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9 Platform Ejector

9.01 Guidelines fulfilled by the Platform Ejector

The fulfilled guidelines relate to the operating conditions that arise from a Montrac-system as well as from all functions that the platform ejector must fulfill according to the description.

- Machine Guideline:** • 98/37/EG.
- EMV-Guideline: Emissions:**
- Transmitted interference on the feeder in accordance with EN 55011 or EN 55022 class A.
 - Parasitic radiation in accordance with EN 55011 or EN 55022 class A.
- Immunity:**
- to electromagnetic fields in accordance with IEC 801-3: 10 V/m, 1 kHz, 80% AM.
 - to Burst in accordance with IEC 801-4: 2 kV.
 - to conducted narrow-band interference in accordance with IEC 801-6: 10 VEMF.
 - to 50 Hz magnetic fields in accordance with EN 61000-4-8: 30 A/m.

The precondition for the fulfillment of these guidelines is the compliance with the requirements stipulated in the EU-Declaration of Conformity with regard to a) the power supply and b) the safety devices.

9.02 Description of Operation

The platform ejector is used for removing the platform from the shuttle automatically. For this purpose, the platform is raised with the help of one pneumatic cylinder and then moved horizontally by a second pneumatic cylinder.

The platform ejector makes it possible to perform operations such as pressing up to a force of $F_z > 3000\text{N}$. It is essential to support the platform against the resulting forces. The design of the support depends on the magnitude of vector and contact point of the force generated during the operation. As this varies considerably depending on the application, the manufacturer does not envisage a standard design of the support. However the manufacturer draws attention to the fact that use of the platform ejector is not permitted without a suitable support.

The platform ejector is also used for processing workpieces in awkward positions, in particular from below.

The platform ejector is available for platform size 200 x 300 mm as well as platform size 300 x 400 mm.

9.03 Hazards

The condition for fulfilling the guidelines is compliance with the requirement regarding safety devices, stipulated in the EU Conformity Declaration.

The platform ejector may not be put into operation without a safety device, see EU Conformity Declaration section "b".

9.04 Technical Data

Size	200x300 mm	300x400 mm
Weight	15.5 kg	19.8 kg
Actuating medium	Air filtered to 5 µm, oiled or unoled	
Operating pressure	3 – 6 bar	3 – 6 bar
Nominal pressure	5 bar	5 bar
Air consumption	69.1 cm ³ /Hub	100.5 cm ³ /Hub
Pneumatic connection (plug coupling)	NG 4	NG 4
Travel distance	220 mm	320 mm
Positioning accuracy	± 0.2 mm*	± 0.2 mm*
Time per ejection operation **	~ 2 s	~ 3 s
Load during ejection operation (incl. platform)	12 kg	12 kg
Service life	5 x 10 ⁶ strokes	5 x 10 ⁶ strokes
Rated voltage	24 VDC	24 VDC
Environment :	Permissible temp. range	0 – 40°C
	Air purity	Atmosphere for the assembly of precision mechanical products
	Relative humidity	= 90 % without condensation
Ref. No.	46531	46532

*If required, a positioning accuracy in the horizontal direction of ±0.05 mm can be achieved by the manufacture of special shuttle platforms.

**The time per ejection operation depends to a great extent on the setting of the throttle valves.

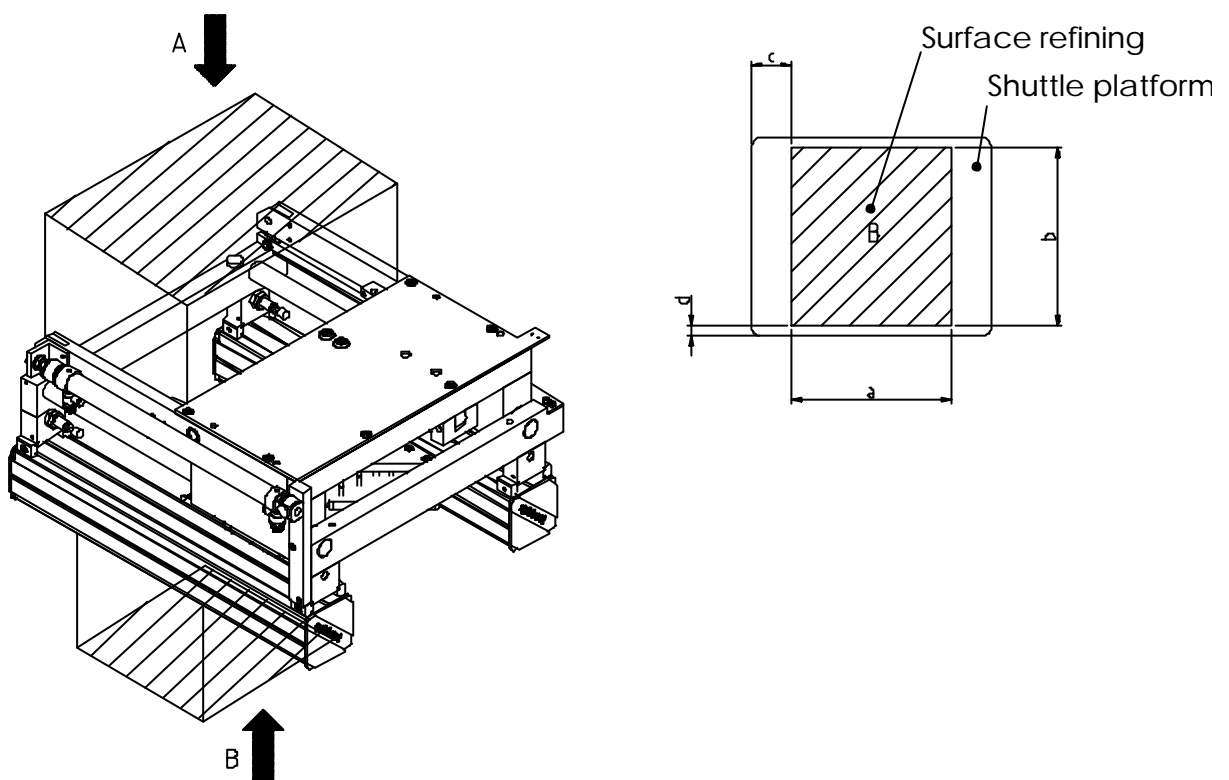
9.05 Load Limits

The maximal vertical force (F_z) exerted by the platform on the platform ejector during the ejection operation may not exceed 120 N.

As mentioned in section "Description of operation", an individual support must be provided for processing. This determines the permissible load capacity of the platform. The use of the ejector is not permissible without a support dimensioned for the respective load.

9.06 Surface Refining

Fig. 9.1



Surface refining	Shuttle platform 200 x 300 mm	Shuttle platform 300 x 400 mm
A, from above	a = 260 mm	a = 360 mm
	b = 200 mm	b = 300 mm
	c = 20 mm	c = 20 mm
	d = 0 mm	d = 0 mm
B, from below	a = 220 mm	a = 320 mm
	b = 180 mm	b = 280 mm
	c = 40 mm	c = 40 mm
	d = 10 mm	d = 10 mm

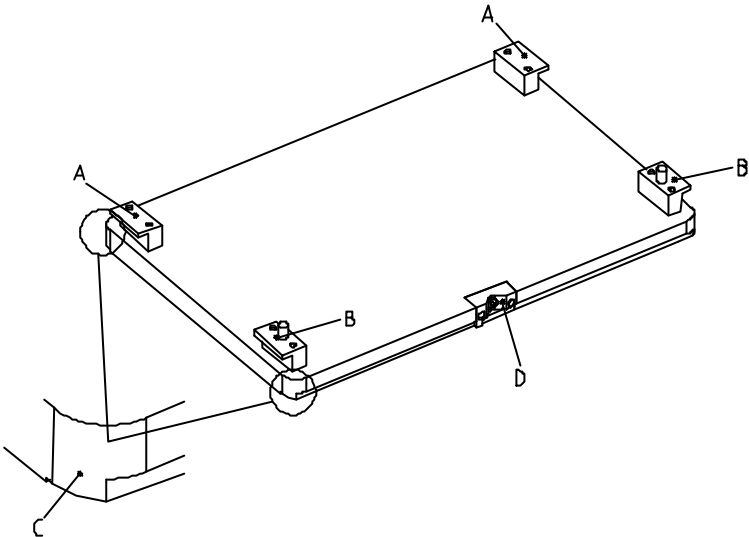
9.07 Installation and Initial Operation Phase

9.07.1 Design of the shuttle platform for the platform ejector

The use of the platform ejector requires a special design of the shuttle platform. Two holders (A + B fig. 9.2) must be mounted at the front and two holders (A + B fig. 9.2) at the back of the platform.

In addition, the shuttle platform must include two bevels (C fig. 9.2) on each of two sides as well as a prism (D fig. 9.2) in the middle of one side.

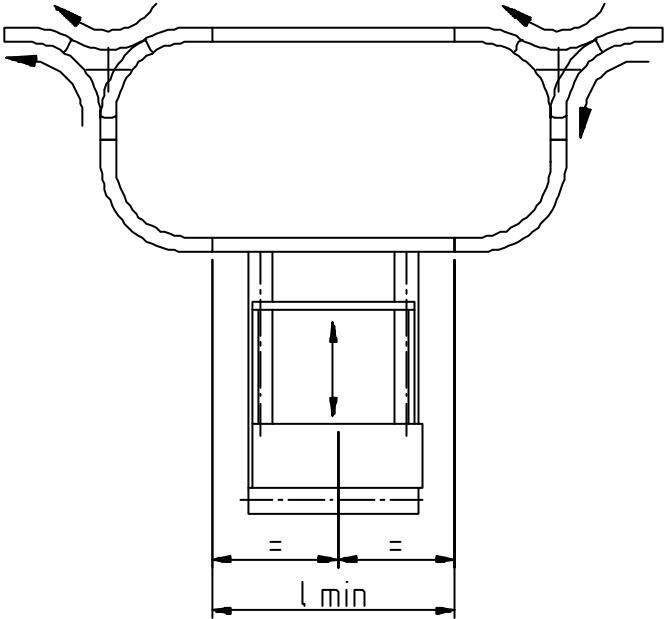
Fig. 9.2



9.07.2 Minimal trac length

The minimal trac length in accordance with fig. 9.3 must taken into consideration for installation of the platform ejector.

Fig. 9.3



Ref. no. platform ejector = 46531
Platform 200 x 300 mm, $L_{min} = 650$ mm

Ref. no. platform ejector = 46532
Platform 300 x 400 mm, $L_{min} = 950$ mm

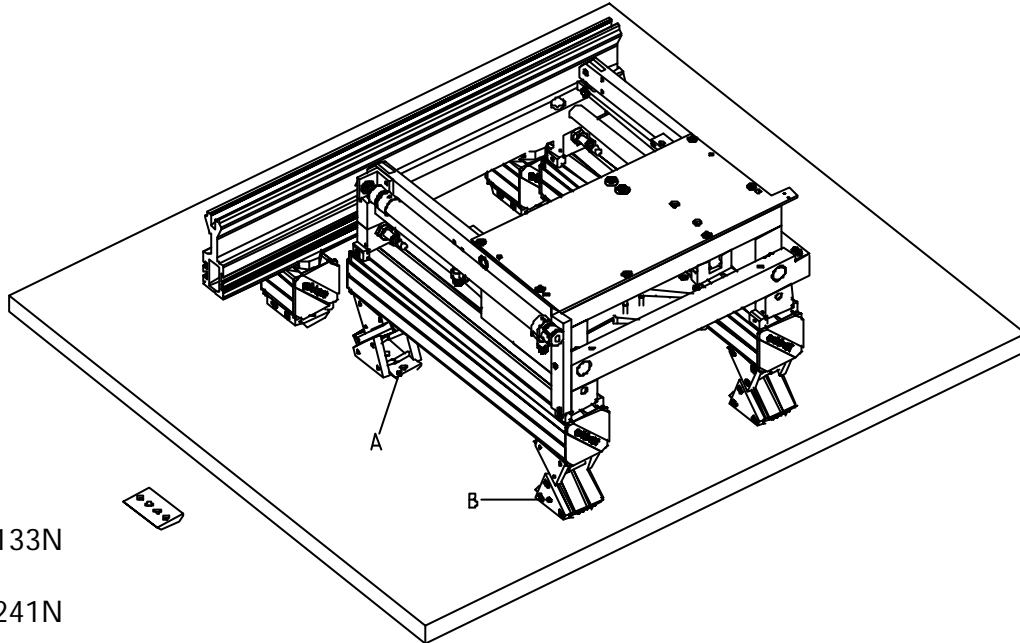
Platform Ejector

Support for the Platform Ejector

Basically a distinction is made between two methods of installation. The platform ejector can be mounted either or directly on a flat table top or on a Quick-Set frame.

9.07.3 Support on a flat table top

Fig. 9.4



9.07.4 Support on a Quick-Set frame

Fig. 9.5

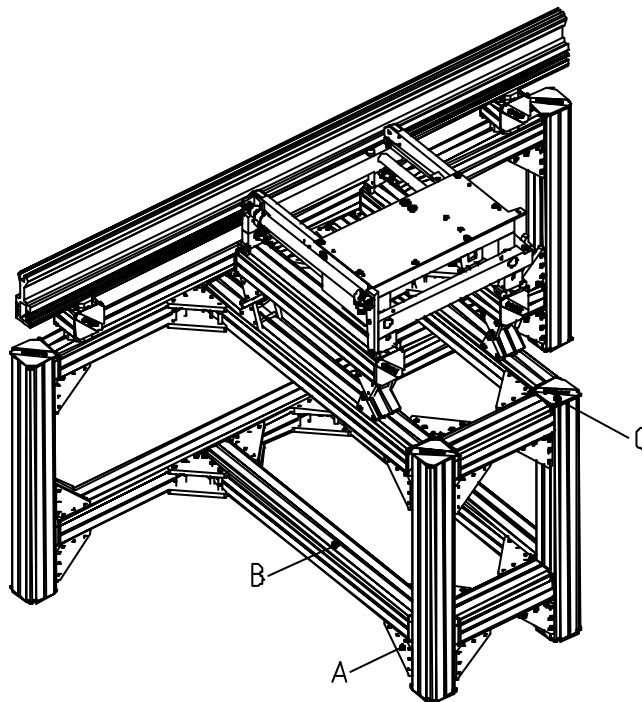
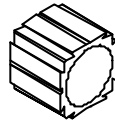


Fig. 9.5 (cont.)



A
EV-4
Ref. no. 44609N



B
TP-66
Ref. no. 42852N/ length



C
AK-66
Ref. no. 44869

9.07.5 Positioning the platform ejector

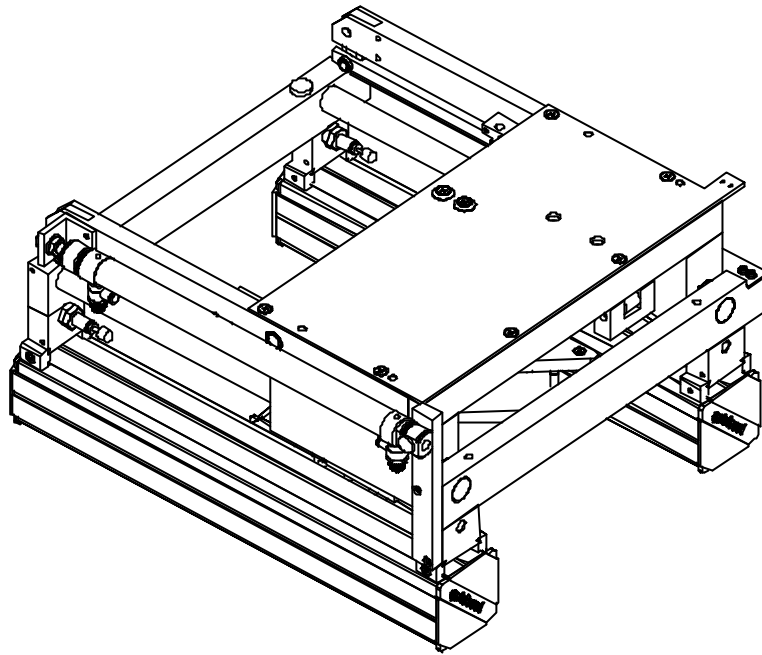
To decidedly simplify the horizontal and vertical adjustment on the platform ejector, a mounting device (fig. 9.7 and 9.8) consisting of 4 bracket elbow screw joints (KW), 4 adjusting elements (EE), 4 clamping elements (SLL-55) and 4 clamping elements (SLL-20) can be requested.

Adjustment procedure

- Mount the 4 adjusting elements and the support profiles TP-16 on the support (Quick-Set frame or flat table top) by using the angle connectors (EV-3/45) as shown in fig. 9.7 resp. 9.8. Do not tighten the screws of the angle connectors at this stage.
- Adjust the height of the platform ejector as follows: Position shuttle on the trac approximately (A, fig. 9.9) and move the ejector platform out manually (B, fig. 9.9). Adjust the height of the device with the aid of the 4 adjusting elements so that the rollers of the platform ejector lie approximately 0.2 mm below the holders of the shuttle platform. (C, fig. 9.9).
- Adjust the distance between the platform ejector and the trac as follows: Move the platform ejector out until the pins (A, fig. 9.10) lie exactly beneath the holes in the platform ejector. The pins must slide without friction into the holes provided (B, fig. 9.10) when the platform is raised or lowered.
- After satisfactory adjustment, tighten all screws and remove the mounting device.
- Mount the positioning unit (270, fig. 9.12) in the middle of the TP-66, so that the slide (300, fig. 9.12) moves into the prism (A, fig. 9.12) of the shuttle platform, without moving the shuttle platform.

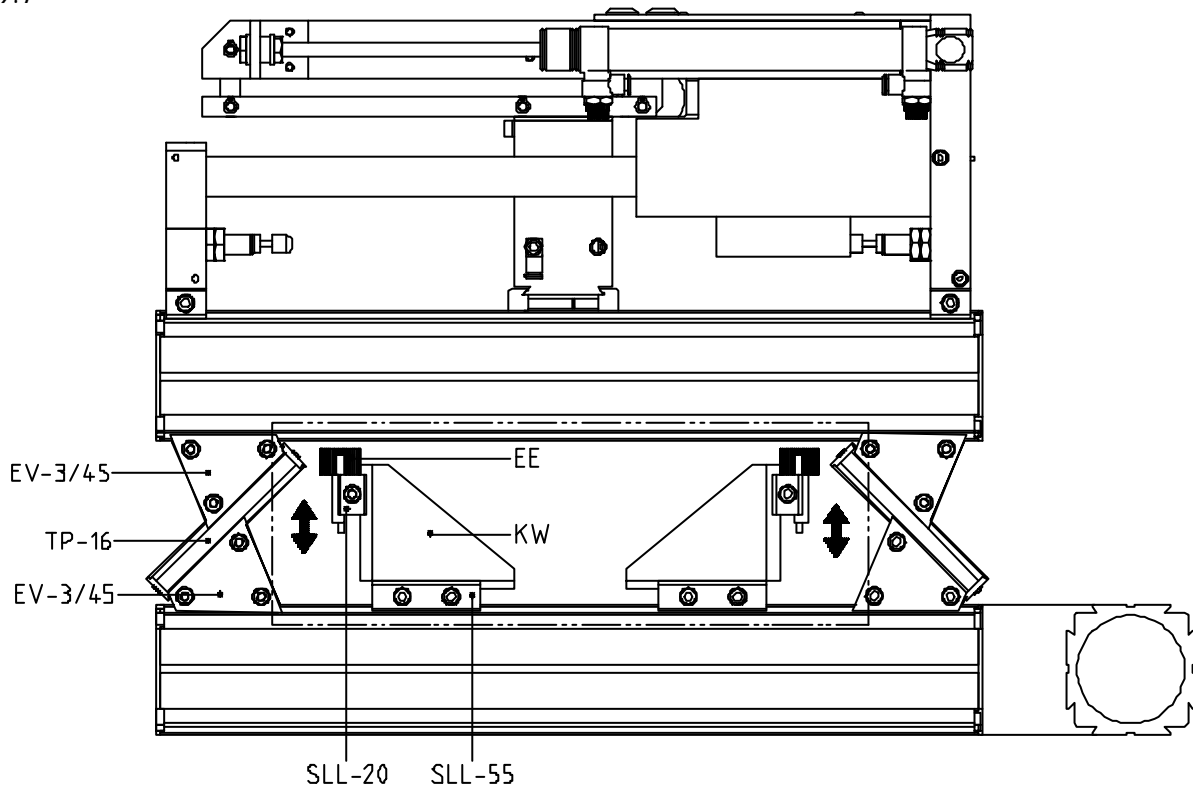
Platform Ejector

Abb. 9.6



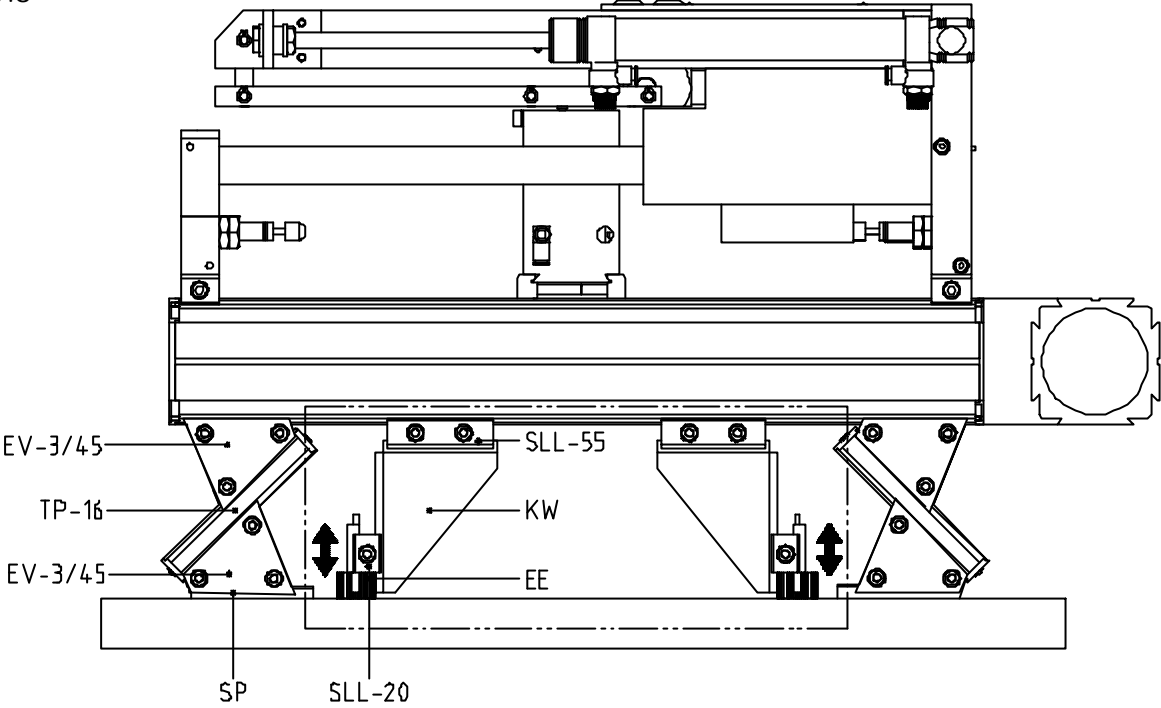
Platform ejector as delivered

Fig. 9.7



Mounting device (side view)

Fig. 9.8



Mounting device (side view)

Fig. 9.9

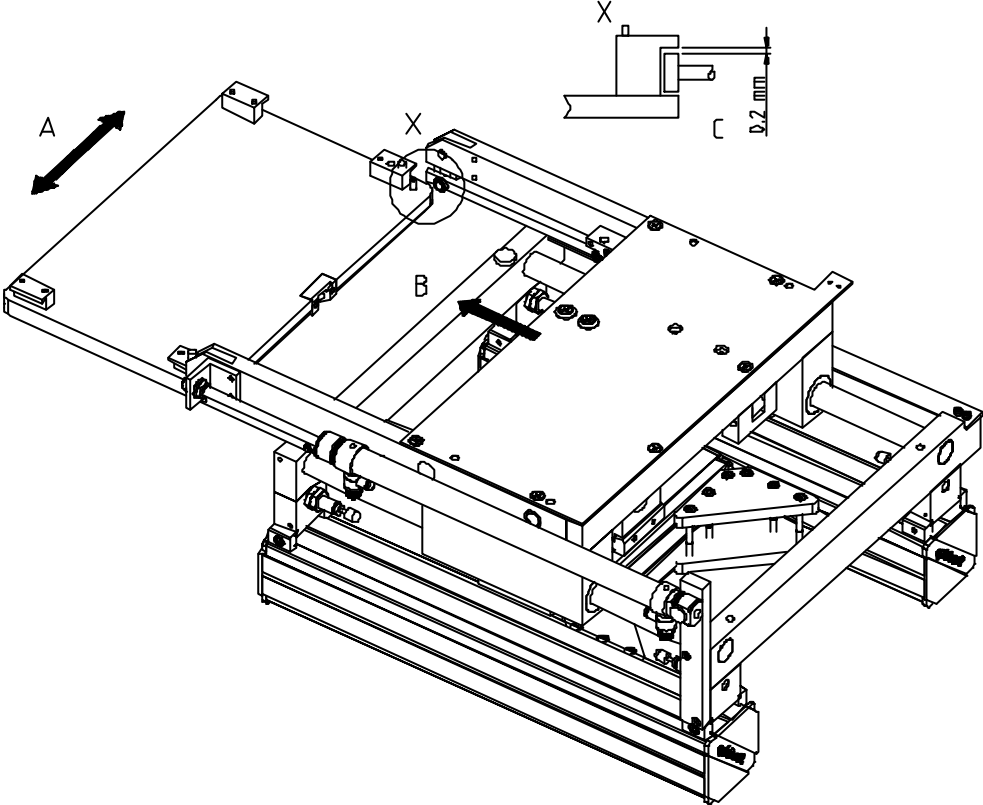
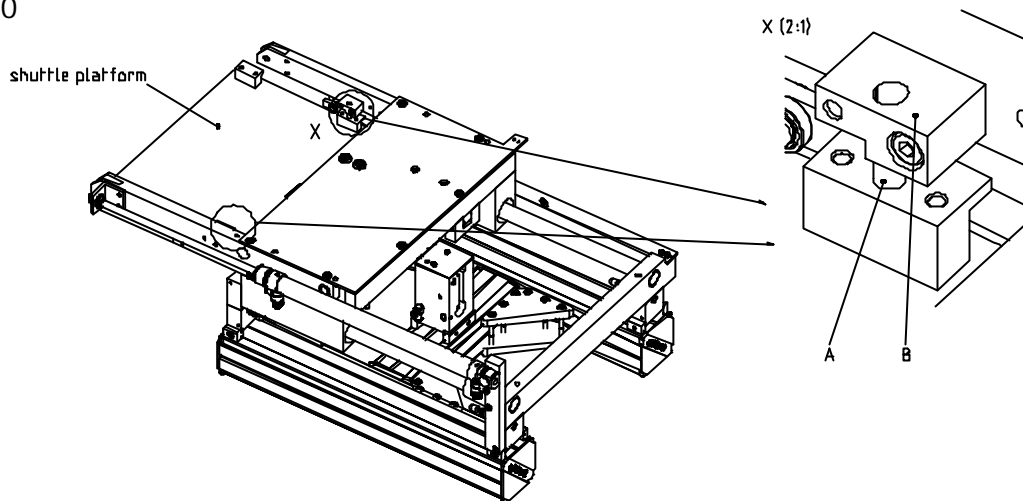


Fig. 9.10

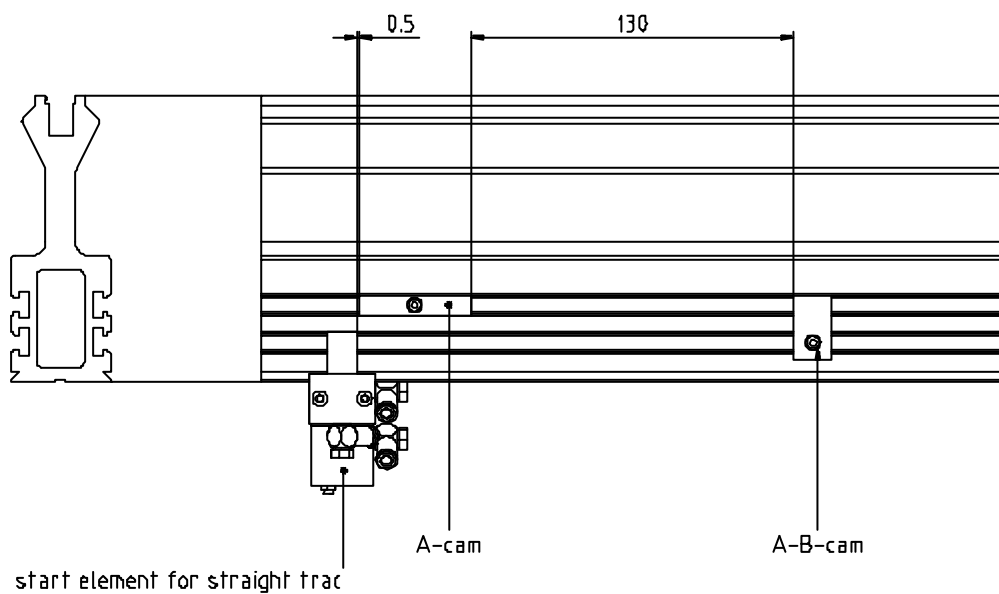


9.07.6 Adjustment of the control cams

- Fix the A-cam approximately in the middle of the positioning unit, in the upper T-slot of the trac (fig. 9.11).
- Switch the shuttle on by means of the toggle switch (fig. 2.14, chapter "Shuttle") in front of the platform ejector. The shuttle travels over the A-cam at a speed of $V_{ed} = 12$ m/min and stops.
- Measure the distance between the prism to be positioned (D, fig. 9.2) in the shuttle platform and one arm of the platform ejector (Center of prism to center of slide).
- Move the A-cam until the shuttle stops in the middle of the two arms.
- Secure the start element as well as the A-B-cams.

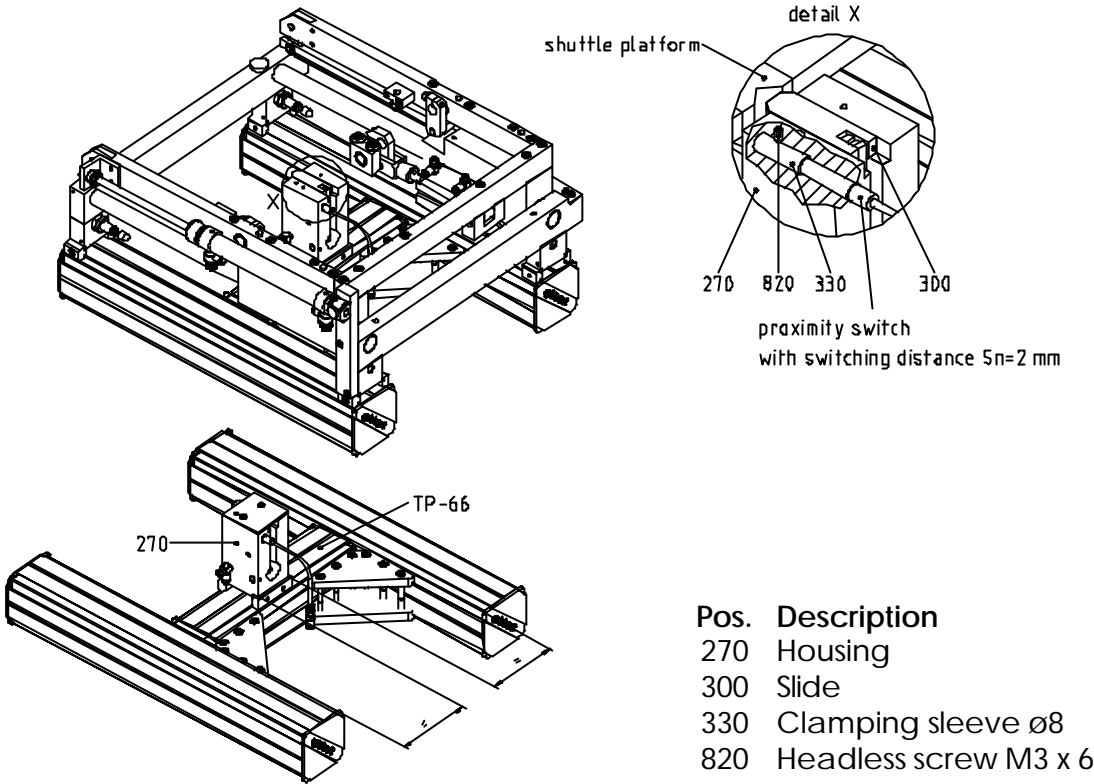
Layout of the control cams in platform ejector

Fig. 9.11



9.07.7 Adjustment of the inductive proximity switches

Fig. 9.12

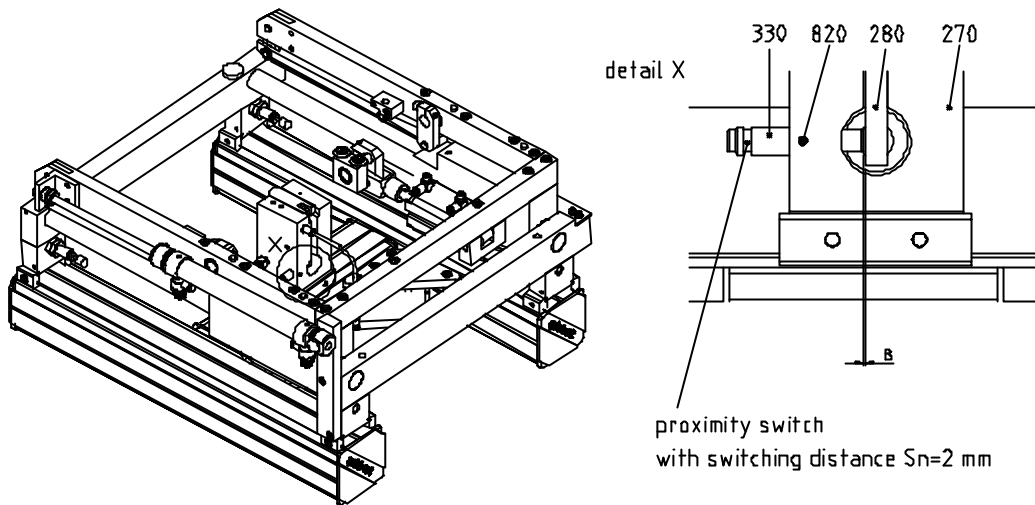


Proximity switch “presence of shuttle platform in retracted position” (fig. 9.12).

- Retracted shuttle platform.
- Loosen headless screw (820).
- Push proximity switch into the sleeve and move against the prism surface (shuttle platform).
- Move the proximity switch and sleeve backwards by 1 mm and secure the headless screw (820).

Proximity switch "shuttle positioned"

Fig. 9.13

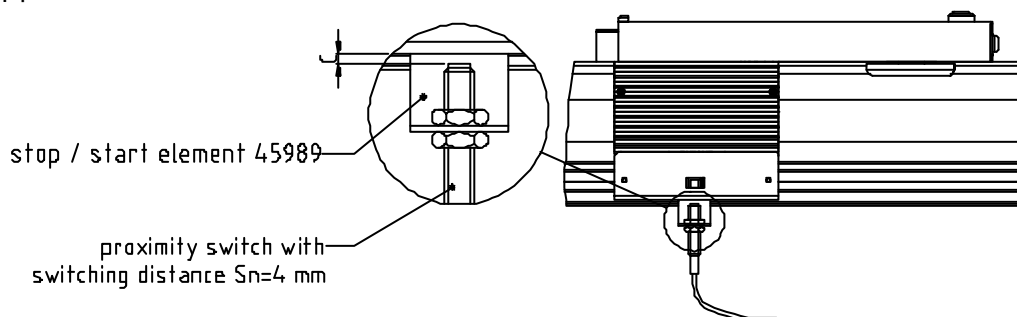


Pos.	Description
270	Housing
280	Lever
330	Clamping sleeve $\varnothing 8$
820	Headless screw M3 x 6

- Move the slide (300, Abb. 9.12) manually or pneumatically in the direction of the shuttle platform.
- Loosen headless screw (820).
- Push the proximity switch into the sleeve, connect electrically and move to slide (280, fig. 9.13).
- Pull proximity switch including sleeve back by 1 mm ($B = 1 \text{ mm}$) and secure headless screw (820, fig. 9.13) lightly.
- Check: Slide the shuttle manually to a position near to a prism. Push the locking slide in manually. The proximity switch may not switch.

Proximity switch present at "stop/start element"

Fig. 9.14



The distance "C" between the proximity switch (switching distance $S_n = 4 \text{ mm}$) and the damper (80, fig. 14) must be set at 1.5 mm.

9.08 Maintenance

every 6 months

9.08.1 Check shock absorbers

The shock absorbers must be checked for perfect performance. Faulty shock absorbers must be replaced.

9.08.2 Check throttles

Check the throttles of the pneumatic cylinder.

9.08.3 Clean and lubricate locking slide

The locking slide must be cleaned and lubricated with Paraliq P460.

9.08.4 Clean and lubricate pistons

The piston of the locking device must be cleaned and lubricated with Paraliq P460 or special pneumatic grease.

9.08.5 Lubricate pivot joints

The pivot joints of the lifting rod systems must be lubricated with Paraliq P460.

9.08.6 Check platforms

Check the shuttle platforms for damaging. In the case of damages please contact MONTECH.

9.08.7 Check and clean platform ejector

The platform ejector must be freed from dirt and checked for extreme wear or damaging.

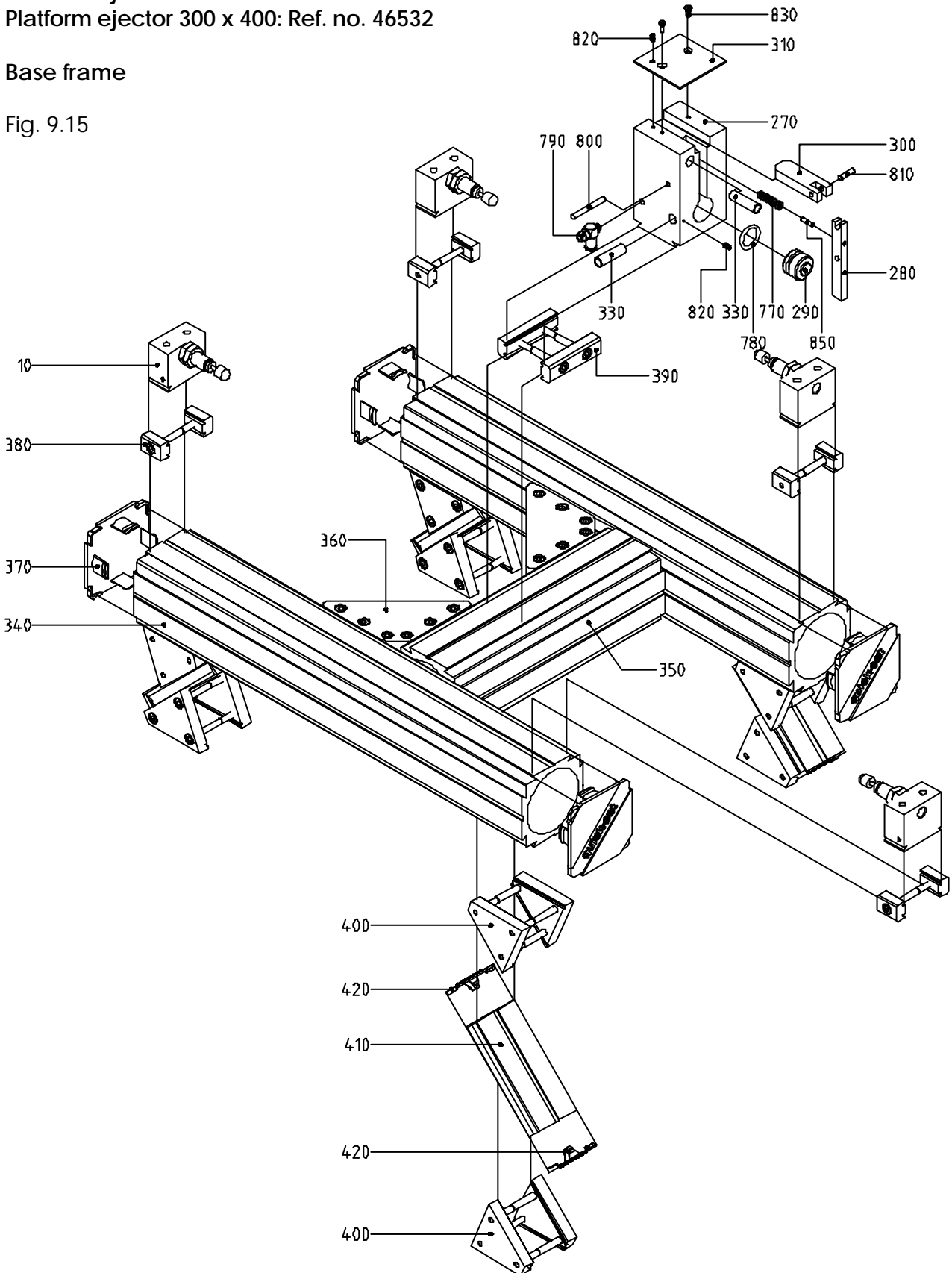
9.09 Explosion View Platform Ejector

Platform ejector 200 x 300: Ref. no. 46531

Platform ejector 300 x 400: Ref. no. 46532

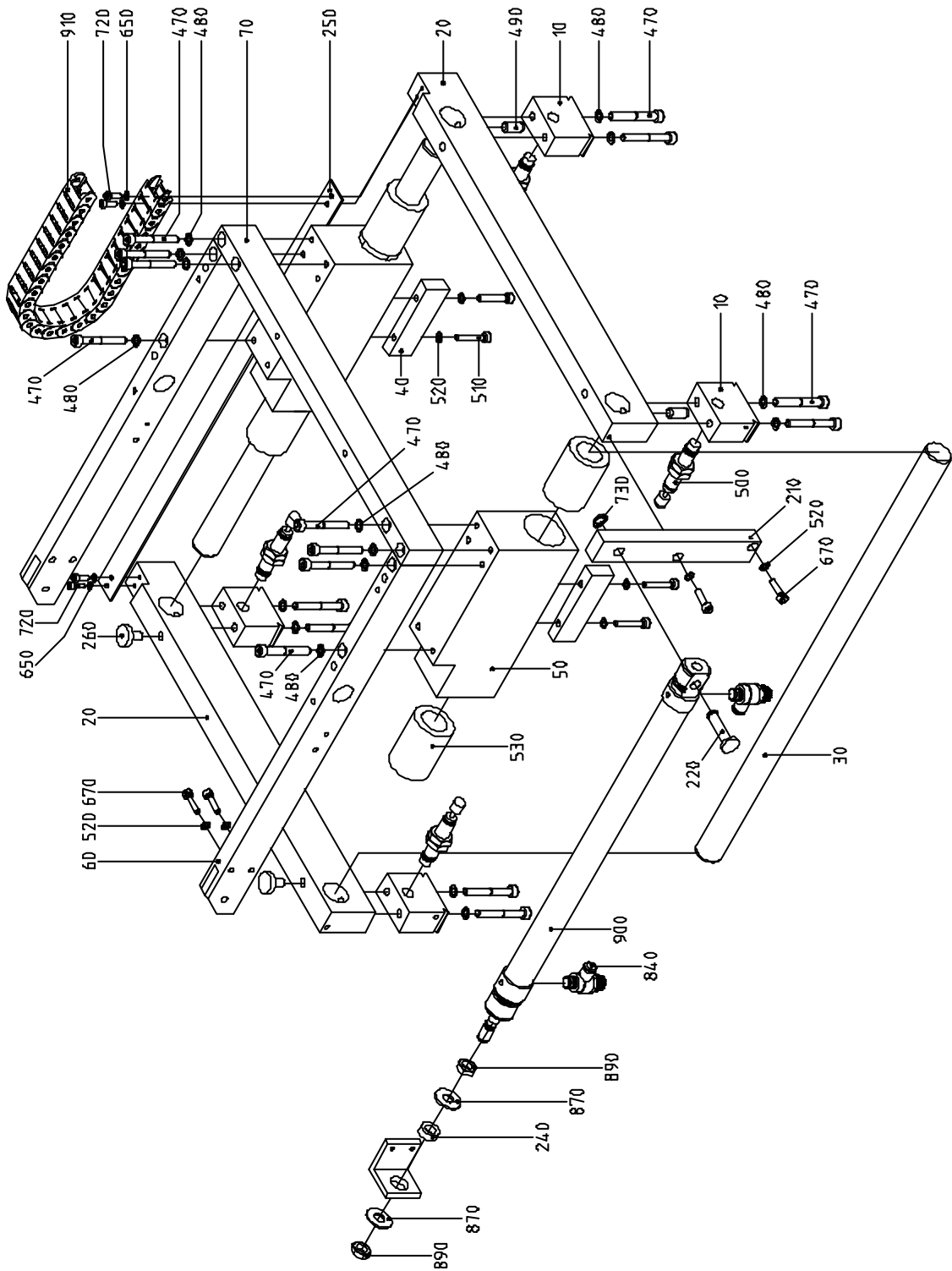
Base frame

Fig. 9.15



Middle assembly

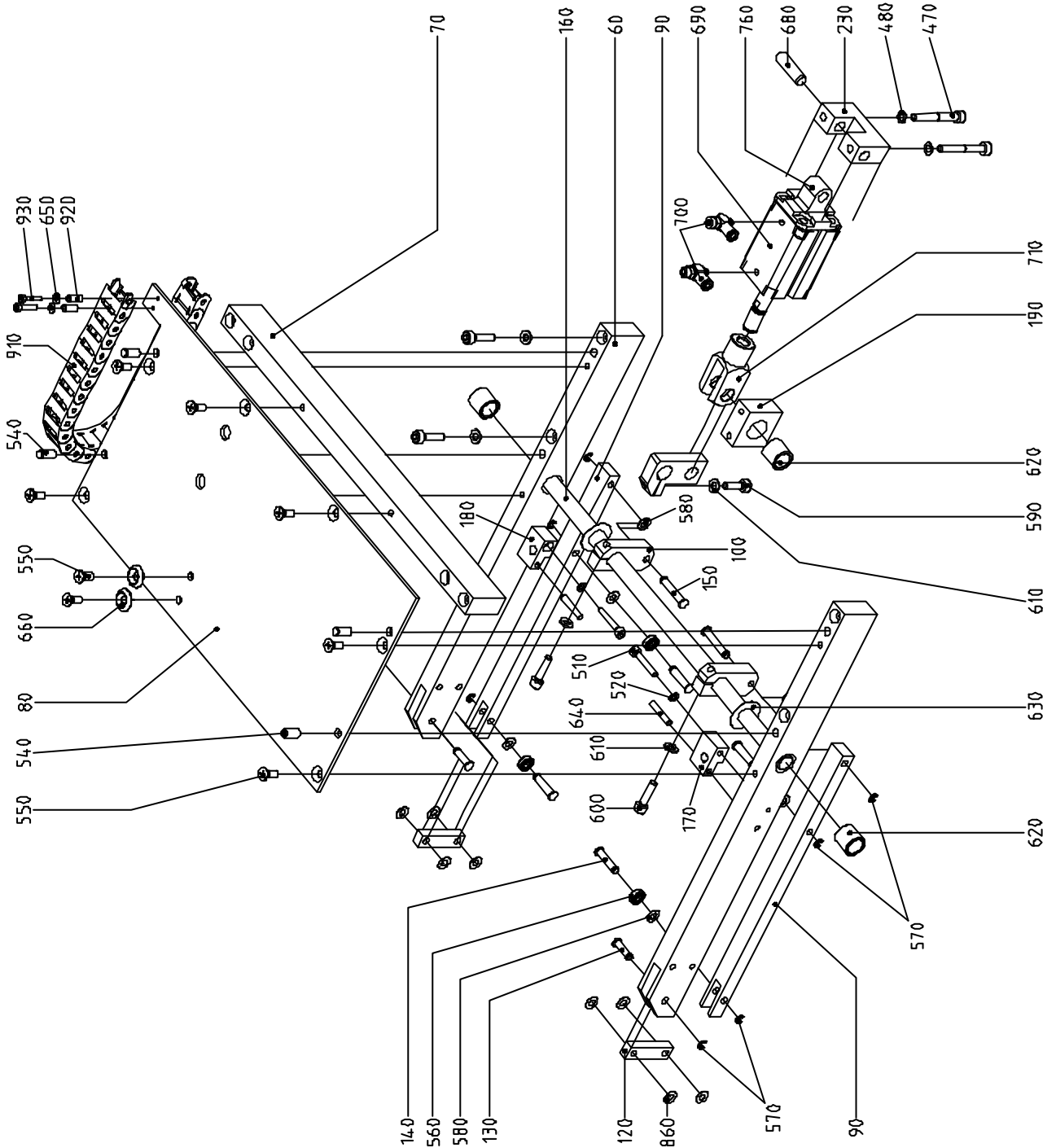
Fig. 9.16



Platform Ejector

Final assembly

Fig 9.17



Platform ejector: ref. no. 46531 (200 x 300), ref. no. 46532 (300 x 400)

Pos.	Ref. No.	Description
10	46307	Support
20	46308	Cross-beam 200x300
20	46334	Cross-beam 300x400
30	46309	Guide shaft 200x300
30	46335	Guide shaft 300x400
40	46310	Stop
50	46311	Slide
60	46312	Arm for 200x300
60	46336	Arm for 300x400
70	46313	Cross-beam for 200x300
70	46337	Cross-beam for 300x400
80	46314	Torsional metal sheet for 200x300
80	46338	Torsional metal sheet for 300x400
90	46315	Tension shaft for 200x300
90	46339	Tension shaft for 300x400
100	46316	Lever
110	46317	Lever
120	46357	Swivel lever
130	46319	Pin ø5-g6-15.2
140	46320	Pin ø5-g6-20.5
150	46321	Pin ø5-g6-25.5
160	46323	Torsion shaft 200x300
160	46340	Torsion shaft 300x400
170	46324	Carrier left
180	46325	Carrier right
190	46326	Bearing block
200	46327	Holding bracket
210	46328	Holder
220	46318	Pin ø8
230	46528	Base
240	46329	Sleeve
250	46490	Metal storage shelf for 200x300
250	46491	Metal storage shelf for 300x400
260	90164	Stop for platform ejector
270	46331	Housing
280	46332	Lever
290	44695	Piston
300	44697	Slide
310	46529	Cover
320	90419	Control element stop/start with locking device
330	42009	Clamping sleeve ø8
340	42852N0417	Support profile TP-66 L=0417mm (200x300)
340	42852N0517	Support profile TP-66 L=0517mm (300x400)
350	42852N0221	Support profile TP-66 L=0221mm (200x300)
350	42852N0321	Support profile TP-66 L=0321mm (300x400)
360	44609N	Corner connector EV-4/N
370	44869	Cover AK-66

Platform Ejector

380	41190N	Clamping element SLL-20/N
390	40201N	Clamping element SLL-55/N
400	45241N	Corner connector EV-3/45°/N
410	44207N0096	Support profile TP-16 L=0096mm
420	44871	Cover AK-16
470	503724	Cheese-head screw M5 x 40 BN 611
480	505254	Ribbed washer 5.3 BN 792
490	505501	Headless screw M 8 x 16 BN 617
500	503680	Shock absorber with cover (M10 x 1)
510	505502	Cheese-head screw M4 x 25 BN 610
520	502606	Ribbed washer 4.3 BN 792
530	505011	Glide ring 20/32x45
540	502061	Cylindrical pin $\varnothing 6$ x 10 h6 BN 858
550	504373	Countersunk screw M5 x 12 BN 616
560	505503	Grooved ball bearing 685 ZZ
570	506888	Crescent-shaped ring for shaft $\varnothing 5$ BN 831
580	505505	Locating disk $\varnothing 5/10$ s=0.3
590	503785	Cheese-head screw M5 x 16 BN 610
600	504799	Cheese-head screw M5 x 20 BN 610
610	504343	Washer 5.3/10 x 1 BN 670
620	505506	Friction-type bearing $\varnothing 12D8/16r8$ x 15
630	505507	Shim $\varnothing 12/24$ s=0.3
640	502139	Cylindrical pin $\varnothing 4$ x 24 m6 BN 857
650	502757	Washer 3.2/6 x 0.5 BN 726
660	504381	Countersunk washer M5 BN 4879
670	505328	Cheese-head screw M4 x 16 BN 610
680	502079	Cylindrical pin $\varnothing 8$ x 30 h6 BN 858
690	505375	Cylinder ADVU-25-20-A-P-A
700	505023	Non-return throttle valve $\varnothing 4$ -M5-W-st.
710	505374	Fork head SG-M10 x 1.25
720	504107	Cheese-head screw M3 x 10 BN 610
730	504797	Snap ring $\varnothing 8$ f. W. BN 682
760	505514	Swivel flange SUA-25
770	505233	Compression spring VD-178B
780	501466	O-ring 15.55 x 2.62
790	503714	Air inlet throttle M5/ $\varnothing 4$
800	502042	Cylindrical pin $\varnothing 4$ x 36 h6 BN 858
810	502037	Cylindrical pin $\varnothing 4$ x 14 h6 BN 858
820	501886	Headless screw M3 x 6 BN 24
830	502548	Countersunk screw M3 x 8 BN 388
840	505889	Non-return throttle valve $\varnothing 4$ -R $1/8$ -W-st
850	502122	Cylindrical pin $\varnothing 3$ x 12 m6 BN 857
860	504915	Shim $\varnothing 5$ x 10 x 0.1
870	502581	Washer 8.4/20/1.2 BN 735
890	505253	Hex nut M8 x 0.5d BN 124
900	505510	Cylinder DSNU-20-250-P-A
910	505964	Power duct 35 links
920	91373	Bushing
930	501607	Cheese-head screw M3 x 16 BN 272

9.10 Environmental Compatibility and Disposal

9.10.1 Materials used

- Aluminum
- Brass
- Steel
- Copper
- Bronze
- Polyamide (PA)
- Polyoxymethylene (Polyacetal) (POM)
- Acrylnitrile-butadiene/styrene (ABS)
- Acrylnitrile-butadiene rubber (NBR)

9.10.2 Surface refining

- Anodizing of aluminum
- Blackening of steel
- Nickelizing of brass

9.10.3 Molding process

- Molding of aluminum
- Machining of aluminum, bronze and steel.

9.10.4 Emissions during operation

- See EMV-Guideline

9.10.5 Disposal

Platform ejectors that are no longer able to be used must be recycled, not as complete units, but dismantled into single components and disposed of according to the type of material. The kind of material of the individual parts is shown in the spare-part list. Material that cannot be recycled must be appropriately disposed of.