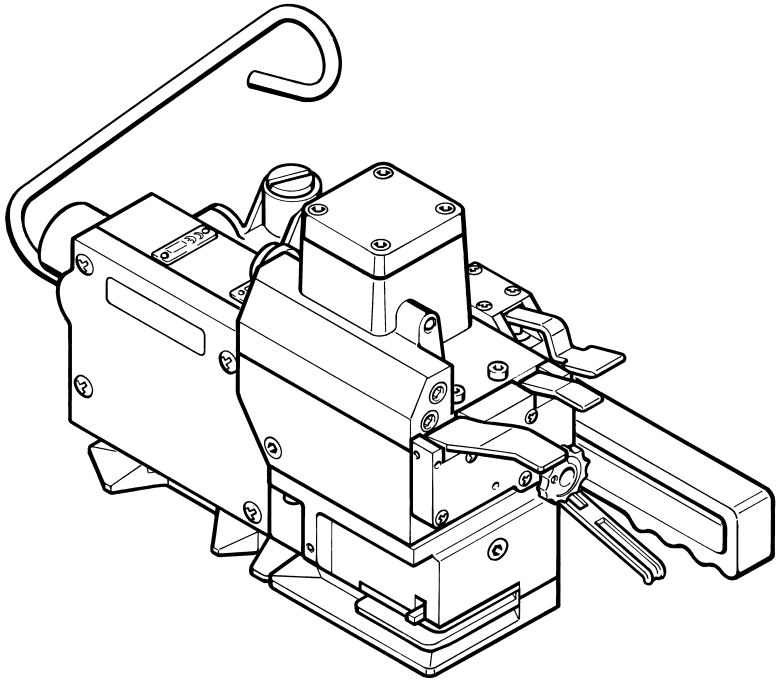
FROMM

OPERATION MANUAL / SPARE PARTS LIST

PNEUMATIC PLASTIC STRAPPING TOOL MODEL P350 SEMI - AUTOMATIC

49.4211.02



CE Declaration of conformity

We declare that the machine P350
is in conformity with the following standard or
standardised documents:
98/37/EEC

FROMM Holding AG
Hinterbergstrasse 26
CH - 6330 Cham
22.01 2002

R.Fromm
Director

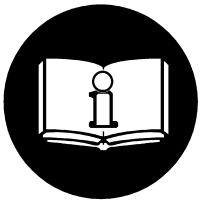
CE

49421102.en/MAS/© 05.04

INDEX

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 responsable 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.

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 P350 has been designed to strap packages with plastic 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 TECHNICAL DATA

Description of the tool

The tool model P350 has been designed to strap packages with plastic strapping. The plastic strapping is fed around the package manually or in combination with a strap feeder. The straps are inserted in the tool, automatically tensioned, sealed by friction welding and separated.

Tool size with suspension bracket

Length:	484 mm / 19.1"
Width:	193 mm / 7.6"
Height:	332 mm / 13.1"
Weight:	16.5 kg / 36.4 lbs

Sound information

The A-weighted equivalent continuous sound level at the work place of the machine operator is typical 74 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^2.
This value was determined according to DIN EN 28 662 T1 (01.93).

Air pressure

Air connection:	G 1/4" minimum (The minimum air passage diameter must not be smaller on fittings and couplings either).
Air pressure:	The maximum air pressure allowed is 6,0 bars / 87 psi The standard working air pressure is 5.5 bar / 80 psi.

Air consumption

Tensioning:	approx. 22 Nl / 0.80 cu.ft uncompressed air per second with the air motor running.
Sealing:	approx. 25 - 50 Nl / 0.90 - 1.80 cu.ft uncompressed air per cycle (approx. 25 Nl / 0.90 cu.ft uncompressed air per second).

Strap tension

Tensioning force	P350/0001: 2300 - 3800N P350/0003: 2300 - 3800N P350/0005: 1300 - 2300N P350/0007: 1300 - 2300N at 6 bar / 87 psi. Ten different steps can be preselected.
Tensioning speed:	approx. 300 mm / 11.8" per second with steady air pressure of 6 bar/87 psi.
Strap qualities:	PET (Polyester) PP (Polypropylen)
Strap dimensions:	1/2" - 1 1/4" x .020" - .050" (see chart of types). (12.7 - 32.0 x 0.50 - 1.27 mm)

5 CHART OF TYPES

5.1 P350/0001 semi - automatic

Item No.	Model	Strap width	Strap thickness	Strap quality
49.5111	P350/19/0.50-0.75/3.8	3/4" / 19.0 mm	.020" - .030"	PET / PP
49.6111	P350/22/0.50-0.75/3.8	7/8" / 22.0 mm	.020" - .030"	PET / PP
49.7111	P350/25/0.50-0.75/3.8	1" / 25.0 mm	.020" - .030"	PET / PP
49.8111	P350/32/0.50-0.75/3.8	1 1/4" / 32.0 mm	.020" - .030"	PET / PP

5.2 P350/0003 semi - automatic

Item No.	Model	Strap width	Strap thickness	Strap quality
49.1201	P350/12.7/0.80-1.10/PET/3.8	1/2" / 12.7 mm	.031" - .044"	PET
49.2201	P350/13/0.80-1.10/PET/3.8	13.0 mm	.031" - .044"	PET
49.3211	P350/15.5/0.80-1.10/3.8	3/5" / 15.5 mm	.031" - .044"	PET / PP
49.4211	P350/16/0.80-1.10/3.8	5/8" / 16.0 mm	.031" - .044"	PET / PP
49.5211	P350/19/0.80-1.10/3.8	3/4" / 19.0 mm	.031" - .044"	PET / PP
49.5311	P350/19/1.12-1.27/3.8	3/4" / 19.0 mm	.044" - .050"	PET / PP
49.6211	P350/22/0.80-1.10/3.8	7/8" / 22.0 mm	.031" - .044"	PET / PP
49.7211	P350/25/0.80-1.10/3.8	1" / 25.0 mm	.031" - .044"	PET / PP
49.8211	P350/32/0.80-1.10/3.8	11/4" / 32.0 mm	.031" - .044"	PET / PP

5.3 P350/0005 semi - automatic

Item No.	Model	Strap width	Strap thickness	Strap quality
49.1103	P350/12.7/0.50-0.75/2.3	1/2" / 12.7 mm	.020" - .030"	PET / PP
49.2103	P350/13/0.50-0.75/2.3	13.0 mm	.020" - .030"	PET / PP
49.3103	P350/15.5/0.50-0.75/2.3	3/5" / 15.5 mm	.020" - .030"	PET / PP
49.4103	P350/16/0.50-0.75/2.3	5/8" / 16.0 mm	.020" - .030"	PET / PP
49.5113	P350/19/0.50-0.75/2.3	3/4" / 19.0 mm	.020" - .030"	PET / PP
49.6113	P350/22/0.50-0.75/2.3	7/8" / 22.0 mm	.020" - .030"	PET / PP
49.7113	P350/25/0.50-0.75/2.3	1" / 25.0 mm	.020" - .030"	PET / PP
49.8113	P350/32/0.50-0.75/2.3	1 1/4" / 32.0 mm	.020" - .030"	PET / PP

5.4 P350/0007 semi - automatic

Item No.	Model	Strap width	Strap thickness	Strap quality
49.1203	P350/12.7/0.80-1.10/2.3	1/2" / 12.7 mm	.031" - .044"	PET / PP
49.2203	P350/13/0.80-1.10/2.3	13.0 mm	.031" - .044"	PET / PP
49.3213	P350/15.5/0.80-1.10/2.3	3/5" / 15.5 mm	.031" - .044"	PET / PP
49.4213	P350/16/0.80-1.10/2.3	5/8" / 16.0 mm	.031" - .044"	PET / PP
49.5213	P350/19/0.80-1.10/2.3	3/4" / 19.0 mm	.031" - .044"	PET / PP
49.5313	P350/19/1.12-1.27/2.3	3/4" / 19.0 mm	.044" - .050"	PET / PP
49.6213	P350/22/0.80-1.10/2.3	7/8" / 22.0 mm	.031" - .044"	PET / PP
49.7213	P350/25/0.80-1.10/2.3	1" / 25.0 mm	.031" - .044"	PET / PP
49.8213	P350/32/0.80-1.10/2.3	1 1/4" / 32.0 mm	.031" - .044"	PET / PP

6 LUBRICANTS

Oil for air unit

HL / CL ISO-VG 10

Oil for the pressure intensifier in the tool

Hydraulic oil corresponding to HM ISO-VG 46

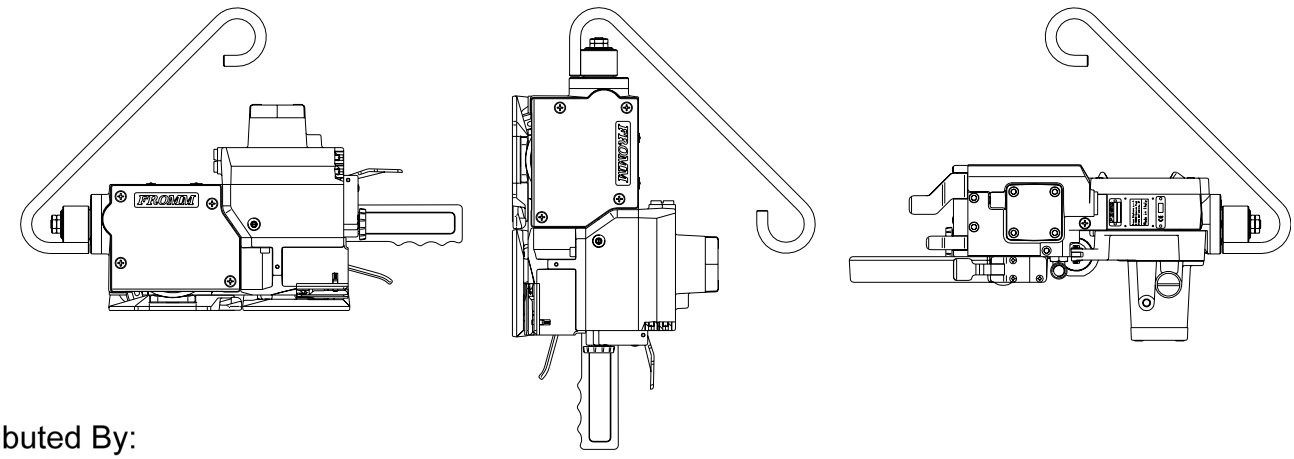
7 INSTALLATION

7.1 Compressed air connection

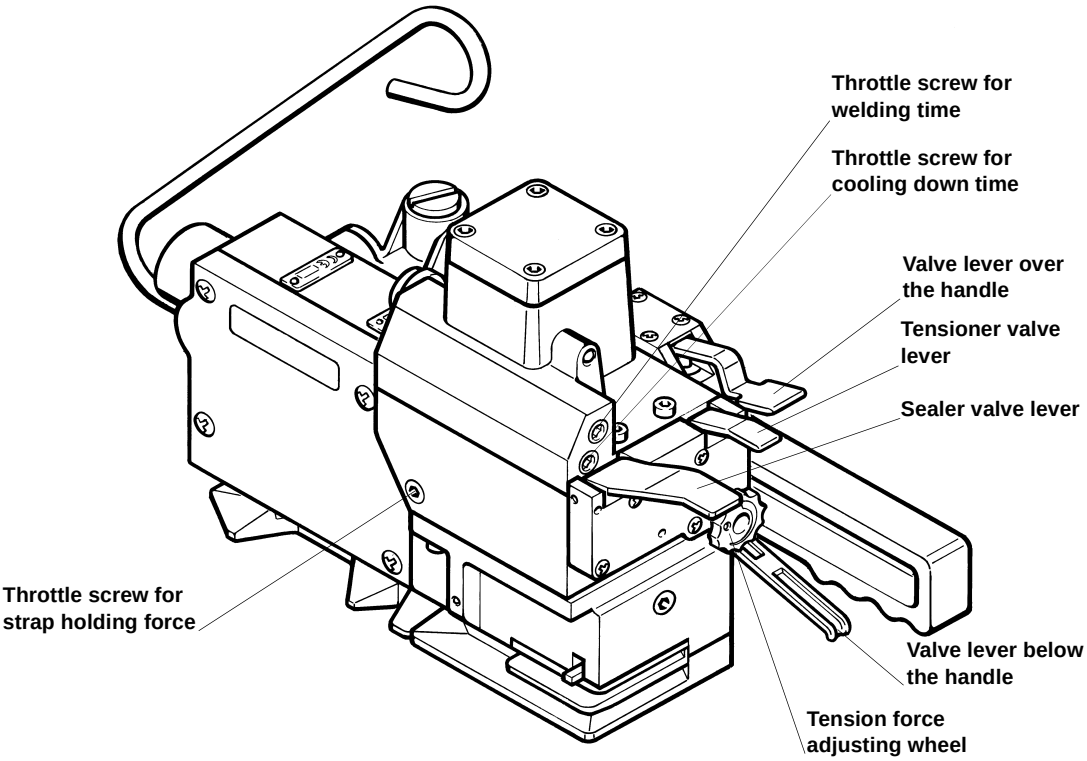
The compressed air hose is connected to the angle connection N6.5624 (G 1/4“) .
An air-unit consisting of a separator for water and dirt, a pressure regulator with a manometer and a lubricator must be installed within a range of 15 ft / 5 meters. The compressed air must be free from dirt, rust and moisture.

7.2 Suspension of tool

It is possible to suspend the tool on a spring loaded balancer using the suspension bracket which is supplied with the tool. The suspension bracket has been designed in such a way, that the tool can be used for all three working positions.



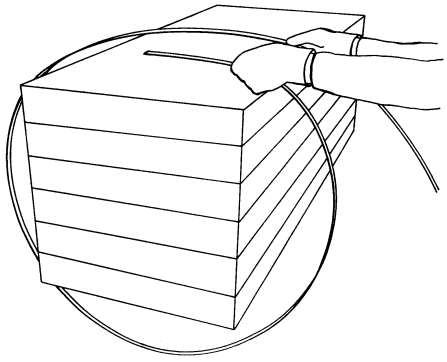
8 OPERATING CONTROLS



9 OPERATION

9.1 Feeding the strap around the package

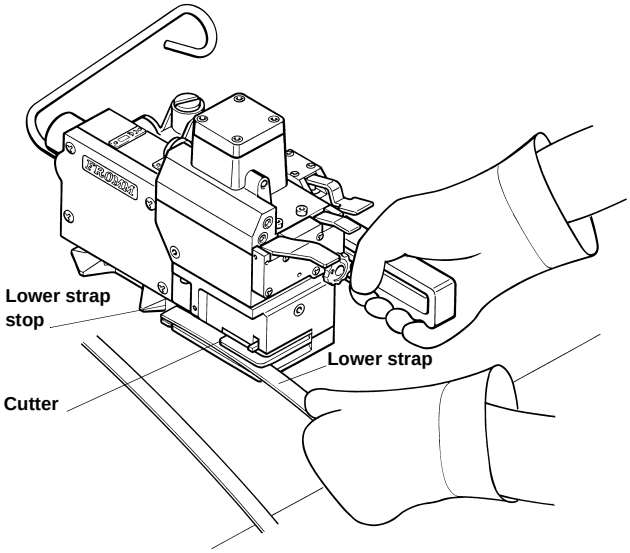
The strapping is fed around the package as illustrated.



Warning! The plastic strap which will be welded must be free from oil, grease and other dirt.
Dirty plastic straps can't be welded correct!

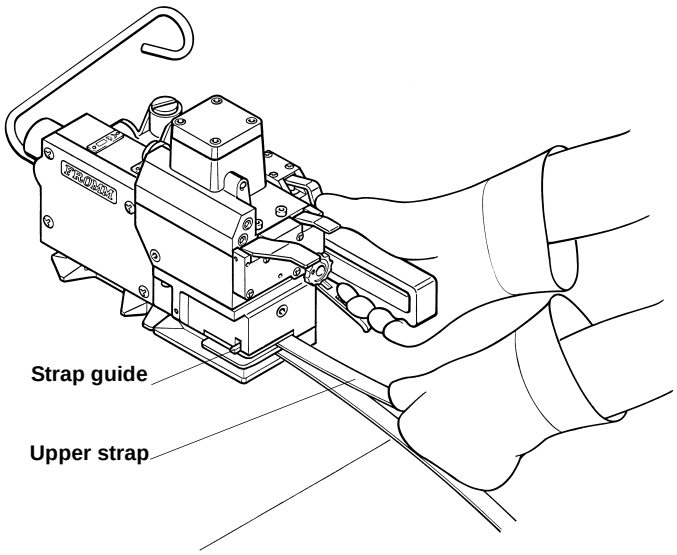
9.2 Inserting the lower strap

Lift and hold the valve lever below the handle with the index finger of the right hand. The left hand inserts the free end of the strap in a sloping position first under the lower strap stop and then under the cutter until it hits the strap stop. Make sure that the strap is well aligned to both strap stops! Release the valve lever, the strap is locked.



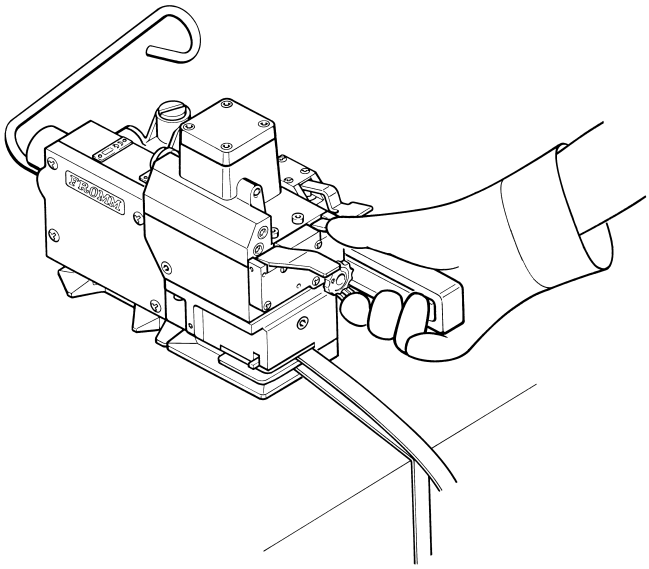
9.3 Inserting the upper strap

Press down and hold with the thumb of the right hand the valve lever over the handle. The left hand inserts the upper strap pulling it slightly over the cutter into the tool until it is caught by the strap guide!
Take up slack from the strap loop by pulling the upper strap with the left hand.
Release the valve lever, the front strap guide close and the feed wheel will move down to the strap.



9.4 Tensioning the strap

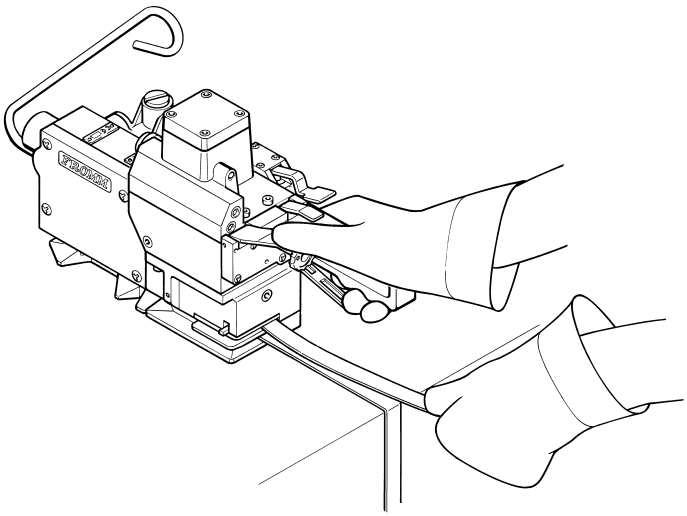
Ten steps of strap tension can be preselected on the adjusting wheel (see point 9.7).
Press down the tensioner valve lever and keep it until the tool has finished the tensioning operation. The tensioning operation can be interrupted by releasing the tensioner valve lever.
When the preselected tension force is reached, the tensioner valve lever maintains its lower position and must be pulled up to release.



9.5 Sealing the straps

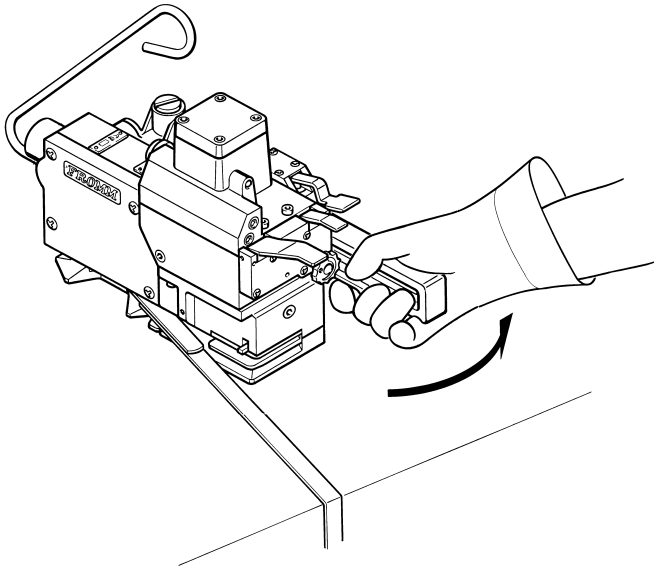
Warning! Never start sealing operation before tension is terminated. Failure to follow these instructions can result in a breakdown of the tool.

Press down and release immediately the sealer valve lever with the thumb of the right hand to start the sealing operation.
The operation is now carried out automatically. The strap tension is interrupted, the reduced holding air pressure prevents the feed wheel from running backwards, the sealing operation is now executed and finally the upper strap is separated.
After termination of the welding operation, the welding gripper remains in its position during the cooling down time.



9.6 Removing the tool from the tensioned and sealed strap

The strapping is held in the tool until the cooling down time has expired.
Lift and hold the valve lever below the handle with the index finger of the right hand and remove the tool to the right/backwards from the tensioned and sealed strap.
Release the valve lever.



9.7 Adjustment of the strap tension

The strap tension can be preselected with the adjusting wheel from 1300N - 2300N (2300N - 3800N). Ten different steps can be preselected. The adjusting wheel can only be operated when pressed to the tool first.

Turning the adjusting wheel clockwise increases the tension force.
Turning the adjusting wheel counter-clockwise decreases the tension force.

9.8 Adjustment of the welding time

Depending on the size and quality of the strap, different welding times are required.
The welding time can be set at the throttle screw using a screw-driver 0.177“ x 0.031“ (4.5 x 0.8 mm).

Turning the screw-driver clockwise increases the welding time.
Turning the screw-driver counter-clockwise decreases the welding time.

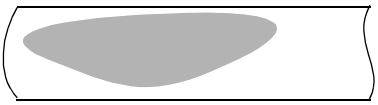
Adjustment in small steps is recommended!

9.9 Seal - Control

A regular control of the seal is necessary. The seal can be checked visually.
Make a seal, peel it apart and examine it as follows:

Correct seal / correctly adjusted welding time

Correct seal shows a melted area over the whole strap width in a lengthof approx. 3/4" (45 mm).
Minor quantities of fused plastic may overflow on sides.



Incorrect seal / welding time too short

The welded surface of the straps is not sufficient. The seal efficiency is insufficient.
Warning! Straps with insufficient seal strength must be removed from the package!
The welding time must be readjusted!

Incorrect seal / welding time too long

If the welding time is too long the straps are overheated. The fused plastic overflows on both sides of the straps. The seal efficiency is affected.
Warning! Straps with insufficient seal strength must be removed from the package!
The welding time must be readjusted!

9.10 Adjustment of the strap holding force

During the sealing operation, the holding air prevents the feed wheel from running backwards. Usually, there is no need to readjust the works setting of the holding air pressure.
In case of loss of strap tension or in case of excessive tension during the sealing operation, the holding force must be readjusted on the throttle screw for the holding force using a screw-driver of 0.177" x 0.031" (4.5 x 0.8 mm).
Turning the screw-driver clockwise decreases the holding force.
Turning the screw-driver counter-clockwise increases the holding force.

The throttle screw for the holding force is adjusted correctly when the strap maintains its tension and doesn‘t move during the sealing operation!

Adjustment in small steps is recommended!

9.11 Adjustment of the cool down time

In order to obtain a high seal strength, the welded straps must cool down under pressure of the sealing jaws. The required cool down time between 2.5 to 4.5 seconds depends on the strap dimension, the strap quality and the strap tension.
The time can be adjusted at the throttle screw for cool down time using a screw-driver of 0.177" x 0.031" (4.5 x 0.8 mm).
Turning the screw-driver clockwise increases the cool down time.
Turning the screw-driver counter-clockwise decreases the cool down time.
Adjustment in small steps is recommended!

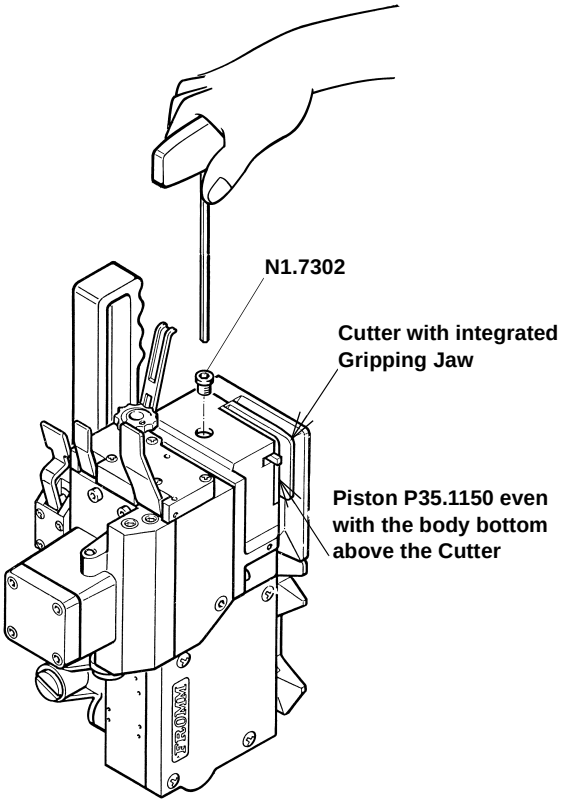
10 MAINTENANCE

10.1 Checking of the oil level

After a lot of running time it is possible that the cylinder which presses the Gripping Jaw onto the strap loses oil. If this happens the Lower Strap can't be gripped by the Gripping Jaw P35.1108 during tensioning. The Lower Strap is pulled out of the tool and the seal fails.

Checking and topping up the oil

1. Put the tool on a flat surface with the oil-filling hole facing up.
2. Remove the Sealing Screw N1.7302. Top up hydraulik oil HM ISO-VG 46 to the top of the thread.
3. Shake the tool to let escape the air out of the oil.
4. Repeat step 2 and 3 as long as air is escaping out of the oil.
5. Screw in the Sealing Screw. Take care that the surplus oil can escape. It would be ideal, if during the screwing in of the Sealing Screw, in the last moment before the screw is stack the piston P35.1150 is moved a very little. This ensures that the cylinder is completely filled with oil. So the maximum pressure is exercised on the Gripping Jaw and thus on the Lower Strap.



10.2 Exchange of wearing parts

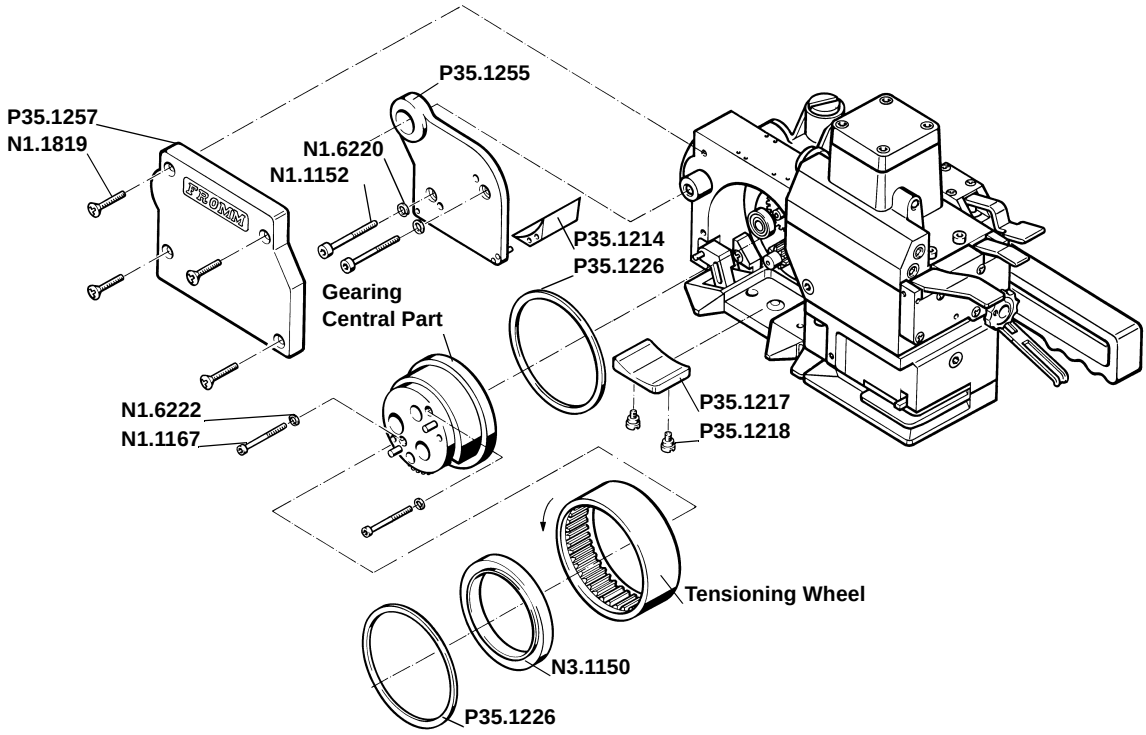
Exchange of tensioning wheel and slide plate

- Screw off the Cover P35.1257;
- Screw off and pull off the Gearing Cover P35.1255;
- Pull off Stripper P35.1214;
- Lift the Tensioning Wheel and pull it off from the Gearing Central Part together with the Ring P35.1226 and the Bearing N3.1150.
  If the Tensioning Wheel cannot be pulled off, it must be dismounted together with the Gearing Central Part. This is to be done as follows:
  - Disassemble both Screws N1.1167 together with the Security Rings N1.6222;
  - Lift the Tensioning Wheel and pull it off together with the Gearing Central Part;
  - Pull off the Tensioning Wheel together with the Ring and the Bearing from the Gearing Central Part.
- Screw off the two Collar Screws P35.1218 at the lower side of the tool;
- Take the Slide Plate P35.1217 from the tool.

Assembling in opposite order.
Secure the Collar Screws P35.1218 with Loctite 222.
The Slide Plate is still loose after driving in the Collar Screws.

Attention! Observe the position of the Tensioning Wheel. The sense of rotation of the Tensioning Wheel is signalized at the front of the Tensioning Wheel.

The Screws N1.1152 have to be tightened with 16 Nm.

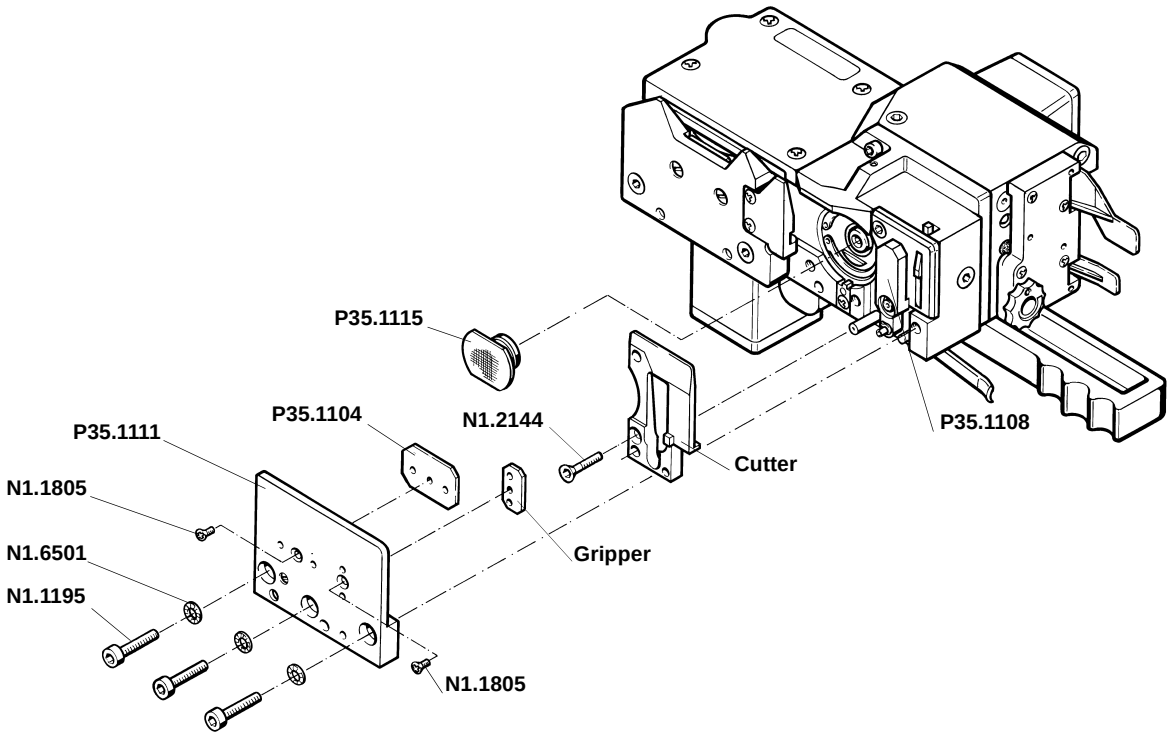


Exchange of gripper, welding stop gripper, welding gripper and cutter

- Disassemble the three Screws N1.1195 together with the Security Rings N1.6501;
- Pull off the Base Plate P35.1111;
- Screw off Gripper and Welding Stop Gripper P35.1104 from the Base Plate;
- Disassamble Welding Gripper P35.1115 with two screw drivers. Remove it cautiously out of its holding device by lever action;
- Dismount Screw N1.2144 and pull off the cutter.

Assembling in opposite order.

The Screws N1.1805 for mounting the Gripper and the Welding Stop Gripper P35.1104 have to be secured with Loctite 222.
The Screws N1.1195 have to be tightened with 48 Nm.



11 CLEANING

Clean strap gripping parts from strap abrasion regularly using compressed air (do not use any mechanical tool for cleaning).

When cleaning the surface of the tool do not use water or aggressive solvents!

12 SERVICE / REPAIR

Servicing and repair work must only be carried out by authorized service centres.
If the tool breaks down or does no longer operate do not disassemble it. Send it fully assembled to the local service centre (see name and address on the rear page of this manual). Use original packing.

The pneumatic plastic strapping tool P350 is a high performance tool. We strongly recommend you to have it serviced by an authorized service shop after 12 months at the latest if used one shift per day. If used two or more shifts per day the tool has to be serviced after a shorter period of time.

13 SPARE PARTS LIST 49.4211.02

49.4211.02	P350/16/0.80-1.10/3.8		P350.0003.02		23.02.00
Item-No.		in group	Pcs.	Description	Dimension	Field
A38.1230		P35.0104	1	SEALING SCREW		C13
A38.1230		P35.0106	1	SEALING SCREW		A3
A38.1265		P35.0103	5	SUSTAINING RING		B34+
[A38.1348]		P35.0105	1	ROTOR		--
[A38.1348]		P35.0107	1	ROTOR		--
A38.1351	*	P35.0105	8	VANE		A15+
A38.1351	*	P35.0107	8	VANE		B5
A38.1352		P35.0105	1	END PLATE		C14
A38.1352		P35.0107	1	END PLATE		B4
A38.1354		P35.0104	1	COVER		A16
A38.1354		P35.0106	1	COVER		C5
A38.1374		P35.0105	16	FELT		A14+
A38.1374		P35.0107	16	FELT		B5
A38.1376		A38.1348	1	ROTOR		B5
A38.1376		A38.1348	1	ROTOR		B5
A38.1377		A38.1348	1	COUPLING		B4
A38.1377		A38.1348	1	COUPLING		B4
A38.1378		A38.1348	1	DOWEL		B4
A38.1378		A38.1348	1	DOWEL		B4
A38.2307			1	INTERMEDIATE WHEEL	2-3	C2
A38.3405		P35.1401	2	RATCHET DISK		B38
A38.3407		P35.1401	1	THRUST WASHER		A38
A48.3138		P35.0109	1	PISTON ROD		B8
A48.3153		P35.0102	1	VALVE RING		B22
N11.1123			2	SCREW	M6 X 30	A34
N1.1106		P35.1401	3	SCREW	M6 X 20	B38
N1.1116			1	SCREW	M6 X 25	C4
N1.1144			1	SCREW	M6 X 70	A20
N1.1151			2	SCREW	M6 X 80	C15
N1.1152			2	SCREW	M6 X 60	D3
N1.1167			2	SCREW	M4 X 45	C2+
N1.1180		P35.0104	4	SCREW	M6 X 90	A16
N1.1180		P35.0106	4	SCREW	M6 X 90	B6+
N1.1195			5	SCREW	M8 X 1 X 36	C26+
N1.1805			2	SCREW	M5 X 8	D27
N1.1807			2	SCREW	M5 X 12	D27
N1.1818		P35.0109	1	SCREW	M5 X 20	B28
N1.1819			7	SCREW	M6 X 30	B1+
N1.1820		P35.0102	4	SCREW	M4 X 25	C24+
N1.1820		P35.0103	6	SCREW	M4 X 25	A33+
N1.2102			1	COUNTERSUNK SCREW	M6 X 20	B29
N1.2144			1	COUNTERSUNK SCREW	M6 X 30	C29
N1.3515		P35.0102	1	SOCKET SET SCREW	M4 X 8	D24
N1.5130		P35.1401	2	HEXAGON NUT	M10	A37
N1.5608		P35.0102	1	SLOTTED ROUND NUT	M8 X 1	A21
N1.5608		P35.0109	1	SLOTTED ROUND NUT	M8 X 1	B8
N1.6220			8	SPRING LOCK WASHER	M6	A20+
N1.6220		P35.0104	4	SPRING LOCK WASHER	M6	A15+
N1.6220		P35.0106	4	SPRING LOCK WASHER	M6	B6+
N1.6220		P35.1401	3	SPRING LOCK WASHER	M6	B38+
N1.6222			2	SPRING LOCK WASHER	M4	C2+

* = Wearing Parts

[ ] = Group

49.4211.02	P350/16/0.80-1.10/3.8		P350.0003.02		23.02.00
Item-No.		in group	Pcs.	Description	Dimension	Field
N1.6501			5	SAFETY WASHER	M8	C26+
N1.7302			2	SEALING SCREW	M10 X 1 X 8	C42+
N2.1107			1	SECURITY RING	E8	C29
N2.1118			1	SECURITY RING	E6	C29
N2.1212		P35.0109	1	SECURITY RING	J24	B10
N2.1220		P35.0109	1	SECURITY RING	JV47	C10
N2.1221		P35.0102	1	SECURITY RING	J36	A21
N2.1507		P35.0109	1	SPRING RING	22	C10
N2.1601		P35.0102	1	SPRING RING	SW12	C20
N2.1701		P35.0109	1	SECURITY RING	17	A8
N2.1803			2	SECURITY RING	4	B4
N2.1803		P35.0109	2	SECURITY RING	4	A8
N2.2101		P35.1255	1	PARALLEL PIN	5 m6 X 12	D3
N2.2105			1	PARALLEL PIN	6 m6 X 30	C29
N2.2106		P35.0109	1	PARALLEL PIN	5 m6 X 20	B28
N2.2109			3	PARALLEL PIN	8 m6 X 30	B26+
N2.2129			4	PARALLEL PIN	5 m6 X 10	C27+
N2.2138			1	PARALLEL PIN	4 m6 X 12	A29
N2.2172			1	PARALLEL PIN	5 m6 X 30	C4
N2.2174		P35.1209	2	PARALLEL PIN	6 m6 X 60	C2+
N2.2179			1	PARALLEL PIN	8 m6 X 45	D28
N2.2180		P35.0102	1	PARALLEL PIN	4 m6 X 16	B21
N2.2180		P35.1201	2	PARALLEL PIN	4 m6 X 16	B4
N2.2180		P35.1255	2	PARALLEL PIN	4 m6 X 16	D4
N2.2181		P35.0102	2	PARALLEL PIN	4 m6 X 8	C23
N2.2181		P35.0104	1	PARALLEL PIN	4 m6 X 8	D13
N2.2182			3	PARALLEL PIN	6 m6 X 16	D10+
N2.2413		P35.0105	1	DOWEL PIN	4 X 20	C14
N2.2413		P35.0107	1	DOWEL PIN	4 X 20	B4
N2.2445		P35.0105	1	DOWEL PIN	2.5 X 6	A14
N2.2445		P35.0107	1	DOWEL PIN	2.5 X 6	B5
N2.4204			1	RIVET	2 X 15	A29
N2.4205		P35.0109	3	RIVET	3 X 20	B8
N2.4407			4	RIVET	2 X 3	C2+
N2.4902			4	HAMMER HEAD BOLT	1.85 X 4.76	A40
N2.5179			1	PRESSURE SPRING	0.32 X 2.82 X 34/30.5	A29
N2.5182		P35.0103	2	PRESSURE SPRING	0.63 X 5.5 X 27/15.5	B32+
N2.5199		P35.0109	3	PRESSURE SPRING	0.6 X 4.6 X 40/23.5	B8
N2.5221			2	PRESSURE SPRING	1.5 X 14 X 17/4.5	A29
N2.5222		P35.0102	1	PRESSURE SPRING	1.1 X 21.5 X 80/7.5	A21
N2.5223		P35.0102	2	PRESSURE SPRING	0.8 X 8 X 31/11.5	C19+
N2.5224		P35.0104	2	PRESSURE SPRING	0.5 X 9 X 17/6.5	C17+
N2.5225		P35.0102	2	PRESSURE SPRING	0.3 X 6.3 X 26/19.5	B20+
N2.5226		P35.0103	2	PRESSURE SPRING	1 X 11 X 21.4/5.5	A34+
N2.5228		P35.0102	1	PRESSURE SPRING	0.90 X 6 X 47.50/24.5	C23
N2.5229		P35.0102	1	PRESSURE SPRING	1.1 X 14 X 65.4/10.5	A22
N2.5604		P35.1401	2	CUP SPRING	31.5 X 16.3 X 1.25	A38
N2.5609		P35.0104	2	CUP SPRING	45 X 22.4 X 1.75	B16
N2.5609		P35.0106	2	CUP SPRING	45 X 22.4 X 1.75	C5
N3.1123		P35.0105	1	BALL BEARING	10 X 26 X 8	C14
N3.1123		P35.0107	1	BALL BEARING	10 X 26 X 8	A5
N3.1133		P35.0105	1	BALL BEARING	10 X 30 X 14	B16
N3.1133		P35.0107	1	BALL BEARING	10 X 30 X 14	A5

* = Wearing Parts

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49.4211.02	P350/16/0.80-1.10/3.8			P350.0003.02		23.02.00
Item-No.		in group	Pcs.	Description	Dimension	Field
N3.1134		P35.1209	1	BALL BEARING	7 X 22 X 7	C3
N3.1138		P35.0102	1	BALL BEARING	8 X 22 X 7	B20
N3.1138		P35.1201	1	BALL BEARING	8 X 22 X 7	B3
N3.1149		P35.0109	1	BALL BEARING	20 X 42 X 12	B9
N3.1150			2	BALL BEARING	70 X 90 X 10	C1+
N3.1702		P35.0102	5	BALL	4 MM	C22+
N3.1702		P35.0109	18	BALL	4 MM	B10
N3.1706		P35.0102	1	BALL	15 MM	B22
N3.2209		P35.0109	2	NEEDLE BEARING	16 X 24 X 13	B10
N3.2322		P35.1201	1	NEEDLE CASE	8 X 12 X 10	A3
N3.2322		P35.1209	1	NEEDLE CASE	8 X 12 X 10	C2
N3.2323		P35.1201	1	NEEDLE CASE	12 X 16 X 10	B4
N3.2323		P35.1209	1	NEEDLE CASE	12 X 16 X 10	C2
N3.2403		P35.0109	2	INNER RACEWAY	15 X 20 X 12	B2
N3.2403		P35.1201	1	INNER RACEWAY	15 X 20 X 12	B3
N3.2403		P35.1255	1	INNER RACEWAY	15 X 20 X 12	C3
N3.3149		P35.1221	2	SLIDE-BEARING	10 X 12 X 10	D3
N41.9128			1	ADHESIVE LABEL	30 X 10 X 0.1	B39
N41.9129			1	ADHESIVE LABEL	p max. 6 bar/87 psi	B39
N4.9158			1	LABEL	<<P350>>	B40
N4.9159			1	LABEL	<<CE>>	B39
N61.5606		P35.0102	1	REDUCING COUPLING		B21
[N6.3404]		P35.0102	1	PISTON	35 X 8	A21
[N6.3404]		P35.0109	1	PISTON	35 X 8	B8
N6.3504		N6.3404	1	INNER PACKING	8.3 X12.1X4	B8
N6.3504		N6.3404	1	INNER PACKING	8.3 X12.1X4	B8
N6.3508		N6.3404	1	EXTERNAL PACKING RING	35	B8
N6.3508		N6.3404	1	EXTERNAL PACKING RING	35	B8
N6.5509		P35.0104	1	EXHAUST SILENCER	28 X 20	C14
N6.5509		P35.0106	1	EXHAUST SILENCER	28 X 20	A3
N6.5510		P35.0104	1	EXHAUST SILENCER	18 X 20	C14
N6.5510		P35.0106	1	EXHAUST SILENCER	18 X 20	A3
N6.5624		P35.0102	1	ANGLE	G 1/4	A21
N6.6113		P35.0109	1	PACKING RING	10 X 16 X 4.5	A8
N6.6117		P35.0102	5	SEAL	6 X 13 X 2.3	B23+
N6.6121		P35.0102	1	SEAL	8 X 15 X 2.3	B24
N6.6121		P35.0103	5	SEAL	8 X 15 X 2.3	B34+
N6.6122		P35.0102	1	SEAL	20 X 13 X 2.3	C20
N6.6123		P35.0102	7	SEAL	12 X 19 X 2.3	B23+
N6.6147		P35.0102	1	SEAL	10 X 17 X 2.3	B22
N6.6155		P35.0109	1	SEAL	40 X 49 X 3	A10
N6.6156		P35.0109	1	SEAL	10 X 17	C12
N6.6157		P35.0104	2	PACKING RING	4 MM	C17+
N6.6159		P35.0109	3	PACKING RING	20 X 14 X 2.55	B11+
N6.6160		P35.0109	3	PACKING RING	2.5 X 1.6 X 56.6	B11+
N6.6161		P35.0102	1	PACKING RING	10 X 6 X 2.55	B20
N6.6162		P35.0109	3	PACKING RING	20 X 12 X 4.2	B11+
N6.6204		P35.0102	7	O-RING	18 X 2	B21+
N6.6209		P35.0103	6	O-RING	17 X 2	C34+
N6.6211			1	O-RING	16 X 2	A11
N6.6223		P35.0104	1	O-RING	50 X 2	C14
N6.6223		P35.0106	1	O-RING	50 X 2	A4
N6.6240			5	O-RING	15 X 3	B2+

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49.4211.02	P350/16/0.80-1.10/3.8			P350.0003.02		23.02.00
Item-No.		in group	Pcs.	Description	Dimension	Field
N6.6240		P35.0106	1	O-RING	15 X 3	A3
N6.6241		P35.0105	2	O-RING	46 X 2	B14+
N6.6241		P35.0107	2	O-RING	46 X 2	A5+
N6.6247		P35.0102	1	O-RING	5 X 2.5	B21
N6.6253			1	O-RING	42 X 1,5	A9
N6.6255		P35.0102	11	O-RING	21 X 2	C19+
N6.6260			1	O-RING	73 X 2	A9
N6.6262		P35.0109	1	O-RING	32 X 2.0	A8
N6.6263		P35.0104	1	O-RING	15 X 2.5	C13
N6.6263		P35.0106	1	O-RING	15 X 2.5	A3
N6.6264			4	O-RING	4 X 2.0	C9+
N6.6265		P35.0106	1	O-RING	9 X 2.0	A3
N6.6266		P35.0102	1	O-RING	5 X 1.0	B19
N6.6266		P35.0104	2	O-RING	5 X 1.0	D17
N6.6267		P35.0102	3	O-RING	10 X 2.0	B21+
N6.6268		P35.0102	1	O-RING	6 X 2.5	B20
N6.6269		P35.0102	2	O-RING	8.5 X 2.0	B19+
N6.6269		P35.0104	4	O-RING	8.5 X 2.0	C16+
N6.6313		P35.0109	1	SEAL	55 X 44 X 4.2	A10
N6.6314		P35.0109	1	SEAL	70 X 59 X 4.2	B9
N6.6803		P35.0102	1	PACKING RING	10 X 19 X 7/ 9.8	A20
N6.6803		P35.1201	1	PACKING RING	10 X 19 X 7/ 9.8	A4
[P35.0102]			1	MOTOR FLANGE		A23
[P35.0103]			1	HANDLE		A36
[P35.0104]			1	WELDING MOTOR		A18
[P35.0105]		P35.0104	1	MOTOR CELL	EX. 2.5	A14
[P35.0106]			1	TENSIONING MOTOR		A4
[P35.0107]		P35.0106	1	MOTOR CELL	EX. 3,0	A6
[P35.0109]			1	BODY		A12
[P35.1101]		P35.0102	1	MOTOR FLANGE		B21
P35.1103			1	FIXING PLATE		B29
P35.1104	*		1	WELDING STOP GRIPPER		B28
P35.1106	*		1	GRIPPER		C28
P35.1107			1	GUIDE POLE		A29
P35.1108	*		1	GRIPPING JAW		B29
[P35.1109]			1	STOP BOLT		D27
P35.1111			1	BASE PLATE		C28
P35.1112			1	SEALING COVER		B11
P35.1113		P35.0109	1	PISTON GUIDE		B28
P35.1114		P35.0109	1	PISTON		A10
P35.1115	*	P35.0109	1	WELDING GRIPPER		C10
P35.1116		P35.0109	1	CENTERING BUSH		B9
P35.1117		P35.0109	1	WELDING EXCENTRIC		A9
P35.1118		P35.0109	1	HOLDER		C10
P35.1119		P35.0109	1	BALL CAGE		B10
P35.1123	*		1	CUTTER		B29
P35.1131			1	STRAP GUIDE		B29
P35.1136		P35.0102	1	PISTON		A21
[P35.1140]		P35.0104	1	MOTOR HOUSING		C15
P35.1146		P35.0105	1	JACKET		B14
P35.1147		P35.0105	1	END PLATE		A14
P35.1148		P35.0109	1	PISTON		B11
P35.1149		P35.0109	1	PISTON		C11

* = Wearing Parts

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49.4211.02	P350/16/0.80-1.10/3.8			P350.0003.02		23.02.00
Item-No.		in group	Pcs.	Description	Dimension	Field
P35.1150		P35.0109	1	PISTON		D11
[P35.1201]		P35.0106	1	MOTOR SUPPORT		A3
[P35.1202]		P35.1201	1	MOTOR SUPPORT		A3
[P35.1205]		P35.0109	1	BODY		B2
P35.1207			1	INSERT		B26
P35.1208			1	BASE PLATE		B26
[P35.1209]			1	GEARING CENTRAL PART		C3
P35.1210		P35.1209	1	GEARING CENTRAL PART		C3
P35.1211		P35.0109	1	SEALING PLUG		A8
[P35.1212]			1	PIVOT PIN		B2
P35.1214			1	STRIPPER		D4
P35.1215		P35.0109	1	FORK		A8
P35.1216			1	FORK BOLT		B4
P35.1216		P35.0109	1	FORK BOLT		A8
P35.1217	*		1	SLIDE JAW		B26
P35.1218			2	COLLAR SCREW		C26
[P35.1219]		P35.0106	1	MOTOR HOUSING		A4
[P35.1221]			1	INTERMEDIATE WHEEL		D2
P35.1222		P35.1221	1	INTERMEDIATE WHEEL		D2
P35.1223			1	INTERMEDIATE WHEEL SHAFT		C2
P35.1224			1	PINION		B2
P35.1225			1	INTERMEDIATE WHEEL		B2
P35.1226			2	RING		C1+
P35.1228	*		1	TENSIONING WHEEL		D1
P35.1232			1	STRAP STOP		D4
P35.1240			1	STRAP STOP		C2
P35.1248			1	STRAP STOP		D27
P35.1253		P35.0107	1	JACKET		B4
P35.1254		P35.0107	1	END PLATE		B5
[P35.1255]			1	GEARING COVER		C4
P35.1256		P35.1255	1	GEARING COVER		C3
P35.1257			1	COVER		A1
P35.1301		P35.0102	1	VALVE STEM		C20
P35.1302		P35.0102	1	VALVE STEM		C20
P35.1303		P35.0102	1	END RING		C20
P35.1304		P35.0102	1	VALVE LEVER		C23
P35.1305		P35.0102	1	SUSTAINING RING		C21
P35.1306		P35.0102	3	SUSTAINING RING		C21+
P35.1307		P35.0102	1	RING		C19
P35.1308		P35.0102	1	CYLINDER		C19
P35.1309		P35.0102	1	INTERMEDIATE RING		D20
P35.1310		P35.0102	3	SUSTAINING RING		D20+
P35.1311		P35.0102	1	SUSTAINING RING		D21
P35.1312		P35.0102	1	RING		D21
[P35.1313]		P35.0103	1	HANDLE		B34
P35.1315		P35.0102	1	THROTTLE HOLDER		C19
P35.1315		P35.0104	2	THROTTLE HOLDER		D17+
P35.1316		P35.0102	1	THROTTLE SCREW		C19
P35.1317		P35.0102	1	VALVE STEM		C21
P35.1318		P35.0102	1	VALVE STEM		C22
P35.1319		P35.0103	1	VALVE STEM		C35
P35.1320		P35.0103	1	STOP SLEEVE		A34
P35.1321		P35.0103	1	STOP SLEEVE		C35

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49.4211.02	P350/16/0.80-1.10/3.8		P350.0003.02		23.02.00
Item-No.		in group	Pcs.	Description	Dimension	Field
P35.1322		P35.0103	1	END RING		D34
P35.1323		P35.0103	1	HOLDING BUSH		D35
P35.1324		P35.0103	1	HOLDING BUSH		A34
P35.1325			1	SEAL PLATE		D14
P35.1326			1	SEAL PLATE		D13
P35.1327		P35.0102	1	LEVER BODY		C24
P35.1329		P35.0102	1	VALVE LEVER		C24
P35.1330		P35.0103	1	VALVE LEVER		A33
P35.1331		P35.0103	1	VALVE LEVER		C33
P35.1332		P35.0103	2	LEVER BODY		A32+
P35.1333		P35.0102	1	LEVER SHAFT		D23
P35.1334			1	SEAL PLATE		B33
P35.1335			1	CONNECTION PIECE		C8
P35.1336		P35.0102	1	LEVER SHAFT		C24
P35.1336		P35.0103	2	LEVER SHAFT		A33+
P35.1337		P35.0102	1	SPRING GUIDE		C23
P35.1338		P35.0102	1	VARIABLE PISTON		B21
P35.1339		P35.0102	1	VALVE FACE RING		B21
P35.1340		P35.0102	1	EXHAUST RING		B22
P35.1343		P35.0102	1	ADJUSTING WHEEL		D24
P35.1344		P35.0102	1	SLIDE GATE		C22
P35.1345		P35.0102	1	VALVE SUPPORT		C22
P35.1346		P35.0102	1	INTERMEDIATE RING		C22
P35.1347		P35.0104	2	THROTTLE SCREW		C17+
P35.1348		P35.0104	2	THROTTLE BODY		C17+
P35.1349		P35.0104	2	THROTTLE SEAT		C16
P35.1350		P35.0102	1	COUNTER SLEEVE		B21
P35.1351		P35.0102	1	THROTTLE SLEEVE		B20
P35.1352		P35.0102	1	VALVE STEM		B20
P35.1353		P35.0102	1	END RING		B24
P35.1354		P35.0102	1	CYLINDER		B23
P35.1355		P35.0102	1	VALVE RING		B23
P35.1356		P35.0102	1	RING		B22
P35.1357		P35.0102	1	VALVE STEM		B23
P35.1358		P35.0102	1	RETAINER		B20
[P35.1401]			1	SUSPENSION		A37
[P35.1402]		P35.1401	1	SUSPENSION BRACKET		A38
P35.1405		P35.1401	1	FLANGE SHAFT		C39

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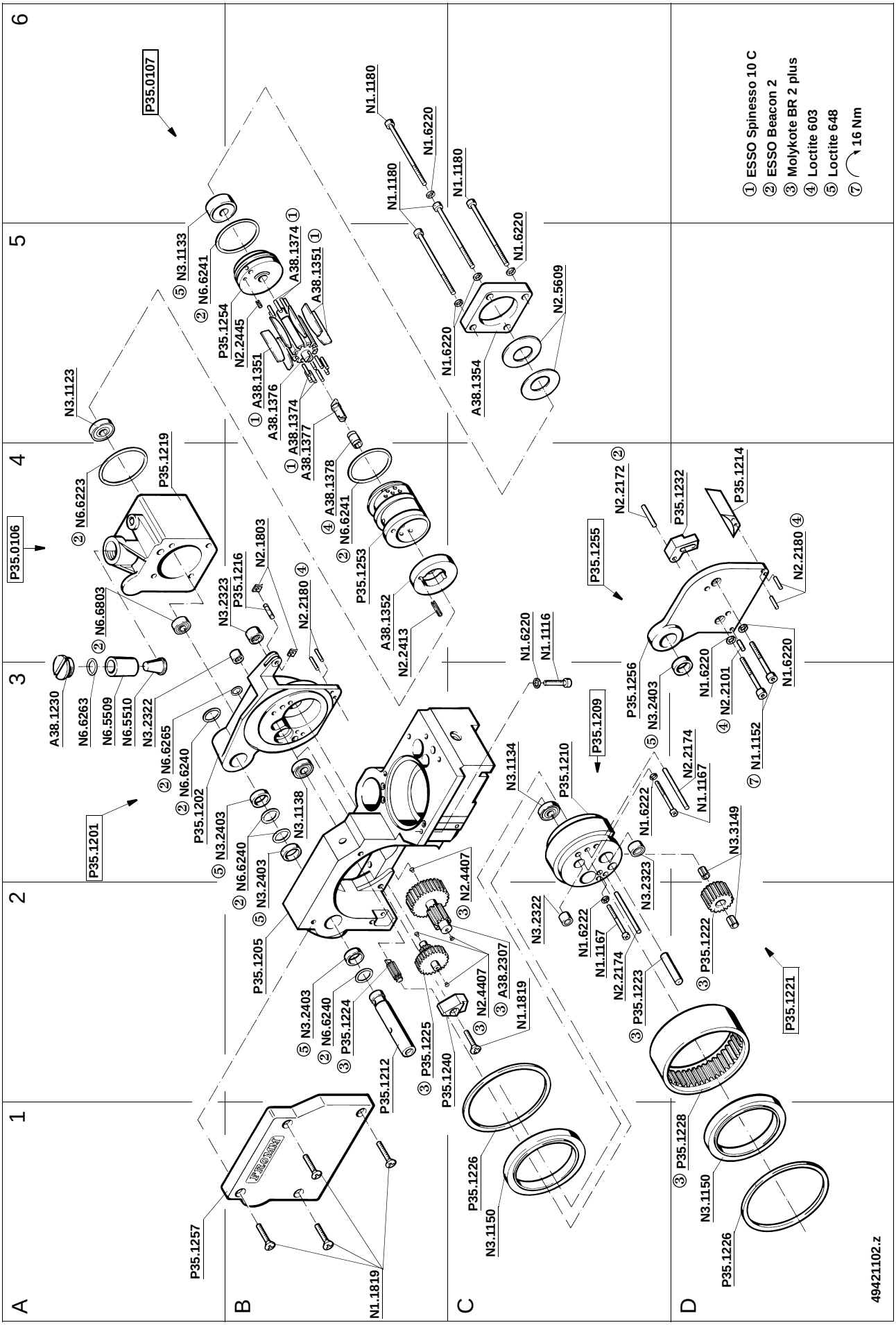
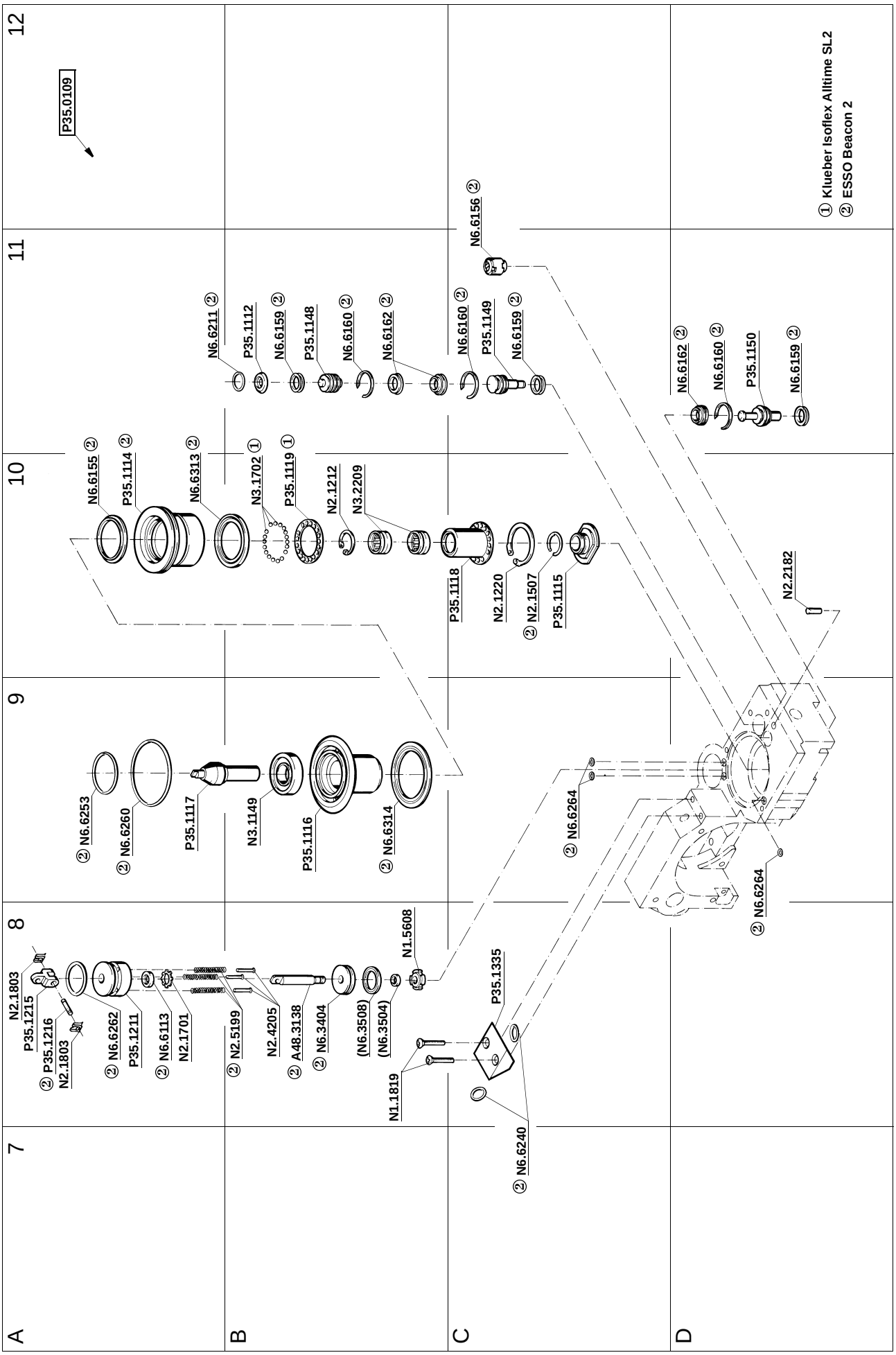
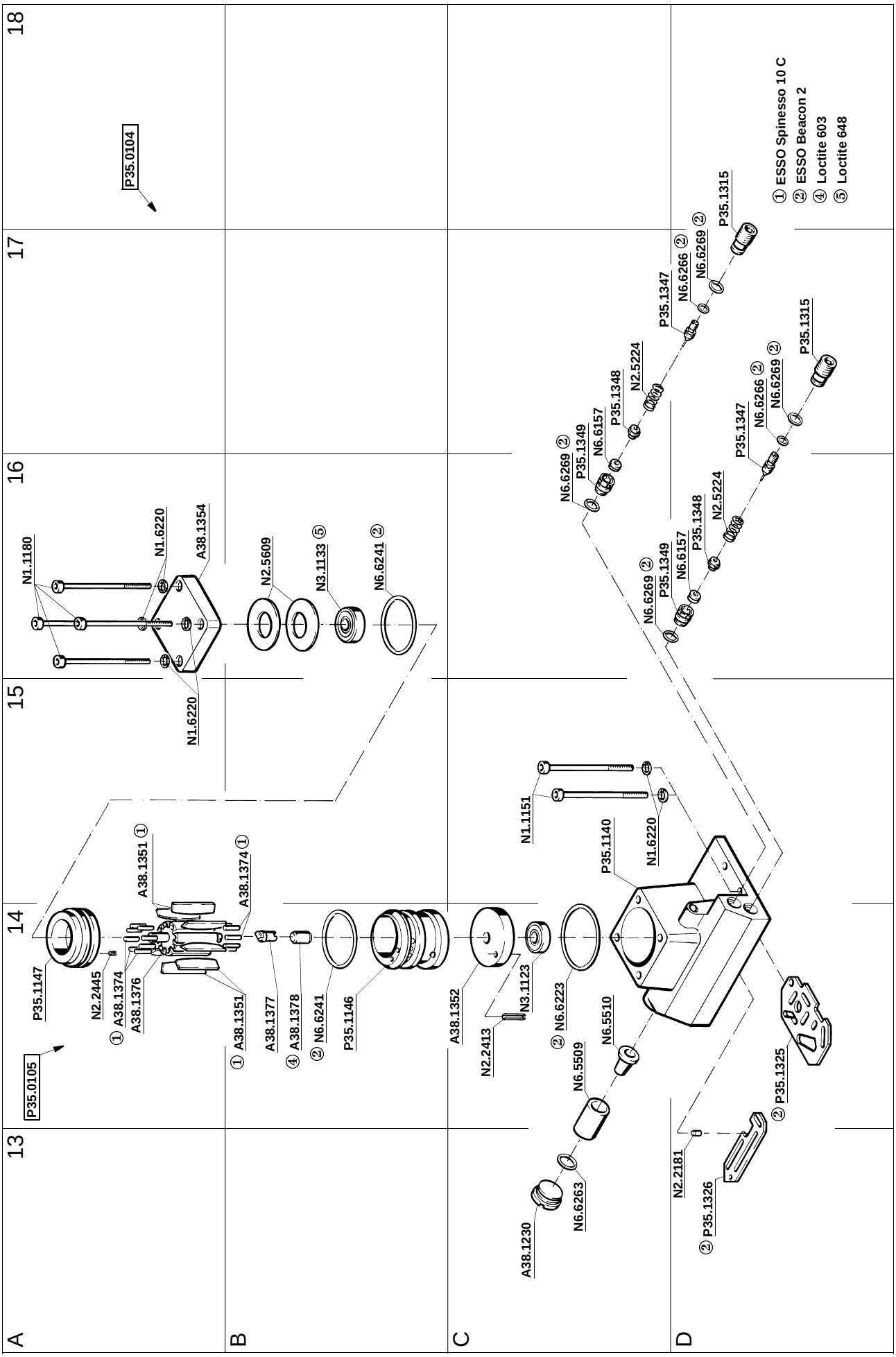
[ ] = Group






① ESSO Spinesso 10 C
② ESSO Beacon 2
④ Loctite 603
⑤ Loctite 648
P35.0104
P35.0105
P35.1147
N2.2445
① A38.1374
A38.1376
① A38.1351
A38.1351 ①
A38.1374 ①
A38.1377
④ A38.1378
② N6.6241
P35.1146
N1.1180
N1.6220
A38.1354
N1.6220
N2.5609
N3.1133 ⑤
N6.6241 ②
A38.1352
N2.2413
N3.1123
N1.1151
N1.6220
P35.1140
② N6.6223
N6.5510
N6.5509
N6.6263
A38.1230
N6.6269 ②
P35.1349
N6.6157
P35.1348
N2.5224
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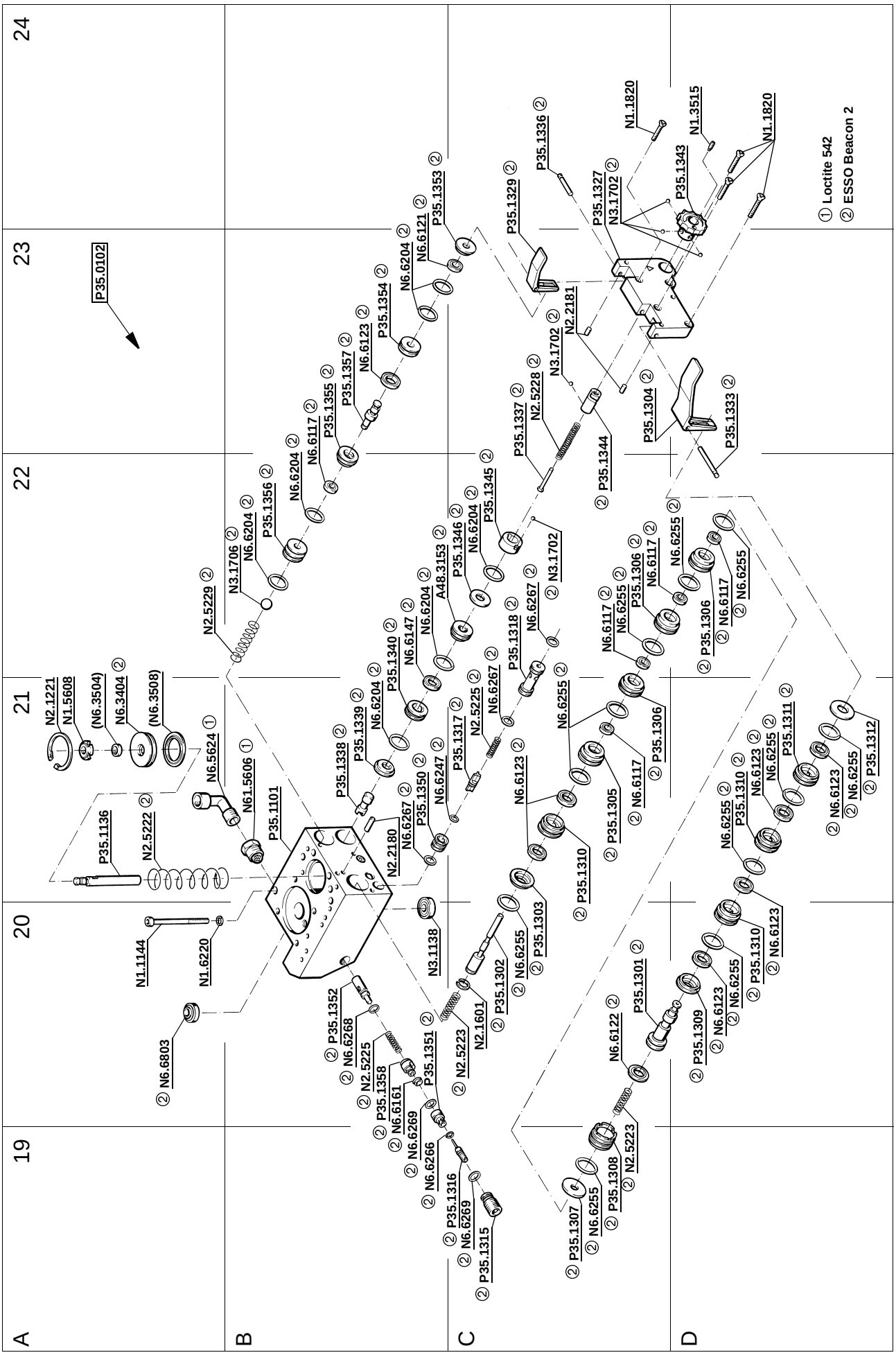
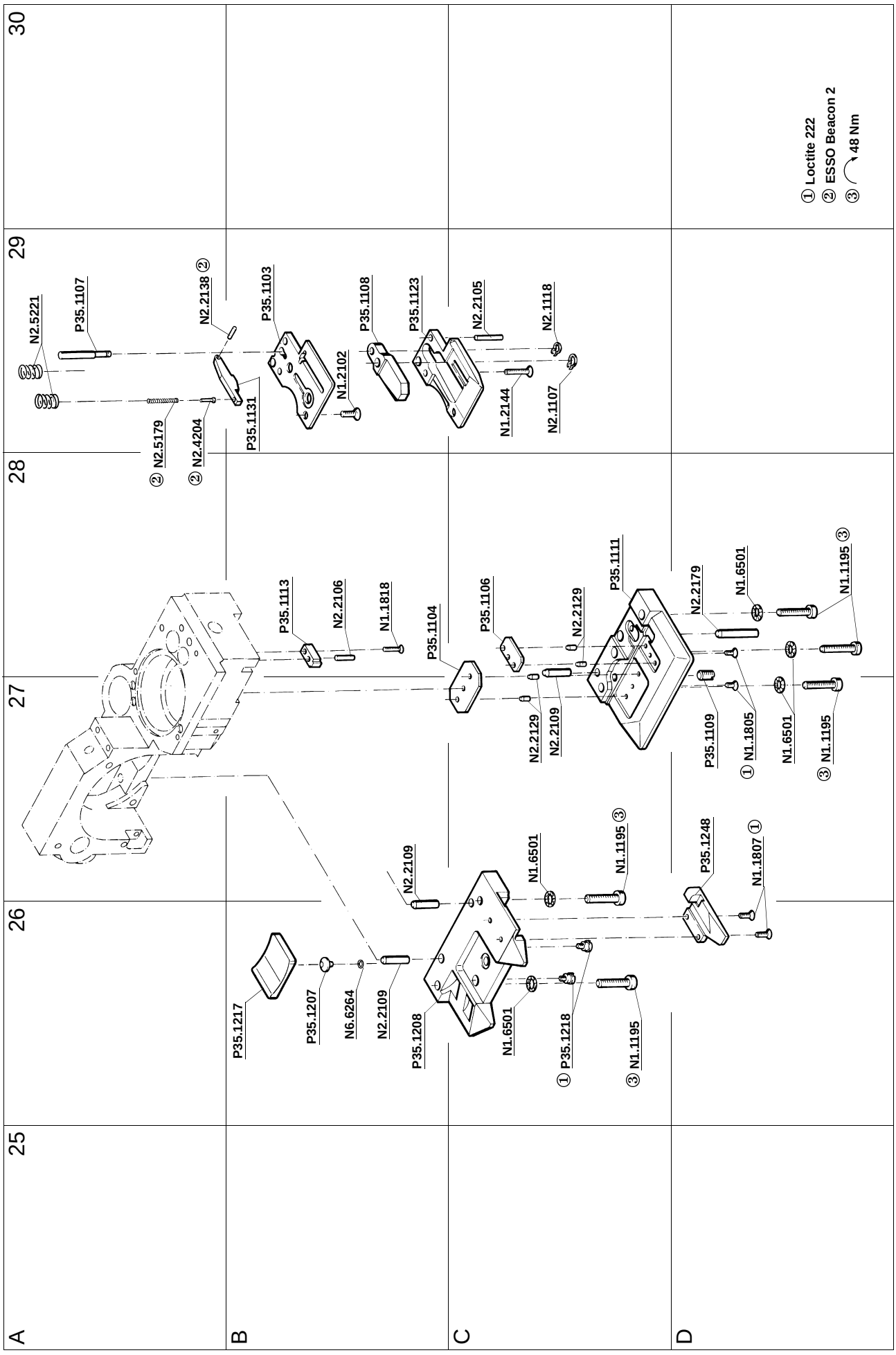
N6.6269 ②
P35.1315
② P35.1325
N2.2181
② P35.1326




① Loctite 222
② ESSO Beacon 2
③ 48 Nm
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P35.1107
N2.2138 ②
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P35.1108
P35.1123
N2.2105
N2.1118
N1.2102
N1.2144
N2.1107
② N2.5179
② N2.4204
P35.1131
P35.1113
N2.2106
N1.1818
P35.1104
P35.1106
N2.2129
P35.1111
N2.2179
N1.6501
N1.1195 ③
N2.2129
N2.2109
P35.1109
① N1.1805
N1.6501
③ N1.1195
N2.2109
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P35.1217
P35.1207
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P35.1208
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① P35.1218
③ N1.1195