## FRDMM

OPERATION MANUAL / SPARE PARTS LIST
PNEUMATIC STEEL
STRAPPING TOOL
MODEL A383.0001


We declare that the machine A383
is in conformity with the following standard or
standardised documents: 98/37/EEC

FROMM Holding AG
Hinterbergstrasse 26
CH - 6330 Cham
Distributed By:
Allstrap
27.032001

1719 Kenny Rd
Columbus, OH, 43212
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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 A383 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

Item
Model Strap width
Strap thickness
Max. tension
No.


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## 5 TECNICAL DATA

## Dimensions without suspension bracket

| Length: | $420 \mathrm{~mm} / 16.5^{\prime \prime}$ |
| :--- | :--- |
| Width: | $195 \mathrm{~mm} / 7.6^{\prime \prime}$ |
| Height: | $350 \mathrm{~mm} / 13.7^{\prime \prime}$ |
|  |  |
| Weight: | $23.1 \mathrm{~kg} / 50.82 \mathrm{lbs}$ |

## Sound information

The A-weighted equivalent continuous sound level at the work place of the machine operator is typical 78 dB (A).
This value was determind according to DIN 45635 T3 (11.85).

## Vibration information

The weighted effective value of the acceleration typically amounts to less than $2,5 \mathrm{~m} / \mathrm{s}^{2}$.
This value was determined according to DIN EN 28662 T1 (01.93).

## Compressed air

Joining thread: $\quad$ G 1/4" min.
Max. air pressure: 6 bar / 87 psi.

## Air consumption

Tensioning:
Sealing:

## Steel strap

Width:
19-32 mm/ 3/4"-1 1/4" (see chart of types).
Thickness: $\quad 0.63 \mathrm{~mm}-1.3 \mathrm{~mm} / .025$ " -.050 " (see chart of types).
Quality: $\quad$ Fundamentaly the A383 allows the use of all current steel straps ranging from 700 to $1100 \mathrm{~N} / \mathrm{mm}^{2}$ (100 000-159500 psi) in tensile (see chart of types).
Strap with less than $600 \mathrm{~N} / \mathrm{mm}^{2}$ ( 87000 psi ) in tensile is not suitable for the A383 tool.

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## 6 INSTALLATION

## Compressed air connection

The compressed air should be connected to the tool preferably by a quick disconnector.
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 $5 \mathrm{~m} / 15 \mathrm{ft}$.

## 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.

A38.2413 SUSPENSION UNIVERSAL (no picture)


NORMAL, VERTICAL, HORIZONTAL incl. air supply

A38.2410
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## 7 OPERATING CONTROLS



## 8 OPERATION

### 8.1 Feeding the strap around the package

The strap is fed arround 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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### 8.3 Tensioning the strap

The motor valve lever is pressed down with the thumb of the right hand so that the catch locks. Let the tool tension until the motor stalls.

If the tensioning cycle has to be interrupted (faulty strapping, applying of corner protection angles) press the red lever.


### 8.4 Sealing the strap

Hold the strap which is reeled off from the strap coil with the left hand. Press and hold down the sealing valve lever until the strap is cut off.
Release the sealing valve lever.


### 8.5 Removing the tool from the 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.


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## 9 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 be conform to the illustration. This means that the depth with which the upper strap hooks into the lower one must be $1-1.5 \mathrm{~mm}$ in min. and 2 mm in max.. 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 not sufficient 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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## 10 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 $90^{\circ}$ equals a stroke correction of $0.25 \mathrm{~mm} / .010^{\prime \prime}$.

## Sealing depth is insufficient

Turn adjusting screw counterclockwise. A turn of $90^{\circ}$ equals a stroke correction of $0.25 \mathrm{~mm} / .010^{\prime \prime}$.

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 inproper 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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## 11 MAINTENANCE

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

### 11.1 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

### 11.2 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

- Turn tool with flapper in an upward position. Remove sealing screw.
- Introduce wrench (N7.3250) into boring with valve handle being parallel to the toggle, turn toggle by $90^{\circ}$ (thus the sealing piston is moved into its correct position).
- Turn back the wrench and remove it.
- Fill in oil of type SAE 20 and let escape air bubbles. Screw in sealing screw again and tighten it.
- Check the position of the sealing piston as per afore mentioned instructions.


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### 11.3 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.

### 11.4 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.

## 12 Exchange of wearing parts

### 12.1 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 the punch and the die halves must be examined.
If the cutting edges are destroyed or worn heavily (attention! the cutting edges of new punches and dies are also rounded slightly) the corresponding 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 .
Distributed By:
A||strap The screws N1.1323 und N1.1806 have to be secured with Loctite 222.
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### 12.2 Exchange of the feed wheel

- Remove the left strap stop
- Unscrew the three screws and remove the bearing cover.
- Remove the front distance ring, the O-ring and the feed wheel from the feed wheel shaft.
- Assembling in opposite order.


## Important! Take notice of the assembling position of the feed wheel.



### 12.3 Exchange of the gripper

- Remove the left strap stop and the bearing cover.
- Remove the front distance ring, the O-ring and the feed wheel from the feed wheel shaft.
- Remove cross-recess screw and holder so that the gripper can be removed.
- Clean the groove and firmly retighten the holder after insertion of the new gripper.
- Assembling in opposite order.



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Important! The screw N1.1807 has to be secured with Loctite 222..
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### 12.4 Exchange of cutter

- Remove base plate, guard plate with guide and right strap stop.
- Using a hexagon socket spinner wrench to unscrew and remove cutter screw $\mathrm{M} 6 \times 12$ across the appropriate boring in the sealing body.
- Replace cutter.
- Assemble in the opposite order.


Important! The screw N1.1193 has to be secured with Loctite 222.

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## 13 CONTROL SYSTEM

### 13.1 Pneumatic schematic A383.0001

Throttle 1,2
Throttle 1,2
Flapper valve
Flapper security valve
Sealing valve
Motor valve
Throttle valve
Pilot valve
Throttle
Throttle 1,8
Holding air throttle 2,0
Non-return valve
Diaphragm
Holding air valve
Air-pressure-reduction-valve Throttle 1,2
Rocker cylinder Throttle 1,2
Flapper cylinder Sealing cylinder Muffler
Air Motor
Flapper valve lever
Motor valve lever Sealing valve lever Catch Flapper Lever Holding air throttle Ejection bolt


### 13.2 Details of the control system



PO
1
POS. DESCRIPTION


Throttle 1,2
Throttle 1,2
Flapper valve
Flapper security valve
Sealing valve
Motor valve
Throttle valve
Pilot valve
Throttle
Throttle 1,8
Holding air throttle 2,0
Non-return valve
Diaphragm
Holding air valve
Air-pressure-reduction-
valve
Throttle 1,2
Rocker cylinder
Throttle 1,2
Flapper cylinder


Sealing cylinder Muffler
Air Motor
Flapper valve lever
Motor valve lever
Sealing valve lever
Catch
Flapper


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## 14 Functional characteristics

## Idle position

Because of the connection of the tool to the compressed air-net (connection P) compressed air flows through flapper valve 3 to the flapper cylinder 19 and rocker cylinder 17.
As a result of this air-flow, the closing force of the spring of the flapper cylinder 19 is supported by compressed air on the one hand (flapper closed) and the feed-wheel is lowered to the gripper on the other hand.
The closed flapper 27 holds open flapper security valve 4 . Flapper security valve 4 opens the line to sealing valve 5 and motor valve 6 (both closed) and also to pilot valve 8 , throttle 10, diaphragm 13 and holding air valve 14.
As a result, holding air valve 14 is kept closed. Compressed air is also conducted to the holding air throttle 11 directly from the main connection and stops at the closed holding air valve 14.

## Inserting the strap

To insert the strap, the flapper valve lever 23 of the flapper valve 3 is lifted. The valve switches, the flapper cylinder 19 opens the flapper 27 and the rocker cylinder 17 lifts the feed wheel.
After inserting the strap, the flapper valve lever 23 is released again; flapper valve 3 and both cylinders 17 and 19 stay again in their idle position. The throttles 1, 2, 16 and 18 avoid jerking motions.

## Tensioning

By pressing down the motor valve lever 24 the motor valve 6 is commuted and catches in an open position. Compressed air now flows from connection $P$ through the flapper security valve 4 and motor valve 6 , the adjustable throttle valve 7 and through the non-return valve 12 to the air motor 22 and drives the latter. The used air leaves the air motor through the muffler 21. At the same time also the control pistons of the pilot valve 8 and the holding air valve 14 are admitted with pressure from the right.
The left control side of the holding air valve 14 is deaerated through pilot valve 8 and the holding air valve 14 opens the opening area from the holding air throttle 11 through the adjustable holding air throttle to the air motor 22.
This state remains unchanged until the air motor 22 stalls (through overcharge). If the tensioning cycle has to be interrupted the blocking of the motor valve 6 must be suspended (press down lever 28).
Because of this the catch 26 is hooked out through the ejection bolt 30. At the same time the holding air valve 14 is closed so that the air motor 22 stalls.

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 23 the catch 26 is hooked out automatically. So the started tensioning process is stopped and has to be restarted.

## Sealing

The sealing action is started by pressing down the sealing valve lever 25 . Sealing valve 5 switches and the blocking of motor valve 6 is suspended.
The air motor 22 is held under pressure by the holding air throttle 11 and the holding air valve 14 in order to avoid the rewinding of the feed wheel which is under pressure.

From sealing valve 5 compressed air flows to the pressure reduction valve 15 (to be adjusted at 5.3 bar/76 psi) as well as to the sealing cylinder 20. At the same time diaphragm 13 and through throttle 9 also pilot valve 8 are admitted with compressed air from the left.
Pilot valve 8 changes to opening and diaphragm 13 to locking. Since the right side of diaphragm 13 has a smaller control piston surface than the left side, diaphragm 13 remains in a locking position and consequently avoids the switching off of holding air valve 14. The piston of the cylinder 20 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.

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As soon as the upper strap is sheared off, the sealing valve lever 25 can be released. Sealing valve 5 switches to deaeration, the compressed air in cylinder 20 starts to flow back and escapes through the pressure reduction valve 15 (back stroke area), sealing valve 5 and the lower part of the cylinder 20 into the athmosphere.
The pressure in the line between pressure reduction valve 15 and sealing valve 5 drops continually. As a result of this, the pressure on the left control side of diaphragm 13 is reduced.
The surface relation of the left to the right control side is modulated in such a way that diaphragm 13 switches in dependence to the piston movement of the sealing cylinder and opens the input to the left control side of holding air valve 14.

Holding air valve 14 interrupts the holding air. The pressure in the air motor 22 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.

## Removing the tool

The tool is opened by pulling the Flapper valve lever 23; the tool is then pushed away from the seal to the right.

### 14.1 Adjustments

## Tension speed / tension force

Throttle valve 7 limits the tension speed and also the tension force in the lower range of adjustments. Factory presetting adjustment: $90 \%$ of the maximum speed.

## Sealing cylinder

The air pressure reduction valve 15 limits the entry pressure to the sealing cylinder 20. Factory presetting adjustment: 5.3 bar ( 76 psi ).

Important! The presetting adjustments must not be exceeded.

## Timing of the interlock

Under normal conditions the holding air throttle 29 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.

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## 15 SPARE PARTS LIST 13.6740.01

| 13.6740 .01 | A383/32/0.80-0.90/10.0 |  | A383.0001.01 |  | 09.11.99 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Item-No. | in group | Pcs. | Description | Dimension | Field |
| A3H. 1110 |  | 1 | FILTER NETTING |  | B9 |
| A3H. 1111 |  | 1 | NETTING FRAME |  | C9 |
| A3H. 1112 |  | 1 | PROTECTION NETTING |  | B9 |
| [A38.0109] |  | 1 | CONTROL VALVE |  | A17 |
| [A38.0111] |  | 1 | TENSIONING UNIT | 10KN | A22 |
| [A38.0113] |  | 1 | VALVE HANDLE |  | C17 |
| [A38.0114] |  | 1 | PISTON PLATE |  | B11 |
| [A38.0115] |  | 1 | CYLINDER COVER |  | A12 |
| [A38.0118] | A38.0111 | 1 | AIR MOTOR | EXC. 3.0 | A22 |
| [A38.0132] | A38.0118 | 1 | MOTOR CELL | EXC. 3,0 | B20 |
| A38.1114 | A38.2118 | 1 | BUSH |  | A6 |
| A38.1138 |  | 1 | SOCKET SET SCREW |  | B3 |
| A38.1142 |  | 1 | BOLT |  | C9 |
| A38.1145 |  | 1 | CYLINDER COVER |  | B10 |
| A38.1147 |  | 1 | FORK |  | C23 |
| A38.1148 |  | 1 | SHAFT |  | C23 |
| A38.1149 |  | 1 | COVER |  | B7 |
| A38.1152 |  | 2 | BLIND PLUG |  | C8+ |
| A38.1156 |  | 1 | DISK |  | B11 |
| A38.1204 | A38.0113 | 1 | SHAFT |  | D14 |
| A38.1205 | A38.0113 | 1 | SECURITY LEVER |  | D14 |
| A38.1206 | A38.0113 | 1 | LEVER BODY |  | D13 |
| A38.1208 | A38.0113 | 1 | SEALER VALVE SHELL |  | B14 |
| A38.1209 | A38.0113 | 2 | VALVE BOLT |  | A14 |
| A38.1210 | A38.0113 | 1 | TENSIONER VALVE LEVER |  | A15 |
| A38.1211 | A38.0113 | 1 | SEALING VALVE LEVER |  | B15 |
| A38.1212 | A38.0113 | 1 | SHAFT |  | A14 |
| A38.1213 | A38.0113 | 1 | LEVER BODY |  | A14 |
| A38.1214 | A38.0113 | 1 | CATCH PIN |  | B15 |
| A38.1215 | A38.0113 | 1 | GUIDE RING |  | C16 |
| A38.1216 | A38.0109 | 4 | SUSTAINING RING |  | D9+ |
| A38.1216 | A38.0113 | 5 | SUSTAINING RING |  | B18+ |
| A38.1216 |  | 5 | SUSTAINING RING |  | C16+ |
| A38.1217 | A38.0113 | 1 | GUIDE RING |  | C17 |
| A38.1218 | A38.0113 | 1 | VALVE PISTON |  | C17 |
| A38.1220 | A38.0113 | 1 | VALVE LEVER |  | D17 |
| A38.1221 | A38.0113 | 1 | SHAFT |  | D17 |
| A38.1222 | A38.0113 | 1 | LEVER BODY |  | D17 |
| A38.1226 | A38.0109 | 1 | CYLINDER CAP |  | D18 |
| A38.1227 | A38.0109 | 1 | CYLINDER RING |  | C18 |
| A38.1228 | A38.0109 | 1 | PISTON BAR |  | C18 |
| A38.1229 | A38.0109 | 1 | THRUST PIECE |  | A18 |
| A38.1231 |  | 1 | SEAL PLATE |  | B17 |
| [A38.1236] |  | 1 | MOTOR TUBE |  | A16 |
| A38.1242 | A38.0113 | 1 | TENSIONER VALVE SHELL |  | B15 |
| A38.1243 |  | 1 | SEAL PLATE |  | C14 |
| [A38.1244] | A38.0109 | 1 | CONTROL VALVE BODY |  | A17 |
| [A38.1246] |  | 1 | VALVE HEAD |  | D10 |
| A38.1248 |  | 1 | SEALING STRIP |  | D10 |
| A38.1249 |  | 1 | VALVE STEM |  | D10 |
| A38.1250 |  | 1 | DISTANCE SLEEVE |  | D9 |
| A38.1251 |  | 1 | COMPENSATOR RING |  | C10 |



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| :---: | :---: | :---: | :---: | :---: | :---: |
| Item-No. | in group | Pcs. | Description | Dimension | Field |
| A38.2136 |  | 1 | COVER DISK |  | C8 |
| A38.2139 |  | 1 | PLUNGER |  | C11 |
| A38.2140 | A38.0114 | 1 | PISTON PLATE |  | B11 |
| A38.2141 | A38.0115 | 1 | CYLINDER COVER |  | A11 |
| A38.2143 |  | 1 | STRAP STOP |  | B4 |
| A38.2144 |  | 1 | GUIDE GIB |  | B4 |
| A38.2145 |  | 1 | GUARD-PLATE |  | B4 |
| A38.2147 |  | 1 | STRAP STOP |  | C21 |
| A38.2148 | A38.0115 | 1 | CONNECTING SCREW |  | B12 |
| [A38.2149] |  | 1 | SEALING BODY |  | A4 |
| A38.2151 |  | 1 | SEALING CYLINDER |  | C8 |
| A38.2152 |  | 1 | HINGE |  | C9 |
| A38.2153 |  | 1 | HINGE PIVOT PIN |  | B2 |
| A38.2154 |  | 1 | HINGE PLATE |  | B1 |
| [A38.2155] |  | 1 | PISTON PLATE |  | C9 |
| A38.2156 |  | 1 | STOP DISK |  | C9 |
| A38.2157 |  | 1 | SUPPORTING DISK |  | C9 |
| A38.2158 |  | 1 | HEXACON NUT |  | B9 |
| A38.2201 | A38.0113 | 1 | SECURITY VALVE SHELL |  | D14 |
| A38.2202 | A38.0113 | 1 | VALVE BOLT |  | D14 |
| [A38.2203] | A38.0113 | 1 | VALVE HOUSING |  | C15 |
| [A38.2205] |  | 1 | CYLINDER HOSE |  | C12 |
| A38.2206 | A38.0113 | 1 | SPRING BUSHING |  | C15 |
| A38.2301 | A38.0132 | 1 | END PLATE |  | C19 |
| A38.2302 | A38.0132 | 1 | JACKET |  | B21 |
| [A38.2303] | A38.0111 | 1 | HOUSING |  | C22 |
| A38.2307 | A38.0111 | 1 | INTERMEDIATE WHEEL | 2-3 | B23 |
| A38.2308 | A38.0111 | 1 | TENSION SHAFT |  | C23 |
| A38.2310 | * | 1 | TENSIONING WHEEL |  | D21 |
| A38.2311 |  | 1 | SPACER RING |  | D21 |
| A38.2312 |  | 1 | BOLT |  | D20 |
| A38.2313 |  | 1 | PIVOT PIN |  | C20 |
| A38.2314 |  | 1 | END COVER |  | C20 |
| A38.2316 | * | 1 | GRIPPER |  | B5 |
| A38.2317 |  | 1 | HOLDER |  | B5 |
| A38.2318 |  | 1 | SPACER RING |  | D21 |
| A38.2319 | A38.0111 | 1 | PINION |  | A23 |
| A38.2320 | A38.0111 | 1 | INTERMEDIATE WHEEL | 1-2 | A23 |
| [A38.2401] |  | 1 | SUSPENSION |  | -- |
| [A38.2402] | A38.2401 | 1 | SUSPENSION BRACKET |  | -- |
| A48.1234 | A38.0113 | 1 | CATCH |  | B15 |
| A48.1237 | A38.0113 | 1 | SIEVE |  | C13 |
| N1.1104 | A38.2401 | 2 | SCREW | M8 X 20 | -- |
| N1.1106 |  | 5 | SCREW | M6 X 20 | B8+ |
| N1.1113 | A38.0111 | 4 | SCREW | M5 X 20 | A24 |
| N1.1114 |  | 3 | SCREW | M5 X 25 | D19 |
| N1.1125 |  | 4 | SCREW | M6 X 16 | C8 |
| N1.1130 | A38.0111 | 4 | SCREW | M5 X 35 | A24+ |
| 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 |  | 3 | SCREW | M5 X 16 | A10 |
| N1.1174 |  | 5 | SCREW | M10 X $1 \times 40$ | D5 |
| N1.1180 | A38.0118 | 4 | SCREW | M6 X 90 | B19 |


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| Item-No. | in group | Pcs. | Description | Dimension | Field |
| N1.1193 |  | 1 | SCREW | M6 X 12 | C4 |
| N1.1323 |  | 2 | SCREW | M5 X 8 | D6 |
| N1.1560 |  | 7 | HEXAGON SCREW | M5 X 10 | B1+ |
| N1.1806 |  | 4 | SCREW | M4 X 10 | D3+ |
| N1.1807 |  | 1 | SCREW | M5 X 12 | C5 |
| N1.1811 |  | 2 | SCREW | M6 X 40 | B5 |
| N1.1812 |  | 2 | SCREW | M6 X 16 | C21 |
| N1.2101 |  | 1 | COUNTERSUNK SCREW | M8 X 25 | B11 |
| N1.2102 |  | 4 | COUNTERSUNK SCREW | M6 X 20 | A11 |
| N1.2106 |  | 2 | COUNTERSUNK SCREW | M4 X 8 | C9 |
| N1.2212 | A38.0113 | 7 | COUNTERSUNK SCREW | M4 X 25 | D16+ |
| N1.2214 |  | 2 | COUNTERSUNK SCREW | M5 X 12 | D3 |
| N1.5608 |  | 1 | SLOTTED ROUND NUT | M8 X 1 | B7 |
| N1.6207 | A38.0111 | 8 | SPRING LOCK WASHER | M5 | C5+ |
| N1.6207 |  | 10 | SPRING LOCK WASHER | M5 | A23+ |
| N1.6220 | A38.0118 | 4 | SPRING LOCK WASHER | M6 | B8+ |
| N1.6220 |  | 14 | SPRING LOCK WASHER | M6 | A20 |
| N1.6310 | A38.0111 | 2 | SPACER WASHER | $14 \times 26 \times 0,5$ | B23 |
| N1.6501 | A38.2401 | 2 | SAFETY WASHER | M8 | -- |
| N1.6502 |  | 5 | SAFETY WASHER | M10 | D5+ |
| N1.7302 |  | 1 | SEALING SCREW | M10 X 1 | -- |
| N2.1125 | A38.0113 | 2 | SECURITY RING | E3.2 | A15+ |
| N2.1125 |  | 2 | SECURITY RING | E3.2 | -- |
| N2.1215 | A38.0113 | 1 | SECURITY RING | J22 | B15 |
| N2.1301 | A38.2118 | 1 | CIRCLIP | 6 MM | A6 |
| N2.1302 | A38.2125 | 1 | SECURITY RING | 8 | B6 |
| N2.1701 |  | 1 | SECURITY RING | 17 MM | -- |
| N2.1702 |  | 1 | SECURITY RING | 26 MM | -- |
| N2.2101 |  | 4 | PARALLEL PIN | 5 M6 X 12 | -- |
| N2.2107 |  | 2 | PARALLEL PIN | 5 M6 X 40 | -- |
| N2.2109 |  | 2 | PARALLEL PIN | 8 M6 X 30 | -- |
| N2.2114 | A38.0113 | 1 | PARALLEL PIN | 4 M6 X 24 | C14 |
| N2.2138 |  | 2 | PARALLEL PIN | 4 M6 X 12 | -- |
| N2.2143 | A38.0111 | 2 | PARALLEL PIN | $5 \mathrm{H} 6 \times 16$ | A24 |
| N2.2144 | A38.0111 | 1 | PARALLEL PIN | 14 H6 X 75 | C23 |
| N2.2413 | A38.0132 | 1 | DOWEL PIN | $4 \times 20 \mathrm{MM}$ | B21 |
| N2.2445 | A38.0132 | 1 | DOWEL PIN | 2,5 X 6 MM | C19 |
| N2.4407 | A38.0111 | 4 | RIVET | $2 \times 3$ | A23+ |
| N2.4902 |  | 4 | HAMMER HEAD BOLT | 1,85 X 4,76 | -- |
| N2.5102 | A38.0109 | 1 | PRESSURE SPRING | $0.6 \times 8 \times 14 / 6$ | A18 |
| N2.5160 | A38.0113 | 3 | PRESSURE SPRING | $1 \times 12 \times 26$ | C16+ |
| N2.5161 | A38.0113 | 1 | PRESSURE SPRING | $1 \times 12 \times 20$ | D14 |
| N2.5161 | A38.0115 | 1 | PRESSURE SPRING | $1 \times 12 \times 20$ | B12 |
| N2.5162 |  | 1 | PRESSURE SPRING | $2 \times 42 \times 22$ | -- |
| N2.5168 |  | 1 | PRESSURE SPRING | $0.5 \times 10 \times 22$ | -- |
| N2.5171 |  | 1 | PRESSURE SPRING | $1 \times 8 \times 26$ | -- |
| N2.5179 | A38.0113 | 1 | PRESSURE SPRING | 0.32X2.82X34/30.5 | C15 |
| N2.5192 | A38.0113 | 2 | PRESSURE SPRING | $0.7 \times 8 \times 28$ | B14 |
| N2.5193 |  | 1 | PRESSURE SPRING | 6.3X81.6X220 | -- |
| N2.5601 | A38.2118 | 72 | CUP SPRING | 12.5X6.2X0.7 | A6 |
| N2.5609 | A38.0118 | 2 | CUP SPRING | 45X22.5X1.75 | A20 |
| N2.5612 | A38.0115 | 9 | CUP SPRING | 20X10.2X0.5 | A11 |
| N2.5613 | A38.2125 | 57 | CUP SPRING | 16X8,2X0,9 | B6 |
| N2.5614 | A38.2104 | 72 | CUP SPRING | 10X4,2X0,6 | C3 |

[ ] = Group

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| Item-No. | in group | Pcs. | Description | Dimension | Field |
| N2.5616 |  | 2 | CUP SPRING | $50 \times 25.4 \times 2.5$ | -- |
| N3.1109 | A38.1372 | 1 | BALL BEARING |  | A23 |
| N3.1109 | A38.2303 | 1 | BALL BEARING |  | B22 |
| N3.1123 | A38.0132 | 1 | BALL BEARING |  | B21 |
| N3.1133 | A38.0132 | 1 | BALL BEARING |  | C19 |
| N3.1703 | A38.0111 | 1 | BALL | 5 MM . | C24 |
| N3.1706 | A38.0113 | 2 | BALL | 15 MM | B14+ |
| N3.1706 | A38.0115 | 1 | BALL | 15 MM | B12 |
| N3.1709 | A38.0113 | 1 | BALL | 12 MM | D14 |
| N3.2322 | A38.1372 | 1 | NEEDLE CASE |  | A23 |
| N3.2322 | A38.2303 | 1 | NEEDLE CASE |  | B22 |
| N3.2323 | A38.1372 | 1 | NEEDLE CASE |  | B24 |
| N3.2323 | A38.2303 | 1 | NEEDLE CASE |  | B22 |
| N3.3129 | A38.0111 | 2 | SLIDE-BEARING |  | B23 |
| N3.3130 | A38.0111 | 1 | HEADED PRESS FIT BUSH |  | C24 |
| N3.3140 | A38.0111 | 1 | HEADED PRESS FIT BUSH |  | C23 |
| N3.3141 |  | 1 | HEADED PRESS FIT BUSH |  | -- |
| N41.9128 |  | 1 | ADHESIVE LABEL |  | -- |
| N41.9129 |  | 1 | ADHESIVE LABEL |  | -- |
| N4.5110 | A38.0113 | 1 | CAP |  | A16 |
| N4.5110 |  | 1 | CAP |  | -- |
| N4.9132 |  | 1 | LABEL | <<A383>> | -- |
| N4.9159 |  | 1 | LABEL | <<CE>> | -- |
| [N6.3404] |  | 1 | PISTON |  | -- |
| N6.3501 | A38.0114 | 1 | INNER PACKING | 12.31X24.1X6.5 | B11 |
| N6.3504 | N6.3404 | 1 | INNER PACKING | 8.3X12.1X4 | -- |
| N6.3507 | A38.2155 | 1 | EXTERNAL PACKING RING |  | -- |
| N6.3508 | N6.3404 | 1 | EXTERNAL PACKING RING |  | -- |
| N6.5133 | A38.0113 | 1 | REDUCING COUPLING |  | C13 |
| N6.5138 | A38.0115 | 1 | SEALING SCREW |  | A11 |
| N6.5508 | A38.0118 | 1 | EXHAUST SILENCER | R 1/2" | A21 |
| N6.5624 | A38.0113 | 1 | ANGLE |  | C13 |
| N6.5627 |  | 1 | HOLLOW SCREW |  | -- |
| N6.5634 |  | 2 | PACKING RING |  | -- |
| N6.5637 | A38.0118 | 1 | ADAPTER |  | A21 |
| N6.5673 |  | 2 | HOLLOW SCREW | M22X1,5 | -- |
| N6.5674 |  | 4 | PACKING RING | $22 \times 27 \times 1.5$ | -- |
| N6.6108 |  | 1 | SEAL | $16 \times 24 \times 5$ | -- |
| N6.6113 |  | 1 | PACKING RING | $10 \times 16 \times 4.5$ | -- |
| N6.6114 | A38.0109 | 1 | LIP SEAL | $12 \times 6 \times 4$ | C18 |
| N6.6115 | A38.0109 | 1 | LIP SEAL | $16 \times 10 \times 4$ | C18 |
| N6.6117 | A38.0109 | 4 | SEAL | $6 \times 13 \times 2.3$ | -- |
| N6.6117 | A38.0113 | 5 | SEAL | $6 \times 13 \times 2.3$ | B18+ |
| N6.6117 |  | 5 | SEAL | $6 \times 13 \times 2.3$ | C16+ |
| N6.6120 |  | 1 | SEAL | $16 \times 9 \times 2.3$ | -- |
| N6.6124 | A38.0115 | 1 | PACKING RING | $25 \times 18 \times 2.3$ | B12 |
| N6.6142 |  | 1 | SEAL |  | -- |
| N6.6143 |  | 1 | SEAL |  | -- |
| N6.6145 |  | 1 | DIAPHRAGM |  | -- |
| N6.6202 | A38.0111 | 1 | O-RING | $25 \times 2,5$ | C22 |
| N6.6204 | A38.0113 | 4 | O-RING | $18 \times 2$ | B14+ |
| N6.6207 | A38.1244 | 1 | O-RING | 3,1 $\times 1,6$ | A17 |
| N6.6213 |  | 1 | O-RING | $20 \times 2$ | -- |
| N6.6217 | A38.0109 | 6 | O-RING | $15 \times 2$ | A18+ |


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| Item-No. | in group | Pcs. | Description | Dimension | Field |
| N6.6217 | A38.0113 | 8 | O-RING | $15 \times 2$ | C16+ |
| N6.6217 |  | 6 | O-RING | $15 \times 2$ | -- |
| N6.6223 | A38.0118 | 1 | O-RING | $50 \times 2$ | B21 |
| N6.6229 | A38.0111 | 1 | O-RING | $14 \times 1$ | B24 |
| N6.6233 | A38.0113 | 1 | O-RING | $6 \times 2$ | B15 |
| N6.6235 | A38.0113 | 2 | O-RING | $12 \times 2$ | B14+ |
| N6.6237 |  | 1 | O-RING | $33 \times 1,5$ | -- |
| N6.6238 |  | 1 | O-RING | $60 \times 2$ | -- |
| N6.6241 | A38.0132 | 2 | O-RING | $46 \times 2$ | C19+ |
| N6.6244 | A38.0115 | 1 | O-RING | $22 \times 2$ | B12 |
| N6.6247 |  | 1 | O-RING | $5 \times 2,5$ | -- |
| N6.6248 | A38.0113 | 1 | O-RING | $10 \times 1.5$ | D14 |
| N6.6249 | A38.0115 | 1 | O-RING | $155 \times 3$ | A10 |
| N6.6251 |  | 1 | O-RING | $18 \times 1.5$ | -- |
| N6.6252 |  | 1 | O-RING | $12 \times 1.5$ | -- |
| N6.6310 | A38.0114 | 1 | SEAL |  | B11 |
| N6.6504 | A38.0115 | 1 | FLAT SEAL | $13 \times 10 \times 1,5$ | A11 |
| N6.6803 | A38.0111 | 1 | PACKING RING | $10 \times 19 \times 9.8$ | C22 |
| N7.1106 |  | 1 | BUSH |  | -- |
| N7.1203 |  | 1 | SEALING DISK |  | -- |
| N7.1204 |  | 1 | SEALING DISK |  | -- |

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