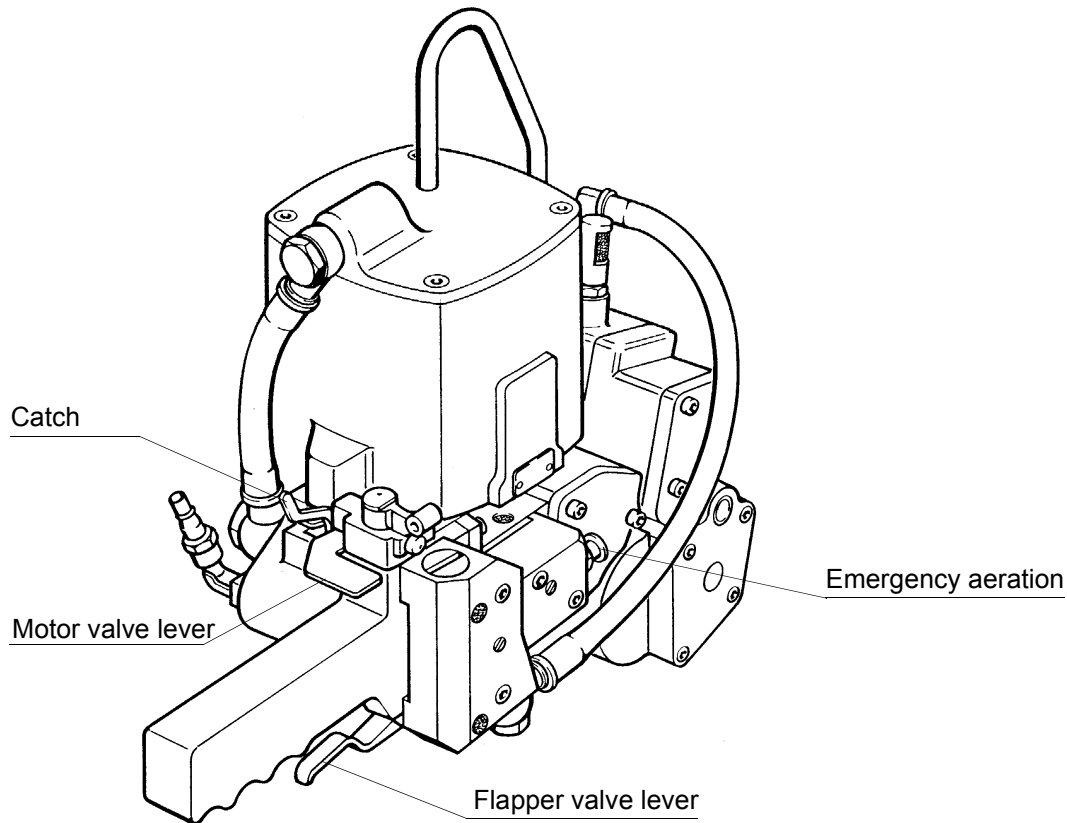
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## 7 OPERATING CONTROLS



## 8 OPERATING

### 8.1 Feeding the strap around the package

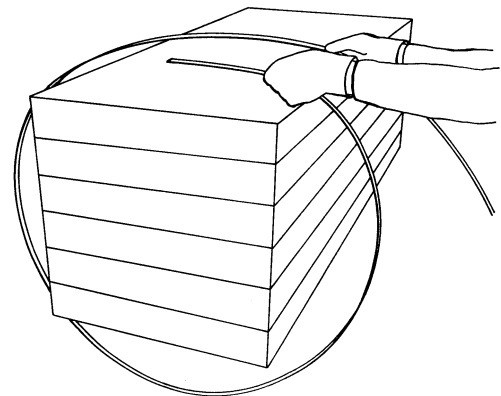
The strap is fed around the package in the direction as shown in the illustration. The end of the strap is held tightly with the left hand and pulled firmly towards the operator with the right hand.



Always wear safety glasses with side shields which conform to ANSI Standard Z87.1.

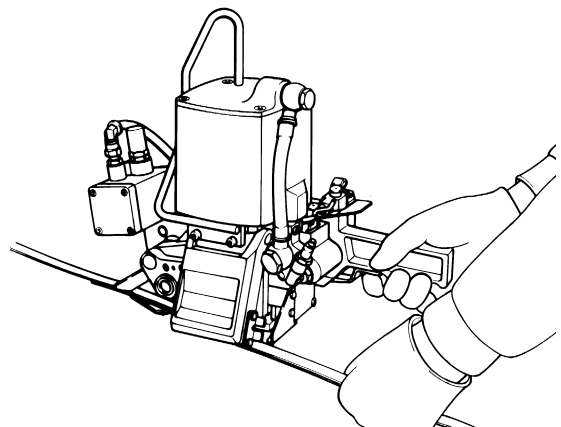


When handling strap, always wear protective gloves.



### 8.2 Loading the strap

- Lift and hold the flapper valve lever with the index finger of the right hand.
- The left hand inserts the two straps lying precisely upon another into the tool until they hit the strap stops.
- The lower strap end must slightly protrude the end of the base plate.
- Release the flapper valve lever; the flapper closes and the feed wheel is lowered to the strap.



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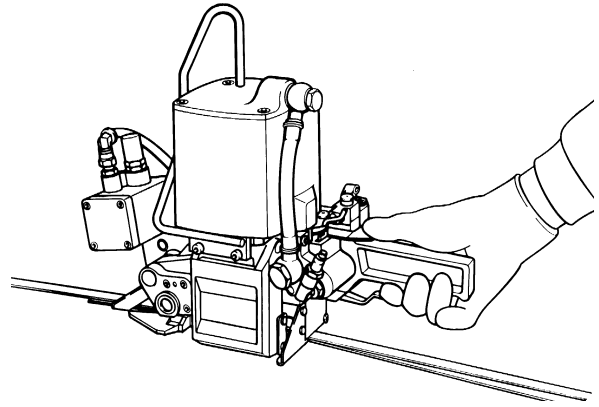
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### 8.3 Tensioning and sealing the strap

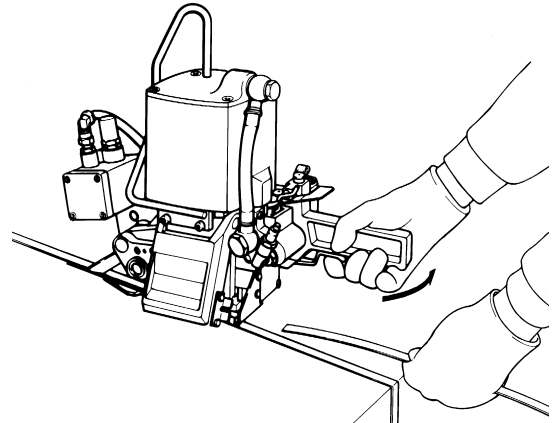
- Hold the strap which is reeled off from the strap coil with the left hand and press down with the thumb of the right hand the motor valve lever so that the catch locks.
- Let the tool tension and seal until the strap is cut off.

If the tensioning cycle has to be interrupted (faulty strap, applying of corner protection angles) release the catch.



### 8.4 Removing the tool from tensioned strap

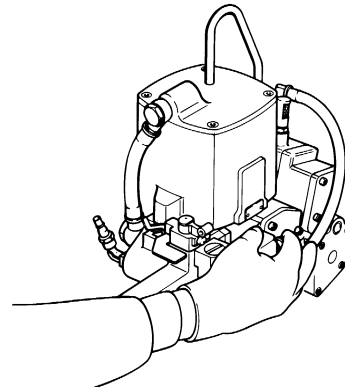
- Hold the cut strap end firmly with your left hand.
- Lift the flapper valve lever with the right hand and push the tool hard to the right from the tensioned strap.
- Release the flapper valve lever.



### 8.5 Emergency release of the sealing cycle

Particularly in cases where the air pressure is less than 5 bar/71 psi it is possible that after a relatively long working interruption the sealing operation is not released automatically.

Through a short operation of the emergency aeration the sealing cycle is activated.



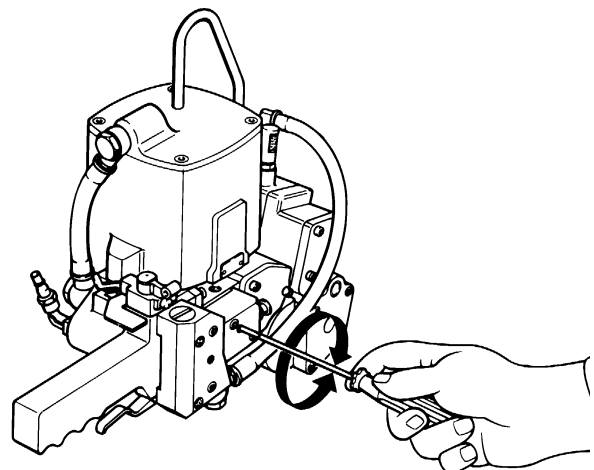
## 9 ADJUSTMENT OF AUTOMATIC SEQUENCE

The tools are adjusted in our works; thus a readjustment should only be made under exceptional circumstances.

### Adjustment of the sealing dwell time

Depending on the strap dimension and the type of strap resp. as well as on the air pressure situation a shorter or longer sealing dwell time (time from switching point to strap cut-off) is required. The adjustment of the sealing dwell time is made on the lateral throttle screw:

- Turning the lateral throttle screw in a clockwise direction closes the throttle and extends the sealing dwell time.
- Turning the lateral throttle screw in a counter clockwise direction opens the throttle and reduces the sealing dwell time



## 10 SEAL CONTROL

A regular control of the seal is necessary. The seal can be checked visually and the person controlling can easily judge the quality of the seal. When checking the seal the following illustrations must be compared.

### Correct seal

A correct seal must conform to the illustration. This means that the depth with which the upper strap hooks into the lower one must be 1 – 1.5 mm (0.039 – 0.059") in min. and must not exceed 2 mm (0.079"). The upper strap must be sheared clean and the cutter must not leave scratch marks on the lower strap.



### Incorrect seal (the sealing mechanism is adjusted too high)

This stamped seal is not deep enough and the upper strap is not sheared. The tensile strength of this seal is insufficient and the strapping must be taken away from the package. The tool must be readjusted immediately (see SEAL ADJUSTMENT).



### Incorrect seal (the sealing mechanism is adjusted too low)

This stamped seal is too deep and the lower strap is scratched by the cutter. Although the tensile strength of this seal is sufficient the strapping must be taken away from the package because of the scratched lower strap. The tool must be readjusted immediately (see SEAL ADJUSTMENT).



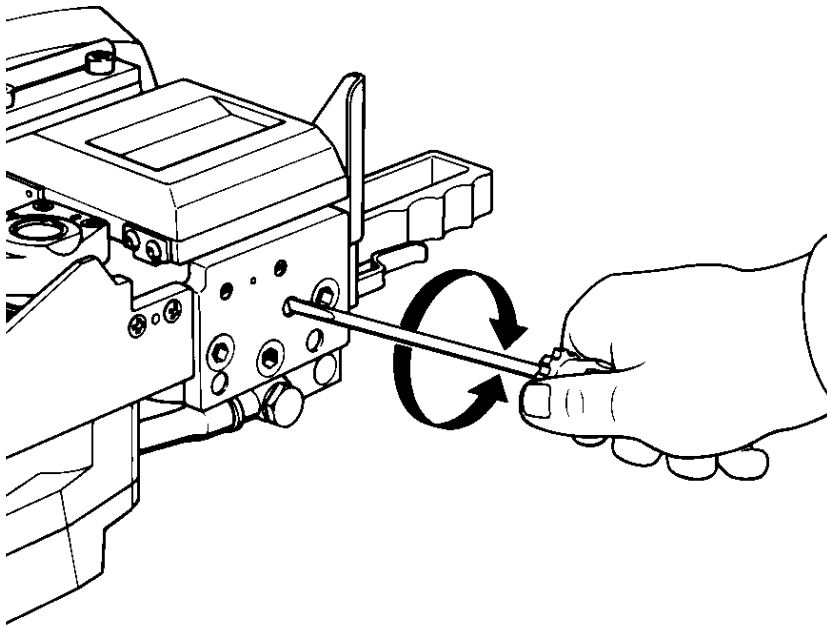
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## 11 SEAL ADJUSTMENT

The depth of the sealing mechanism and the cutter can be steplessly adjusted by turning the adjusting screw with a screw driver.



### Sealing depth is excessive

Turn adjusting screw clockwise. A turn of 90° equals a stroke correction of 0.25 mm / .010".

### Sealing depth is insufficient

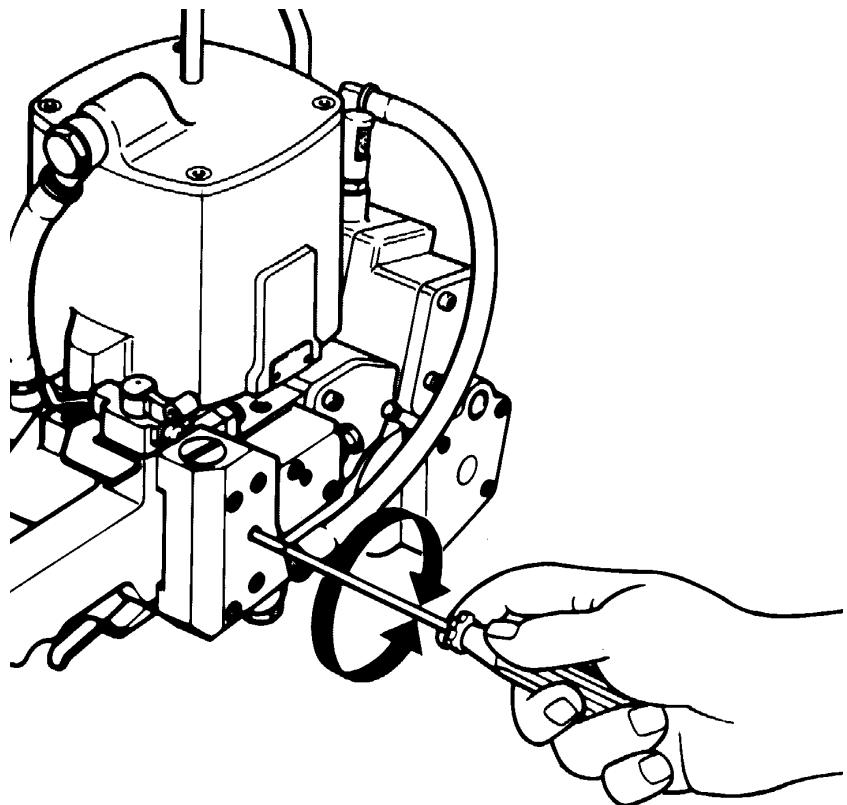
Turn adjusting screw counter-clockwise. A turn of 90° equals a stroke correction of 0.25 mm / .010".

If low gauge and soft straps are used the sealless joint is not always properly formed (the straps do not interlock properly). In order to avoid improper interlocking the timing of the interlock can be influenced by the adjustment of a throttle on the control valve body.

Under normal conditions the holding air throttle is screwed flush into the outside of the control valve body. If the straps do not interlock properly (one or two notches do not interlock at all) the throttle has to be turned in a clockwise direction.

#### Attention!

Adjust holding air throttle in such a way that no tension marks on the bottom of the seal caused by the punch will be noticed. If marks are noticed the punch might wear prematurely.



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## 12 MAINTENANCE

Depending on the working conditions and the use of the tool the following maintenance has to be made periodically:

### 12.1 Air-unit

- Checking the air pressure daily
- Checking the oil-level daily
- The water separator must be emptied before it is full (unless automatic)
- The filter has to be cleaned following the instructions of the manufacturer of the air- unit.

### Oil for the air-unit

HL or CL ISO-VG 10

### 12.2 Oil level in the pressure intensifier

#### Control

A proper operation of the tool is only warranted if there is the correct amount of oil in the pressure intensifier. The position of the piston in its idle position reveals whether there is enough, too much or not enough oil in the pressure intensifier. A flawless operation of the tool is guaranteed only if the amount of oil in the pressure intensifier is correct!

If there is too much oil in the pressure intensifier the position of the piston in its idle position is lower than the lower edge of the body (visible when flapper is open). As a result of this faulty position of the piston there is not enough space for the straps and the seal joint resp; it is difficult or impossible to insert the straps into the tool and to remove them from the tool resp..

If there is not enough oil in the pressure intensifier the position of the piston in its idle position is higher than the lower edge of the body (visible when the flapper is open). As a result of this faulty position of the piston there is a risk that the stroke of the piston during the sealing action is too short and consequently the seal joint is not formed properly and the upper strap is not cut entirely in spite of the correct adjustment of the adjusting screw resp..

### Oil for the pressure intensifier in the tool

SAE 20 (for refilling)

### Refilling of oil into the pressure intensifier

Disassembling

Remove following parts before refilling:

- Suspension bracket
- Air connection on cylinder cover
- Cylinder cover
- Piston with plunger
- Pressure spring

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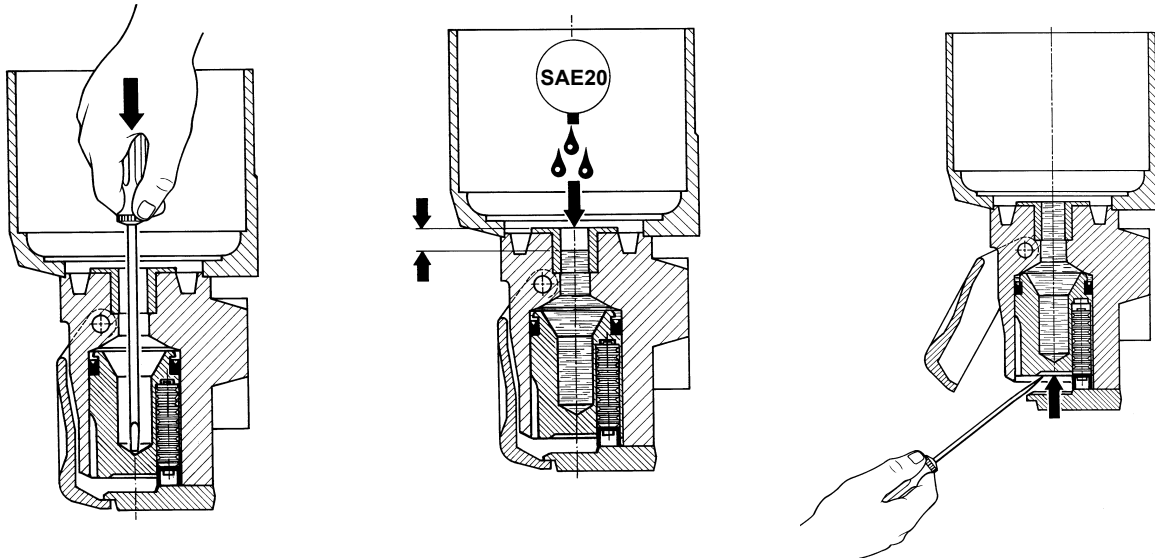
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## Filling procedure

- Push the piston down as far as it stops on the springs package (use a screw driver passing it through the plunger guide).
- Fill oil (SAE 20) to the middle of the plunger seal. Then push the piston up to the upper stop (use a screw driver passing it through the open flapper).
- It is recommended to wait about 10 minutes before assembling in order to let escape air from the oil.



## Assembling

- Grease the O-ring on the cover for holding it in the position.
- Check cleanness of piston, plunger and cylinder bore, grease slightly the mentioned parts.
- Put the pressure spring in, lay the piston with plunger on it and put the cover on the top (pay attention to the air inlet position), prepare the four cover screws and allen-key near at hand.
- Push the cover and the piston against the spring down as far as the cover closes the cylinder. Lock it in the position with two screws.
- Then assemble the remaining parts and tighten the screws firmly.

## End control

Check whether the lower edge of the piston is flush with the lower edge of the body (visible when flapper is open).

## 12.3 Cleaning

If impact of dirt and dust is considerable and if painted straps are used the feed wheel must be cleaned regularly. Normally it is sufficient to blow out this part by using an air gun.

## 12.4 Lubrication

The gear is filled with MOLYKOTE BR 2 PLUS. Use the same type of grease after repairs. When being exchanged, all valve parts and other movable parts have to be greased with grease of type ESSO BEACON 2 or with any equivalent product.

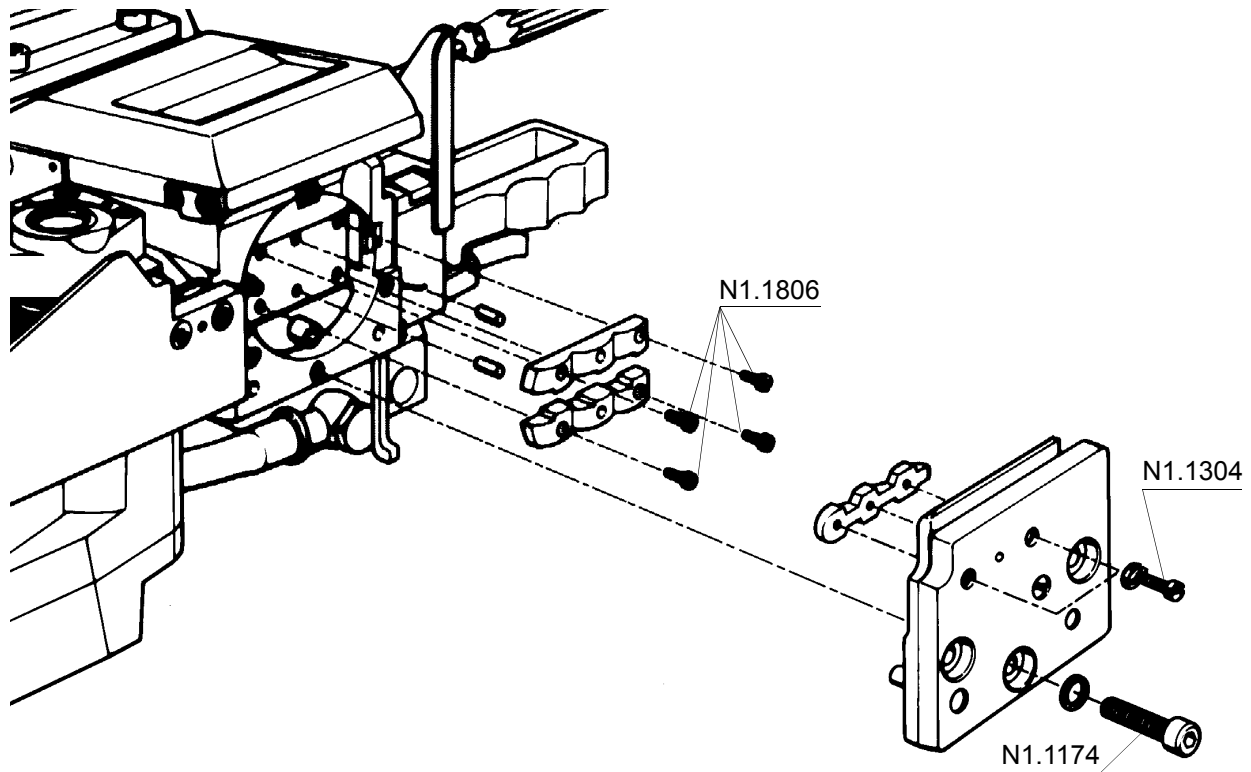
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## 13 EXCHANGE OF WEARING PARTS

### 13.1 Exchange of punch and die halves

If in spite of a correct adjustment of the adjusting screw it is no longer possible to make a proper seal (see seal control) the base plate must be removed and the wear of punch and die halves must be examined. If the cutting edges are destroyed or heavily worn (Attention! The cutting edges of new punches and dies are also rounded slightly) the equivalent parts must be replaced.



### Important!

Make sure that the mounting surfaces are completely free from dirt before the new parts are installed.

After assembling the base plate, the base plate screws must be tightened using a torque wrench with a torque of 90 Nm/66.6 ft lbs

Safe the screws N1.1304 and N1.1806 with Loctite 222.

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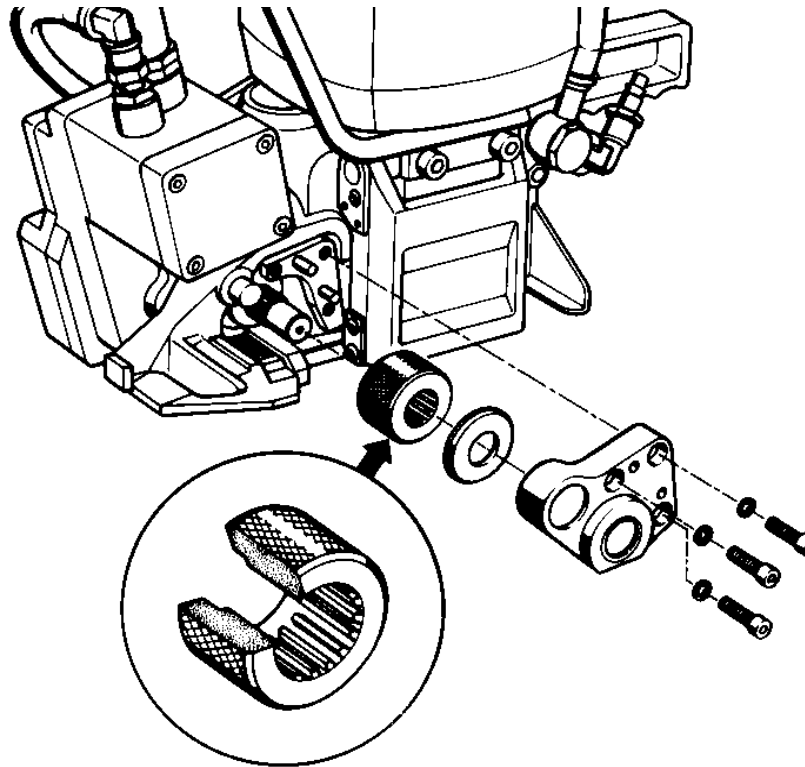
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### 13.2 Exchange of the feed wheel

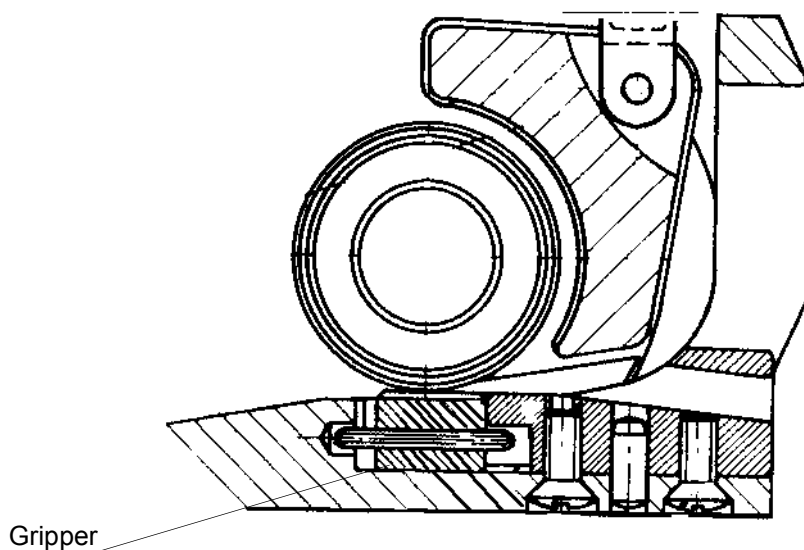
- Remove the three screws and the bearing cover.
- Remove the front distance ring and the feed wheel from the feed wheel shaft.
- Assemble in opposite order.

**Important!**  
 Consider assembling position of the feed wheel



### 13.3 Exchange of the gripper

- Loosen both cross-head screws in the tension body and lift the holder so that the gripper can be removed.
- Clean the groove and firmly retighten the holder after insertion of the new gripper.



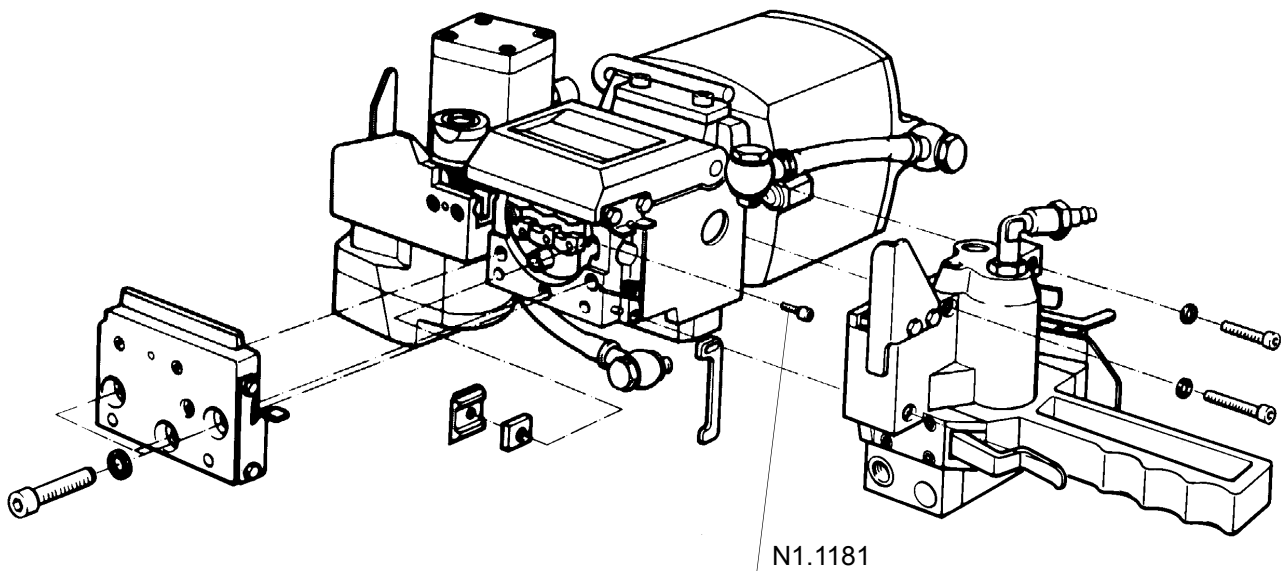
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### 13.4 Exchange of cutter

- Remove base plate and valve body
- Loosen and remove piston screw N1.1181 through the provided boring in the sealer body using a hexagon socket spinner wrench.
- Exchange cutter.
- Assembling in opposite order.

When valve body is mounted, make sure that bending spring N2.5805 is in its correct position.



**Important!**

**Safe screw N1.1181 with Loctite 222**

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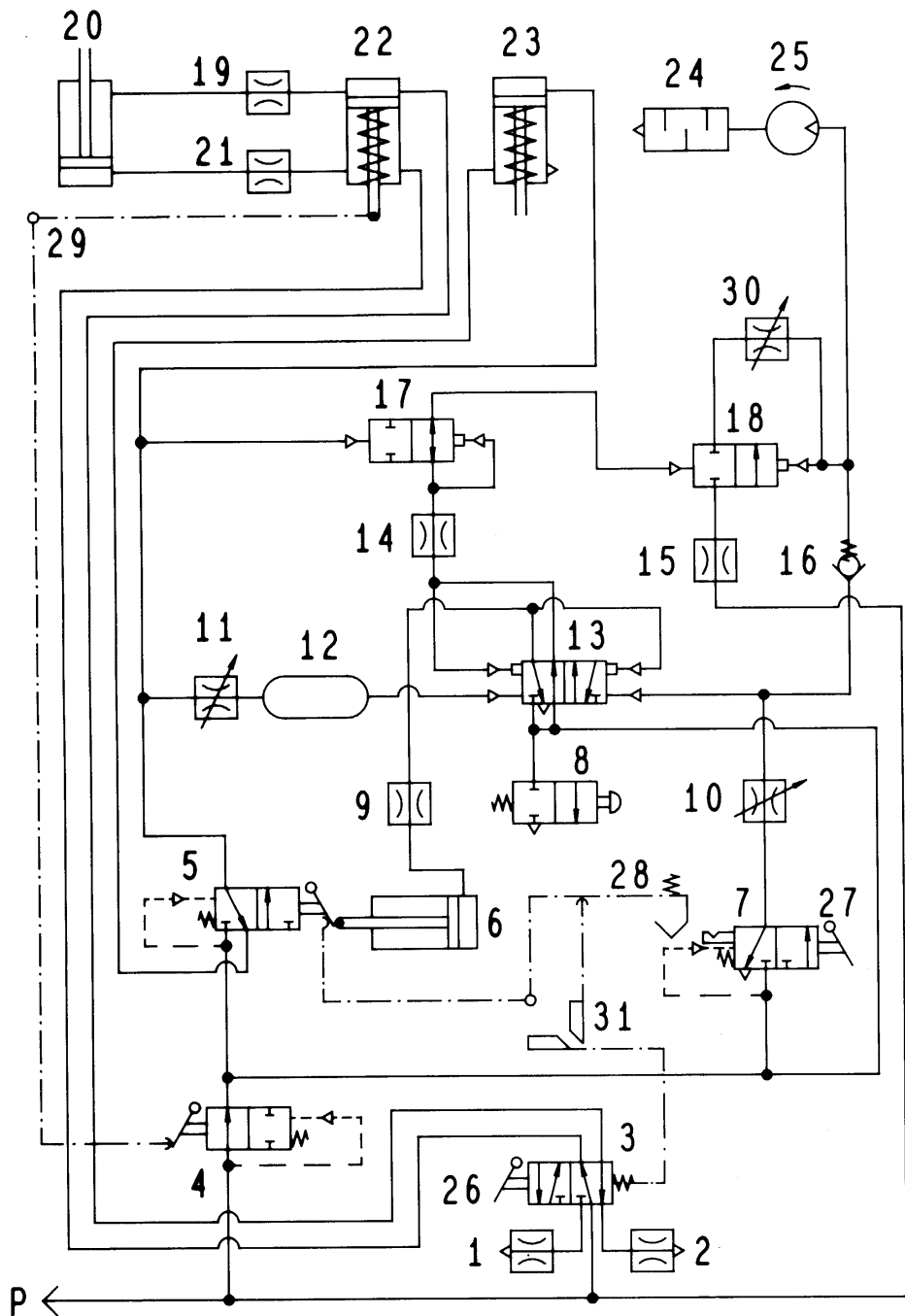
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## 14 CONTROL SYSTEM

### 14.1 Pneumatic schematic A380.0003

POS.	DESCRIPTION
1	Throttle 1,2
2	Throttle 1,2
3	Flapper valve
4	Flapper security valve
5	Sealing valve
6	Release piston
7	Motor valve
8	Emergency aeration
9	Throttle 0,3
10	Throttle screw
11	Sealing time throttle
12	Volume
13	Pilot valve
14	Throttle 1,8
15	Holding air throttle 2,0
16	Nonreturn valve
17	Diaphragm
18	Holding air valve
19	Throttle 1,2
20	Feed wheel cylinder
21	Throttle 1,2
22	Flapper cylinder
23	Sealing cylinder
24	Muffler
25	Air motor
26	Flapper valve lever
27	Motor valve lever
28	Catch
29	Flapper
30	Holding air throttle
31	Ejector bolt



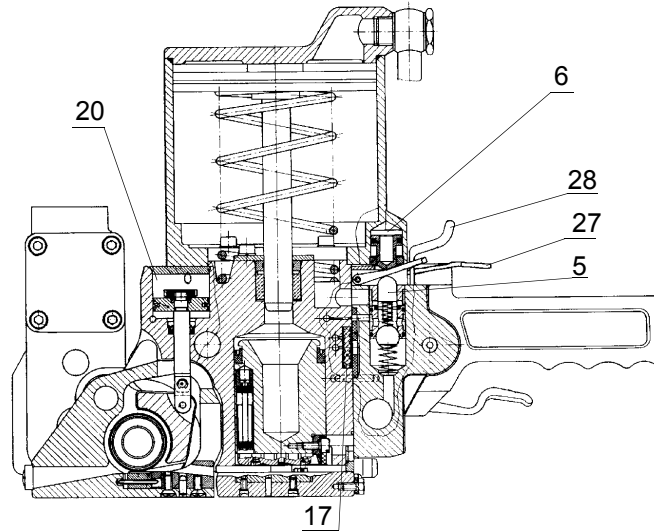
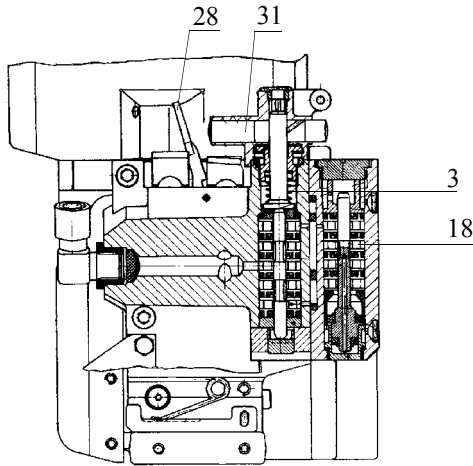
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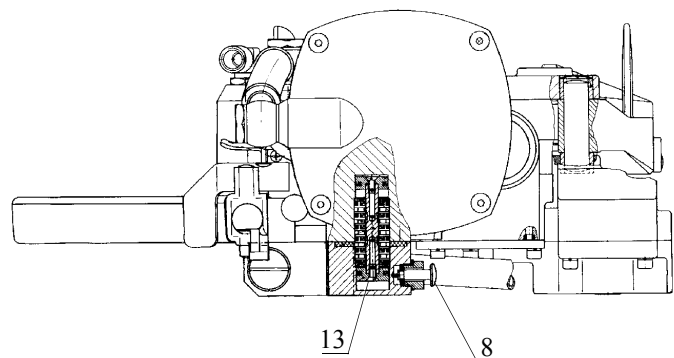
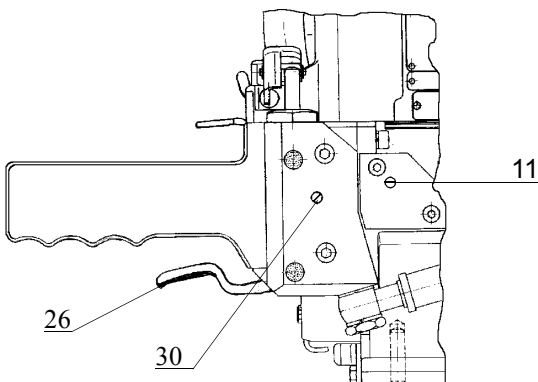
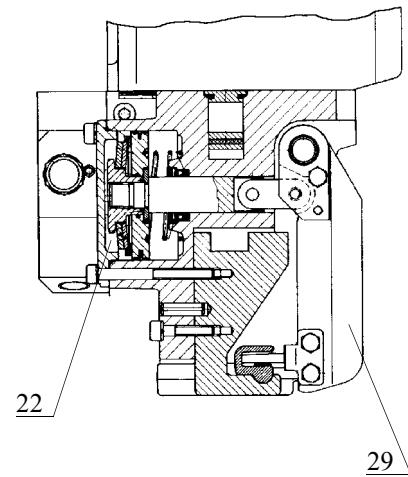
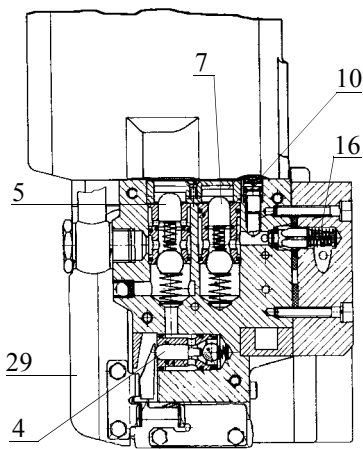
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14.2 Details of pneumatic control system



POS.	DESCRIPTION				
1	Throttle 1,2	11	Sealing time throttle	22	Flapper cylinder
2	Throttle 1,2	12	Volume	23	Sealing cylinder
3	Flapper valve	13	Pilot valve	24	Muffler
4	Flapper security valve	14	Throttle 1,8	25	Air motor
5	Sealing valve	15	Holding air throttle 2,0	26	Flapper valve lever
6	Release piston	16	Nonreturn valve	27	Motor valve lever
7	Motor valve	17	Diaphragm	28	Catch
8	Emergency aeration	18	Holding air valve	29	Flapper
9	Throttle 0,3	19	Throttle 1,2	30	Holding air throttle
10	Throttle screw	20	Feed wheel cylinder	31	Ejector bolt
		21	Throttle 1,2		



## 15 FUNCTIONAL CHARACTERISTICS

### Idle Position

- Through the connection of the tool to the compressed air-net (connection P) compressed air flows through flapper valve 3 to the flapper cylinder 22 and rocker cylinder 20.
- As a result of this air-flow, the closing force of the spring of the flapper cylinder 22 is supported by compressed air on the one hand (flapper closed) and the feed-wheel is lowered to the gripper through the rocker cylinder 20 on the other hand.
- The closed flapper 29 holds open flapper security valve 4.
- Flapper security valve 4 opens the connection area to sealing valve 5 and motor valve 7 (both closed) and also to emergency aeration 8, to pilot valve 13, to throttle 14, to diaphragm 17 and to holding air valve 18.
- As a result, holding air valve 18 is kept closed.
- Compressed air is also conducted to the holding air throttle 15 directly from the main connection and stops at the closed holding air valve 18.

### Inserting the strap

- To insert the strap, the flapper valve lever 26 of the flapper valve 3 is lifted.
- The valve switches, the flapper cylinder 22 opens the flapper 29 and the rocker cylinder 20 lifts the feed wheel.
- After inserting the strap, the flapper valve lever 26 is released again; flapper valve 3 and both cylinders 20 and 22 stay again in their idle position.
- The throttles 1, 2, 19 and 21 avoid jerking motions.

### Tensioning and sealing

- By pressing down the motor valve lever 27 the motor valve 7 is commuted and catches in an open position.
  - Compressed air now flows from connection P through the flapper security valve 4 motor valve 7, the adjustable throttle valve 10 and through the nonreturn valve 16 to the air motor 25 and drives the latter.
  - The unstressed air leaves the air motor 25 through the muffler 24.
  - At the same time also the control pistons of the pilot valve 13 and the holding air valve 18 are admitted with pressure from the right.
  - The holding air valve 18 does not yet switch since the left side of the control pusher has a larger piston surface and is under pressure.
  - Also the pilot valve 13 does not yet switch (although the left piston surface of the control pusher is slightly smaller than the one of the right one) since the pressure between the throttle 10 and the air motor 25 running is lower than the pressure in the air-net.
  - The pressure in the line to the air motor 25 does not build up until the air motor 25 stalls through overcharge and comes to a standstill.
  - Under these conditions the difference of the piston surfaces are acting and the pilot valve 13 switches.
- If the tensioning cycle has to be interrupted the blocking of the motor valve 7 must be suspended (release catch 28) so that the air motor 25 stops.

**Remark:** If the strap is not transported after pressing the motor valve lever the procedure "Inserting the strap" has to be done again. By pressing the flapper valve lever 26 the catch 28 is hooked out automatically. So the started tensioning process is stopped and has to be restarted.

- As soon as the pilot valve 13 has switched, the left control side of the holding air valve 18 is deaerated through the diaphragm 17, the throttle 14, the pilot valve 13 and as a result the holding air valve 18 switches.
- As a consequence the opening area for the holding air from the air-net to the air motor 25 through the holding air throttle 15, through the holding air valve 18 and through the adjustable holding air throttle 30 is cleared.
- At the same time also the release piston 6 from the pilot valve 13 is operated through throttle 9.
- The release piston 6 moves out, activates the sealing valve 5 and simultaneously suspends the blocking of the motor valve 7.

Particularly in cases where the air-pressure is less than 5 bar/71 psi it is possible that after a relatively long

working interruption the sealing operation is not released automatically.

- Through a short operation of the emergency aeration the sealing cycle is activated.
- The air motor 25 is held under pressure by the holding air throttles 15, 30 and the holding air valve 18 in order to avoid the rewinding of the feed wheel which is under pressure.
- From the sealing valve 5 compressed air flows to the sealing cylinder 23.
- At the same time diaphragm 17 is admitted with compressed air from the left and switches to locking. Compressed air starts to fill volume 12 through the sealing time throttle 11.
- The piston of the sealing cylinder moves out and under the use of a hydraulic pressure intensifier produces the necessary power to cut the sealing profile into the two straps and to shear off the upper strap.
- In the mean time the pressure in volume 12 has built up to the point where the pilot valve switches (the duration of the air-pressure increase depends on the adjustment of the sealing time throttle 11).
- The pilot valve 13 returns to its initial position.
- Through this the sealing valve 5 switches to deaeration by the force of the recuperating spring, the compressed air in the sealing cylinder 23 starts to flow back and escapes through the sealing valve 5 and through the lower part of the sealing cylinder 23 into the atmosphere.
- The pressure in the line between the sealing cylinder 23 and sealing valve 5 drops continually.
- As a result of this, the pressure on the left control side of diaphragm 17 is reduced.
- The surface relation of the left to the right control side is modulated in such a way that diaphragm 17 switches in dependence to the piston movement of the sealing cylinder 23 and opens the opening to the left control side of holding air valve 18.
- Holding air valve 18 interrupts the holding air.
- The pressure in the air motor 25 drops.
- The air motor can be turned back by the tension in the strap.
- The two straps provided with the sealing profile can now interlock.
- At this point the piston (piston with dies and cutter) is positioned approx. one to two mm (.040" to .080") from its lowest position on its way to its initial position.
- By adjusting holding air throttle 30 it is possible to control the straps inserting process. Adjustment in a clockwise direction causes less holding air and therefore quicker inserting.

## Removing the tool

- The tool is opened by pulling the flapper valve lever 26; the tool is then pushed away from the seal to the right.

## 15.1 Adjustments

### Tension speed / tension force

Throttle valve 10 limits the tension speed and also the tension force in the lower range of adjustments and also influences the switching time between "tensioning" and "sealing". Screwing in the throttle screw 10 causes a retarded switching time.

Works adjustment: 90% of the maximum speed.

### Dwell time of the sealing piston

The sealing time throttle 11 determines the aeration of the sealing cycle. Increased throttling (turning the throttle screw in a clockwise direction) increases the dwell time of the sealing piston.

### Timing of the interlock

Under normal conditions the holding air throttle 30 is screwed flush into the outside of the control valve body. If the straps do not interlock properly (one or two notches do not interlock at all) the throttle has to be turned in a clockwise direction; this causes a reduction of the holding air on the motor and the tensioned strap is held with less power so that it will interlock quicker after sealing.

#### **Attention!**

Adjust holding air throttle in such a way that no tension marks on the bottom of the seal caused by the punch will be noticed. If marks are noticed the punch might wear prematurely.

16 SPARE PARTS LIST 13.6285.01

13.6285.01	A380/13/0.50-0.63/4.5/A		A380.0003.01		15.07.99	
Item-No.		in group	Pcs.	Description	Dimension	Field
A3H.1110			1	FILTER NETTING		B9
A3H.1111			1	NETTING FRAME		B9
A3H.1112			1	PROTECTION NETTING		B9
A3H.1709			1	ADJUSTING SCREW		D6
[A38.0101]			1	TENSIONING UNIT	1/2"-20.0/4,5KN	A22
[A38.0108]			1	VALVE HANDLE		C15
[A38.0110]			1	CONTROL VALVE		A17
[A38.0117]		A38.0101	1	AIR MOTOR	EXC. 2,5	B22
[A38.0131]		A38.0117	1	MOTOR CELL	EXC. 2,5	B21
A38.1104	*		1	DIE HALF		D3
A38.1105	*		1	DIE HALF		D4
A38.1111			1	GUIDE KEY		B3
[A38.1112]			1	SPRING PACKAGE		B6
A38.1113		A38.1112	1	SPINDLE		B5
A38.1114		A38.1112	1	BUSH		B5
A38.1115			1	BASE PLATE		C6
A38.1117	*		1	PUNCH		C5
A38.1120			1	STRAP CLAMP		B4
A38.1122			1	STRAP STOP		C6
A38.1126			1	FLAPPER		C2
A38.1128			1	STRAP GUIDE		C2
A38.1133			1	STRAP GUIDE		B1
A38.1137			1	FLAP PIVOT PIN		B3
A38.1138			1	SOCKET SET SCREW		A3
A38.1140			1	PISTON ROD		C9
A38.1141			1	HINGE		C9
A38.1142			1	BOLT		C9
A38.1143			1	BOLT		B1
A38.1144			1	HINGE PLATE		B1
A38.1145			1	CYLINDER COVER		A9
A38.1146			1	PISTON ROD		C7
A38.1147			1	FORK		C23
A38.1148			1	SHAFT		C23
A38.1149			1	COVER		B7
A38.1150			1	GUIDE RING		C8
A38.1151			1	COVER DISK		C8
A38.1152			3	BLIND PLUG		B9+
[A38.1154]			1	PISTON PLATE		B11
A38.1155			1	PLUNGER		C11
A38.1156			1	DISK		B11
A38.1157			1	CYLINDER COVER		A10
A38.1158	*		1	CUTTER		C4
[A38.1178]			1	SEALING HOUSING		A4
[A38.1180]			1	SEALING CYLINDER		B8
A38.1186		A38.1189	1	EJECTOR SPINDLE		C3
A38.1187		A38.1189	1	EJECTING BUSH		C3
[A38.1189]			1	EJECTOR		C4
A38.1190		A38.1189	1	CAP		C3
A38.1191			1	DIE AND CUTTER SUPPORT		B4
A38.1202		A38.0108	1	SECURITY VALVE SHELL		D14
A38.1203		A38.0108	1	VALVE BOLT		D13

\* = Wearing parts

[ ] = Group

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A38.1206		A38.0108	1	LEVER BODY		D13
A38.1208		A38.0108	1	SEALER VALVE SHELL		B14
A38.1209		A38.0108	2	VALVE BOLT		A14
A38.1210		A38.0108	1	TENSIONER VALVE LEVER		A15
A38.1212		A38.0108	1	SHAFT		A14
A38.1214		A38.0108	1	CATCH PIN		B15
A38.1215		A38.0108	1	GUIDE RING		C16
A38.1216		A38.0108	5	SUSTAINING RING		B17+
A38.1216		A38.0110	4	SUSTAINING RING		B18
A38.1217		A38.0108	1	GUIDE RING		C17
A38.1218		A38.0108	1	VALVE PISTON		C17
A38.1220		A38.0108	1	VALVE LEVER		D17
A38.1221		A38.0108	1	SHAFT		D17
A38.1222		A38.0108	1	LEVER BODY		D17
A38.1226		A38.0110	1	CYLINDER CAP		C18
A38.1227		A38.0110	1	CYLINDER RING		C18
A38.1228		A38.0110	1	PISTON BAR		C18
A38.1229		A38.0110	1	THRUST PIECE		A18
A38.1230		A38.0110	1	SEALING SCREW		A18
A38.1231			1	SEAL PLATE		B17
[A38.1236]			1	MOTOR TUBE		A16
[A38.1237]			1	CYLINDER HOSE		C12
A38.1238		A38.0108	1	GUARD-PLATE		D14
[A38.1241]		A38.0108	1	VALVE HOUSING		C15
A38.1242		A38.0108	1	TENSIONER VALVE SHELL		B15
A38.1243			1	SEAL PLATE		C14
[A38.1244]		A38.0110	1	CONTROL VALVE BODY		A17
A38.1253		A38.0108	1	THROTTLE SCREW		C14
A38.1257		A38.0108	1	SEALING VALVE LEVER		B15
A38.1258		A38.0108	1	LEVER BODY		A14
A38.1259			1	CONTROL PISTON		C9
A38.1260			1	GUIDE RING		C9
[A38.1261]			1	VALVE HEAD		D10
A38.1263			1	COUPLER		D9
A38.1264			1	INTERMEDIATE WASHER		D9
A38.1265			5	SUSTAINING RING		C9+
A38.1266			1	COMPENSATOR RING		D10
A38.1267			2	PISTON		D9+
A38.1268			1	SEAL		D10
A38.1269			1	ADJUSTING SCREW		D11
A38.1270		A38.1261	1	VALVE FACE		D9
A38.1271		A38.1261	1	TOUCH BOLT		D9
A38.1272			1	JOINT CONE		B16
A38.1274		A38.1244	1	HOLDING AIR THROTTLE		A17
A38.1275		A38.0108	1	SLIDE BOLT		C16
A38.1276		A38.0108	1	RING		B15
A38.1277		A38.0108	1	SCREW		A15
A38.1278		A38.0108	1	EJECTION HEAD		A15
A38.1279		A38.0108	1	EJECTING BOLT		A15
A38.1310			1	TENSIONING BODY		C22
[A38.1311]	*		1	GRIPPER		C22

\* = Wearing parts

[ ] = Group

13.6285.01	A380/13/0.50-0.63/4.5/A		A380.0003.01			15.07.99
Item-No.		in group	Pcs.	Description	Dimension	Field
A38.1313			1	RETAINER		D22
A38.1314			1	PIVOT PIN		C21
A38.1315			1	BOLT		D21
A38.1316			1	SPACER RING		C21
A38.1317	*		1	TENSIONING WHEEL		D21
A38.1320			1	SPACER RING		D21
A38.1322			1	STRAP HOLDER		D21
A38.1326			1	END COVER		D21
A38.1328			1	STRAP STOP		C21
A38.1349		A38.0131	1	END PLATE		C20
A38.1350		A38.0131	1	JACKET		B21
A38.1351	*	A38.0131	8	VANE		C20
A38.1352		A38.0131	1	END PLATE		B21
[A38.1353]		A38.0117	1	AIR MOTOR HOUSING		B21
A38.1354		A38.0117	1	COVER		A20
[A38.1355]		A38.0101	1	HOUSING		C22
A38.1362		A38.0101	1	PINION		A23
A38.1363		A38.0101	1	INTERMEDIATE WHEEL	2-3	B23
A38.1367		A38.0101	1	INTERMEDIATE WHEEL	1-2	A22
A38.1368		A38.0101	1	TENSION SHAFT		C23
A38.1370		A38.0101	1	BEARING PLATE		C24
A38.1371		A38.0101	1	INTERMEDIATE WHEEL		B23
[A38.1372]		A38.0101	1	BODY COVER		B24
A38.1374		A38.0131	16	FELT		B20+
A38.1376		A38.0131	1	ROTOR		C20
A38.1377		A38.0131	1	COUPLING		B20
A38.1378		A38.0131	1	DOWEL		B20
[A38.1431]			1	SUSPENSION		--
[A38.1432]		A38.1431	1	SUSPENSION BRACKET		--
A38.1513			1	CLAMPING PIECE		C4
[A38.2155]			1	PISTON PLATE		C9
A38.2156			1	STOP DISK		C9
A38.2157			1	SUPPORTING DISK		B10
A38.2158			1	HEXACON NUT		B9
A48.1234		A38.0108	1	CATCH		B15
A48.1237		A38.0108	1	SIEVE		C13
N1.1104		A38.1431	2	SCREW	M8 X 20	--
N1.1106			5	SCREW	M6 X 20	A8+
N1.1113		A38.0101	4	SCREW	M5 X 20	A24
N1.1114			4	SCREW	M5 X 25	C24+
N1.1125			4	SCREW	M6 X 16	B8
N1.1130		A38.0101	4	SCREW	M5 X 35	B24
N1.1133			2	SCREW	M5 X 40	D10
N1.1141			1	SCREW	M6 X 40	D15
N1.1143			4	SCREW	M6 X 35	A17+
N1.1168			1	SCREW	M5 X 16	A10
N1.1174			3	SCREW	M10 X 1 X 40	D5
N1.1175			2	SCREW	M5 X 55	A10
N1.1180		A38.0117	4	SCREW	M6 X 90	B19
N1.1181			1	SCREW	M5 X 12	C4
N1.1304			2	SCREW	M3 X 8	D5
N1.1560		A38.0108	2	HEXAGON SCREW	M5 X 10	D14
N1.1560			7	HEXAGON SCREW	M5 X 10	B1+

\* = Wearing parts

[ ] = Group

13.6285.01	A380/13/0.50-0.63/4.5/A		A380.0003.01		15.07.99	
Item-No.		in group	Pcs.	Description	Dimension	Field
N1.1806			4	SCREW	M4 X 10	D4
N1.1807			3	SCREW	M5 X 12	C21+
N1.2101			1	COUNTERSUNK SCREW	M8 X 25	B11
N1.2102			4	COUNTERSUNK SCREW	M6 X 20	A10
N1.2106			4	COUNTERSUNK SCREW	M4 X 8	C9+
N1.2212		A38.0108	7	COUNTERSUNK SCREW	M4 X 25	A14+
N1.2212			1	COUNTERSUNK SCREW	M4 X 25	B3
N1.5608			1	SLOTTED ROUND NUT	M8 X 1	B7
N1.6203			2	SPRING LOCK WASHER	M3	C5
N1.6207		A38.0101	8	SPRING LOCK WASHER	M5	A24+
N1.6207			9	SPRING LOCK WASHER	M5	A10+
N1.6220		A38.0117	4	SPRING LOCK WASHER	M6	A20
N1.6220			14	SPRING LOCK WASHER	M6	B8+
N1.6310		A38.0101	2	SPACER WASHER	14 X 26 X 0,5	B23+
N1.6501		A38.1431	2	SAFETY WASHER	M8	--
N1.6502			3	SAFETY WASHER	M10	D6
N2.1125			2	SECURITY RING	E3.2	C22
N2.1215		A38.0108	1	SECURITY RING	J22	B15
N2.1301		A38.1112	1	CIRCLIP	6 MM	A6
N2.1701			1	SECURITY RING	17 MM	C7
N2.1702			1	SECURITY RING	26 MM	D9
N2.2101			1	PARALLEL PIN	5 M6 X 12	B1
N2.2107			2	PARALLEL PIN	5 M6 X 40	D21
N2.2109			2	PARALLEL PIN	8 M6 X 30	B6
N2.2112			1	PARALLEL PIN	3 M6 X 12	C5
N2.2114		A38.0108	1	PARALLEL PIN	4 M6 X 24	C14
N2.2138			3	PARALLEL PIN	4 M6 X 12	D4+
N2.2143		A38.0101	2	PARALLEL PIN	5 H6 X 16	A23
N2.2144		A38.0101	1	PARALLEL PIN	14 H6 X 75	C23
N2.2413		A38.0131	1	DOWEL PIN	4 X 20 MM	B21
N2.2440			1	DOWEL PIN	4 X 12 MM	B4
N2.2441			2	DOWEL PIN	6 X 20 MM	C23
N2.2445		A38.0131	1	DOWEL PIN	2,5 X 6 MM	C20
N2.2449			2	DOWEL PIN	3,5 X 20 MM	C24
N2.4407		A38.0101	4	RIVET	2 X 3	A23+
N2.4902			4	HAMMER HEAD BOLT	1,85 X 4,76	B9
N2.5102		A38.0108	1	PRESSURE SPRING	0.6 X 8 X 14/6	D14
N2.5151		A38.0108	1	PRESSURE SPRING	0.3 X 2.8 X 11	C15
N2.5159		A38.0108	2	PRESSURE SPRING	0.5 X 7 X 18	B14
N2.5160		A38.0108	1	PRESSURE SPRING	1 X 12 X 26	C16
N2.5161		A38.0108	2	PRESSURE SPRING	1 X 12 X 20	B14
N2.5162			1	PRESSURE SPRING	2 X 42 X 22	C8
N2.5163			1	PRESSURE SPRING	5.5 X 74 X 155	A8
N2.5168			1	PRESSURE SPRING	0.5 X 10 X 22	B16
N2.5178		A38.1261	1	PRESSURE SPRING	0.32X2.82X20.5	D9
N2.5601		A38.1112	52	CUP SPRING	12.5X6.2X0.7	B5
N2.5609		A38.0117	2	CUP SPRING	45X22.5X1.75	A20
N2.5610		A38.1189	60	CUP SPRING	8X3.2X0.5	C3
N2.5616			2	CUP SPRING	50 X 25.4 X 2.5	C10
N2.5805			1	BENDING SPRING		A4
N3.1109		A38.1355	1	BALL BEARING		B22
N3.1109		A38.1372	1	BALL BEARING		A23
N3.1123		A38.0131	1	BALL BEARING		B21

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Item-No.		in group	Pcs.	Description	Dimension	Field
N3.1133		A38.0131	1	BALL BEARING		C19
N3.1703		A38.0101	1	BALL	5 MM.	C24
N3.1706		A38.0108	2	BALL	15 MM	B14
N3.1708		A38.0108	1	BALL	10 MM	D14
N3.2319			1	NEEDLE CASE		D21
N3.2322		A38.1355	1	NEEDLE CASE		B22
N3.2322		A38.1372	1	NEEDLE CASE		A23
N3.2323		A38.1355	1	NEEDLE CASE		B22
N3.2323		A38.1372	1	NEEDLE CASE		B24
N3.2602			1	PACKING RING		D21
N3.2603		A38.0101	1	PACKING RING		C22
N3.3119			1	SLIDE-BEARING		B2
N3.3124			1	SLIDE-BEARING		B2
N3.3128		A38.0101	1	HEADED PRESS FIT BUSH		C23
N3.3129		A38.0101	2	SLIDE-BEARING		B23+
N3.3130		A38.0101	1	HEADED PRESS FIT BUSH		C24
N41.9128			1	ADHESIVE LABEL		A11
N41.9129			1	ADHESIVE LABEL		A11
N4.5110		A38.0108	1	CAP		B15
N4.5110			1	CAP		A15
N4.9131			1	LABEL	<<A380>>	B9
N4.9159			1	LABEL	<<CE>>	B8
[N6.3404]			1	PISTON		B7
N6.3501		A38.1154	1	INNER PACKING	12.31X24.1X6.5	B11
N6.3504		N6.3404	1	INNER PACKING	8.3X12.1X4	B7
N6.3505		A38.1154	1	EXTERNAL PACKING RING	125X12	C11
N6.3507		A38.2155	1	EXTERNAL PACKING RING		B10
N6.3508		N6.3404	1	EXTERNAL PACKING RING		B7
N6.5133		A38.0108	1	REDUCING COUPLING		C13
N6.5508		A38.0117	1	EXHAUST SILENCER	R 1/2"	A22
N6.5624		A38.0108	1	ANGLE		C13
N6.5627			1	HOLLOW SCREW		B17
N6.5628			2	HOLLOW SCREW		C12+
N6.5634			2	PACKING RING		B17
N6.5635			4	PACKING RING		C12+
N6.5637		A38.0117	1	ADAPTER		A21
N6.6107			1	SEAL	56 X 46 X 10	B4
N6.6108			1	SEAL	16 X 24 X 5	D8
N6.6113			1	PACKING RING	10 X 16 X 4.5	C7
N6.6114		A38.0110	1	LIP SEAL	12 X 6 X 4	C18
N6.6115		A38.0110	1	LIP SEAL	16 X 10 X 4	C18
N6.6116			1	SEAL	18 X 28 X 17.5	C8
N6.6117		A38.0108	5	SEAL	6 X 13 X 2.3	B16+
N6.6117		A38.0110	4	SEAL	6 X 13 X 2.3	A18+
N6.6121			6	SEAL	8 X 15 X 2.3	C10+
N6.6122			3	SEAL	20 X 13 X 2.3	C9+
N6.6145			1	DIAPHRAGM		C14
N6.6204		A38.0108	4	O-RING	18 X 2	B14
N6.6207		A38.1244	1	O-RING	3,1 X 1,6	A17
N6.6207			1	O-RING	3,1 X 1,6	D11
N6.6209			6	O-RING	17 X 2	C9+
N6.6216			1	O-RING	125 X 2	A11
N6.6217		A38.0108	8	O-RING	15 X 2	B16+

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Item-No.		in group	Pcs.	Description	Dimension	Field
N6.6217		A38.0110	6	O-RING	15 X 2	A18+
N6.6223		A38.0117	1	O-RING	50 X 2	B21
N6.6229		A38.0101	1	O-RING	14 X 1	B24
N6.6230		A38.0108	1	O-RING	8 X 1,5	D14
N6.6233		A38.0108	1	O-RING	6 X 2	B15
N6.6235		A38.0108	2	O-RING	12 X 2	B15
N6.6237			1	O-RING	33 X 1,5	B7
N6.6238			1	O-RING	60 X 2	B9
N6.6241		A38.0131	2	O-RING	46 X 2	B20+
N6.6247		A38.1261	1	O-RING	5 X 2,5	D10
N6.6247			1	O-RING	5 X 2,5	B16
N6.6251			1	O-RING	18 X 1.5	C9
N6.6252			1	O-RING	12 X 1.5	B9
N6.6501		A38.1261	1	FLAT SEAL	18 X 13 X 2	D10
N6.6803		A38.0101	1	PACKING RING	10 X 19 X 9.8	C22
N7.1104			1	BUSH		D20
N7.1202			1	SEALING DISK		D20

Distributed By:

**Allstrap**

1719 Kenny Rd

Columbus, OH, 43212

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