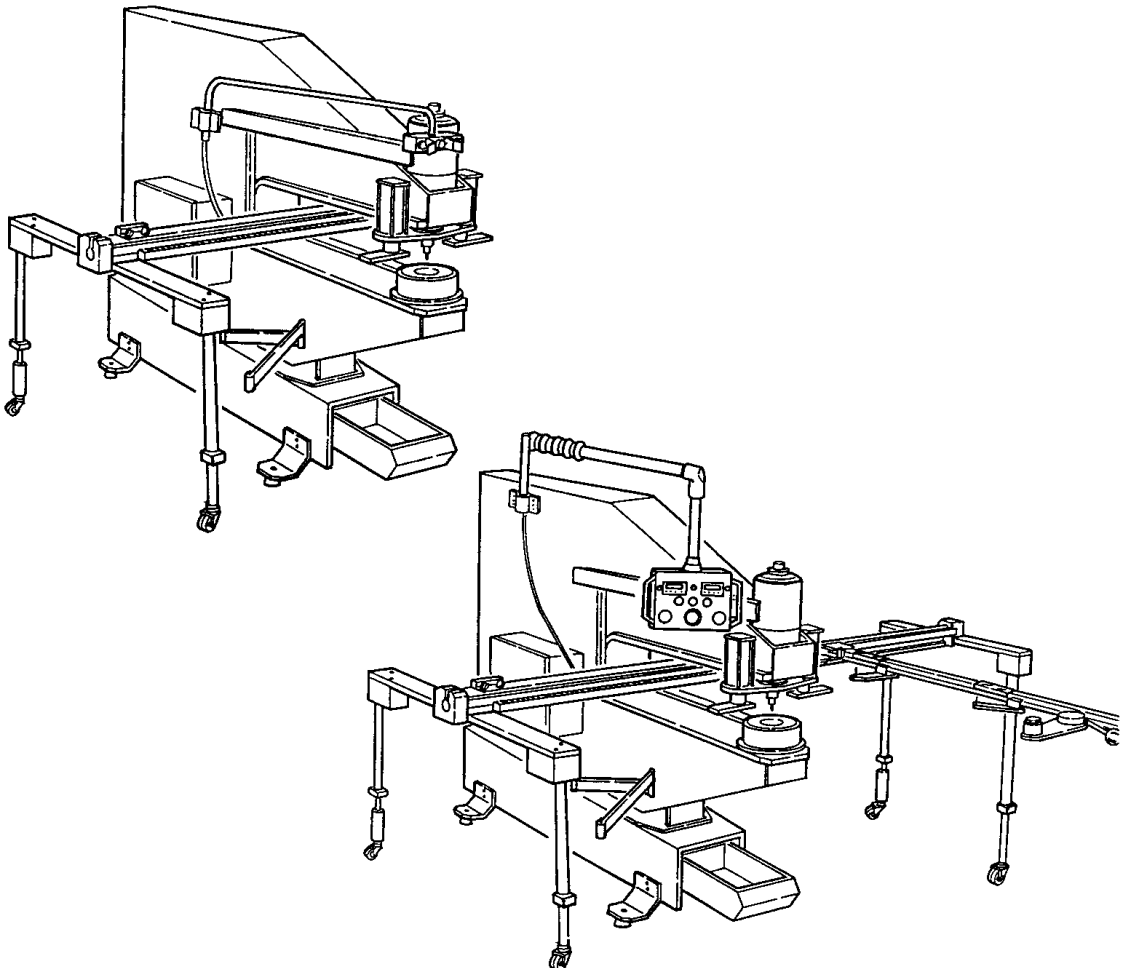


**Repair Instruction  
and  
Spare Parts Lists  
for the**

***NOVO*press**

**Stationary sheet metal punch  
HSTL-880**



## Contents

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## GENERAL SAFETY REGULATIONS

### **Read all safety regulations and instructions!**

1. Keep the place of work clean.  
Disorderly work-places and work-benches invite accidents.  
Ensure that lighting is good.
2. Keep children away.  
Do not allow unauthorised persons to touch the device or the cable.  
Keep unauthorised persons away from your place of work.
3. Wear suitable working clothing.  
Do not wear any wide clothes nor jewellery - they may get caught up in moving parts.  
When working in the open it is recommended that you wear rubber gloves and non-slip footwear. Wear a hair- net if you have long hair.
4. Always be alert.  
Only use a device after having been instructed in its operation.  
Concentrate on your work. Proceed sensibly.  
Do not use the device when you are distracted.
5. Do not lean too far forward. Avoid abnormal stance.  
Make sure that you have a secure standing position, and maintain balance at all times.
6. Leave safety devices where they belong.
7. Hand tools may not be installed as fixtures.
8. Repair and maintenance.  
Have repairs and maintenance work carried out in an authorised NOVOPRESS specialist workshop.  
Only use original and identical NOVOPRESS spare parts.  
We reject all responsibility and liability for work carried out by third- party personnel.

## SAFETY INSTRUCTIONS FOR HYDRAULIC EQUIPMENT

1. Please read the operating instructions.  
Acquaint yourself with the hydraulic equipment.
2. Provide the equipment with the necessary care.  
Always keep the equipment in operational condition.  
Cleanness is an essential requirement for good and safe working.
3. Switch off the electric power supply to the hydraulic equipment,
  - when the equipment is not in use
  - when maintenance work is to be carried out.
4. Avoid unintentional switching - on.  
Keep hands and feet away from the switch when the equipment is not being used.
5. Do not use the equipment in a manner in contravention of the instructions.  
Never carry the equipment by the pipe or pull on the pipe.  
Protect the piping from heat, oil, sharp edges and high levels of weight strain.
6. Use only piping, fittings and accessories which have been designed for the operating pressure of the hydraulic unit.  
**BURSTING PRESSURE OR TEST PRESSURE IS NOT OPERATING PRESSURE!**  
Avoid squashing or bending of the piping.  
Piping must not be painted over.
7. Replace the hydraulic piping
  - when cracks, squashed or bent points are to be seen
  - when blistering is established
  - when hydraulic fluid escapes
  - when pipe fittings are damaged
  - when discolouration is established on the outer layer, e.g. due to the influence of solvents.
8. The hydraulic fluid used in the system is kerosene-based.  
This requires particular care and attention.
  - Avoid continuous contact with the skin
  - ensure that the hydraulic fluid does not get into the eyes or mouth.Hydraulic pipes have to be replaced after 5 years of usage, despite of the circumstance that no damages should be remarkable.
9. The equipment must not be operated, if it has leaks and there is a danger of hydraulic fluid coming into contact with persons, open fire, heating equipment, electric cabling, ground water, foods and other substances which are intended for human consumption.
10. Hydraulic units with petrol engines
  - must not be operated in closed rooms, due to the **DANGER OF INTOXICATION!**
  - do not pour in petrol while the motor is running or in the vicinity of open fire. **DANGER OF EXPLOSION!**

## SAFETY TIPS FOR ELECTRIC TOOLS

**ATTENTION: In order to avoid electric shock, danger of injury and burning the following basic safety measures are always to be taken when using electric tools. Read and observe the notes before using the device. Keep the safety tips in a safe place.**

1. Take influences of the surroundings into account.  
Do not expose electric devices to rain.  
Do not use electric devices in damp or wet surroundings.  
Do not use electric devices in the vicinity of flammable liquids or gases.
2. Protect yourself from electric shock.  
Do not fix additional rating plates or symbols with rivets or screws.  
Use adhesive signs. When working with electric devices avoid body contact with earthed objects such as pipes, heating appliances, refrigerators etc.
3. Use the correct tools.  
Only use the tools and accessories outlined in the operating instructions.  
Do not use the electric device to do work for which it is not intended.
4. Secure the work piece.  
Use gripping devices or vice grips to hold the work piece steady.  
It is more securely held than by hand and you can operate the device with two hands.
5. Do not overload your electric device.  
You can work better and more securely in the indicated power range.
6. Do not use the cable for purposes for which it is not intended.  
Do not carry the electric device by the cable.  
Do not use the cable in order to pull the plug out of the socket. Protect the cable from heat, oil, acids and sharp edges.  
For working in wet rooms or in the open only use the authorised extension cables with the corresponding marking.
7. Avoid unintentional starting.  
Ensure that the electric device is switched off before connecting the mains plug.  
Do not carry the electric device in such a way as that your finger is on the switch.  
Do not use the electric device if the ON/OFF switch does not work perfectly.
8. Disconnect the mains plug:
  - if the device is not in use
  - before maintenance of the electric device
  - when changing tools
9. Carefully maintain the electric device. The best and most secure work is guaranteed if you:
  - keep the electric device clean
  - observe the instructions for greasing, changing the tools and ancillary equipment
  - regularly check the connection cable and the extension cable
  - have damaged cables repaired by a specialist
  - keep hand grips dry, clean and free from oil and fat
  - have the electric device examined and cleaned by a specialist after 900 operating hours.

10. Keep electric devices in a safe place.  
Store electric tools and accessories out of the reach of children, in dry, high-lying places or in locked rooms.
11. Electric devices are often used by more than one person. Therefore before beginning to work you should check:
  - the socket to ensure it is securely fixed and is not damaged in such a way as can be seen from the outside
  - the connection cable for outward damage to the insulation and for sharp kinks
  - that the cable is securely fixed to the device and whether the insulating plastic tube is damaged
  - that the switch is secure and shows no outward signs of damage
  - whether protective appliances or damaged parts function properly
  - whether movable parts jam or are damaged
  - do not use the device in the event of finding defects
  - only allow the device to be repaired by a specialist or in an authorised NOVOPRESS specialist work-shop
  - only use original and identical NOVOPRESS spare parts.

# Stationary sheet metal punch

## with two-handed control

Designation	page
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6490 Blank holder	10
6485 Complete blank holder arm	11
4956 Control valve	12
1721 Hydraulic check valve	13
8002 Device	14
5270 Two-handed control	15,16

## without two-handed control

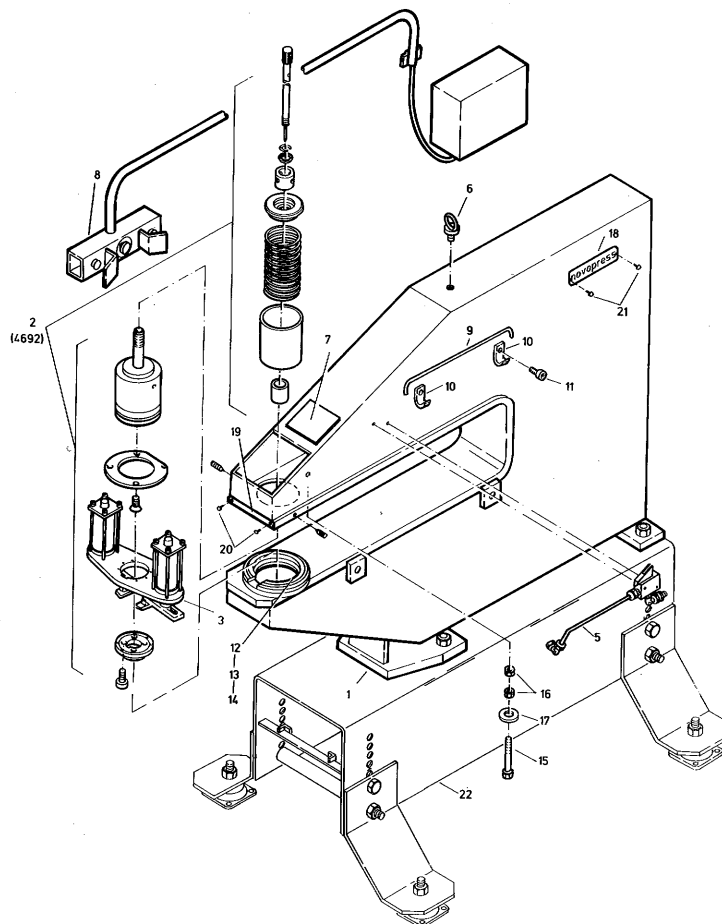
Designation	page
4750 Stationary sheet metal punch	18
4692 Cylinder	4-7
30175 Fixing bolts	8
1937 Fixing bolts	9
6490 Blank holder	10
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## for AV5 and AV5L with digital display

Designation	page
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6485 Complete blank holder arm	11
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8002 Device	14

### 4750-1 Stationary sheet metal punch HSTL 880 with two-handed control

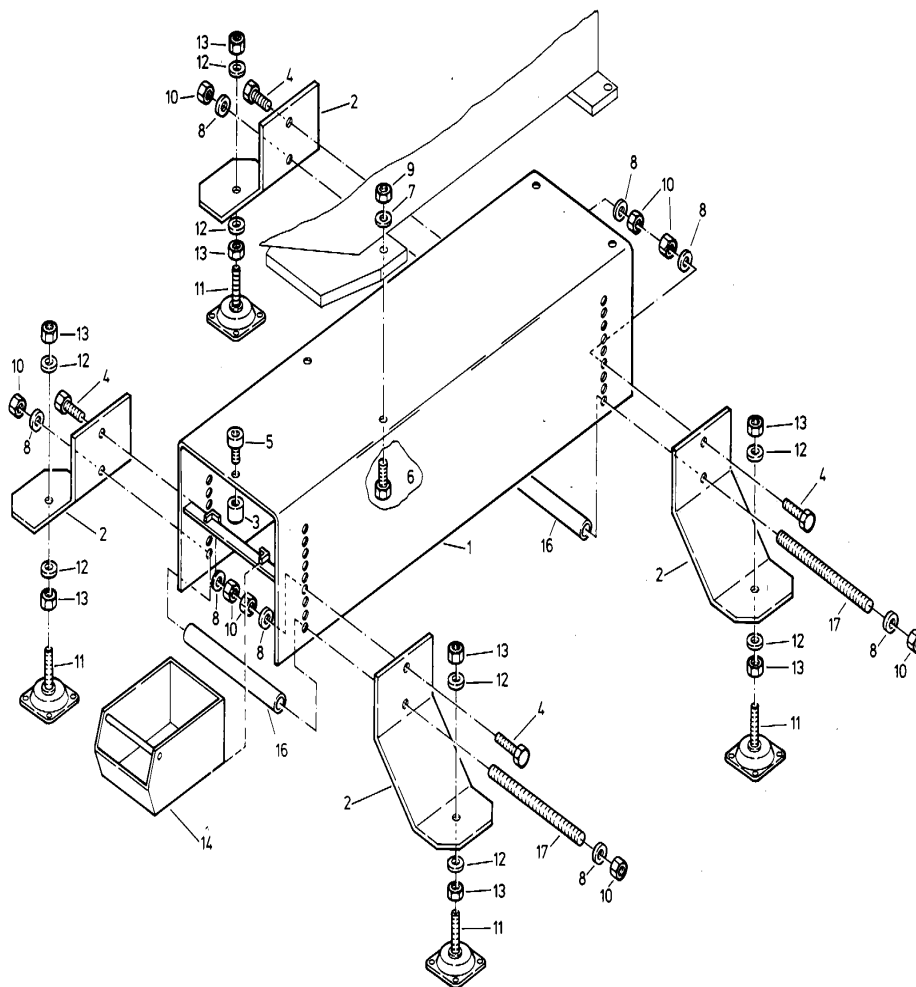
Item	Designation	Order no.	Quantity
1	Column	4691	1
2	Cylinder HSTL	4692	1
3	Blank holder	6490	1
5	Control valve HRV - HSTL	4956	1
6	Eyebolt M 16	11721	1
7	Name plate HTSL	4334	1
8	Two-handed control for HSTL	5270	1
9	Bar	1449	1
10	Hose clip	1722	3
11	Socket head bolt M 6x10	11270	3
12	Centering ring	1622	1
13	Washer A 10,5	11175	4
14	Socket head bolt M 10x30	11320	4
15	Hexagonal screw M 16x110	11176	1
16	Hexagonal nut M 16	12362	2
17	Washer A 17	12363	1
18	Nameplate Novopress	11181	1
19	Nameplate Novopress	12035	1
20	Drive stud 2x6	11120	2
21	Drive stud 3x10	11182	2
22	Console HSTL	7555	1





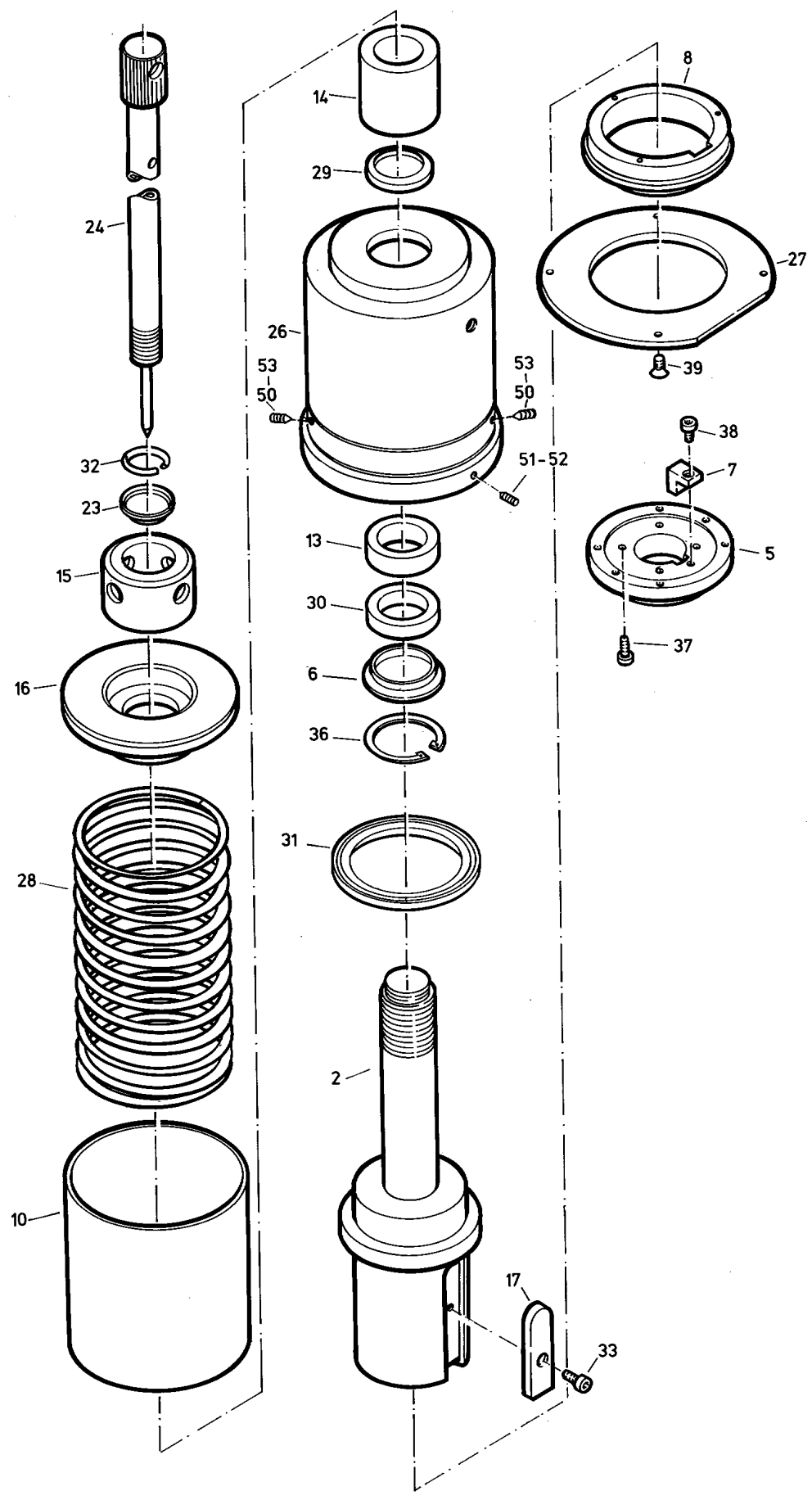
## 7555 Console HSTL

Item	Designation	Order no.	Quantity
1	U-section	7556	1
2	Base	7557	4
3	Sleeve	7558	1
4	Hexagonal screw M 20x40	12637	4
5	Socket head bolt M6x16	11095	1
6	Hexagonal screw M 16x40	12582	4
7	Washer 17	11835	4
8	Washer 21	11492	8
9	Nut M 16	11179	4
10	Nut M 20	11491	8
11	Head element with screw	12685	4
12	Washer 13	11207	8
13	Nut M 12	11256	8
14	Bearing fixture case	12686	1
16	Sleeve	7845	2
17	Threaded pin	12715	2



**4692 Cylinder**

Item	Designation	Order no.	Quantity
2	Piston to HSTL	1615	1
5	Plate	5842	1
6	Support ring for HSTL	1619	1
7	Fitting piece	1620	1
8	Adjustment ring for HSTL	2269	1
10	Protective sleeve	1623	1
13	Bush	1433	1
14	Spacer	1432	1
15	Clamping nut	1429	1
16	Spring plate	1430	1
17	Feather key	1435	1
23	Retaining ring	3116	1
24	Retaining bolt for HSTL	1937	1
26	Cylinder head	4695	1
27	Flange	5845	1
28	Compr. spring 10x125x205	11160	1
29	Wiper 40x50x57	11162	1
30	Oil seal 40x56x10	11163	1
31	Oil seal 95x115x15	11164	1
32	Circlip A 35	11166	1
33	Socket bolt M 6x16	11095	1
36	Retaining ring 60x2	11167	1
37	Socket head bolt M 8x20	11094	4
38	Socket head bolt M 4x10	11171	1
39	Countersunk screw M 8x35	12239	4
50	Stud M 8x16	11180	2
51	Stud M 6x12	11624	1
52	Stud M 6x10	12182	1
53	Stud M 8x10	11624	2



4692 Cylinder

## HSTL- Cylinder

### Changing the oil seals

If oil is discharged from the HSTL cylinder, the oil seals are faulty.

The oil seals must be replaced as follows:

Items see drawing nos. 4751 and 4692

#### 1. Dismantling

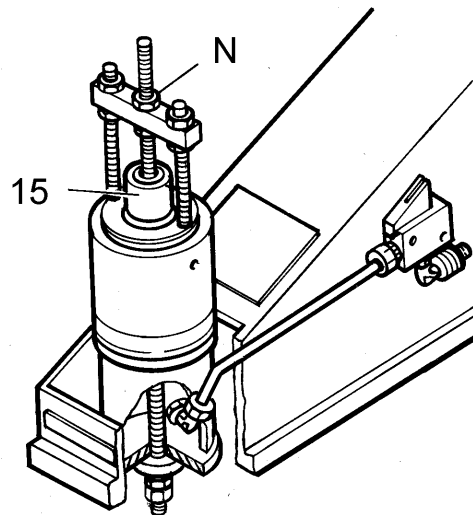
- 1.1 Loosen the screws item 37 (4 ea.) and remove the complete blank holder (3).
- 1.2 Pull out the tool holding rod item 24.
- 1.3 Screw out the return stroke limit screw item 15 (drawing no. 4750-1).
- 1.4 Screw the clamping nut item 15 as far down as required to release the circlip item 32.
- 1.5 Remove the circlip item 32 and the retaining ring item 23.

- 1.6 Please apply the device, drawing no. 8002, page 13 as shown on the sketch at the side before unscrewing the clamping nut item 15.

**WARNING: Danger of injury**

The release spring is pretensioned with approx. 950 N.

- 1.7 Unscrew the clamping nut item 15
- 1.8 Loosen the nut "N" until the release spring is slack.
- 1.9 Remove the device and support the piston using a wood block on the bottom tool.
- 1.10 Remove parts 10,14,15,16,23,24,28 and 32 (Drawing no. 4692).
- 1.11 Mark the exact position of the adjusting ring item 8 (drawing no. 4692) to the cylinder head item 26.
- 1.12. Loosen the screws item 39 (x4) and the screw item 51. Use a 3 mm hollow screw spanner for the screw item 51.
- 1.13 Unscrew the hydraulic connection item 5 from the cylinder.
- 1.14 Remove the wood block.
- 1.15 Dismantle the piston item 2 and the adjusting ring item 8 from the cylinder.
- 1.16 Mark the exact position of the cylinder to the pedestal.
- 1.17 Unscrew the bolts item 50 with a 4 mm hollow screw spanner.
- 1.18 Remove the cylinder and check whether there are tooling marks on the bearing surface. If necessary, polish the bearing surface until smooth.

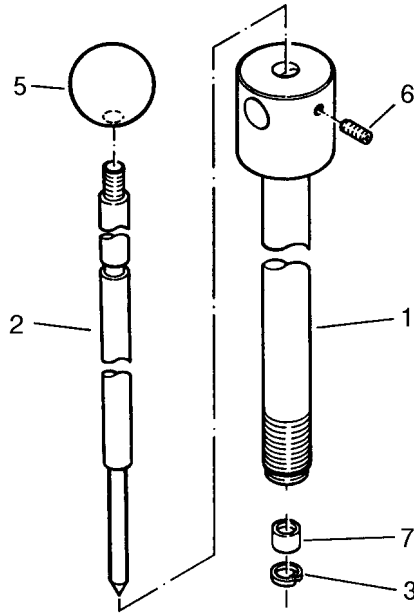


## 2. Assembly

- 2.1 Change the oil seal item 30.
- 2.2 Insert the oil seal item 31 into the cylinder head.
- 2.3 Insert the piston item 2 and the adjusting ring item 8 in the cylinder head.
- 2.4 Adjust the adjusting ring in such a way that the spot drill at the adjusting ring is aligned with the tapped hole in the cylinder head.
- 2.5 Fix the adjusting ring item 8 with the screw item 51.
- 2.6 Insert the cylinder into the pedestal and hold it tight.
- 2.7 Screw down the flange item 27 to the pedestal with the spot face at the back.  
Do **not** tighten the No. 39 bolt.
- 2.8 Adjust the cylinder in such a way that the spot drills on the cylinder are exactly aligned with the tapped holes in the pedestal.
- 2.9 Screw down the bolts item 50 and tighten them.
- 2.10 Tighten screws item 39.
- 2.11 Assemble a profile tool as a check and drive the piston slowly downwards by hand until the top tool projects into the bottom tool. Now check whether the cutting edges of the top tool are parallel to the cutting edges of the bottom tool. If they are **not** parallel to each other, it is necessary to repeat adjustments to the adjusting ring and the cylinder head.
- 2.12 Take out the top tool.
- 2.13 Drive the piston high and support it with a wood block on the bottom tool.
- 2.14 Place items 10,14,28,16,15 and 23 (Drawing no. 4692) on the cylinder.
- 2.15 Use the device, page 13 (drawing no. 8002) as shown on page 6 and pretension the release spring so much as to be able to screw on the clamping nut.
- 2.16 Screw the clamping nut item 15 so far down as to enable the circlip item 32 to be inserted.
- 2.17 Compressed air must be applied once to the cylinder, to ensure the correct positioning of the oil seal, item 30, until the piston moves a few millimeters downwards.
- 2.18 Screw the hydraulic connection to the cylinder.
- 2.19 Turn in the return stroke limit screw item 15.
- 2.20 Fasten the blank holder item 3 using the screws item 37.

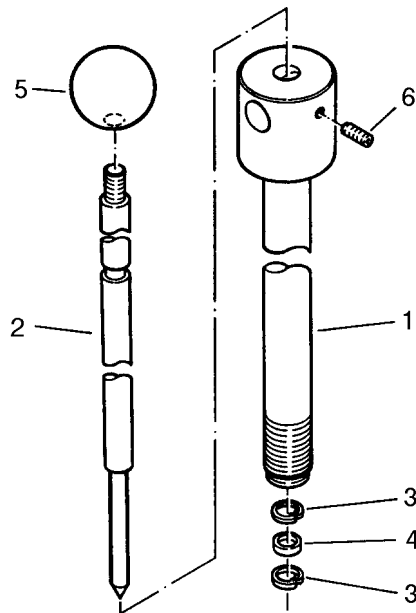
**30175 Fixing bolts for HSTL from device no.: 520**

Item	Designation	Order no.	Quantity
1	Fixing bolt	9191	1
2	Centering bolt	9192	1
3	Retaining ring JZ9/16"	12343	1
5	Ball knob M10	11189	1
6	Stud M 6x16	11737	1
7	Sleeve	33619	1



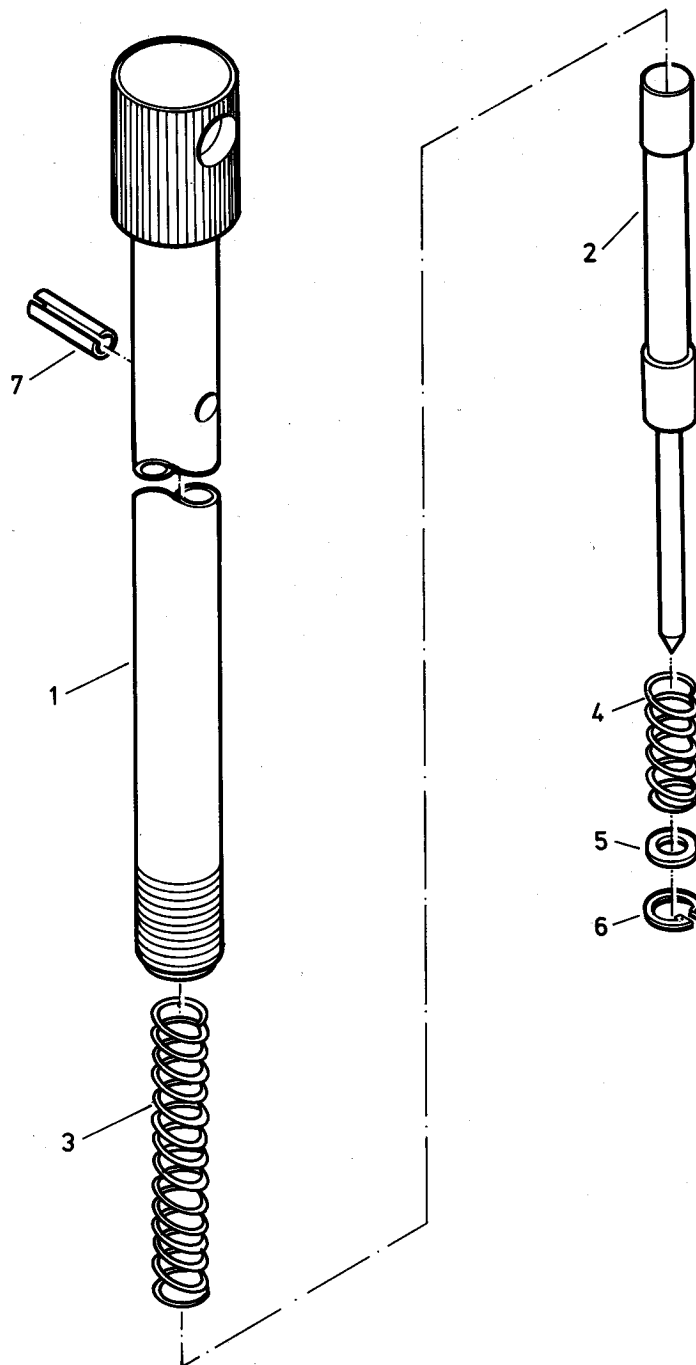
**30175 Fixing bolts for HSTL from device no.: 452 to device no.: 519**

Item	Designation	Order no.	Quantity
1	Fixing bolt	9191	1
2	Centering bolt	9192	1
3	Retaining ring JZ9/16"	12343	2
4	Washer A 7,15	13365	1
5	Ball knob M10	11189	1
6	Stud M 6x16	11737	1



### 1937 Fixing bolts for HSTL to device no.: 451

Item	Designation	Order no.	Quantity
1	Fixing bolt	1431	1
2	Centering bolt	1438	1
3	Compr. spring 1,25x10x93,5	11218	3
4	Compr. spring 1,25x10x16	2751	1
5	Washer A 7,4	11225	1
6	Retaining ring JZ9/16"	12343	1
7	Clamping sleeve 8x22	11365	1



## 6490 Blank holder

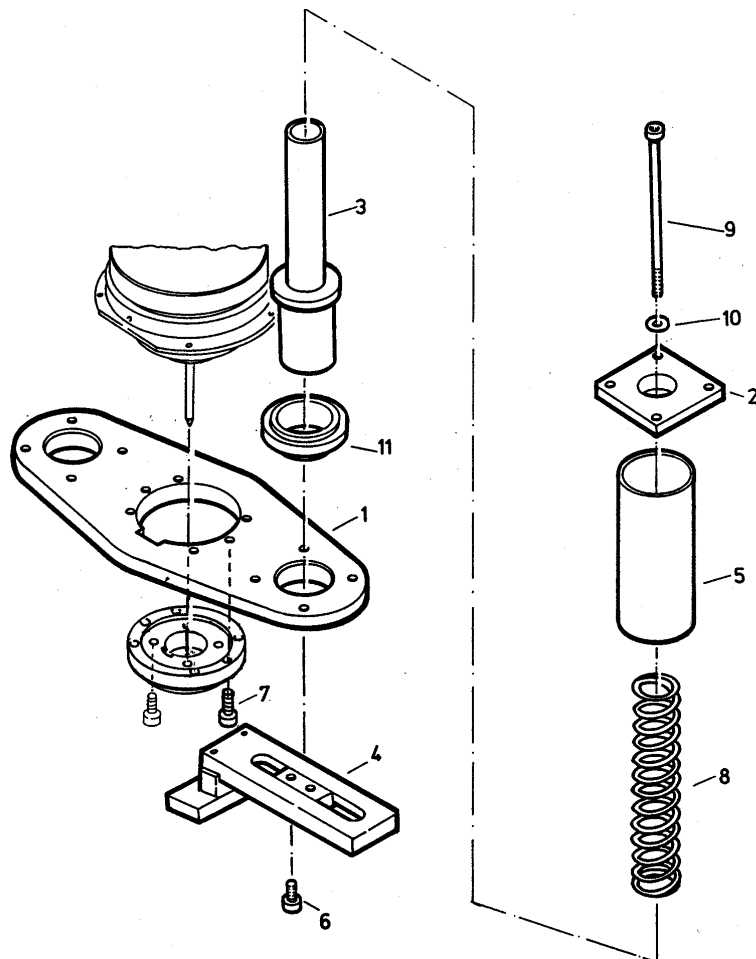
Item	Designation	Order no.	Quantity
1	Blank holder plate	5839	1
2	Cover	1507	2
3	Blank holder piston	1509	2
4	Blank holder arm complete	6485	2
5	Spacer sleeve	1512	2
6	Socket head bolt M 8x16	11170	4
7	Socket head bolt M 6x16	12241	6
8	Compression spring 6,3x40x195	11161	2
9	Socket head bolt M 8x170	11172	8
10	Washer A 8,4	11174	8
11	Bush	5840	2

### 1. Dismantle blank holder

Unscrew the bolts item 7 (x6) and remove the complete blank holder.

### 2. Dismantle complete blank holder arm item 4

Remove the screws item 6 (x2) and remove the blank holder arm.

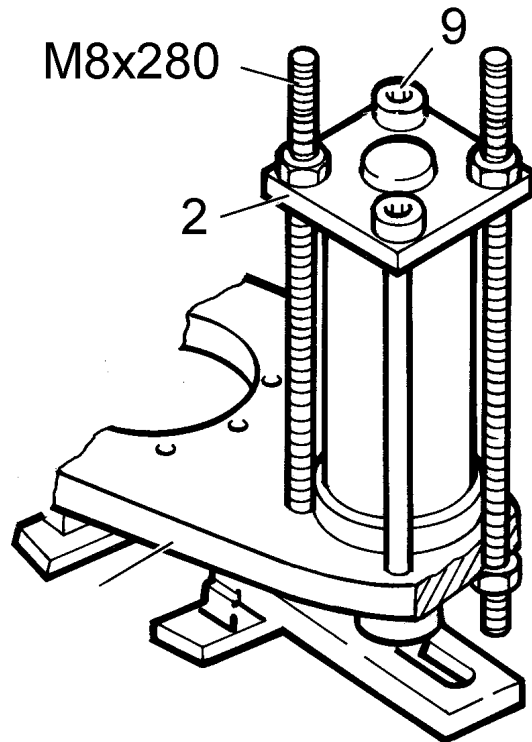




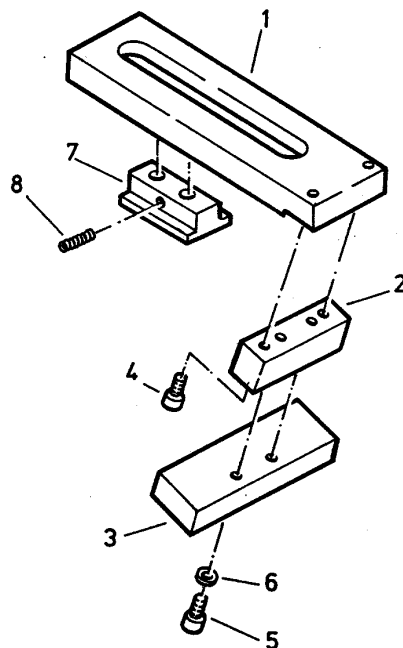
3. Dismantle blank holder piston item 3

**WARNING! Danger of injury**  
Item 2 is under spring pretension

- 3.1 Unscrew two diagonally opposite screws item 9
- 3.2 Insert two threaded pins M 8x280 (see sketch)  
Check the threaded pins on the blank holder plate item 1 using a nut.
- 3.3 Remove the rest of the screws item 9.
- 3.4 Loosen the nuts on the threaded pins alternately until the compression spring becomes slack.

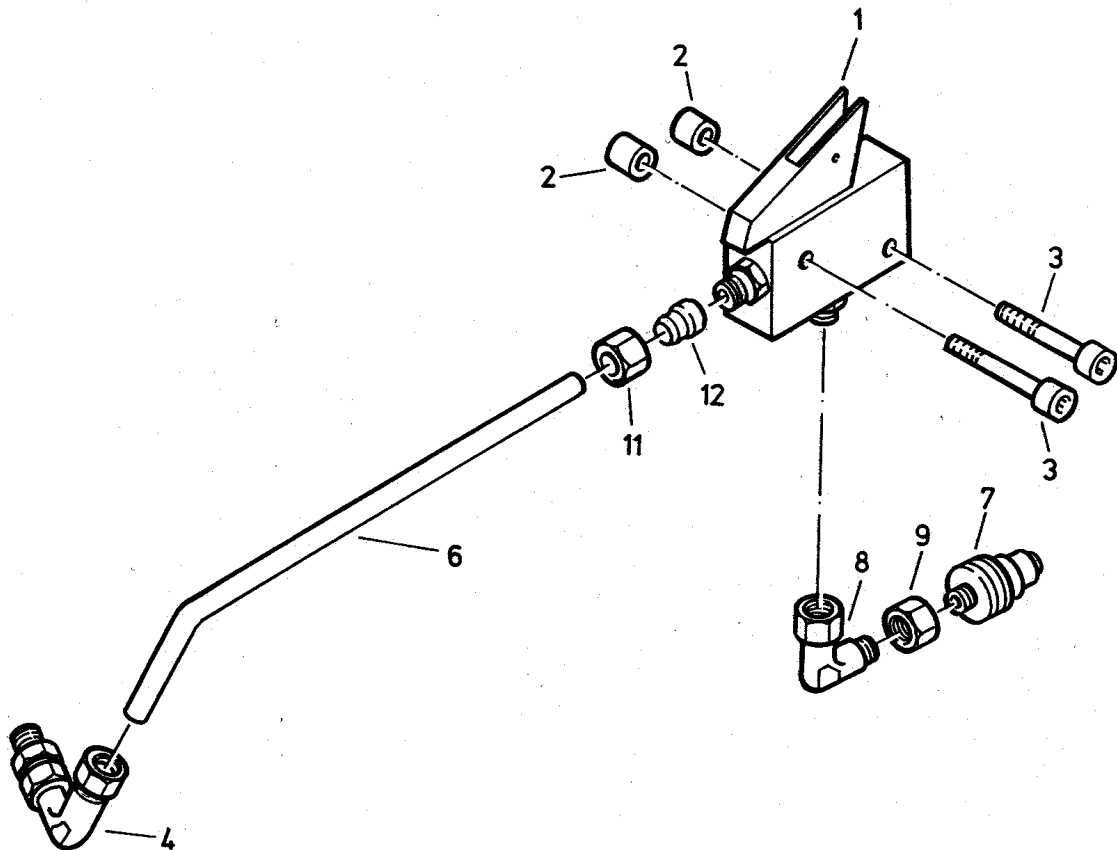
**6485 Complete blank holder arm**

Item	Designation	Order no.	Quantity
1	Blank holder arm	5844	1
2	Insert	5843	1
3	Rail for HSTL	2738	1
4	Socket head bolt M 5x20	11010	2
5	Socket head bolt M 5x16	11096	2
6	Washer A 5,3	11066	2
7	Key	4878	1
8	Compression spring 0,9x6,6x35	1300	1



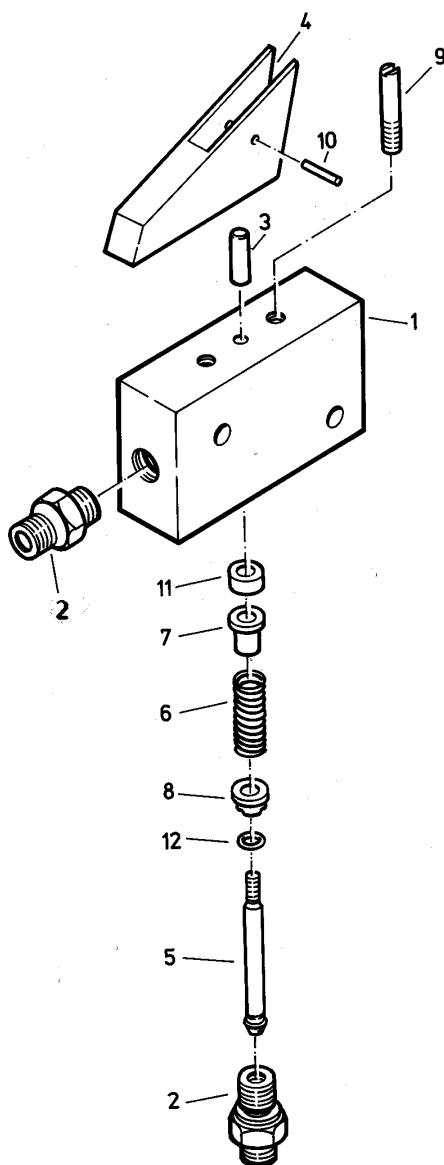
### 4956 Control valve HRV-HSTL

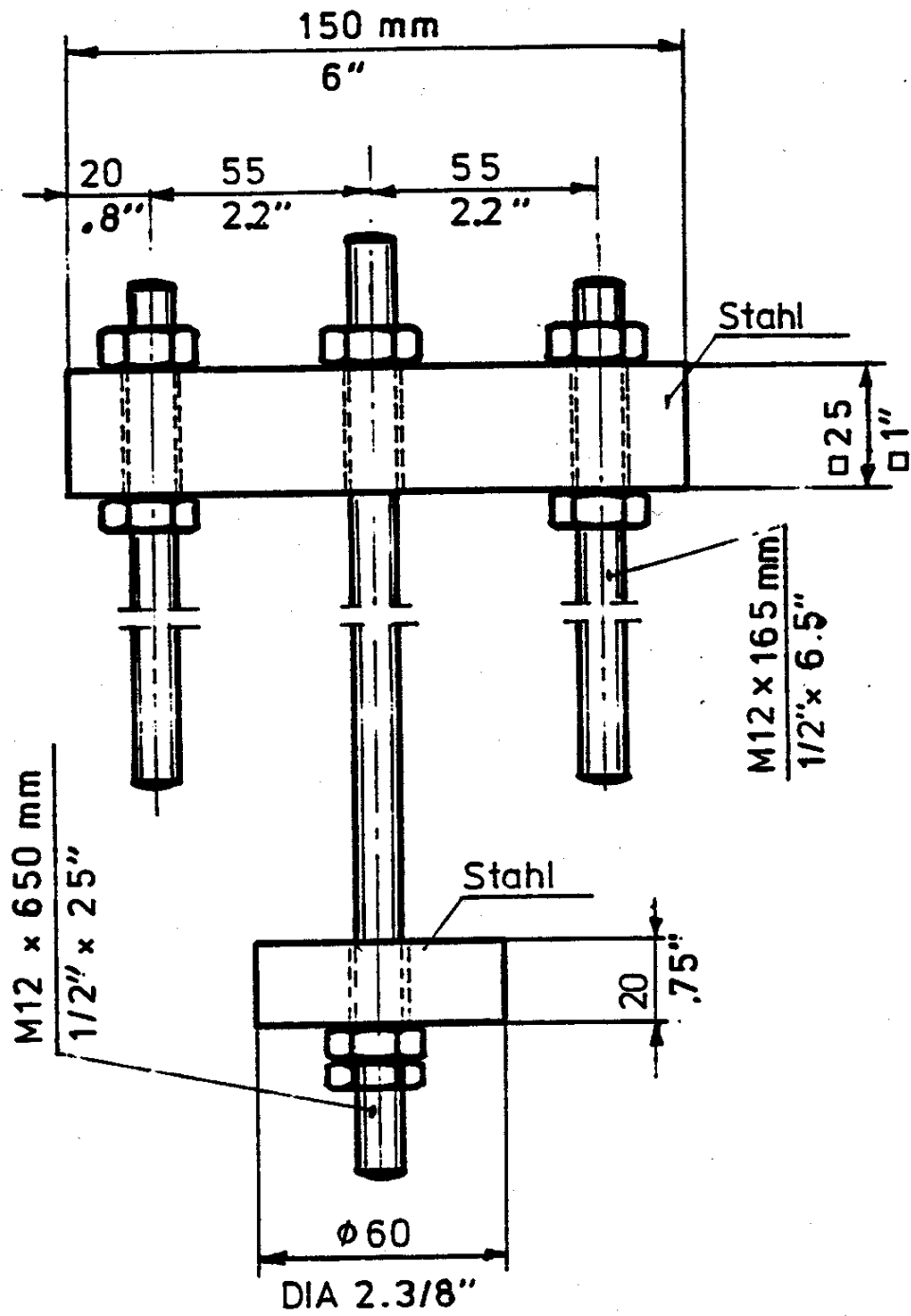
Item	Designation	Order no.	Quantity
1	Hydraulic check valve	1721	1
2	Spacer	1723	2
3	Socket head bolt M 6x60	11364	2
4	Adjustable angle fitting	11528	1
6	Straight fitting 10x1x300	11722	1
7	Coupling plug M 16x1,5,	3659	1
8	Adjustable angle fitting	11212	1
9	Hexagonal nut	1725	1
10	Dust seal for plug end	1514	1
11	Hexagonal nut	11043	1
12	Cutting ring	11214	1



## 1721 Hydraulic check valve

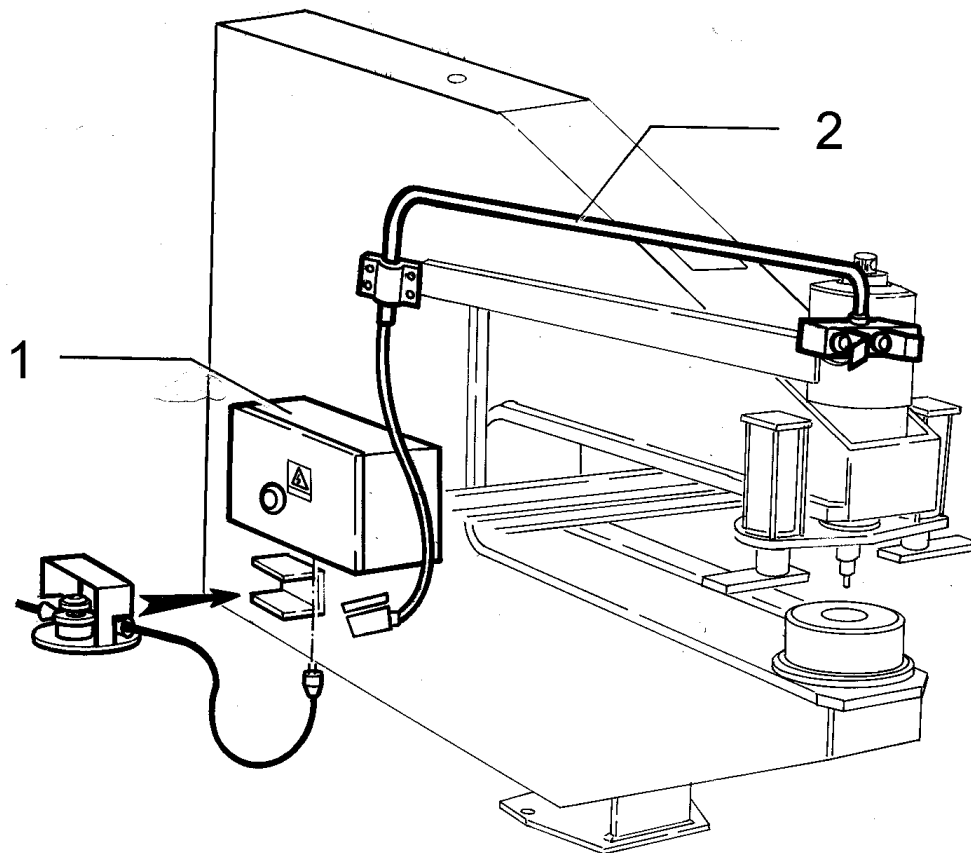
Item	Designation	Order no.	Quantity
1	Housing	1640	1
2	Connection	3248	2
3	Pipe fitting	1642	1
4	Lever	1641	1
5	Piston	3251	1
6	Compr. spring 1,3x10x33	1298	1
7	Stop	1385	1
8	Bush	3247	1
9	Shaft bolt M 6x30	12463	1
10	Clamping sleeve 6x12	13291	1
11	Oil seal 5x11x5	11420	1
12	O-ring 6,1x1,6	11421	1



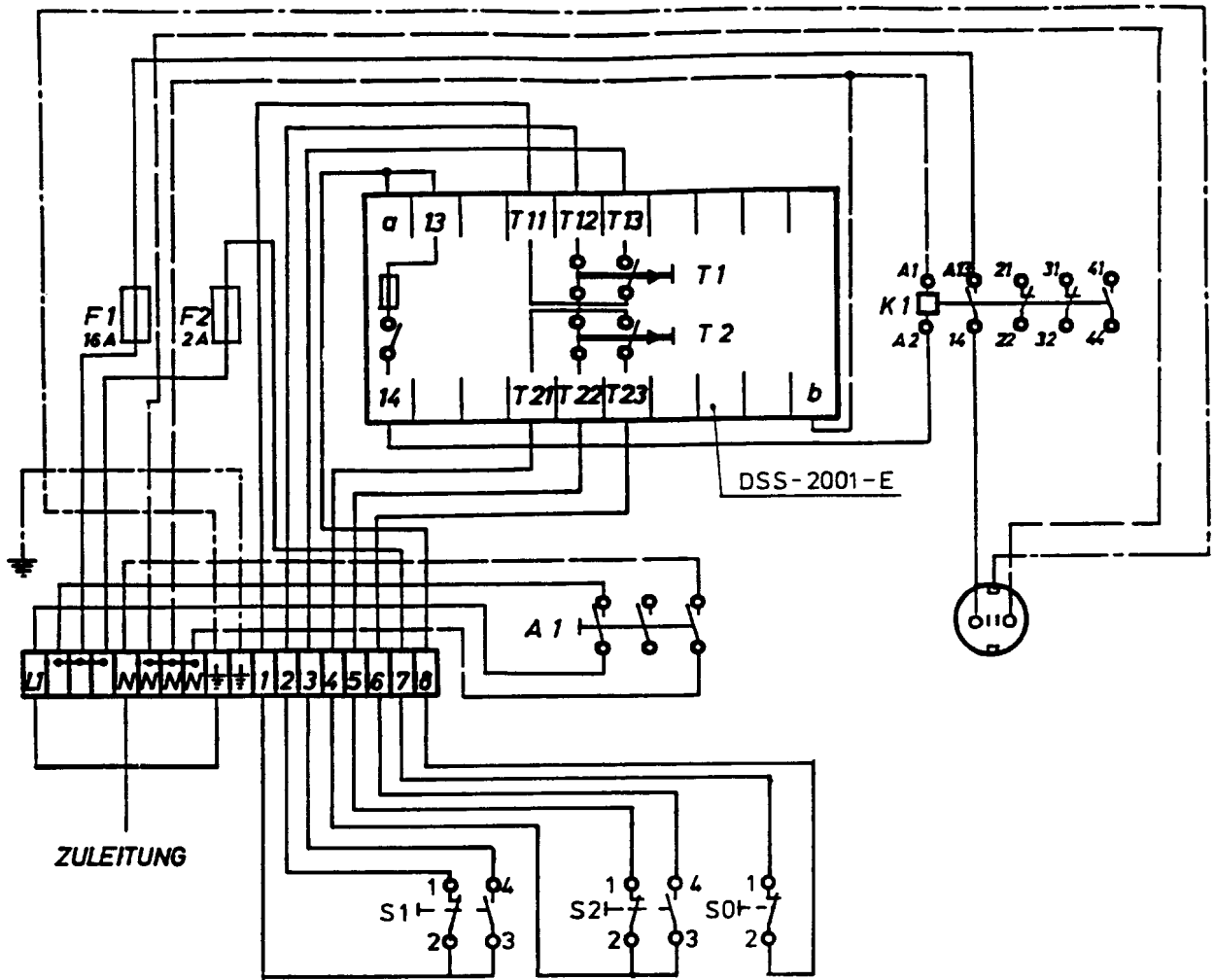


**5270 Two-handed control HSTL - AV4**

Item	Designation	Order no.	Quantity
1	Complete control cabinet	7390	1
2	Pivot arm with pushbutton	7798	1



## 5516 Circuit diagram with twohanded relay DSS-2001-E (old version) (two-handed control AV4 and AV4L)



### Control cabinet

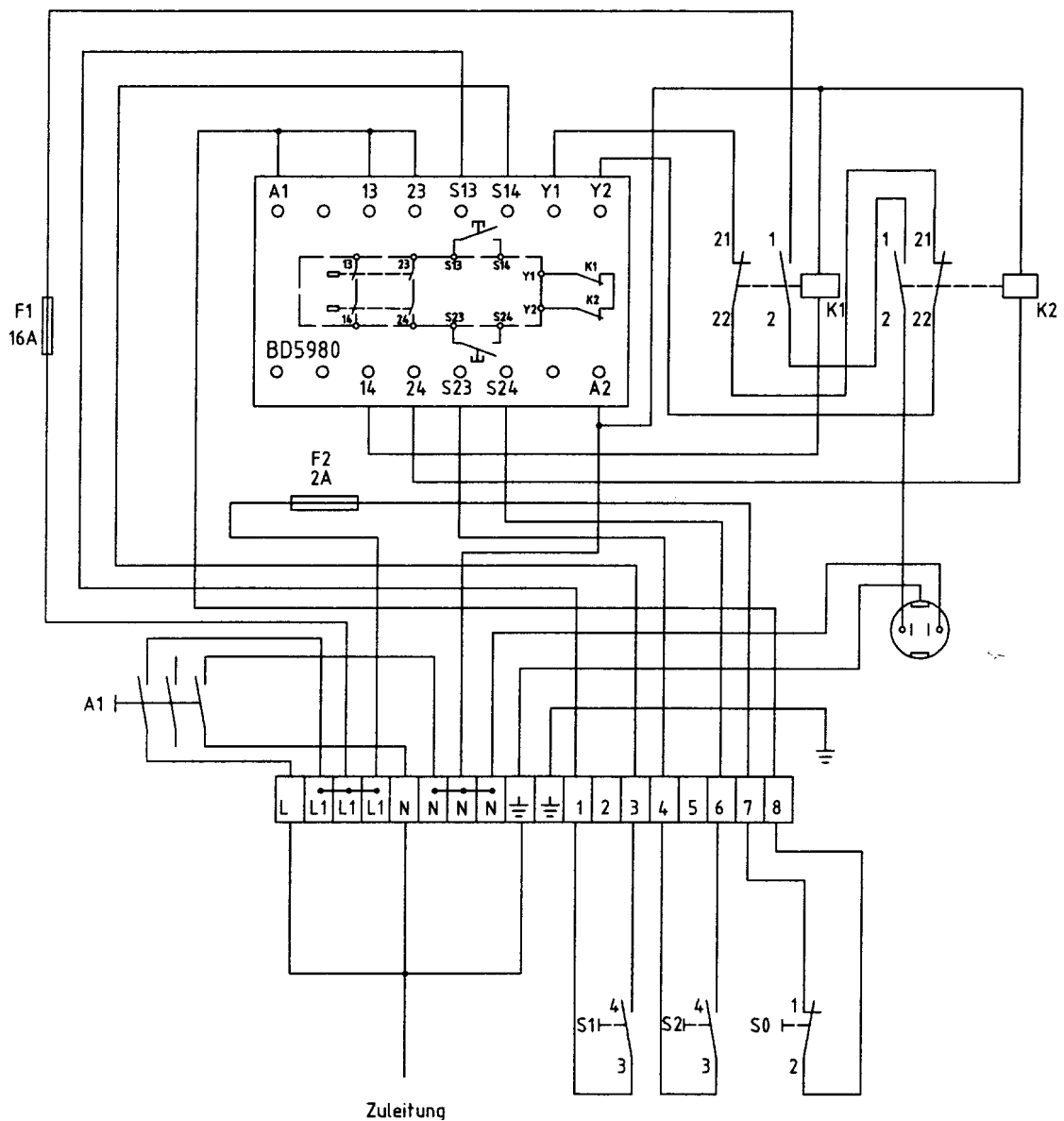
Designation	Circuit diagram	Order no
2-handed relay	DSS-2001-E	] 31201*
Contacteur	K1	
Main switch	A1	12614

\*= consist of new 2-handed relay BD5980 and 2 new contactors.

### Pushbutton housing

Designation	Circuit diagram	Operating instruction	Order no
EMERGENCY STOP	S0	T8	12783
2-handed control	S1 / S2	T7	12784

### 4750BI.3 Circuit diagram with twohanded relay BD5980 (new version) (two-handed control AV4 and AV4L)



#### Control cabinet

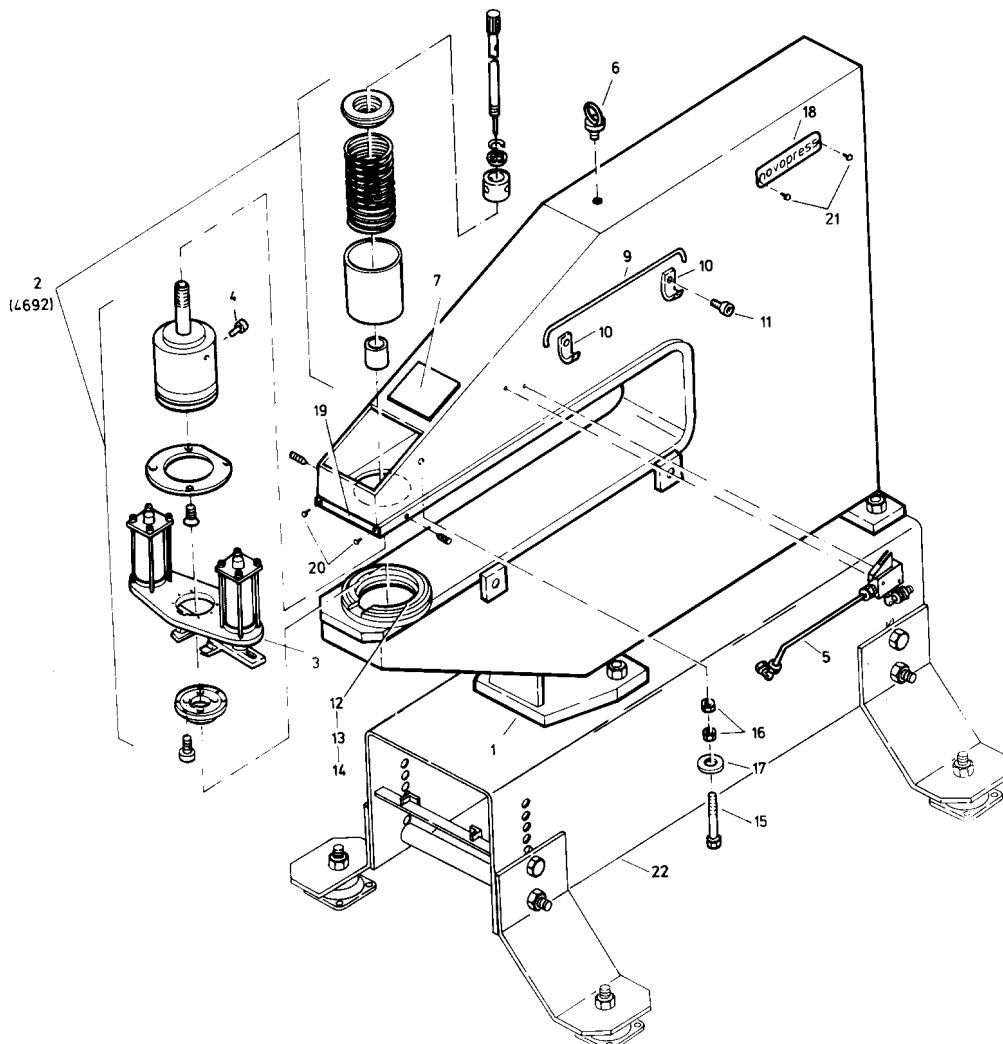
Designation	Circuit diagram	Order no
2-handed relay	BD 5980 N	14122
Contactors	K1	14123
Contactors	K2	14123
Main switch	A1	12614

#### Pushbutton housing

Designation	Circuit diagram	Operating instruction	Order no
EMERGENCY STOP	S0	T8	12783
2-handed control	S1 / S2	T7	12784

**4750 Stationary sheet metal punch HSTL 880**

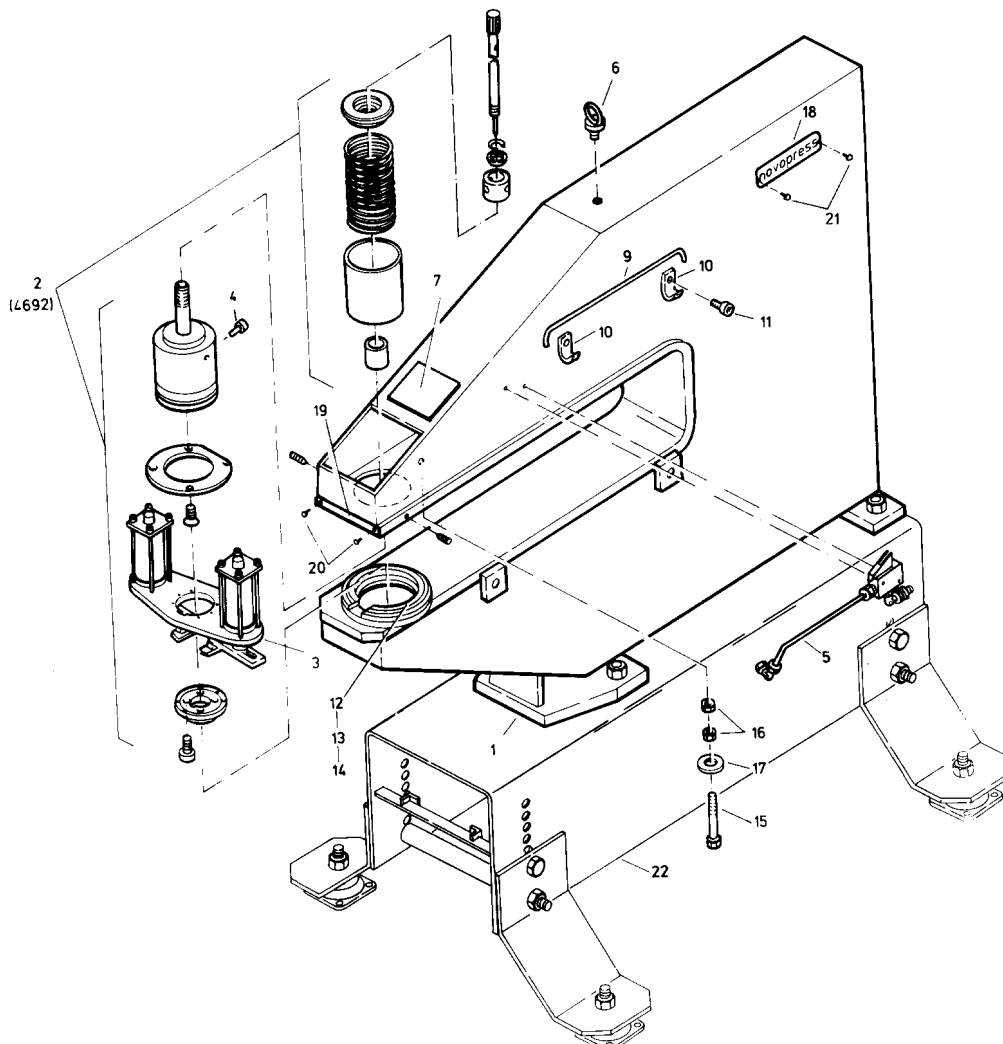
Item	Designation	Order no.	Quantity
1	Column	4691	1
2	Cylinder HSTL	4692	1
3	Blank holder	6490	1
4	Cap screw	14154	1
5	Control valve HRV - HSTL	4956	1
6	Eyebolt M 16	11721	1
7	Name plate HTSL	4334	1
9	Bar	1449	1
10	Hose clip	1722	3
11	Socket head bolt M 6x10	11270	3
12	Centering ring	1622	1
13	Washer A 10,5	11175	4
14	Socket head bolt M 10x30	11320	4
15	Hexagonal screw M 16x110	11176	1
16	Hexagonal nut M 16	12362	2
17	Washer A 17	12363	1
18	Nameplate Novopress	11181	1
19	Nameplate Novopress	12035	1
20	Drive stud 2x6	11120	2
21	Drive stud 3x10	11182	2
22	Console HSTL	7555	1





**7370 Stationary sheet metal punch HSTL 880 for AV5 and AV5L**

Item	Designation	Order no.	Quantity
1	Column HSTL	4691	1
2	Cylinder HSTL	4692	1
3	Blank holder	6490	1
4	Cap screw	14154	1
5	Control valve HRV - HSTL	4956	1
6	Eyebolt M 16	11721	1
7	Name plate HTSL	4334	1
9	Bar	1449	1
10	Hose clip	1722	3
11	Socket head bolt M 6x10	11270	3
12	Centering ring	1622	1
13	Washer A 10,5	11175	4
14	Socket head bolt M 10x30	11320	4
15	Hexagonal screw M 16x110	11176	1
16	Hexagonal nut M 16	12362	2
17	Washer A 17	12363	1
18	Nameplate Novopress	11181	1
19	Nameplate Novopress	12035	1
20	Drive stud 2x6	11120	2
21	Drive stud 3x10	11182	2
22	Console HSTL	7555	1



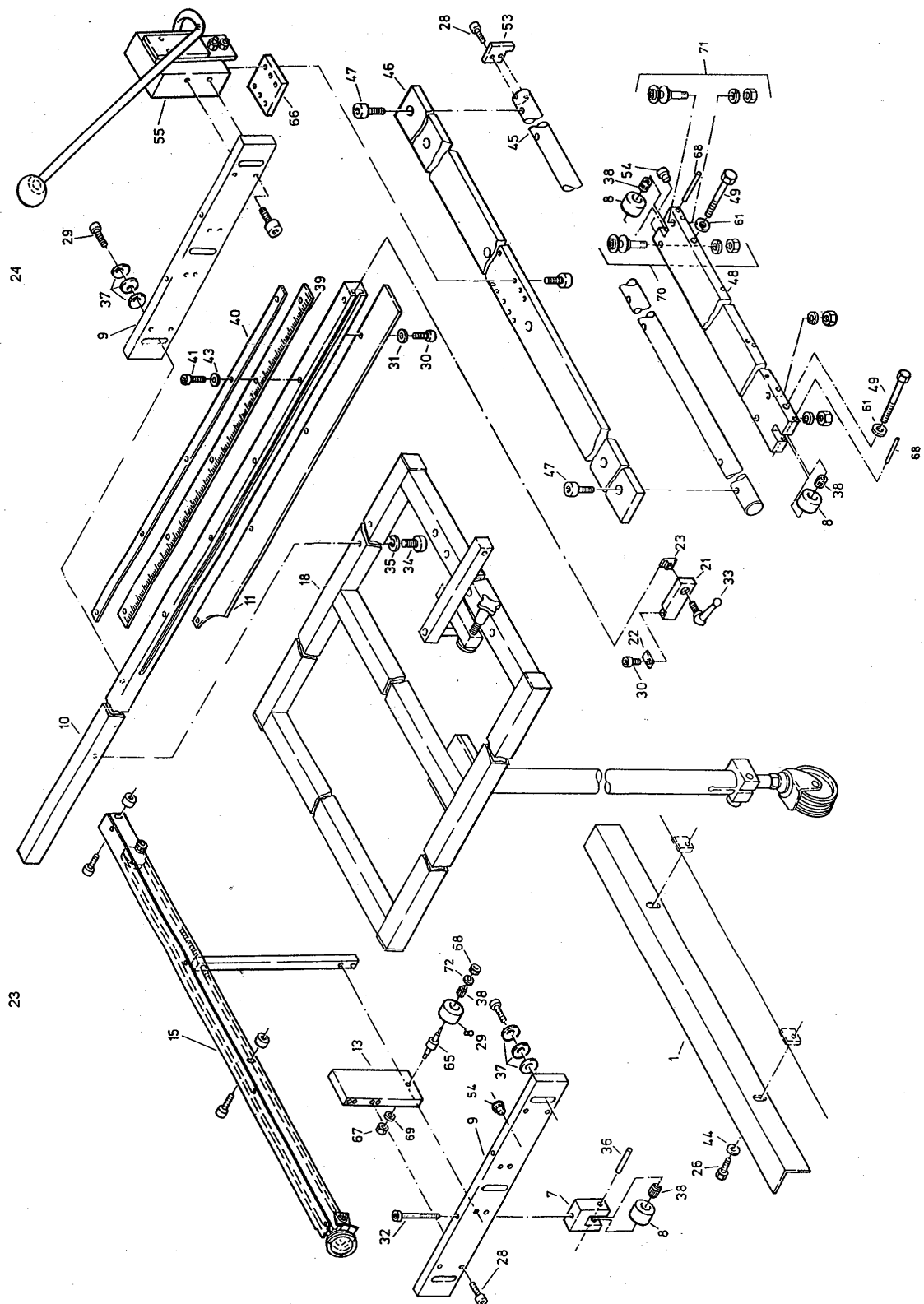


## Stop device AV2

Designation	Page
2080-1 Stop device AV2	22
31079 Support roller cpl.	25
31081 Eccentric support roller	26
5031 Measuring fixture	27
5370 Support and clamping fixture	29
5372 Pedestal	30
5375 Clamping fixture	31
5525 Carriage brake	32

**2080-1 Stop device AV 2**

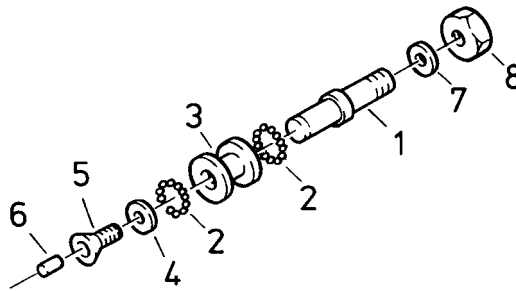
Item	Designation	Order no.	Quantity
1	Angle bracket, left hand	5169	1
7	Bearing block	2048	1
8	Support roller	2049	4
9	Cross head stop	4731	1
10	Stop rail	2051	1
11	Location rail	5368	1
13	Tie panel, left hand	4987	1
15	Measuring fixture	5031	1
18	Support & clamping fixture	5370	1
21	Side stop	2062	1
22	Pointer	2069	1
23	T-piece M 6	11188	1
26	Hexagonal screw M 12x30	11670	2
28	Socket head bolt M 8x20	11094	11
29	Socket head bolt M 10x35	11187	3
30	Socket head bolt M 6x12	11259	5
31	Washer A 6.4	11203	5
32	Hexagonal screw M 8x100	11202	1
33	Clamping lever	11191	1
34	Socket head bolt M 6x10	11270	3
35	Spring washer A 6	11652	3
36	Stud 8 m 6x40	11206	1
37	Spring disc 28x10,2x1,25	11201	9
38	Needle bearing NK8/16TN	11209	4
39	Scale, rustpr. 19x0,6x1000	11192	1
40	Locking rail	2081	1
41	Socket head bolt M 5x12	11039	8
42	Washer A 8,4	11230	6
43	Washer A 5,3	11083	9
44	Washer A 13	11871	2
45	Steel shaft	5521	1
46	Carriage sheet	5522	1
47	Socket head bolt M 12x25	11988	6
48	Bridge	5523	1
49	Socket head bolt M 12x90	13689	2
53	End stop	5695	1
54	Stop button M 4	11739	3
55	Carriage stop	5525	1
61	Spring washer A 12	13555	2
65	Eccentric bolts	4843	1
66	Compensation plate	5742	1
67	Hexagonal nut M8	11367	1
68	Socket head bolt 8 m 6x60	11204	2
69	Spring washer A 8	11235	1
70	Support roller cpl.	31079	2
71	Eccentric support roller	31081	2
72	Washer A 6,4	11273	1



2080-1 Anschlagvorrichtung AV2 mit Auflage

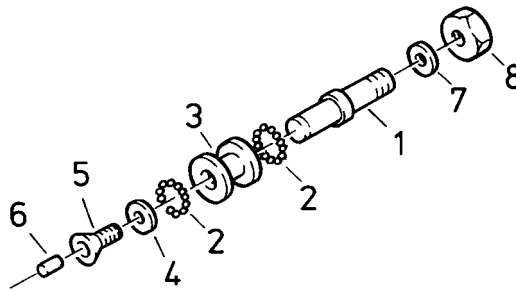
**31079 Support roller cpl.**

Item	Designation	Order no.	Quantity
1	Support roller shaft	4989	1
2	Steel ball dia. 4	11116	26
3	Support roller	4588	1
4	Support roller disc	4958	1
5	Countersunk screw	4321	1
6	Stud	11138	1
7	Spring washer A 12	11672	1
8	Hexagonal nut	11256	1



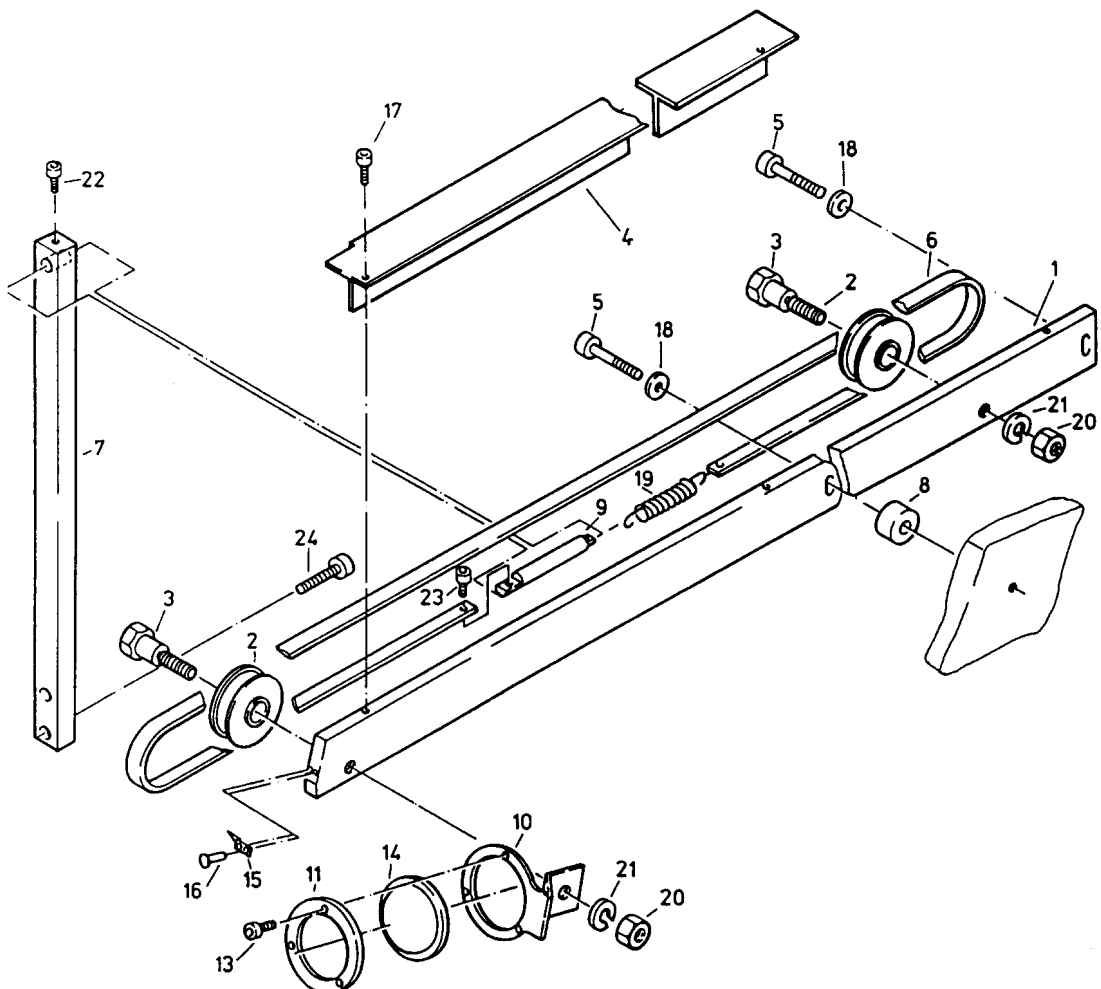
**31081 Eccentric support roller**

Item	Designation	Order no.	Quantity
1	Support roller shaft	4589	1
2	Steel ball dia. 4	11116	26
3	Support roller	4588	1
4	Support roller disc	4958	1
5	Countersunk screw	4321	1
6	Stud	11138	1
7	Spring washer A 12	11672	1
8	Hexagonal nut	11256	1

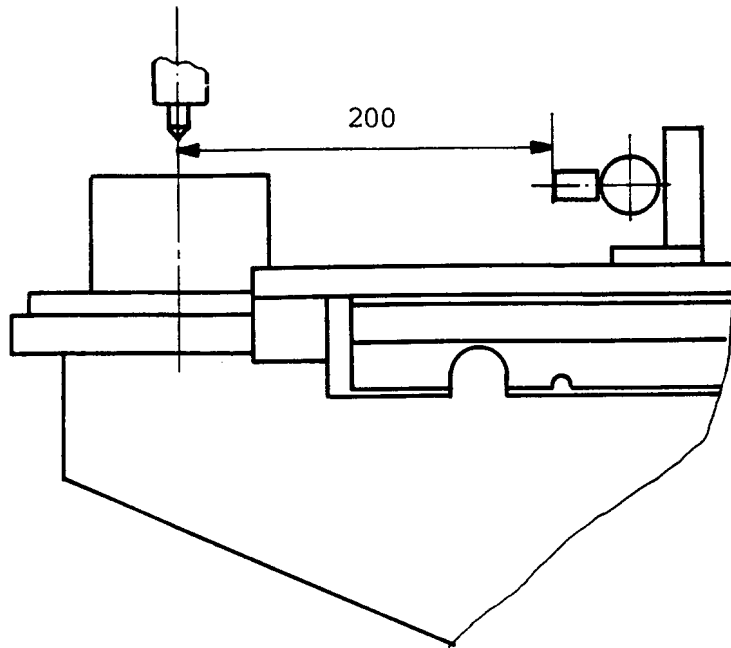


## 5031 Measuring fixture

Item	Designation	Order no.	Quantity
1	Holder	5032	1
2	Guide roller	5033	2
3	Bolt	5034	2
4	Guard	5035	1
5	Socket head bolt	11190	2
6	Peripheral tape measure	5146	1
7	Driver	5036	1
8	Spacer	5037	2
9	Adjusting pin	5038	1
10	Holder	5147	1
11	Lock ring	5046	1
13	Socket head bolt M 3x10	11269	3
14	Lens dia. 50	11682	1
15	Pointer	5148	1
16	Drive stud 2x6	11120	2
17	Socket head bolt M 4x6	11268	4
18	Washer A 6,4	11203	2
19	Tension spring 0,8x5,0x27,6	2176	1
20	Hexagonal nut M 10	11429	2
21	Spring washer A 10	11630	2
22	Socket head bolt M 5x10	11081	1
23	Socket head bolt M 4x6	11268	1
24	Socket head bolt M 8x30	12590	2



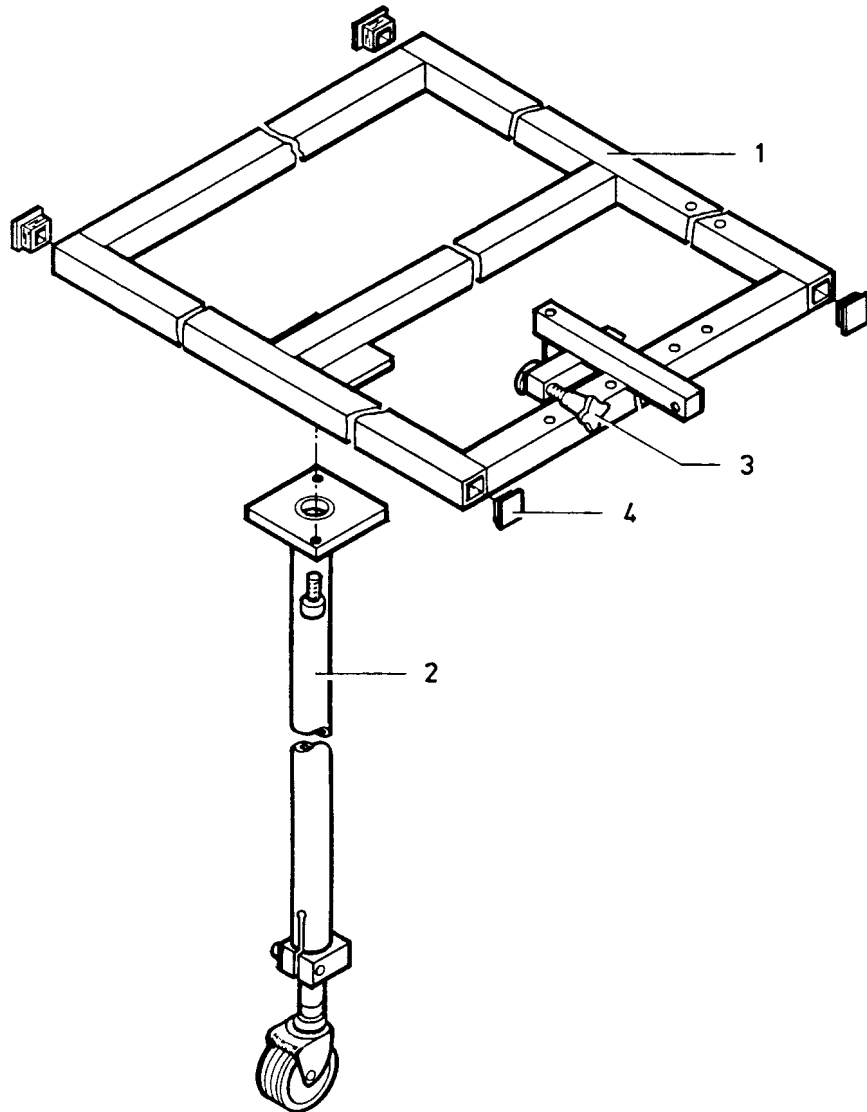


**Adjusting the "Y" axis (5031) of the measuring fixture**

1. Set a distance of 200 mm between the corner points and the stop rail.
2. Lock the carriage using the brake.
3. Slightly loosen screw item 22.
4. Hold the dimensions set using the adjusting pin item 9 (drawing 5031).
5. Lock the adjusting pin again with the screw item 22 (drawing 5031)

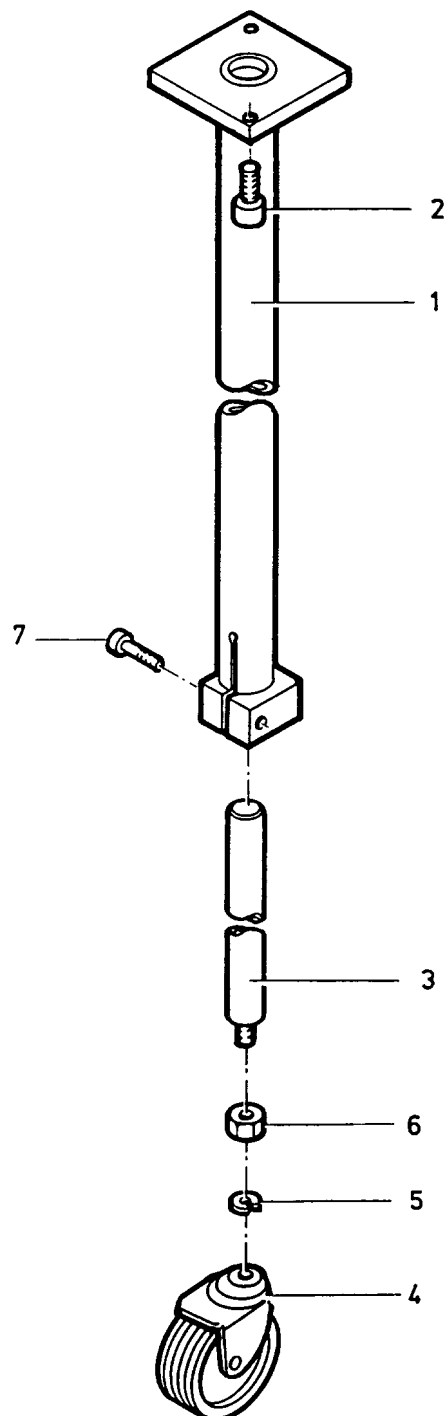
**5370 Supporting and clamping fixture**

Item	Designation	Order no.	Quantity
1	Support frame	5371	1
2	Pedestal	5372	1
3	Clamping fixture	5375	1
4	Square plug	11740	4



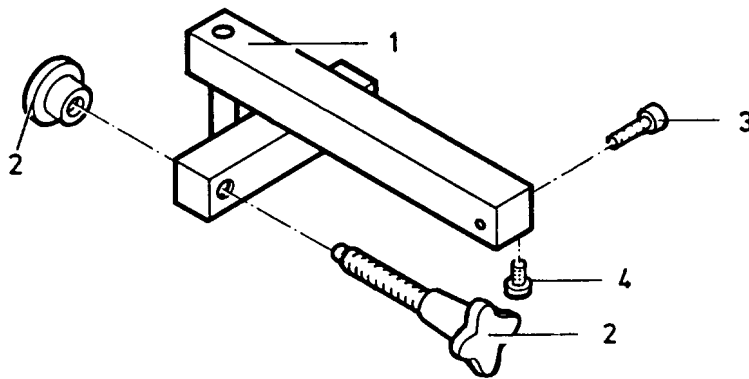
**5372 Pedestal**

Item	Designation	Order no.	Quantity
1	Support tube	5373	1
2	Socket head bolt M 10x25	11248	2
3	Telescopic bar for height	5374	1
4	Double guide roller dia. 50 with rear hole	11618	1
5	Spring washer A 10	11630	1
6	Hexagonal nut M 10	11429	1
7	Socket head bolt M 8x35	11086	1



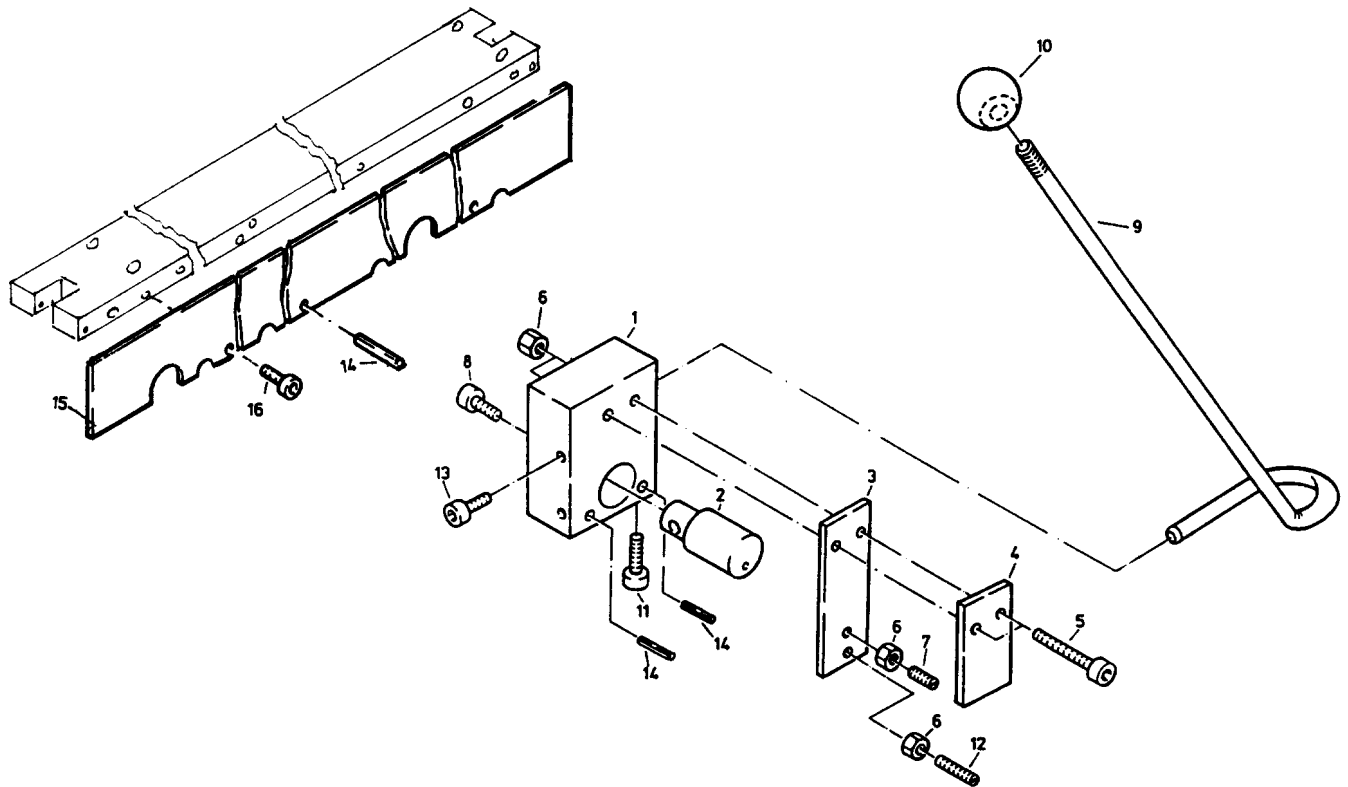
**5375 Clamping fixture**

Item	Designation	Order no.	Quantity
1	Clamping arm	5376	1
2	Clamping bolt M 10	11738	1
3	Stop button M 4	11739	1
4	Socket head bolt M 5x10	11081	1



## 5525 Carriage brake

Item	Designation	Order no.	Quantity
1	Backing plate	5526	1
2	Bolt	5527	1
3	Brake plate	5528	1
4	Brake plate	5529	1
5	Socket head bolt M 10x70	11684	2
6	Hexagonal nut M 10	11429	4
7	Ball thrust bolt	11880	1
8	Socket head bolt M 6x12	11259	1
9	Hand lever	5530	1
10	Ball knob M 10	11189	1
11	Socket head bolt M 8x20	11094	2
12	Stud M 10x35	11426	1
13	Socket head bolt M 8x25	11252	2
14	Clamping pin 8x30	12088	3
15	Brake sheet	5524	1
16	Socket head bolt M8x16	11313	2



FAULT	CAUSE	REMEDY
The brake is released. The carriage can only be moved with difficulty or not at all.	The brake is badly adjusted.	Loosen nut item 6. Turn the bolt item 7 a little to the right until it is possible to move the carriage slightly. Tighten nut item 6.
After adjustment of the item 7 screw, no brake effect can be seen.	The bolt no. 2 is worn.	Insert a new bolt. Order no. 5527

## Stop device AV4 - AV4L

### Stop device AV4

	Designation	Page
	5031 Measuring fixture	27-28
*1	5525 Carriage brake Y-axis	32
	4585 Stop device AV 4	35-38
	5109 Cross rail	39
	4831 Cross rail support	40
	6055 Lens holder	41
	Measuring fixture "X" adjusting	42
*1	4665 Brake X-axis	43
	5116 Clamping fixture	44
	7857 Articulated support	45
	9190 Tension device X-axis	46
	9205 Articulated support	51
	9220 Tension device Y-axis	52
*2	7780 Precision setting X-axis	72-73
*2	7770 Precision setting Y-axis	74-77
	8540 Support left	82

### Stop device AV4 L

	Designation	Page
	5031 Measuring fixture	27-28
*1	5525 Carriage brake	32
	5109 Cross rail	39
	4831 Cross rail support	40
	6055 Lens holder	41
	Measuring fixture "X" adjusting	42
*1	4665 Brake	43
	5116 Clamping fixture	44
	7857 Articulated support	45
	9190 Tension device X-axis	46
	7440 Stop device AV 4 L	47-50
	9205 Articulated support	51
	9220 Tension device Y-axis	52
*2	7780 Precision setting X-axis	72-73
*2	7770 Precision setting Y-axis	74-77
	7856 Pedestal	80
	8540 Support left	82
	8130 Support right	83

Remark! The stop devices AV4 and AV4L can be assembled either with the brake \*1 or with the precision setting \*2.

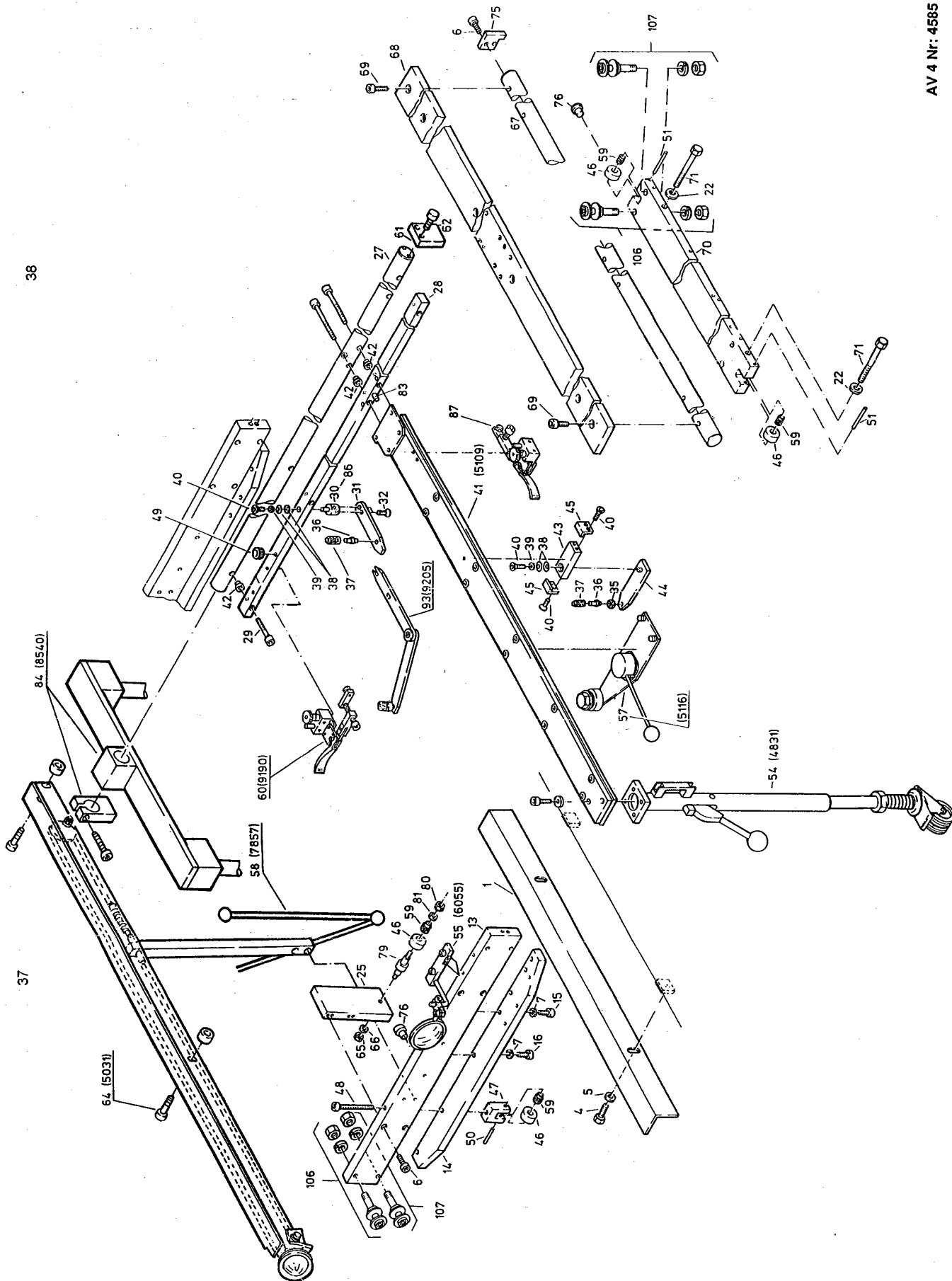


**4585 Stop device AV 4**

Item	Designation	Order no.	Quantity
1	Angle bracket , left hand	5169	1
4	Hexagonal screw M 12x30	11670	2
5	Washer A 13	11871	2
6	Socket head bolt M 8x20	11094	10
7	Washer A 8,4	11174	3
13	Cross head stop	4586	1
14	Rail	4994	1
15	Socket head bolt M 8x25	11252	3
16	Socket head bolt M 8x30	12590	2
22	Spring washer A 12	13555	2
25	Tie panel, left hand	4987	1
27	Steel shaft	5115	1
28	Location rail	5108	1
29	Socket head bolt M 8x40	11392	6
30	Pintail	4672	2
31	Clamping panel	4671	3
32	Countersunk screw M 6x16	11673	6
35	Shim 9x15x1	11676	2
36	Setting bolt	4673	5
37	Stop pin	4669	5
38	Spring disc 23x10,2x0,9	11127	10
39	Washer A 6,4	11273	5
40	Countersunk screw M 6x10	11044	21
41	Cross rail	5109	1
42	Distance bushing	5117	8
43	Distance piece	5118	2
44	Supporting plate	5119	2
45	Support	5120	4
46	Support roller	2049	4
47	Bearing block	2048	1
48	Hexagonal screw M 8x100	11202	1
49	Stop pin	5832	2
50	Stud 8 m 6x40	11206	1
51	Stud 8 m 6x60	11204	2
52	Socket head screw M 5x10	11081	12
54	Cross rail support	4831	1
55	Lens holder	6055	1
57	Clamping fixture	5116	1
58	Articulated support	7857	1
59	Needle bearing NK8/16TN	11209	4

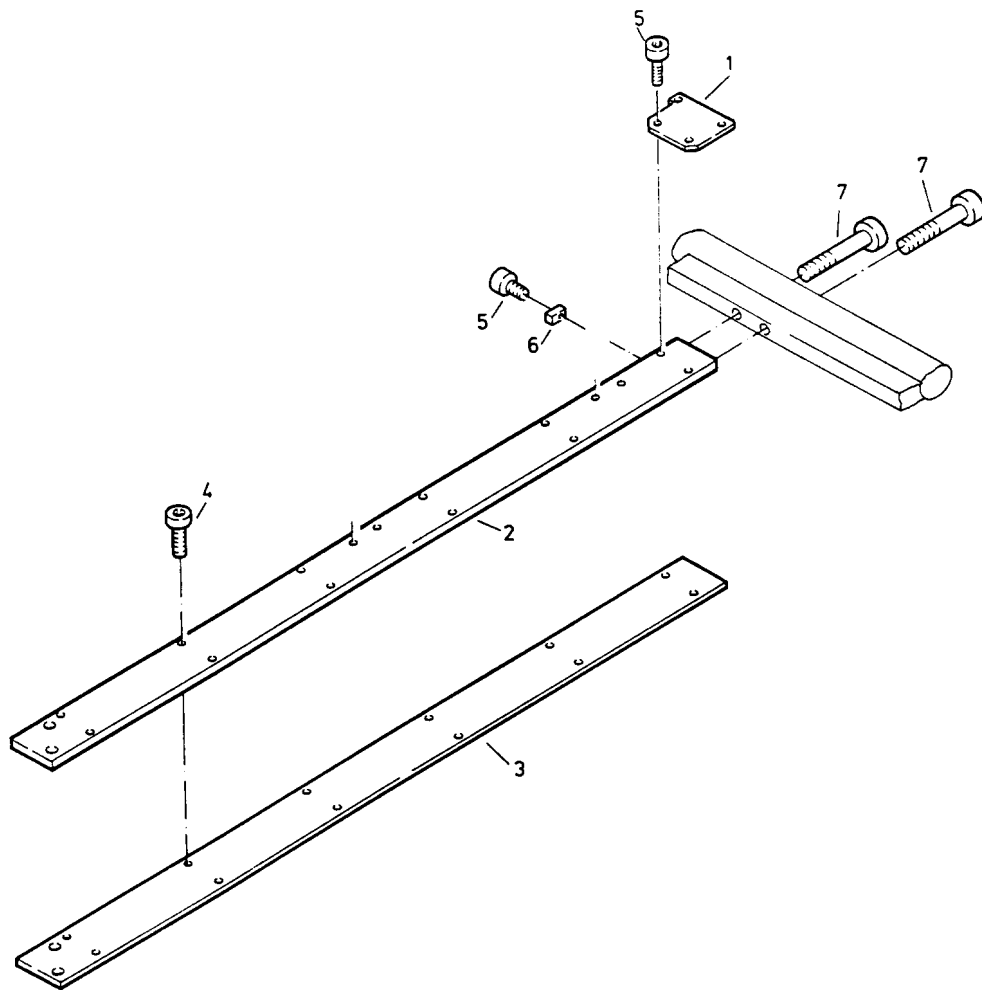


Item	Designation	Order no.	Quantity
60	Tension device	9190	1
61	End stop X	7167	1
62	Socket head bolt M 8x20	11094	2
64	Measuring fixture	5031	1
65	Hexagonal nut M 8	11367	1
66	Spring washer A 8,4	11235	1
67	Steel shaft	5521	1
68	Carriage plate	5522	1
69	Socket head bolt M 12x25	11988	6
70	Bridge	5523	1
71	Hexagonal screw M 12x90	13689	2
75	End stop	5695	1
76	Stop button M 4	11739	3
79	Eccentric pin	4843	1
80	Hexagonal nut M 6	11383	1
81	Washer A 6,4	11273	1
83	Centering pin	7642	1
84	Support left	8540	1
85	Articulated support	9205	1
86	Pintail accorting to pos. 84	9211	1
87	Tension device	9220	1
106	Support roller cpl.	31079	4
107	Eccentric support roller	31081	4



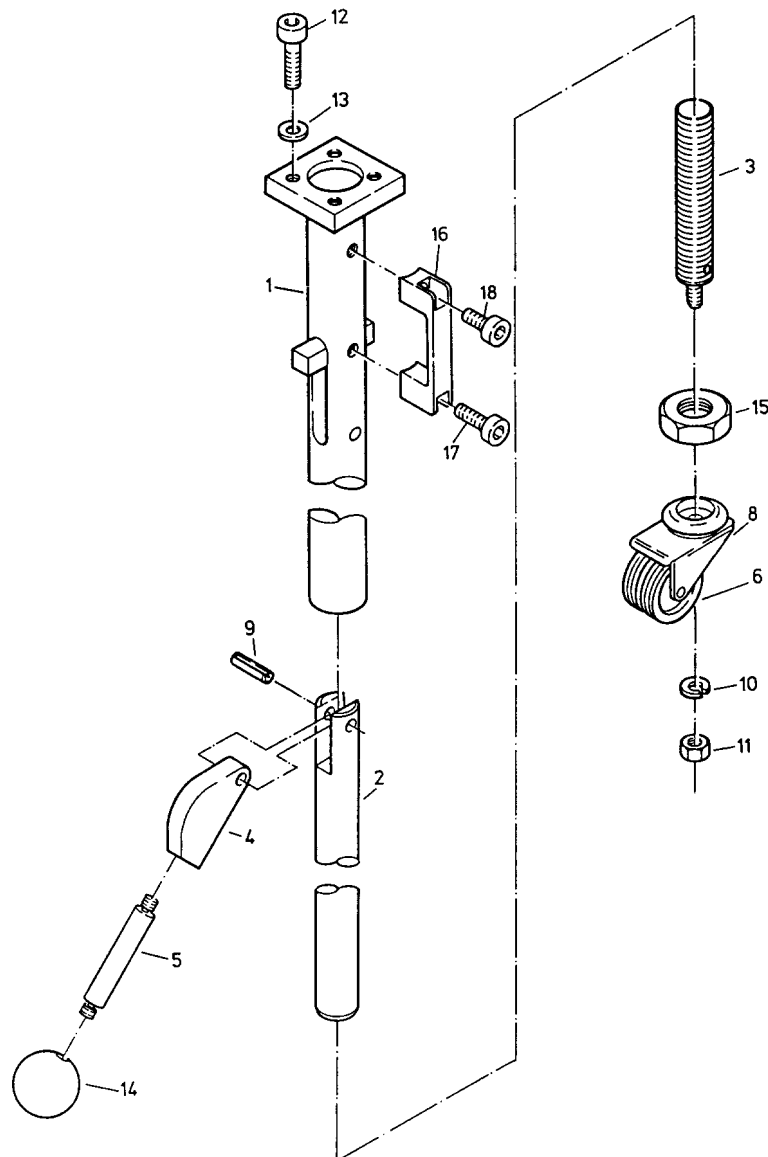
**5109 Cross rail**

Item	Designation	Order no.	Quantity
1	Plate	5576	1
2	Cross rail centre	5111	1
3	Cross rail bottom	5112	1
4	Socket head bolt M 5x16	11264	12
5	Socket head bolt M 5x10	11718	3
6	Stop	5831	1
7	Socket head bolt M 8x80	11677	2



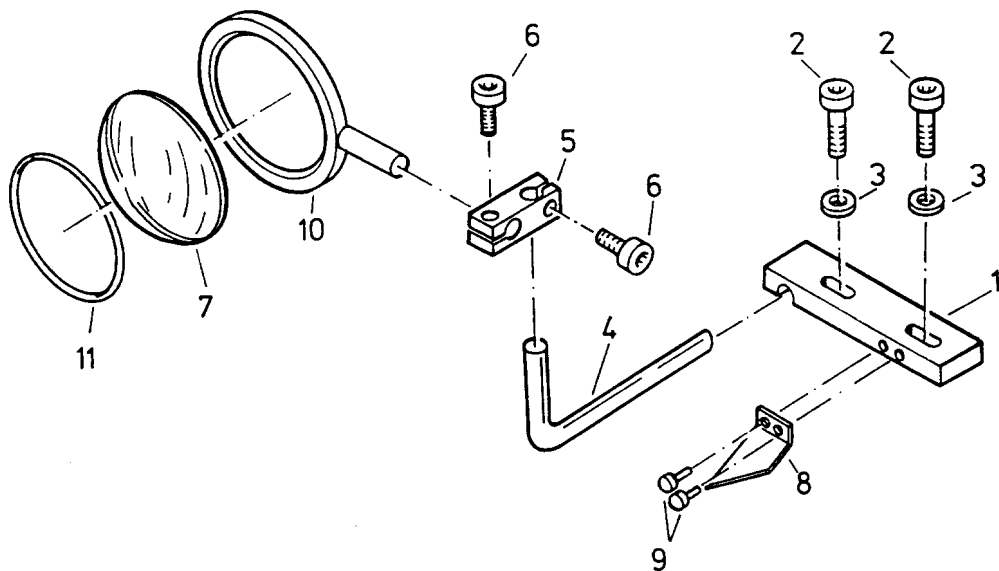
**4831 Cross rail support**

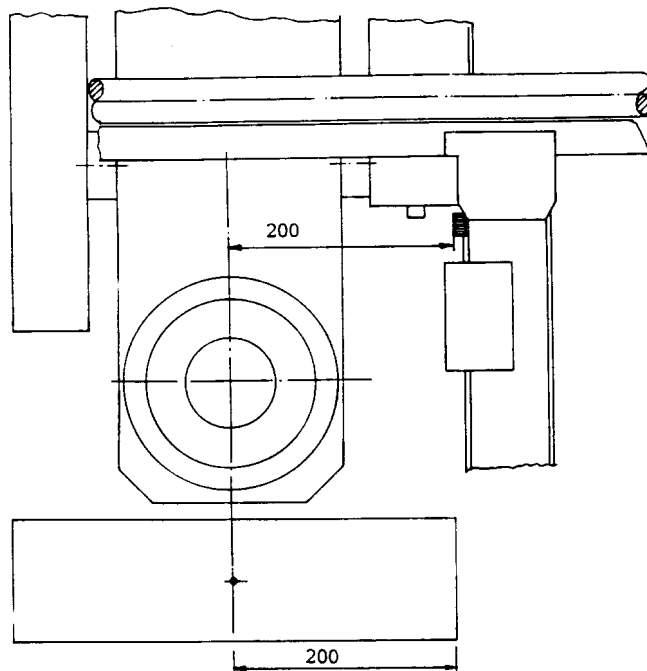
Item	Designation	Order no.	Quantity
1	Support tube	4832	1
2	Support pedestal	4833	1
3	Height adjusting bolt	4834	1
4	Control segment	4835	1
5	Handle bar	4836	1
8	Double guide roller dia. 50 with rear hole		116181
9	Clamping sleeve 8x30	12120	1
10	Spring washer A 10	11630	1
11	Hexagonal nut M 10	11429	1
12	Socket head bolt M 10x35	11187	2
13	Washer A 10,3	11251	2
14	Ball knob M 10	11189	1
15	Nut M 24x1,5	1380	1
16	Handle	9071	1
17	Socket head bolt M 8x25	11252	1
18	Socket head bolt M 8x16	11313	1



**6055 Lens holder**

Item	Designation	Order no.	Quantity
1	Clamping panel	6056	1
2	Socket head bolt M 5x25	11323	2
3	Washer A 5,3	11350	3
4	Holder	6057	1
5	Clamping clip	6058	1
6	Socket head bolt M 5x16	11264	2
7	Lens, biconvex 75 mm/6.0	12139	1
8	Pointer for HSTL	4840	1
9	Drive stud 2x6	11120	2
10	Lens mounting	6059	1
11	O-ring 72x3	12138	1

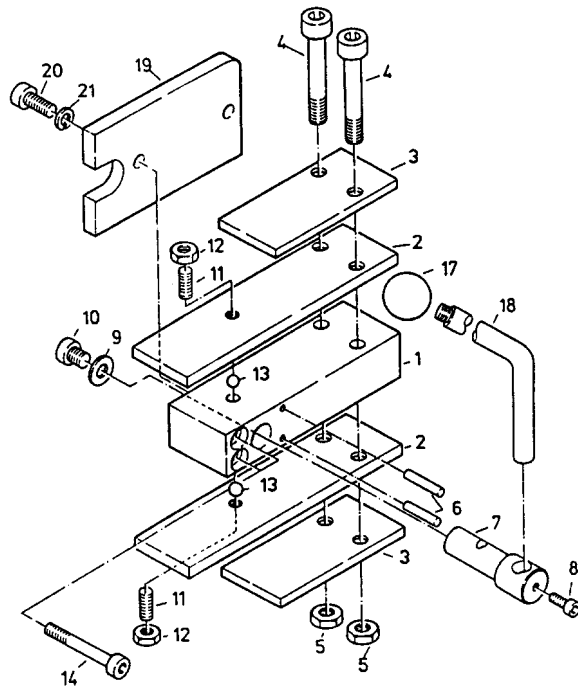


**Adjusting the "X" axis of the measuring fixture**

1. Punch a plate (400x200 mm) at a distance of 200 mm.
2. Place this plate in the stop attachment and fasten it using the clamping fixture.
3. Adjust the stop attachment in order that the centering points of the top tool can dip into the centre punch.
4. Hold the stop attachment using the brakes.
5. Loosen screws item 2 and set the pointer on the lens holder to the set dimension.
6. Tighten screws item 3

**4665 Brake**

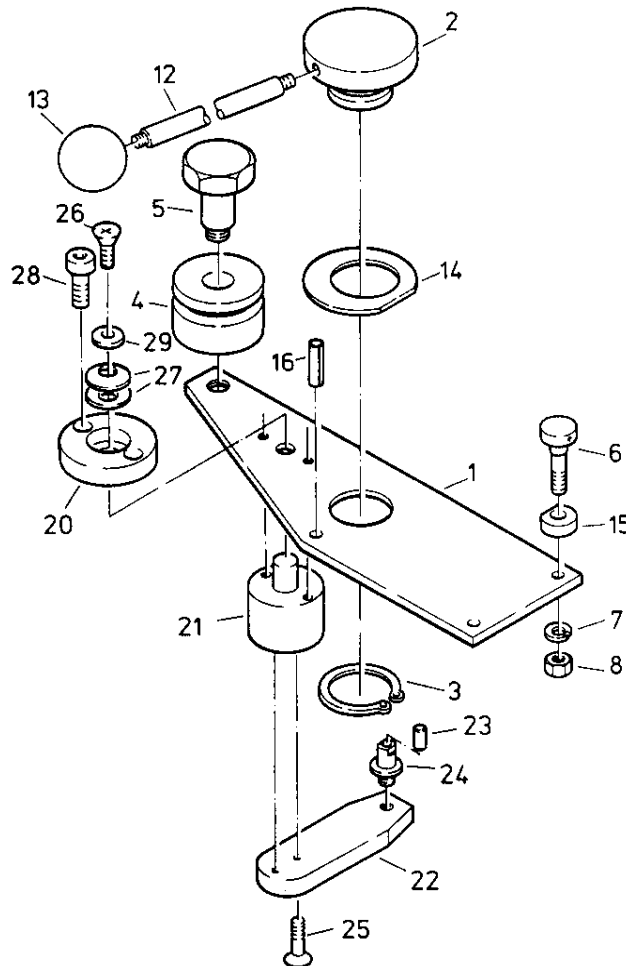
Item	Designation	Order no.	Quantity
1	Pedestal	4666	1
2	Brake plate	4667	2
3	Brake plate	4820	2
4	Socket head bolt M 10x70	11684	2
5	Hexagonal nut M 10	11429	2
7	Pin	4821	1
8	Socket head bolt M 6x12	11069	1
9	Washer A 10,5	11251	1
10	Socket head bolt M 10x12	11686	1
11	Stud M 8x20	11685	2
12	Hexagonal nut M 8	11367	2
13	Ball dia. 8	11210	2
14	Socket head bolt M 8x60	11473	2
17	Ball knob M 10	11189	1
18	Hand lever	2061	1
19	Backing plate	5798	1
20	Socket head bolt M 8x20	11094	2
21	Spring washer A 8	11235	2
22	Hand lever stop	7468	1
23	Socket head bolt M 8x25	11274	2



FAULT	CAUSE	REMEDY
The brake is released. The carriage can only be moved with difficulty or not at all.	The brake is badly adjusted.	Loosen nut item 6. Turn the bolt item 7 a little to the right until it is possible to move the carriage slightly. Tighten nut item 6.
After adjustment of the item 7 screw, no brake effect can be seen.	The bolt no. 2 is worn.	Insert a new bolt. Order no. 5527

**5116 Clamping fixture**

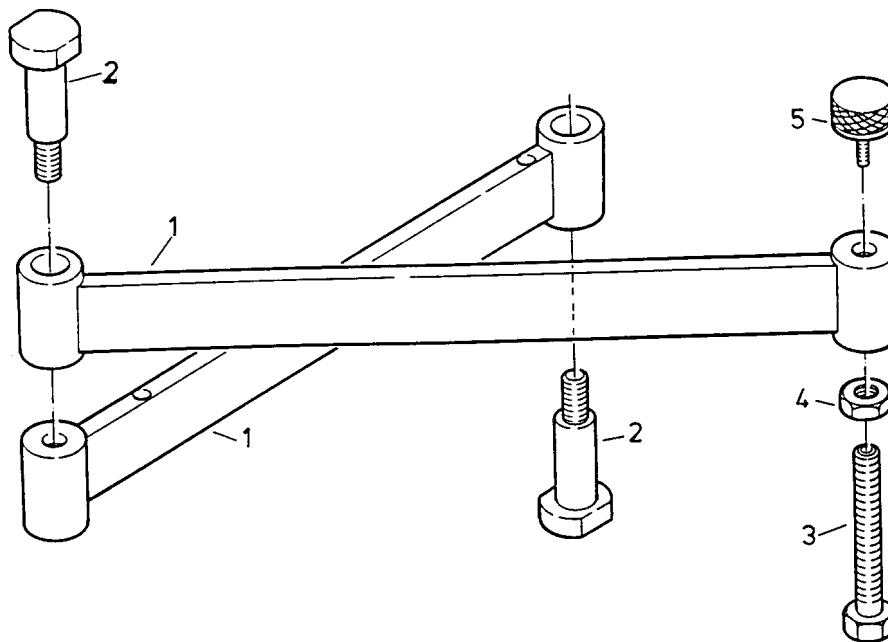
Item	Designation	Order no.	Quantity
1	Clamping lever	5180	1
2	Eccentric cam	6797	1
3	Retaining ring A 35x1,5	12361	1
4	Clamping piece	5122	1
5	Stud	5123	1
6	Guide pin	5124	2
7	Spring washer A 8	11235	2
8	Hexagonal nut M 8	11367	2
12	Handle bar	4828	1
13	Ball knob M 10	11189	1
14	Clamping washer	6799	1
15	Clamping bush	6801	2
16	Clamping sleeve 6x26	12364	1
20	Plate	9803	1
21	Pintail	30994	1
22	Clamping panel	4671	1
23	Stop pin	4669	1
24	Setting bolt	4673	1
25	Countersunk screw M 6x16	11673	2
26	Countersunk screw M 6x10	11044	1
27	Spring disc	11127	2
28	Socket head screw M 5x12	11039	2
29	Washer A 6,4	11273	1





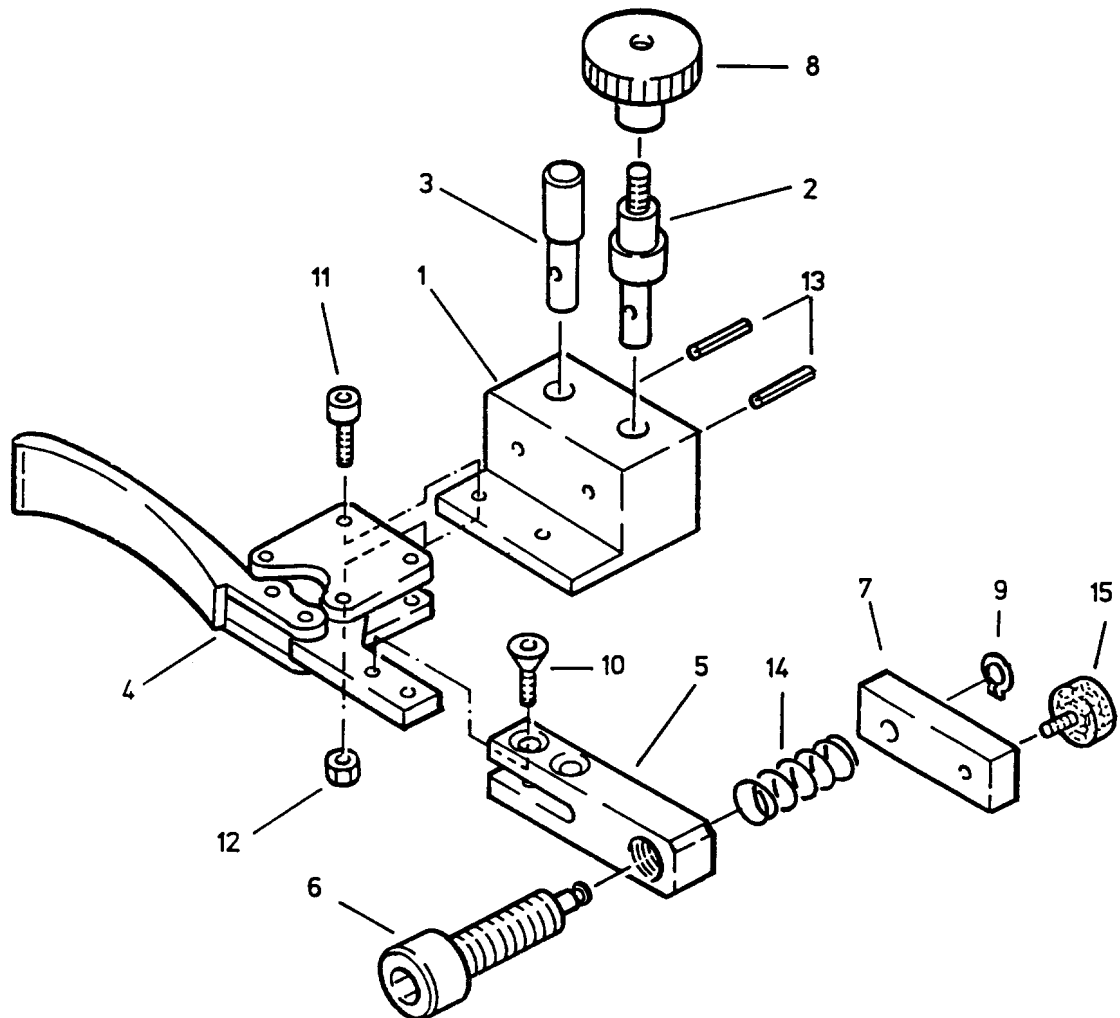
**7857 Articulated support**

Item	Designation	Order no.	Quantity
1	Pivot arm	4862	2
2	Stud	4863	2
3	Adjusting bolt	4859	1
4	Hexagonal nut M 12	11199	1
5	Stop button M 6	11712	1



**9190 Tension device X-axis**

Item	Designation	Order no.	Quantity
1	Support	9193	1
2	Bolt	9194	1
3	Bolt	9195	1
4	Horiz. tension device	9201	1
5	Support	9196	1
6	Spindle	9197	1
7	Clamping piece	9198	1
8	Knurled nut	9199	1
9	Locking ring	13326	1
10	Countersunk screw M 5x16	12755	2
11	Socket head bolt M 5x14	12234	2
12	Hexagonal nut M 5	11065	2
13	Dowel pin	11637	2
14	Pressure spring	13325	1
15	Stop button M4	11739	1



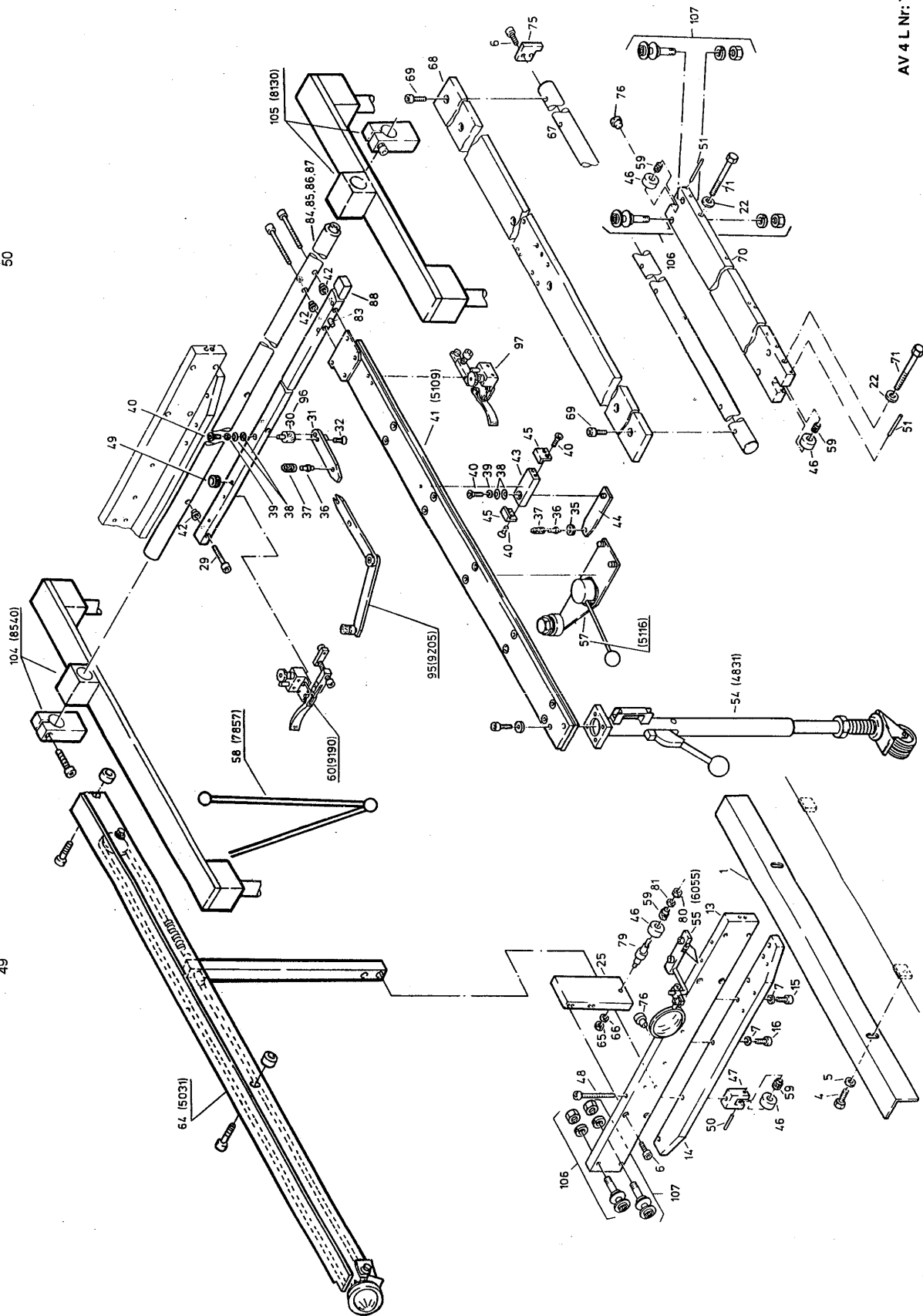
**7440 Stop device AV 4 L**

Item	Designation	Order no.	Quantity
1	Angle bracket , left hand	5169	1
4	Hexagonal screw M 12x30	11670	2
5	Washer A 13	11871	2
6	Socket head bolt M 8x20	11094	10
7	Washer A 8,4	11174	3
13	Cross head stop	4586	1
14	Rail	4994	1
15	Socket head bolt M 8x25	11252	3
16	Socket head bolt M 8x35	11086	2
22	Spring washer A 12	13555	2
25	Tie panel, left hand	4987	1
29	Socket head bolt M 8x40	11086	8
30	Pintail	4672	4
31	Clamping panel	4671	4
32	Countersunk screw M 6x16	11673	8
35	Shim 9x15x1	11676	2
36	Setting bolt	4673	6
37	Stop pin	4669	6
38	Spring disc 23x10,2x0,9	11127	12
39	Washer A 6,4	11273	6
40	Countersunk screw M 6x10	11044	23
41	Cross rail	5109	1
42	Distance bushing	5117	10
43	Distance piece	5118	2
44	Supporting plate	5119	2
45	Support	5120	4
46	Support roller	2049	4
47	Bearing block	2048	1
48	Hexagonal screw M 8x100	11202	1
49	Stop pin	5832	2
50	Stud 8 m 6x40	11206	1
51	Stud 8 m 6x60	11204	2
52	Socket head screw M 5x10	11081	12
54	Cross rail support	4831	1
55	Lens holder	6055	1
57	Clamping fixture	5116	1
58	Articulated support x-axis AV4 + AV5 long	7857	1
59	Needle bearing NK8/16TN	11209	4
60	Tension device	9190	1

Item	Designation	Order no.	Quantity
64	Measuring fixture	5031	1
65	Hexagonal nut M 8	11367	1
66	Spring washer A 8	11235	1
67	Steel shaft	5521	1
68	Carriage plate	5522	1
69	Socket head bolt M 12x25	11988	6
70	Bridge	5523	1
71	Socket head bolt M 12x90	13689	2
75	End stop	5695	1
76	Stop button M 4	11739	2
79	Eccentric pin	4843	1
80	Hexagonal nut M 6	11383	1
81	Washer A 6,4	11273	1
83	Centering pin	7642	1
84	Steel shaft	7511	1
85	Steel shaft	7512	1
86	Tension rod	7513	1
87	Hexagonal screw M 16	11179	1
88	Location rail	7514	1
95	Articulated support	9205	1
96	Pintail to pos. 95	9211	1
97	Tension device	9220	1
104	Support left	8540	1
105	Support right	8130	1
106	Support roller cpl.	31079	4
107	Eccentric support roller	31081	4

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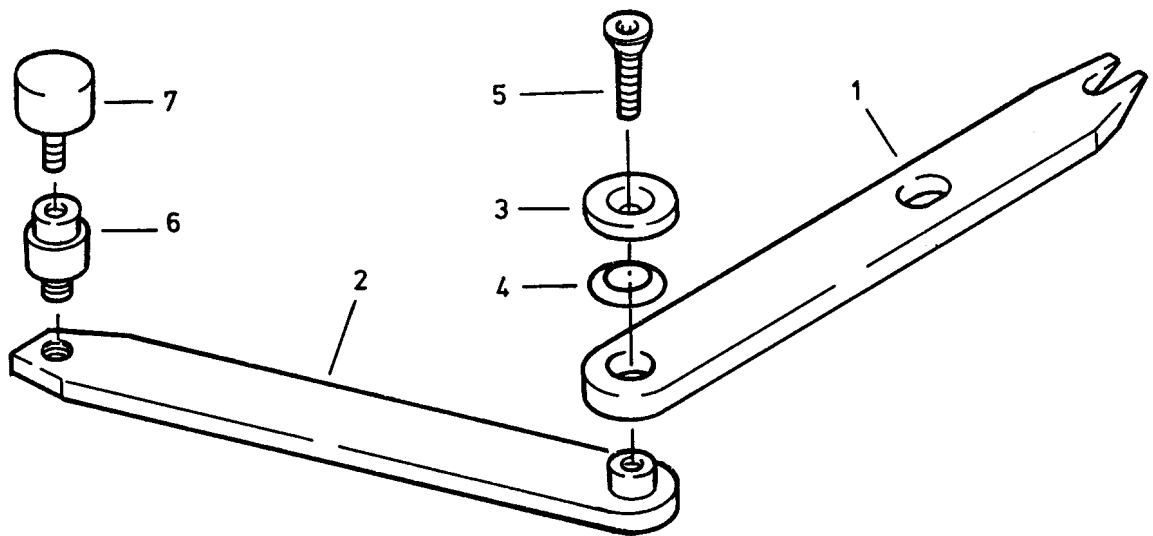
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AV 4 L NF: 7440

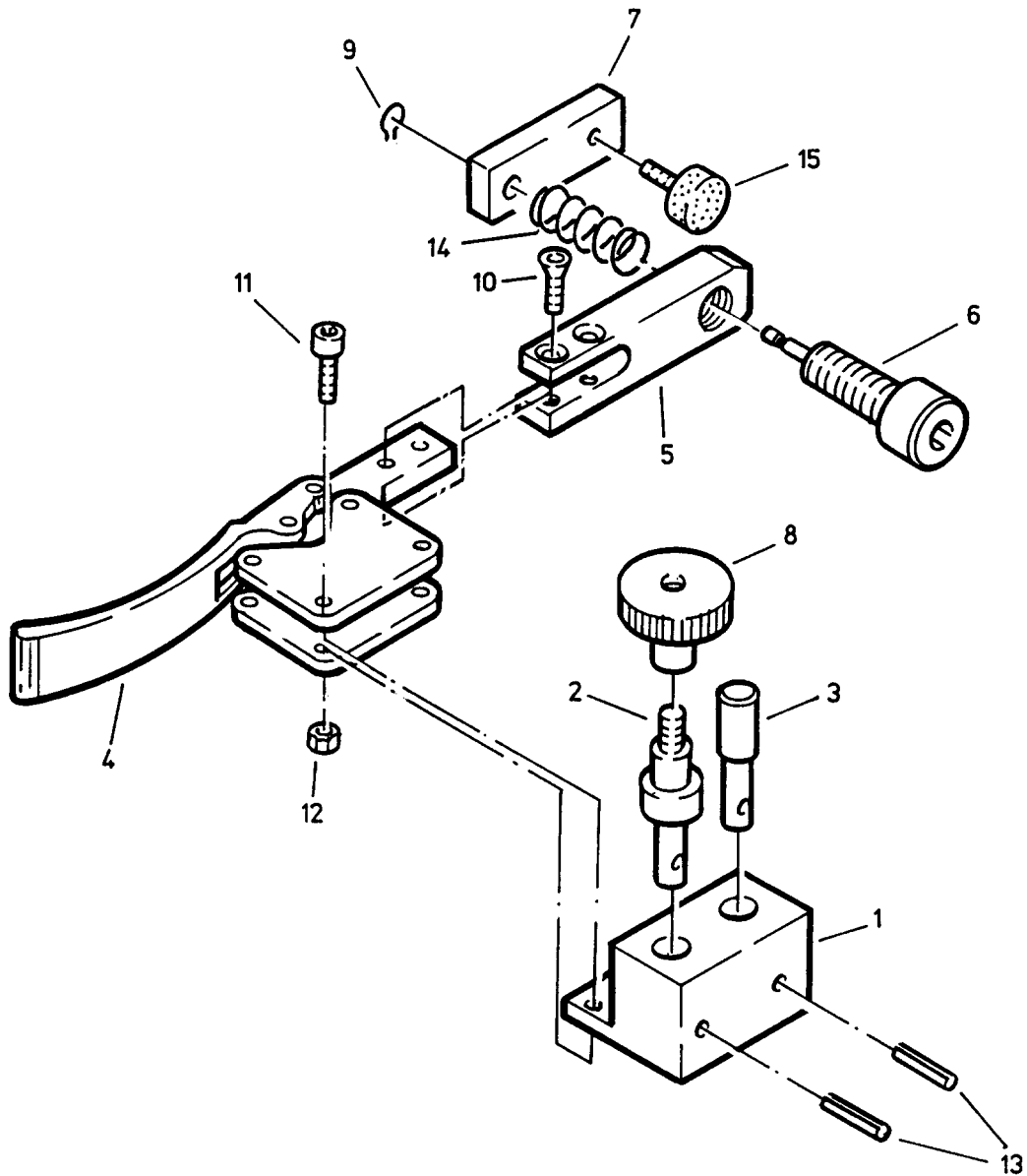
**9205 Articulated support**

Item	Designation	Order no.	Quantity
1	Support arm I	9206	1
2	Support arm II	9207	1
3	Washer	9208	1
4	Spring disc	12453	1
5	Countersunk screw M 8x25	13333	1
6	Bolt	9209	1
7	Stop buffer M 6	11712	1



## 9220 Tension device Y-axis

Item	Designation	Order no.	Quantity
1	Support	9193	1
2	Bolt	9194	1
3	Bolt	9195	1
4	Horiz. tension device	9201	1
5	Support	9196	1
6	Spindle	9197	1
7	Clamping piece	9198	1
8	Knurled nut	9199	1
9	Locking ring	13326	1
10	Countersunk screw M 5x16	12755	2
11	Socket head bolt M 5x14	12234	2
12	Hexagonal nut M 5	11065	2
13	Dowel pin	11637	2
14	Pressure spring	13325	1
15	Stop button M4	11739	1



## Stop device AV5 / AV 5 L

### Stop device AV5

	Designation	Page
*1	5525 Carriage brake Y-axis	32
	5109 Cross rail	39
	4831 Cross rail support	40
*1	4665 Brake X-axis	43
	5116 Clamping fixture	44
	7857 Articulated support	45
	9190 Tension device X-axis	46
	9205 Articulated support	51
	9220 Tension device Y-axis	52
	7380 Stop device AV 5	55
	7160 Measuring fixture Y axis	60
	7150 Measuring fixture X axis	64
*2	7780 Precision setting X-axis	78
*2	7770 Precision setting Y-axis	80
	7856 Pedestal	86
	8540 Support left	88

### Stop device AV5 L

	Designation	Page
*1	5525 Carriage brake	32
	5109 Cross rail	39
	4831 Cross rail support	40
*1	4665 Brake	43
	5116 Clamping fixture	44
	7857 Articulated support	45
	9190 Tension device X-axis	46
	9205 Articulated support	51
	9220 Tension device Y-axis	52
	7160 Measuring fixture Y axis	60
	7810 Stop device AV 5L	69
	7820 Measuring fixture X axis	74
*2	7780 Precision setting X-axis	78
*2	7770 Precision setting Y-axis	80
	7856 Pedestal	86
	8550 Support left	87
	8540 Support right	88

Remark! The stop devices AV5 and AV5L can be assembled either with the brake \*1 or with the precision setting \*2.





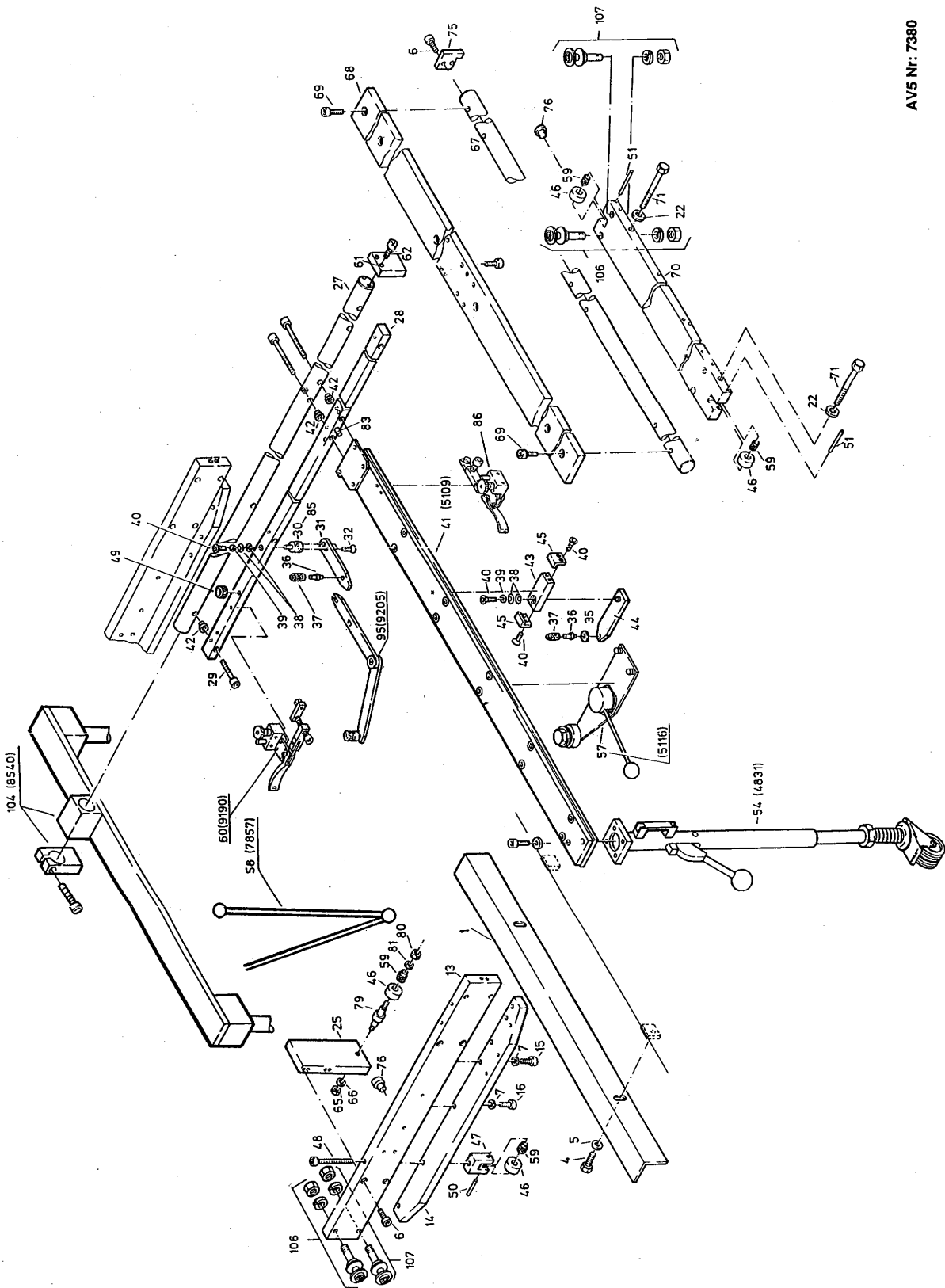
**7380 Stop device AV 5**

Item	Designation	Order no.	Quantity
1	Angle bracket , left hand	5169	1
4	Hexagonal screw M 12x30	11670	2
5	Washer A 13	11871	2
6	Socket head bolt M 8x20	11094	10
7	Washer A 8,4	11174	3
13	Cross head stop	4586	1
14	Rail	4994	1
15	Socket head bolt M 8x25	11252	3
16	Socket head bolt M 8x35	11086	2
22	Spring washer A 12	13555	2
25	Tie panel, left hand	4987	1
27	Steel shaft	7656	1
28	Location rail	5108	1
29	Socket head bolt M 8x35	11086	6
30	Pintail	4672	2
31	Clamping plate	4671	3
32	Countersunk screw M 6x16	11673	6
35	Shim 9x15x1	11676	2
36	Setting bolt	4673	5
37	Stop pin	4669	5
38	Spring disc 23x10,2x0,9	11127	10
39	Washer A 6,4	11273	5
40	Countersunk screw M 6x10	11044	21
41	Cross rail	5109	1
42	Distance bushing	5117	8
43	Distance piece	5118	2
44	Supporting plate	5119	2
45	Support	5120	4
46	Support roller	2049	4
47	Bearing block	2048	1
48	Hexagonal screw M 8x100	11202	1
49	Stop pin	5832	2
50	Stud 8 m 6x40	11206	1
51	Stud 8 m 6x60	11204	2
52	Socket head screw M 5x10	11081	12
54	Cross rail support	4831	1
57	Clamping fixture	5116	1
58	Articulated support	7857	1
59	Needle bearing NK8/16TN	11209	4
60	Tension device	9190	1

Item	Designation	Order no.	Quantity
61	End stop X	7167	1
62	Socket head bolt M 8x20	11094	2
65	Hexagonal nut M 8	11367	1
66	Spring Washer A 8,4	11235	1
67	Steel shaft	5521	1
68	Carriage plate	5522	1
69	Socket head bolt M 12x25	11988	6
70	Bridge	5523	1
71	socket head bolt M12x90	13689	2
75	End stop	5695	1
76	Stop button M 4	11739	2
79	Eccentric pin	4843	1
80	Hexagonal nut M 6	11383	1
81	Washer A 6,4	11273	1
83	Centering pin	7642	1
84	Articulated support	9205	1
85	Pintail accorting to pos. 84	9211	1
86	Tension device	9220	1
102	Plug gange	7357	1
104	Supporting left	8540	1
106	Support roller cpl.	31079	4
107	Eccentric support roller	31081	4

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57

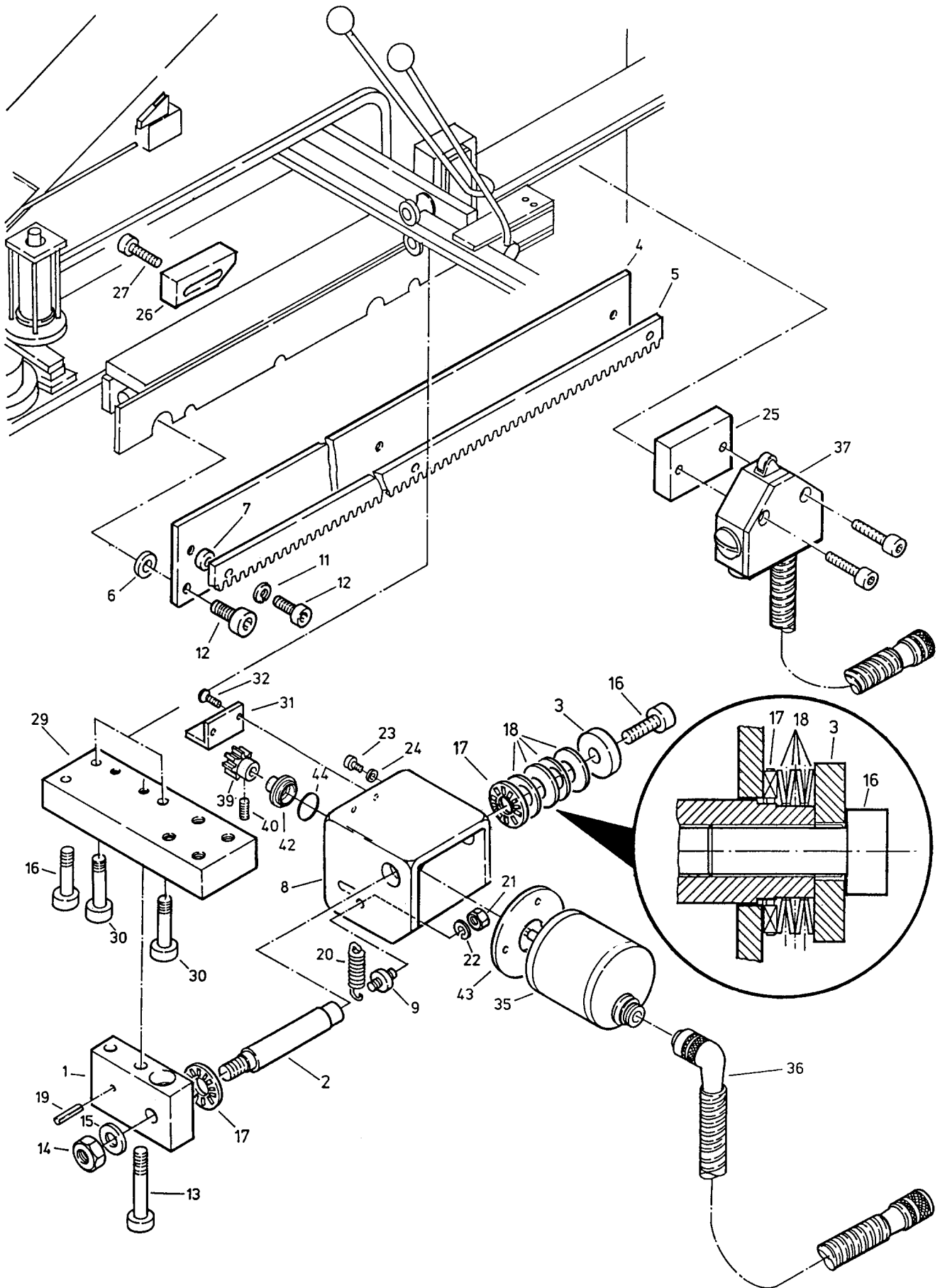


AV5 NF: 7380



**7160 Measuring fixture Y axis up to unit number: 546**

Item	Designation	Order no.	Quantity
1	Case 2	7149	1
2	Bearing bolts	7147	1
3	Washer	7148	1
4	Gear rack holder Y	7151	1
5	Gear rack Y	7152	1
6	Spacer bottom	7153	4
7	Spacer top	7154	5
8	Sensor housing	7155	1
9	Spring bolts	7156	1
10	Socket head bolt M 5x14	11234	5
11	Spring washer A 5	11038	5
12	Socket head bolt M 8x20	11094	4
13	Socket head bolt M 8x50	11085	2
14	Hexagonal nut M 12	11256	1
15	Spring washer A 12	11672	1
16	Socket head bolt M 8x30	12590	1
17	Axial separator	12798	2
18	Cup spring 28x14.2x1	11277	4
19	Clamping sleeve	11637	1
20	Tension spring 1.4x10x26.9	12459	1
21	Hexagonal nut M 5	11065	1
22	Spring washer A 5	11038	1
23	Socket head bolt M 4x12	12460	3
24	Spring washer B 4	12461	3
25	Spacer plate Y	7159	1
26	Trip cam Y	7158	1
27	Socket head bolt M 6x20	11009	2
28	Socket head bolt M 5x25	11323	2
29	Base plate	7144	1
30	Socket head bolt M 8x40	11280	2
31	Protective angle	7161	1
32	Countersunk screw M 4x8	12472	2
35	Angular momentum encoder	12502	1
36	Connecting cable 3 for encoder Y axis	7353	1
37	Limit switch with cable 2 Y axis	7354	1
39	Measuring pinion	9161	1
40	Threaded pin M 3x4	12770	1
42	Sealing washer	9162	1
43	Gasket	9163	1
44	O-ring 18x1,5	13324	1

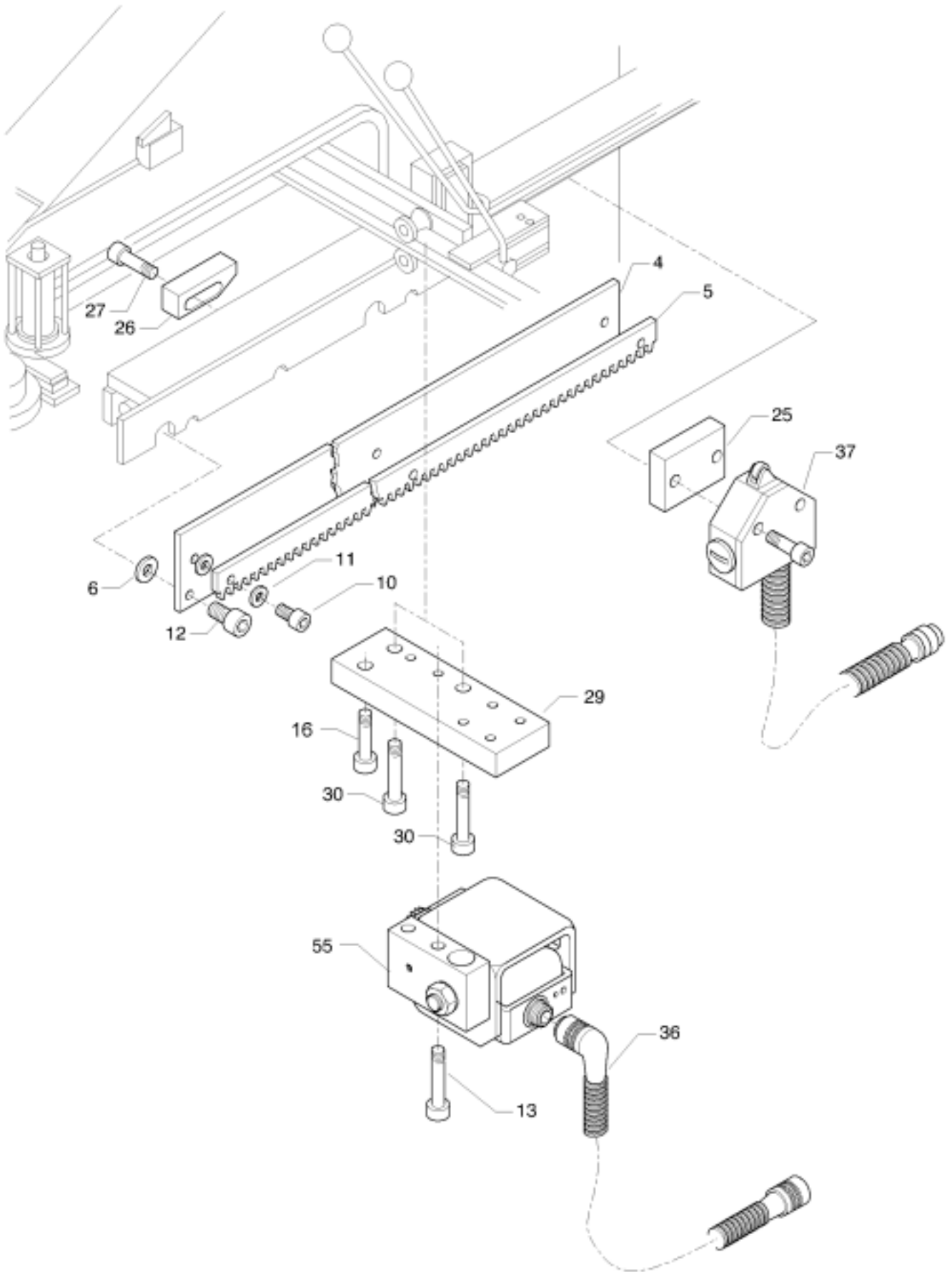


7160 Measuring fixture Y axis

**7160 Measuring fixture Y axis from unit number: 547**

Item	Designation	Order no.	Quantity
4	Gear rack holder Y	7151	1
5	Gear rack Y	7152	1
6	Spacer bottom	7153	4
7	Spacer top	7154	5
10	Socket head bolt M 5x14	11234	5
11	Spring washer A 5	11038	5
12	Socket head bolt M 8x20	11094	4
13	Socket head bolt M 8x50	11085	2
16	Socket head bolt M 8x30	12590	1
25	Spacer plate Y	7159	1
26	Trip cam Y	7158	1
27	Socket head bolt M 6x20	11009	2
29	Base plate	7144	1
30	Socket head bolt M 8x40	11280	2
36	Connecting cable 3 for encoder Y axis	7353	1
37	Limit switch with cable 2 Y axis	7354	1
55	Encoder compl. Y-axis AV5	36608	1





7160 Measuring fixture Y axis

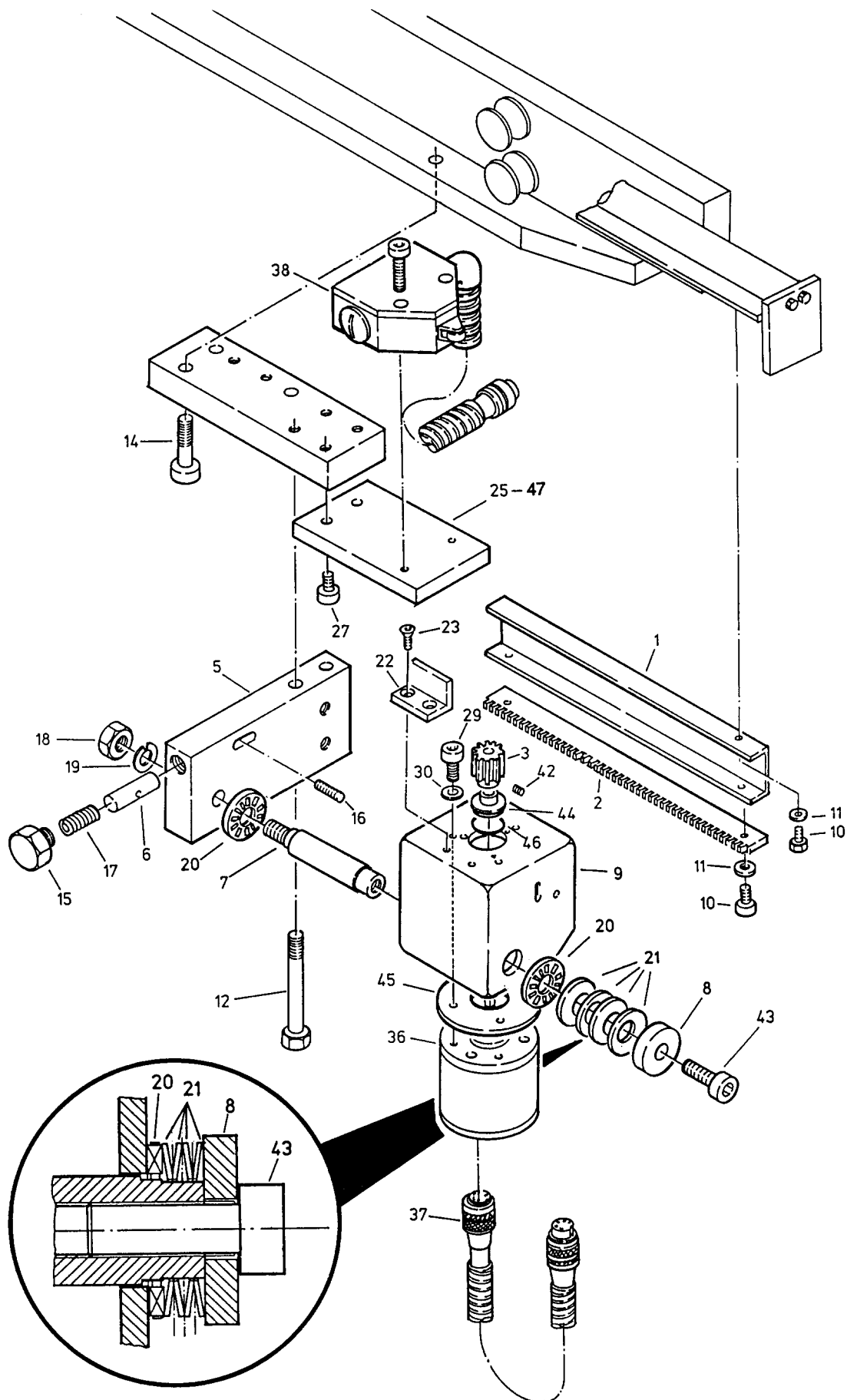
**7150 Measuring fixture X axis for AV 5 up to unit number: 546**

Item	Designation	Order no.	Quantity
1	Gear rack holder X	7141	1
2	Gear rack	7142	1
3	Measuring pinion	9161	1
5	Case 1	7145	1
6	Spring bolts	7146	1
7	Bearing bolts	7147	1
8	Washer	7148	1
9	Encoder housing	7155	1
10	Hexagonal screw M 5x8	11498	14
11	Retaining washer 5	12451	14
12	Socket head bolt M 8x70	11008	2
14	Socket head bolt M 8x30	12590	1
15	Hexagonal screw M 12x12	12452	1
16	Stud M 5x16	12471	1
17	Compress. spring 1.25x8x22	11263	1
18	Hexagonal nut M 12	11256	1
19	Spring washer A 12	11672	1
20	Axial separator	12798	2
21	Cup spring 28x14.2x1	11277	4
22	Protective angle	7161	1
23	Countersunk screw M 4x8	12472	2
25*	Spacer plate X	7166	1
27	Socket head bolt M 8x20	11094	4
29	Socket head bolt M 4x12	12460	3
30	Spring washer B 4	12461	3
36	Angular momentum encoder	12502	1
37	Connecting cable 4 for encoder X axis	7351	1
38	Limit switch with cable 5 for X axis	7352	1
42	Stud M 3x4	12770	1
43	Socket head bolt M 8x30	11226	1
44	Sealing washer	9162	1
45	Gasket	9163	1
46	O-ring 18x1,5	13324	1
47*	Spacer plate X	7889	1

**\* Attention**

Item 25 only AV5 with brake, no. 4665

Item 47 only AV5 with precision setting, no. 7780



7150 Measuring fixture X axis

**7150 Measuring fixture X axis for AV 5 from unit number: 547**

Item	Designation	Order no.	Quantity
1	Gear rack holder X	7141	1
2	Gear rack	7142	1
10	Hexagonal screw M 5x8	11498	14
11	Retaining washer 5	12451	14
12	Socket head bolt M 8x70	11008	2
14	Socket head bolt M 8x30	12590	1
25*	Spacer plate X	7166	1
27	Socket head bolt M 8x20	11094	4
37	Connecting cable 4 for encoder X axis	7351	1
38	Limit switch with cable 5 for X axis	7352	1
47*	Spacer plate X	7889	1
55	Encoder compl. X-axis AV5	36607	1

**\* Attention**

Item 25 only AV5 with brake, no. 4665

Item 47 only AV5 with precision setting, no. 7780





**7810 Stop attachment AV5 L**

Item	Designation	Order no.	Quantity
1	Angle bracket , left hand	5169	1
4	Hexagonal screw M 12x30	11670	2
5	Washer A 13	11871	2
6	Socket head bolt M 8x20	11094	10
7	Washer A 8,4	11174	3
13	Cross head stop	4586	1
14	Rail	4994	1
15	Socket head bolt M 8x25	11252	3
16	Socket head bolt M 8x35	11086	2
22	Spring washer A 12	13555	2
25	Tie panel, left hand	4987	1
29	Socket head bolt M 8x35	11086	8
30	Pintail	4672	3
31	Clamping panel	4671	4
32	Countersunk screw M 6x16	11673	8
35	Shim 9x15x1	11676	2
36	Setting bolt	4673	6
37	Stop pin	4669	6
38	Spring disc 23x10,2x0,9	11127	12
39	Washer A 6,4	11273	6
40	Countersunk screw M 6x10	11044	23
41	Cross rail	5109	1
42	Distance bushing	5117	10
43	Distance piece	5118	2
44	Supporting plate	5119	2
45	Support	5120	4
46	Support roller	2049	4
47	Bearing block	2048	1
48	Hexagonal screw M 8x100	11202	1
49	Stop pin	5832	2
50	Stud 8 m 6x40	11206	1
51	Stud 8 m 6x60	11204	2
52	Socket head screw M 5x10	11081	12
54	Cross rail support	4831	1
57	Clamping fixture	5116	1
58	Articulated support	7857	1
59	Needle bearing NK8/16TN	11209	4
60	Tension device	9190	1

Item	Designation	Order no.	Quantity
65	Hexagonal nut M 8	11367	1
66	Spring Washer A 8,4	11235	1
67	Steel shaft	5521	1
68	Carriage plate	5522	1
69	Socket head bolt M 12x25	11988	6
70	Bridge	5523	1
71	Socket head bolt M12x90	13689	2
75	End stop	5695	1
76	Stop button M 4	11739	2
79	Eccentric pin	4843	1
80	Hexagonal nut M 6	11383	1
81	Washer A 6,4	11273	1
83	Centering pin	7642	1
88	Location rail	7514	1
93	Articulated support	9205	1
94	Pintail according to pos. 93	9211	1
95	Tension device	9220	1
102	Plug gange	7357	1
103	Steel shaft dia. 40x3000	7813	1
104	Supporting left	8540	1
105	Supporting right	8550	1
106	Support roller cpl.	31079	4
107	Eccentric support roller	31081	4







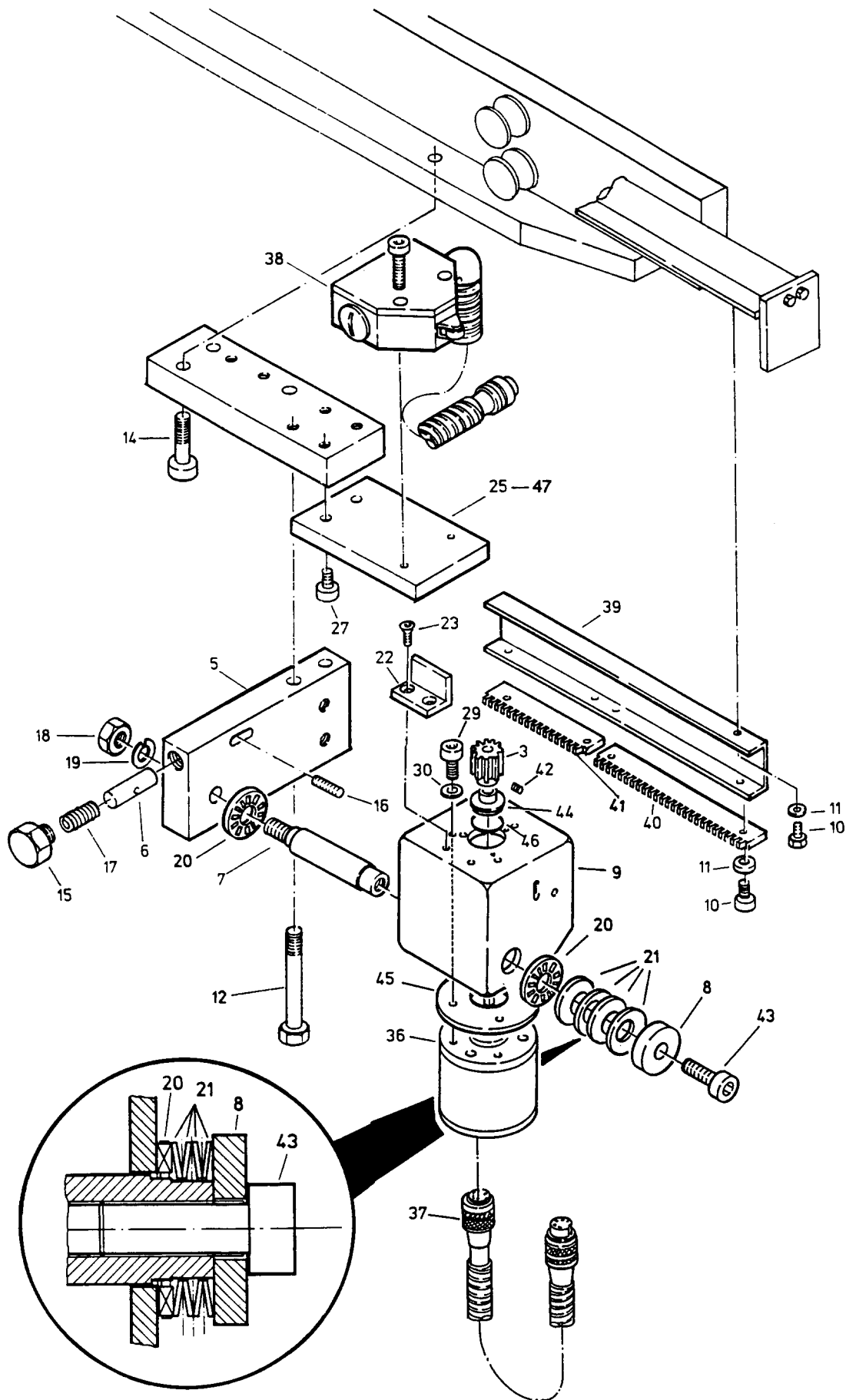
**7820 Measuring fixture X axis for AV5L** up to unit number: 546

Item	Designation	Order no.	Quantity
3	Measuring pinion	9161	1
5	Case 2	7145	1
6	Spring bolts	7146	1
7	Bearing bolts	7147	1
8	Washer	7148	1
9	Encoder housing	7155	1
10	Hexagonal screw M 5x8	11498	22
11	Retaining washer 5	12451	22
12	Socket head bolt M 8x70	11008	2
14	Socket head bolt M 8x30	12590	1
15	Hexagonal screw M 12x12	12452	1
16	Stud M 5x16	12471	1
17	Compress. spring 1.25x8x22	11263	1
18	Hexagonal nut M 12	11256	1
19	Spring washer A 12	11672	1
20	Axial separator	12798	2
21	Cup spring 28x14.2x1	11277	4
22	Protective angle	7161	1
23	Countersunk screw M 4x8	12472	2
25*	Spacer plate X	7166	1
27	Socket head bolt M 8x20	11094	4
29	Socket head bolt M 4x12	12460	3
30	Spring washer B 4	12461	3
36	Angular momentum encoder	12502	1
37	Connecting cable 4 for encoder X axis	7351	1
38	Limit switch with cable 5for X axis	7352	1
39	Gear rack holder X	7518	1
40	Gear rack 3	7811	1
41	Gear rack 4	7812	1
42	Stud M 3x4	12770	1
43	Socket head bolt M 4x16	11313	1
44	Sealing washer	9162	1
45	Gasket	9163	1
46	O-ring 18x1,5	13324	1
47*	Spacer plate X	13324	1

**\* Attention**

Item 25 only AV5 with brake, no. 4665

Item 47 only AV5 with precision setting, no. 7780



7820 Measuring fixture X axis

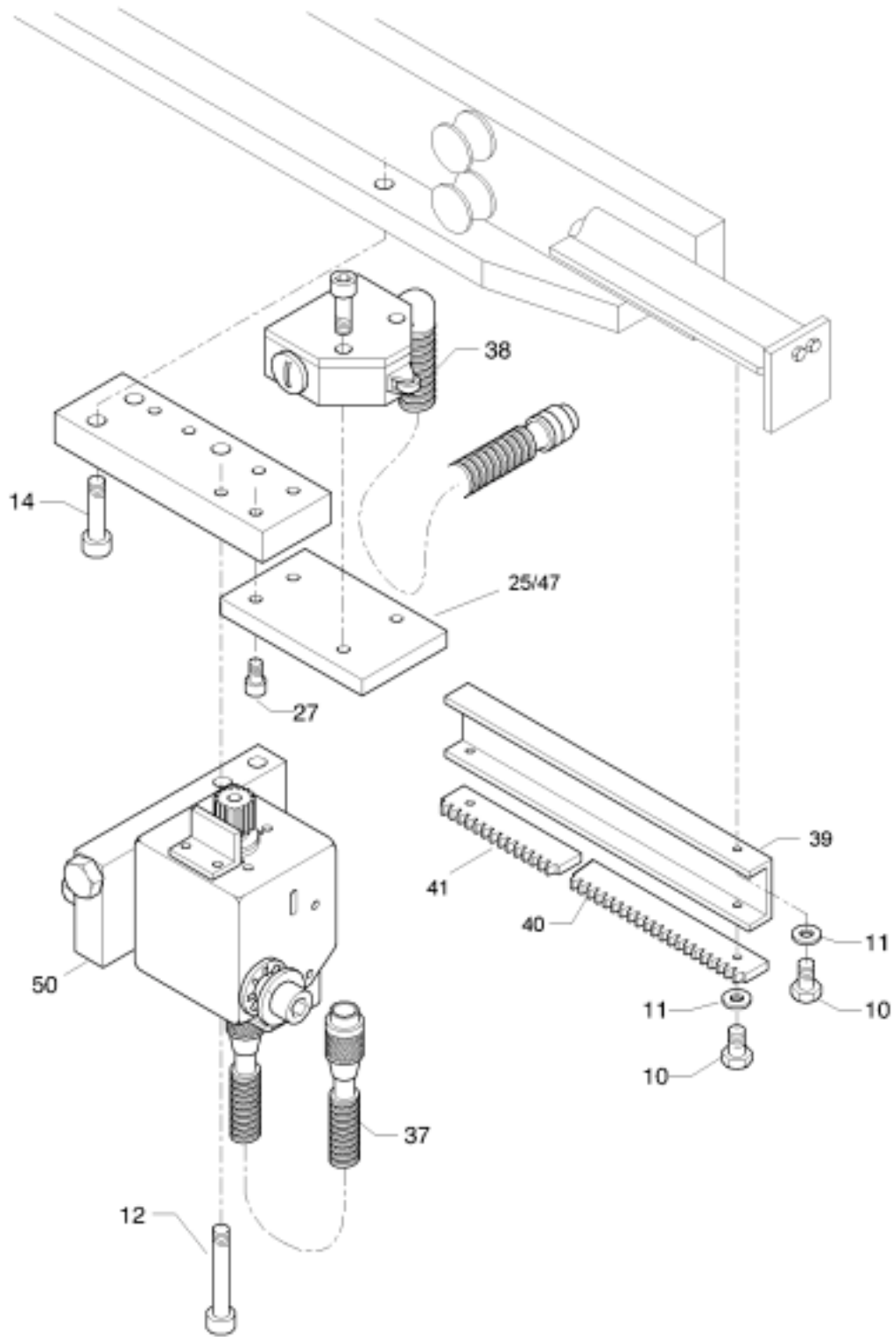
**7820 Measuring fixture X axis for AV5L** from unit number: 547

Item	Designation	Order no.	Quantity
10	Hexagonal screw M 5x8	11498	22
11	Retaining washer 5	12451	22
12	Socket head bolt M 8x70	11008	2
14	Socket head bolt M 8x30	12590	1
25*	Spacer plate X	7166	1
27	Socket head bolt M 8x20	11094	4
37	Connecting cable 4 for encoder X axis	7351	1
38	Limit switch with cable 5for X axis	7352	1
39	Gear rack holder X	7518	1
40	Gear rack 3	7811	1
41	Gear rack 4	7812	1
47*	Spacer plate X	13324	1
50	Encoder comol. X-Axis AV5	36607	1

**\* Attention**

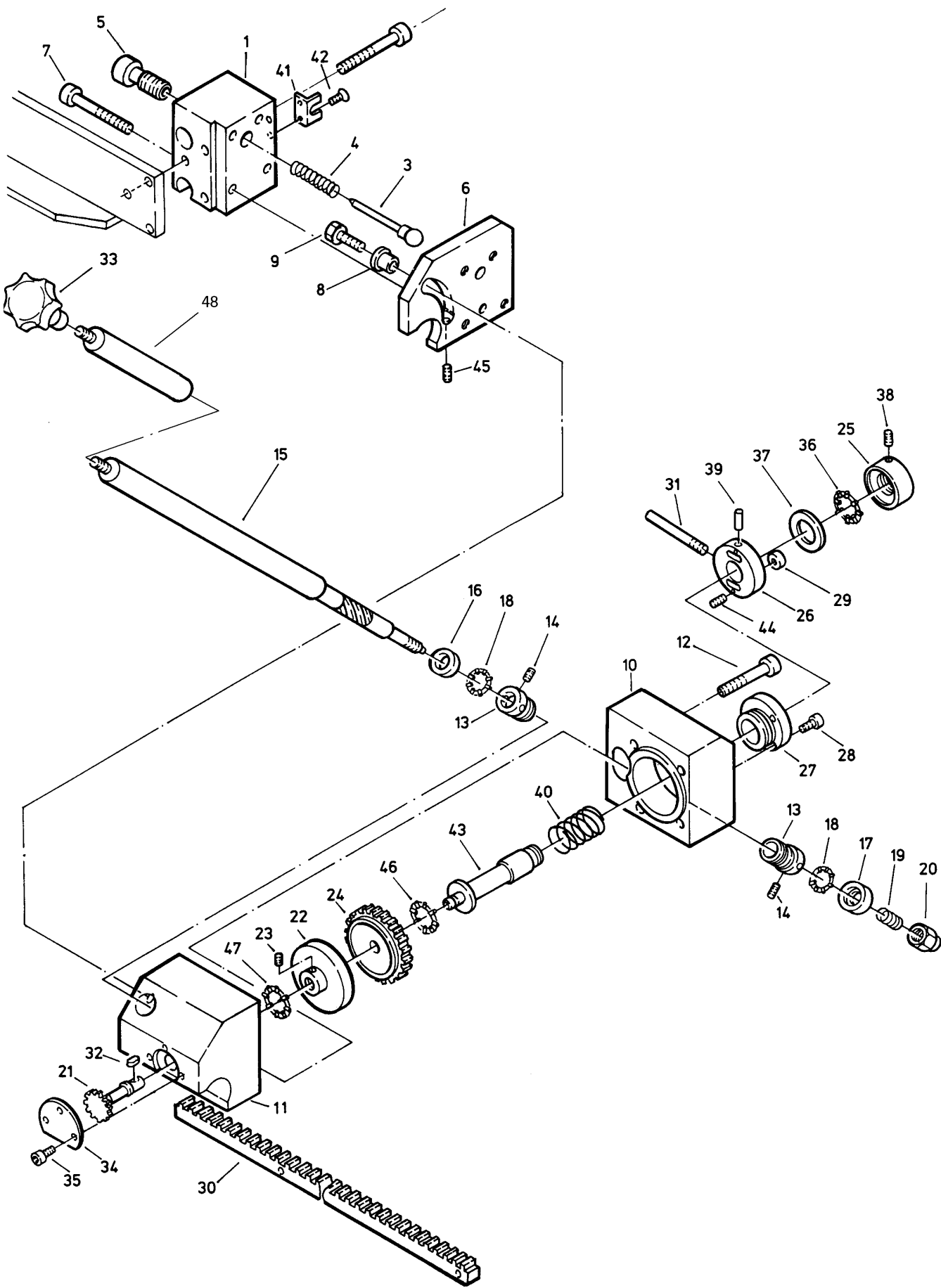
Item 25 only AV5 with brake, no. 4665

Item 47 only AV5 with precision setting, no. 7780



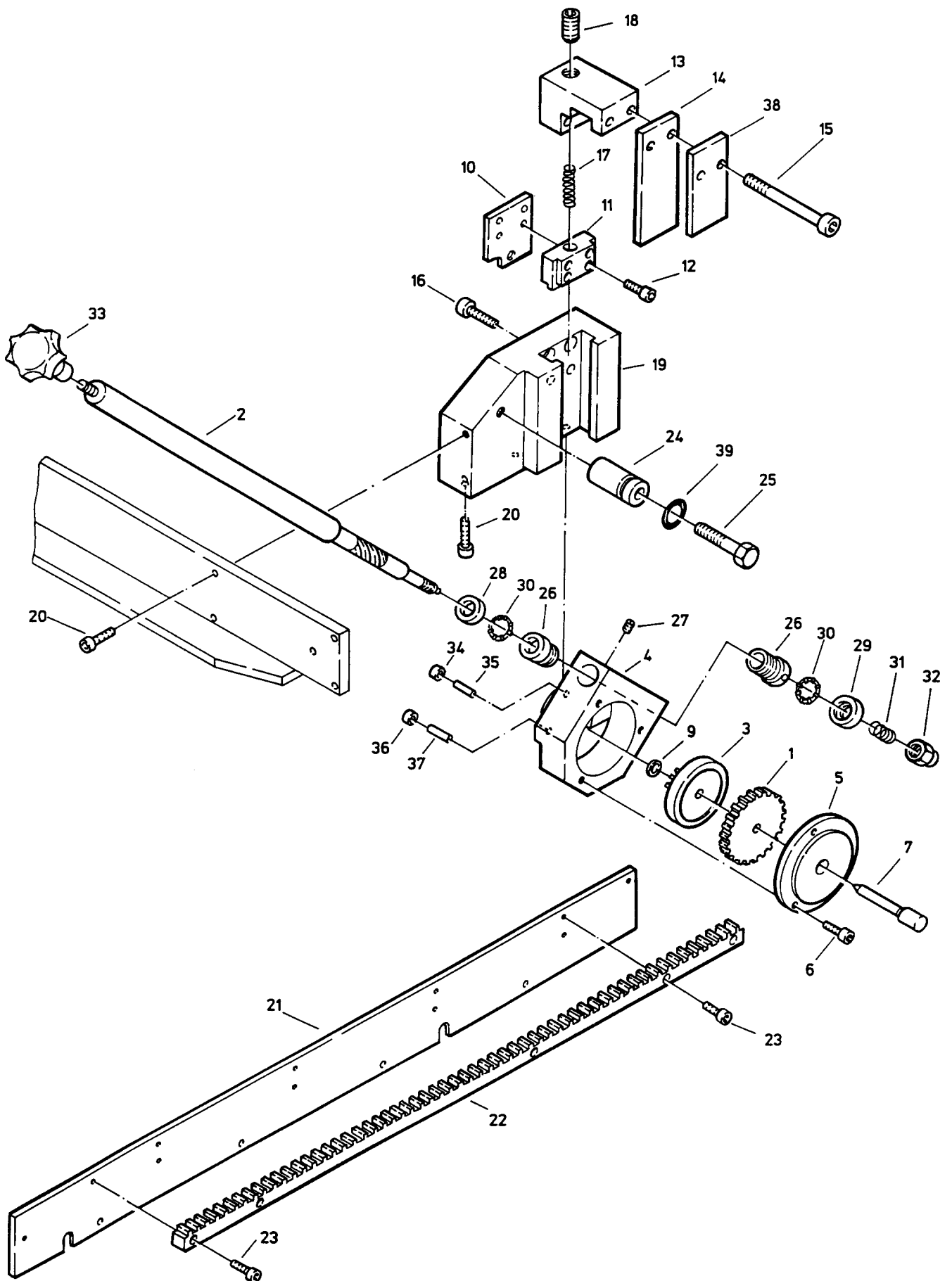
**7780 Precsion setting X-axis**

Item	Designation	Order no.	Quantity
1	Stopper	7885	1
2	Socket head bolt	11282	3
3	Spring bolt	7886	1
4	Pressure spring	13115	1
5	Tensioning bolt	7887	1
6	Plate	7884	1
7	Socket head bolt	11494	4
8	Sleeve	7888	2
9	Hexagon bolt	12735	2
10	Brake housing	7882	1
11	Cover	7883	1
12	Socket head bolt	11283	4
13	Eccentric bushing	7781	2
14	Headless pin	13149	2
15	Setting spindle	7789	1
16	Washer	7782	1
17	Washer	8077	1
18	Axial cage	12802	2
19	Pressure spring	12436	1
20	Cap nut	12803	1
21	Pinion	7849	1
22	Friction wheel	7877	1
23	Headless pin	12736	1
24	Setting gear	7803	1
25	Setting nut	8369	1
26	Swivel bearing	8371	1
27	Tensioning nut	7879	1
28	Socket head bolt	11270	1
29	Roller	8372	2
30	Gear rack X	7788	1
31	Pin	8389	1
32	Feather key	12743	1
33	Star grip	12801	1
34	Guard plate	8373	1
35	Socket head bolt	11124	3
36	Axial cage	12842	1
37	Disk	12843	1
38	Headless pin	12844	1
39	Straight pin	13150	2
40	Pressure spring	12741	1
41	Angle	8534	1
42	Countersunk screw	12472	2
43	Spring mandrel	7878	1
44	Tensioning pin	11889	2
45	Headless pin	12611	1
46	Axial cage	13261	1
47	Axial cage	13262	1
48	Extension for setting spindle	32765	1



7780 Precision setting X-axis

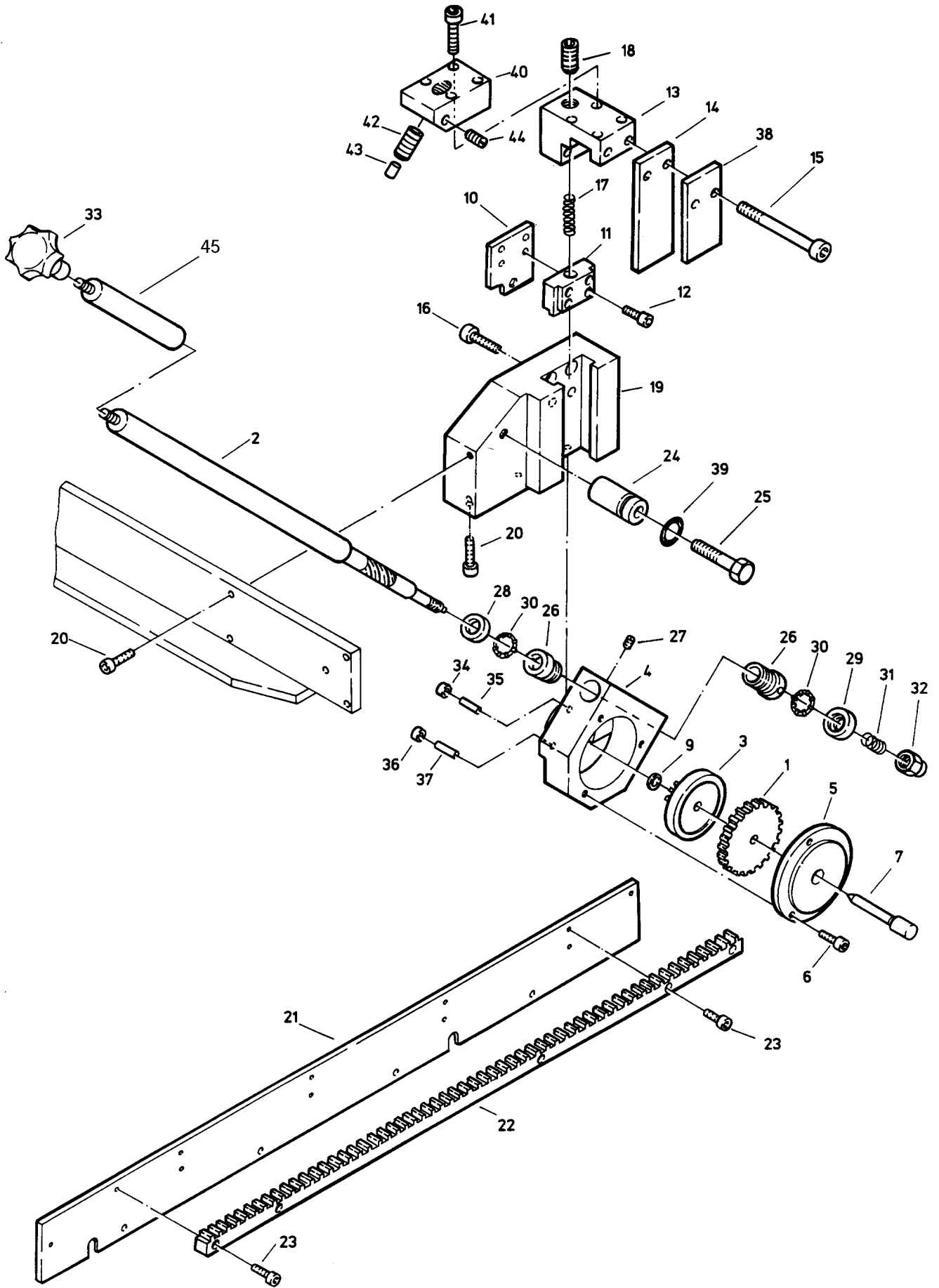




7770 Precision setting Y-axis

**7770 Precision setting Y-axis to pack no. 509**

Item	Designation	Order no.	Quantity
1	Setting gear	7771	1
2	Setting spindle	7779	1
3	Friction wheel	7773	1
4	Brake housing	7774	1
5	Cover	7784	1
6	Socket head bolt	11313	3
7	Pressure pin	7783	1
9	Back-up washer	12745	1
10	Plate	7778	1
11	Slide	7776	1
12	Socket head bolt	11009	4
13	Clamping block	7777	1
14	Leaf spring	7772	1
15	Socket head bolt	12738	2
16	Socket head bolt	11187	2
17	Pressure spring	12742	1
18	Headless pin	12739	1
19	Pillow block	7775	1
20	Socket head bolt	11905	5
21	Gear rack support	7785	1
22	Gear rack Y	7786	1
23	Socket head bolt	11259	5
24	Stopper	7787	1
25	Hexagon bolt	12737	1
26	Eccentric bushing	7781	2
27	Headless pin	12736	2
28	Washer	7782	1
29	Washer	8077	1
30	Axial cage	12802	2
31	Pressure spring	12436	1
32	Cap nut	12803	1
33	Star grip	12801	1
34	Roller	8019	1
35	Straight pin	12832	1
36	Back-up roller	8139	1
37	Straight pin	11071	1
38	Brake pad	5529	1
39	O-Ring	13308	1



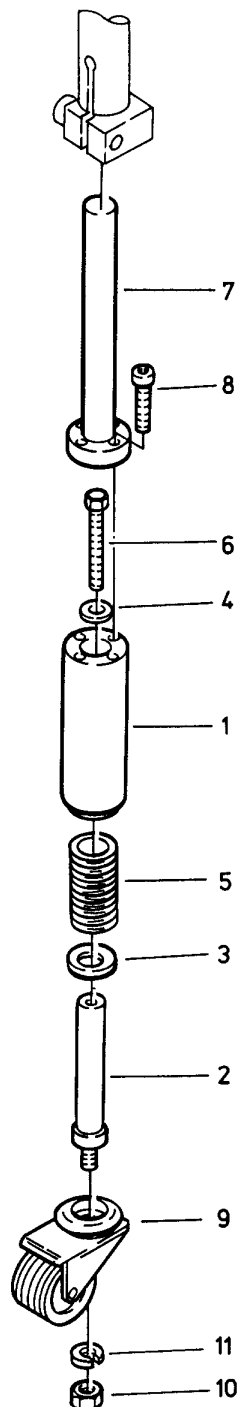
7770 Precision setting Y-axis

**7770 Precision setting Y-axis from pack no. 510**

Item	Designation	Order no.	Quantity
1	Setting gear	7771	1
2	Setting spindle	7779	1
3	Friction wheel	7773	1
4	Brake housing	7774	1
5	Cover	7784	1
6	Socket head bolt	11313	3
7	Pressure pin	7783	1
9	Back-up washer	12745	1
10	Plate	7778	1
11	Slide	7776	1
12	Socket head bolt	11009	4
13	Clamping block	7777	1
14	Leaf spring	7772	1
15	Socket head bolt	12738	2
16	Socket head bolt	11187	2
17	Pressure spring	12742	1
18	Headless pin	12739	1
19	Pillow block	7775	1
20	Socket head bolt	11905	5
21	Gear rack support	7785	1
22	Gear rack Y	7786	1
23	Socket head bolt	11259	5
24	Stopper	7787	1
25	Hexagon bolt	12737	1
26	Eccentric bushing	7781	2
27	Headless pin	12736	2
28	Washer	7782	1
29	Washer	8077	1
30	Axial cage	12802	2
31	Pressure spring	12436	1
32	Cap nut	12803	1
33	Star grip	12801	1
34	Roller	8019	1
35	Straight pin	12832	1
36	Back-up roller	8139	1
37	Straight pin	11071	1
38	Brake pad	5529	1
39	O-Ring	13308	1
40	Setting block	32849	1
41	Socket head bolt M8x45	11233	4
42	Screw	32862	1
43	Buffer	32863	1
44	Headless pin	14765	1
45	Extension for setting spindle	32765	1

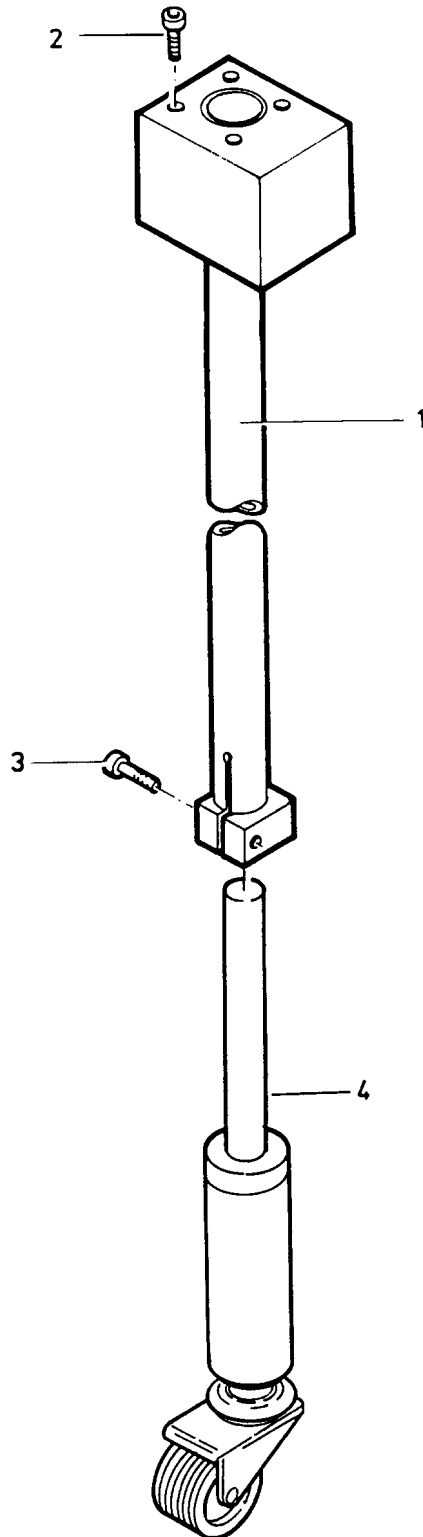
## 8670 Telescopic leg

Item	Designation	Order no.	Quantity
1	Spring chamber	8539	1
2	Spring mandrel	8535	1
3	Back-up washer	8536	1
4	Tensioning washer	8542	1
5	Pressure spring	13102	1
6	Hexagon bolt	13103	1
7	Telescopic bar for height adjustment	8541	1
8	Socket head bolt	11082	4
9	Double guide roller	11618	1
10	Hexagon nut	11429	1
11	Spring washer	11630	1



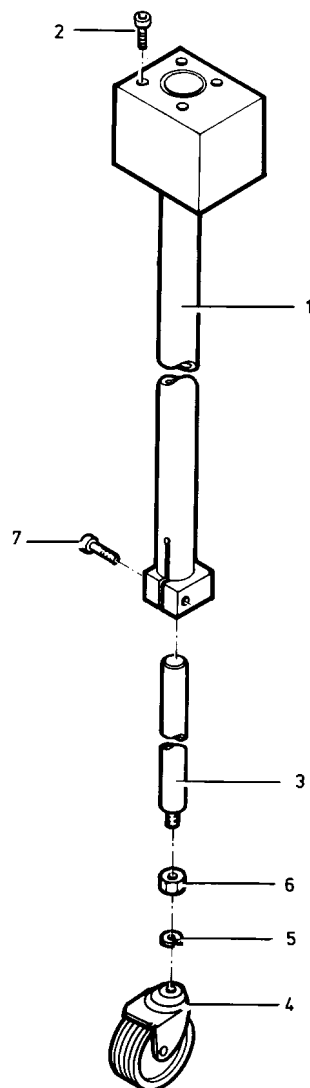
**8660 Spring-type pedestal**

Item	Designation	Order no.	Quantity
1	Supporting tube	7517	1
2	Socket head bolt	11187	2
3	Socket head bolt	11086	1
4	Telescopic leg	8670	1



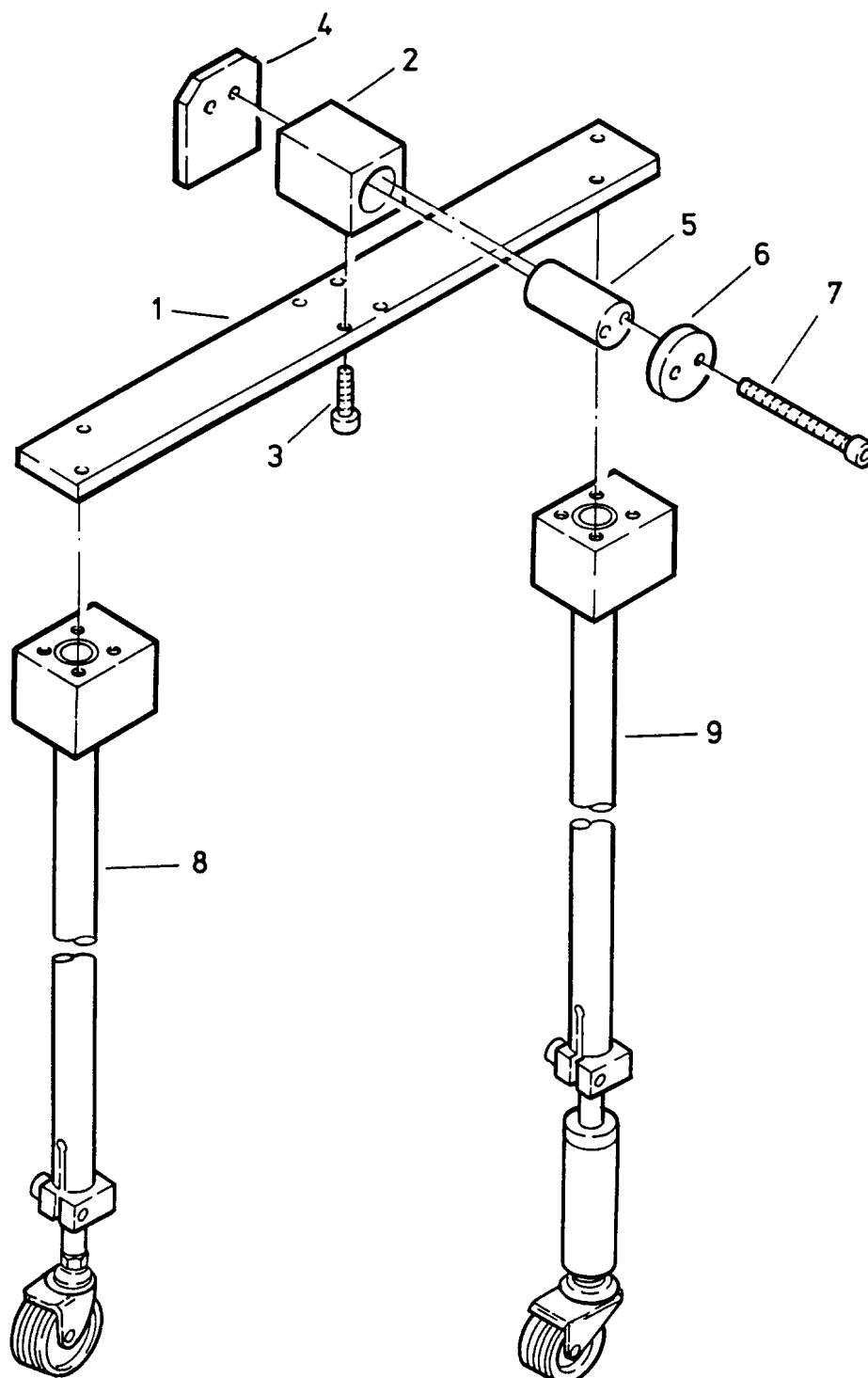
**7856 Pedestal**

Item	Designation	Order no.	Quantity
1	Supporting tube	7517	1
2	Socket head bolt	11187	2
3	Telescopic bar for height adjustment	5374	1
4	Double guide roller dia. 50 with rear hole	11618	1
5	Spring washer 10	11630	1
6	Hexagon nut M10	11429	1
7	Socket head bolt M 8x35	11086	1



## 8550 Right-hand support for AV5L only

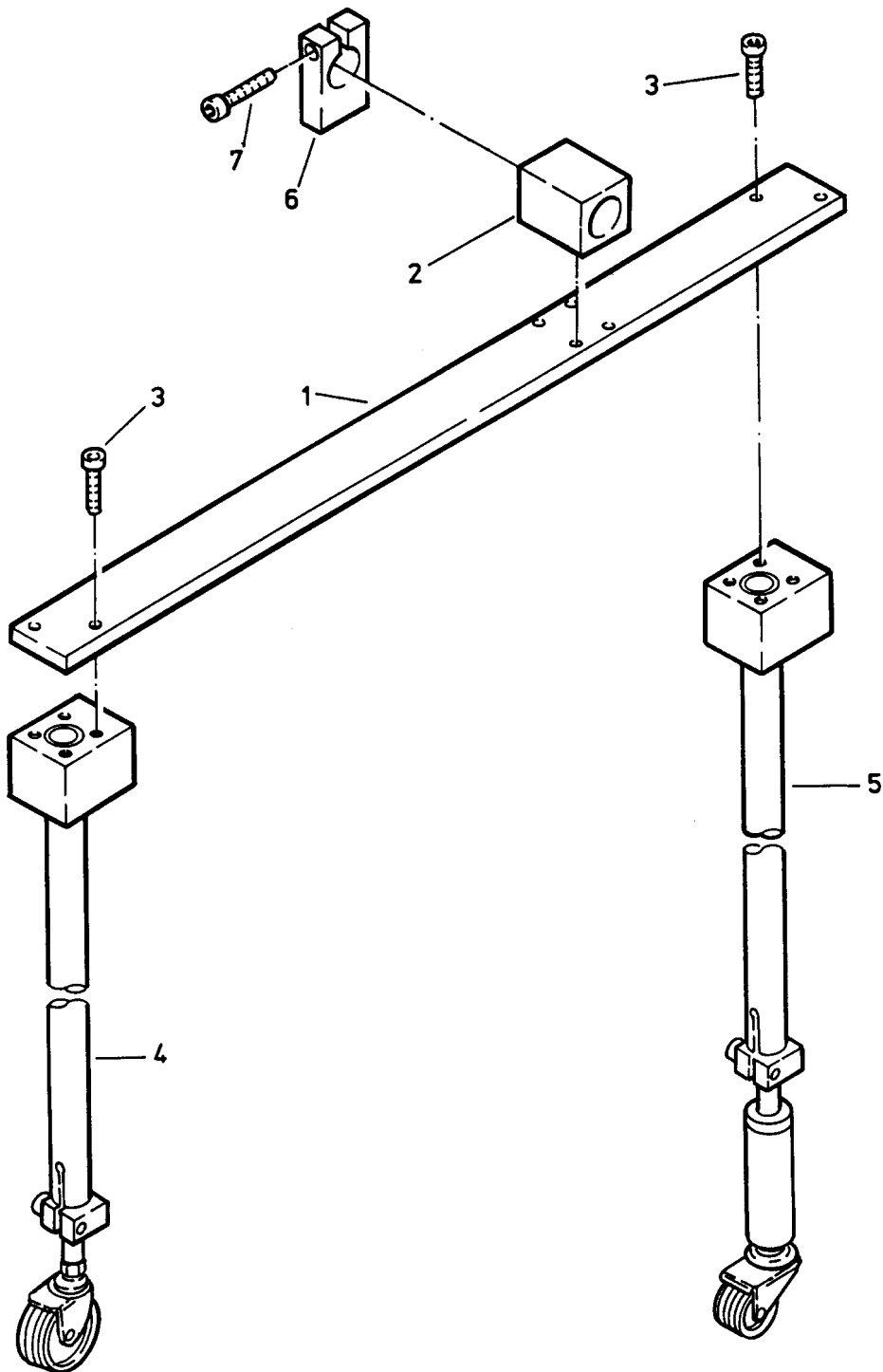
Item	Designation	Order no.	Quantity
1	Right-hand cross rail	8546	1
2	Swivel bearing	7515	1
3	Socket head bolt	11252	4
4	End stopper, long	8545	1
5	Steel shaft	8543	1
6	Tensioning washer	8544	1
7	Socket head bolt	13104	2
8	Pedestal	7856	1
9	Spring-type pedestal	8660	1





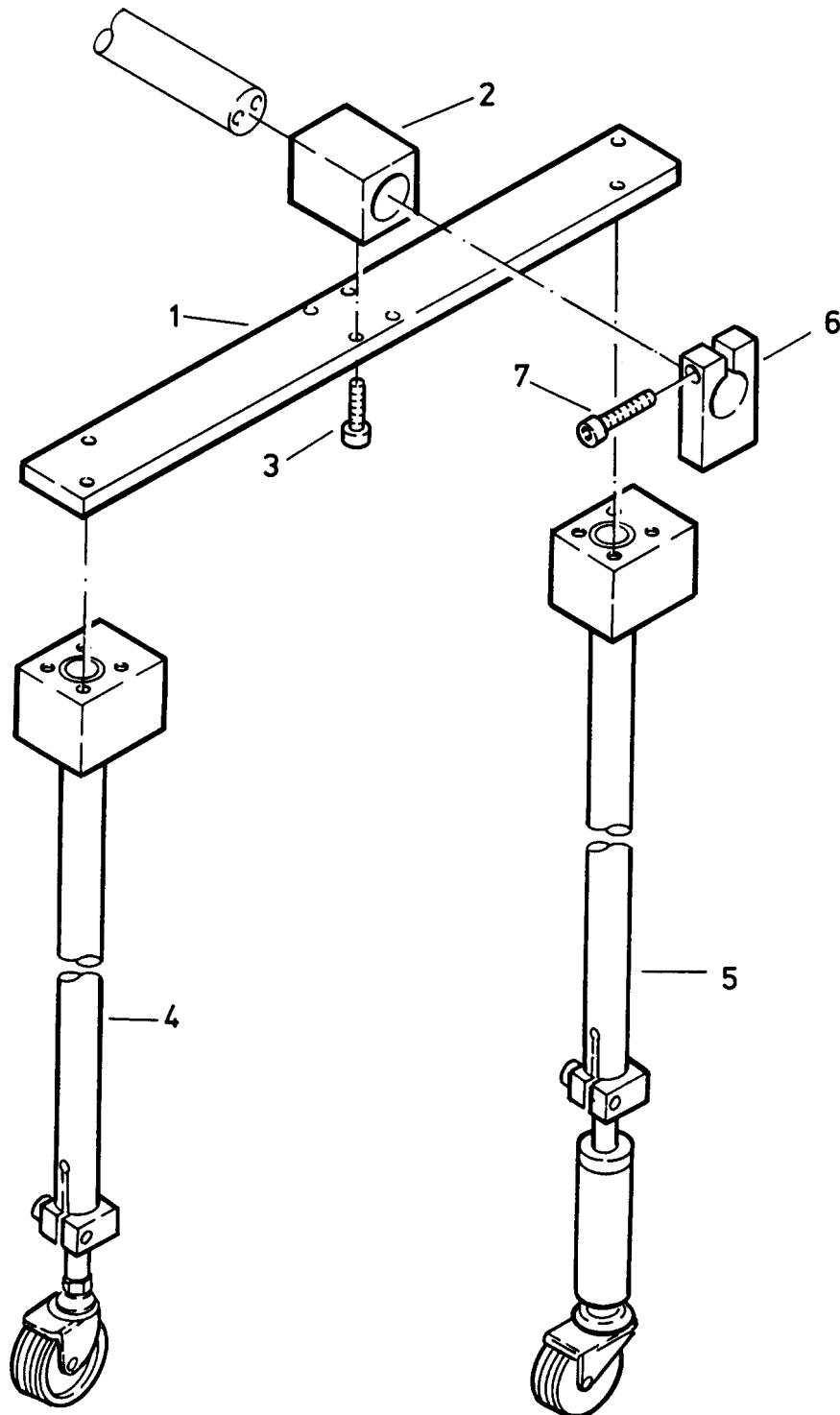
### 8540 Left-hand support AV4 + AV4L - AV5 + AV5L

Item	Designation	Order no.	Quantity
1	Supporting rail	7516	1
2	Swivel bearing	7515	1
3	Socket head bolt	11252	4
4	Pedestal	7856	1
5	Spring-type pedestal	8660	1
6	Holder	4861	1
7	Socket head bolt	11187	1



### 8130 Right-hand support for AV4 (long) only

Item	Designation	Order no.	Quantity
1	Right-hand cross rail	8546	1
2	Swivel bearing	7515	1
3	Socket head bolt	11252	4
4	Pedestal	7856	1
5	Spring-type pedestal	8660	1
6	Holder	4861	1
7	Socket head bolt	11187	1

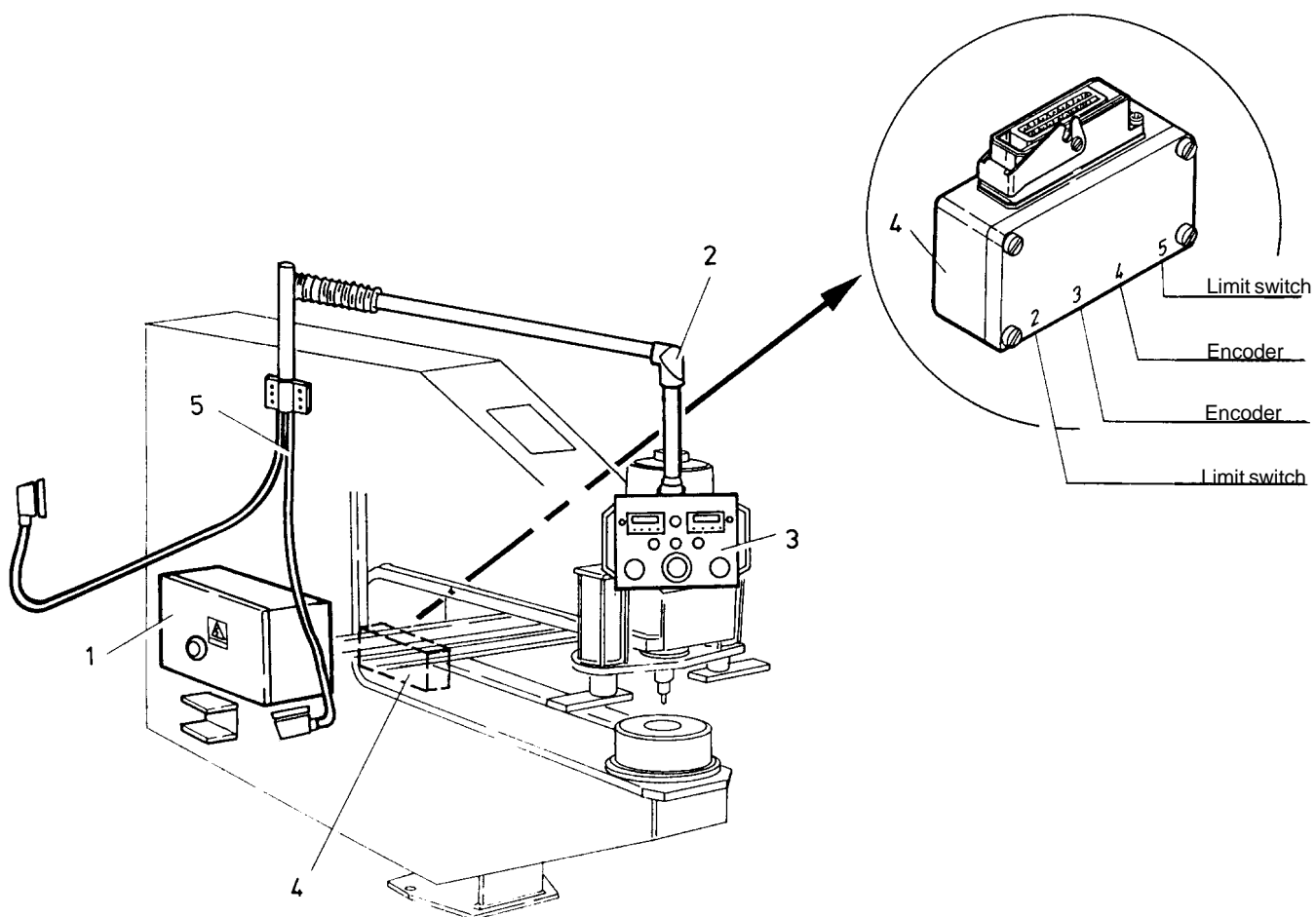


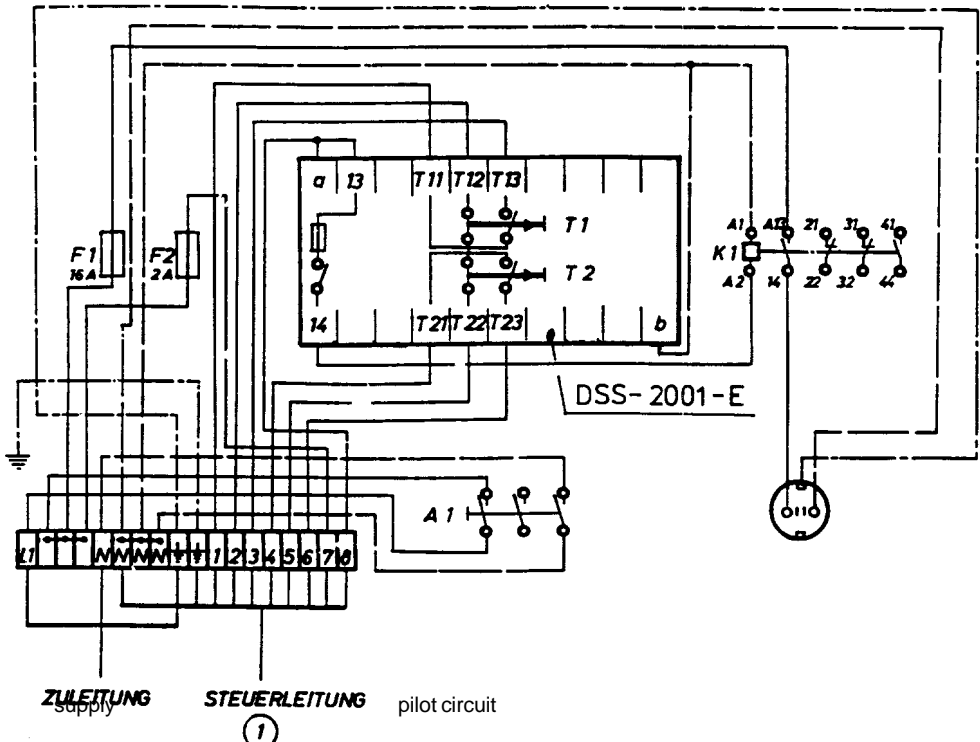
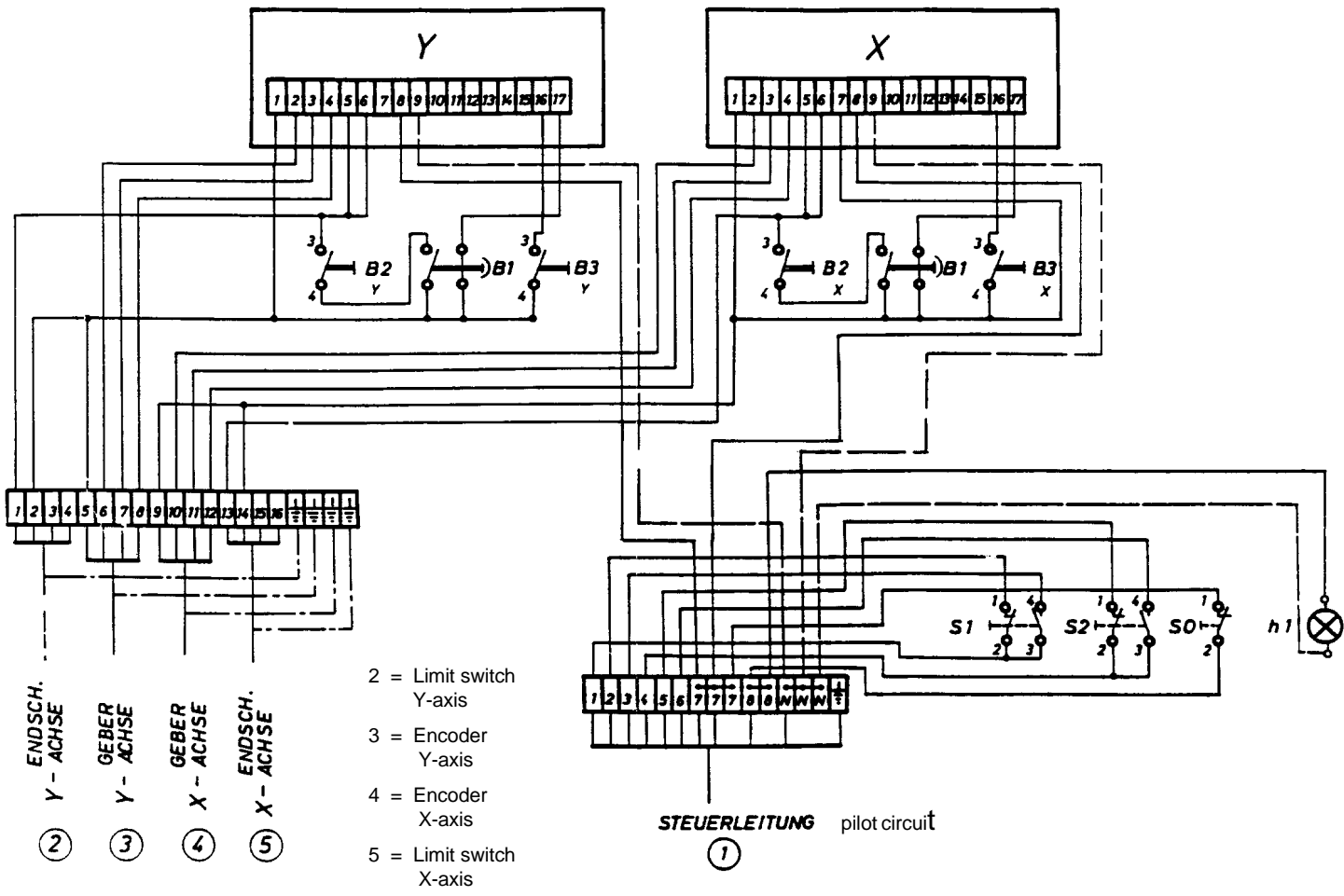
## Two-handed control with digital display for AV5 and AV5 L

Designation	Page
7140 Two-handed control with digital display	91
Operating faults and their remedies	96

## 7140 Two-handed control with digital display for AV5 and AV5 L

Item	Designation	Order no.	Quantity
1	Control cabinet compl. for HSTL 220V	7390	1
2	Pivot arm complete	7330	1
3	Control panel, complete 220V	7300	1
4	Distributor box, controller HSTL-D	7480	1
5	Control cable set compl. plugs 10+ 16-pole	7799	1






ZULEITUNG supply  
 STEUERLEITUNG pilot circuit  
 ①

## 7742 Circuit Diagram (Two-handed controller with digital display for AV5 and AV5L)

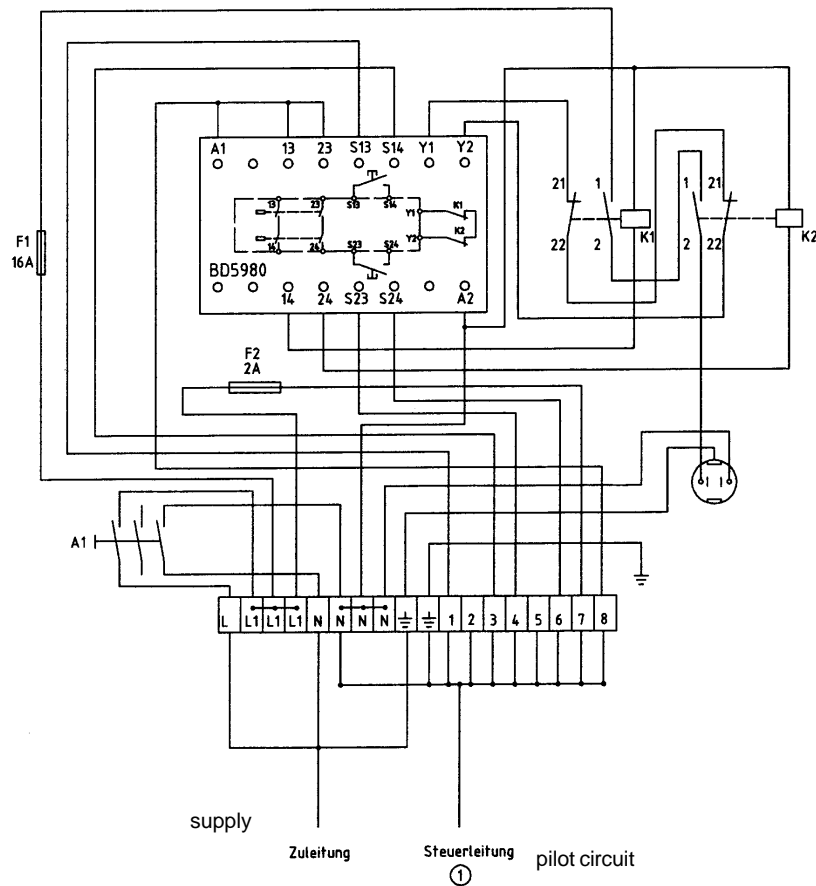
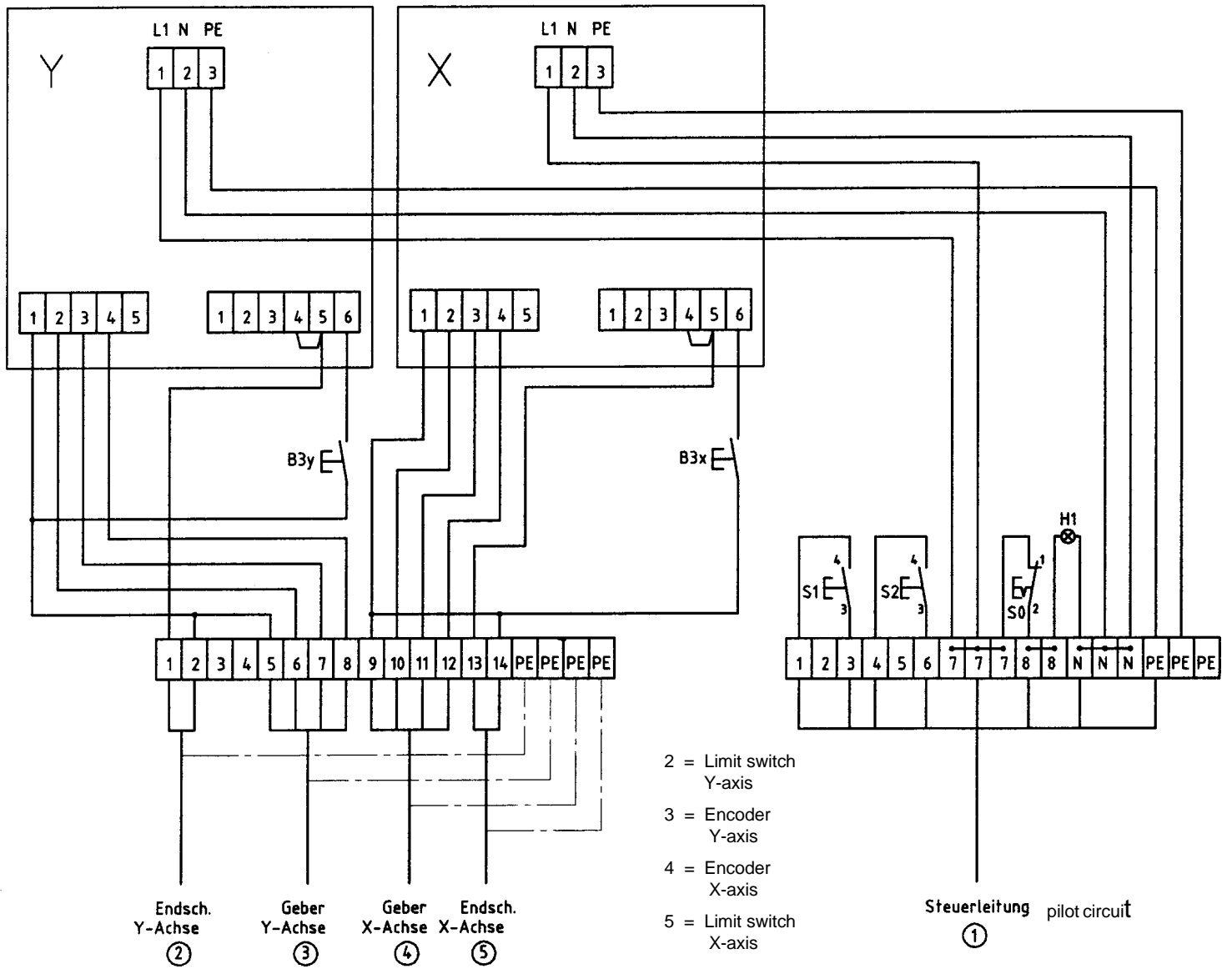
**Control panel** to pack no. 510

Designation	Circuit diagram	Operating instruct.	Order no.
Counter unit	X / Y	Z	12487
Key switch	B1	S1	12780
Reference dimension	B <sub>2</sub> X / B <sub>2</sub> Y	T6	12781
Display to zero	B <sub>3</sub> X / B <sub>3</sub> Y	T5	12782
EMERGENCY STOP	S <sub>0</sub>	T8	12783
Two-handed control	S <sub>1</sub> / S <sub>2</sub>	T7	12784
Control lamp	h1	L1	12785

**Control cabinet** with two-handed control DSS-2001-E

Designation	Circuit diagram	Order no.
Two-handed control	DSS-2001-E	 31201*
Contactors	K1	
Main switch	A1	12614

\* = consist of new 2-handed relay BD5980 and 2 new contactors.



4750 Bl. 1 + 2

**Circuit Diagram (Two-handed controller with digital display for AV5 and AV5L)****Control panel** from pack no. 511.

Designation	Circuit diagram	Operating instruct.	Order no.
Counter unit	X / Y	Z	14667
Display to zero	B <sub>3</sub> X / B <sub>3</sub> Y	T5	12782
EMERGENCY STOP	S <sub>0</sub>	T8	12783
Two-handed control	S <sub>1</sub> / S <sub>2</sub>	T7	12784
Control lamp	H1	L1	12785

**Control cabinet** with two-handed control BD5980

Designation	Circuit diagram	Order no.
Two-handed control	BD 5980 N	14122
Contactora	K1	14123
Contactora	K2	14123
Main switch	A1	12614



## Two-handed control with digital display for HSTL with AV5 and AV5L

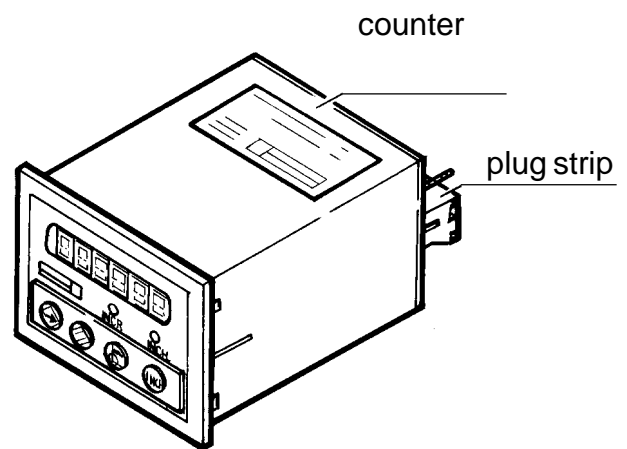
### Operating faults and their remedies

Fault	Cause	Remedy
1. No display on the counter	Counter faulty Encoder faulty	Replace counter Replace encoder
2. Incomplete display	Counter faulty	Replace counter
3. Display value does not agree with path travelled	Counter faulty Encoder faulty	Replace counter Replace encoder
4. The set value does not appear when approaching the end stop.	Limit switch faulty	Replace limit switch

### For faults 1,2 and 3

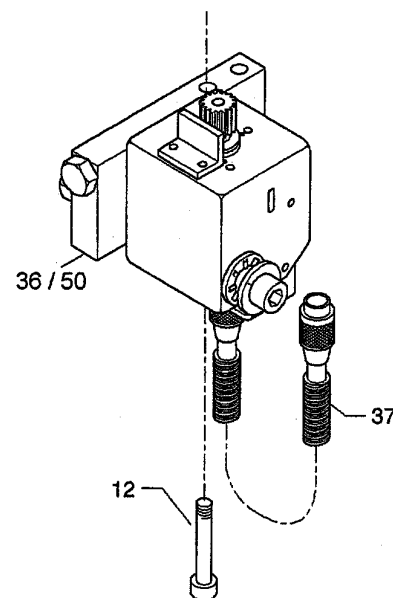
Assume that the counter for the X axis has no display.  
Proceed as follows:

1. Disconnect the plug from the main supply.
2. Remove the plug strip from counter "X".
3. Plug this strip into counter "Y".
4. Connect the plug to the mains.
5. Move the stop attachment in the "Y" direction.
  - a) No display appears on counter "Y".  
The encoder is faulty.  
Replace encoder
  - b) The display works on counter "Y".  
The "X" counter is faulty.  
Replace counter "X".



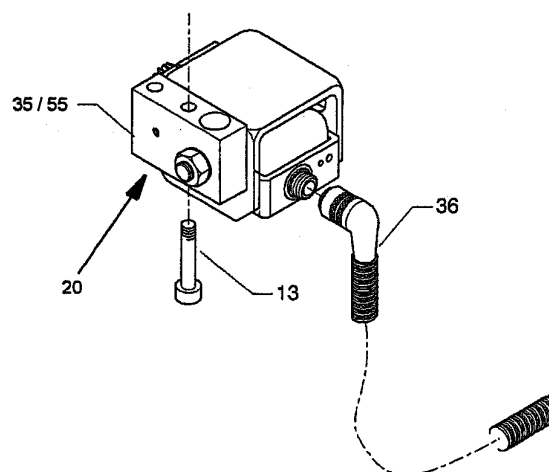
## 6. Change "X" axis encoder (see drawing no. 7150, page 65, and 7820, page 75)

- 6.1 Disconnect mains plug.
- 6.2 Undo connection cable screw cap on rotary shaft encoder and disconnect cable (37) from rotary shaft encoder (36 and
- 6.3 Remove 2 screws (12).
- 6.4 Remove encoder assembly.
- 6.5 Attach new encoder with 2 screws (12).
- 6.6 Holding rotary shaft encoder steady with one hand, unsc brace. Slowly move rotary shaft encoder towards steel s rotary shaft encoder's pinion engages into the rack.
- 6.7 Connect cable (37) to rotary shaft encoder. Pull out main
- 6.2 Loosen the screw cap of the connecting cable and remo cable (37) from angular encoder (36 or 50).
- 6.7 Connect the cable (37) to the encoder.



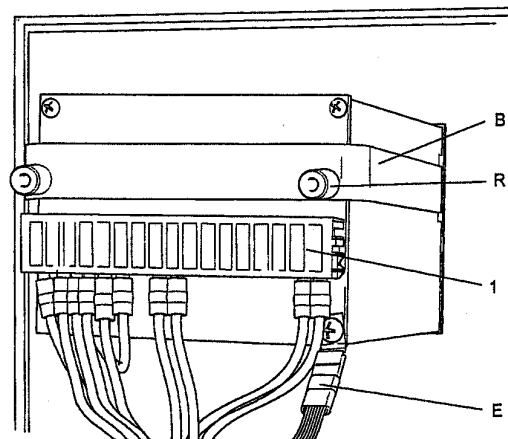
## 7. Change "Y" axis encoder (drwg. 7160, page 61)

- 7.1 Disconnect mains plug.
- 7.2 Detach connection cable from rotary shaft encoder (35 and 55 respectively).
- 7.3 Disengage tension spring (20).
- 7.4 Undo both screws (13) and remove segment (1) with rotary shaft encoder.
- 7.5 Secure new encoder in place with 2 screws (13).
- 7.6 Engage tension spring (20).
- 7.7 Connect cable (37) to rotary shaft encoder.

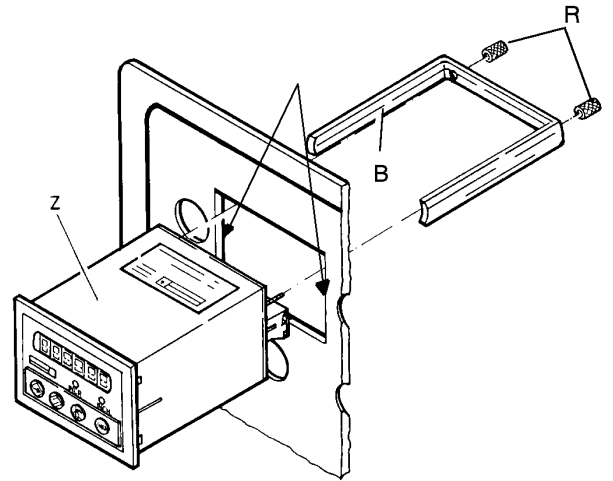


## 8.1 Change counter (up to device no.: 510)

- 8.1.0 Disconnect mains plug.
- 8.1.1 Open command housing.
- 8.1.2 Disconnect plug connector (1).
- 8.1.3 Disconnect earthing cable (E).
- 8.1.4 Unscrew knurled nuts (R).
- 8.1.5 Remove clip (B).
- 8.1.6 Pull counter (Z) out towards front.



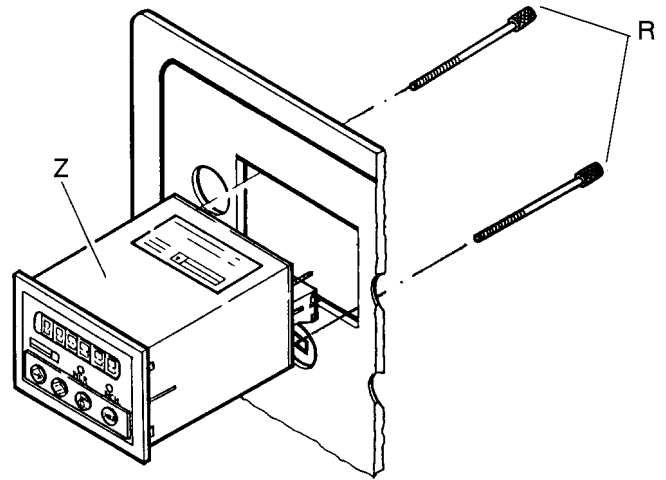
8.1.7 Using a file, increase size of cut-out by 2 mm on left or right.



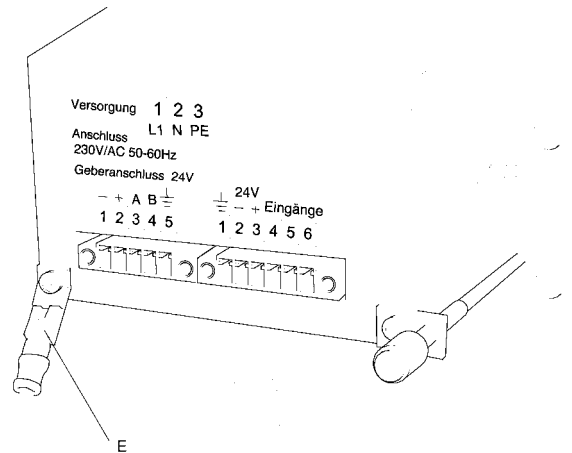
8.1.8 Insert new counter.

8.1.9 Unscrew straps from rear panel.

8.1.10 Screw both knurled nuts (R) into straps and firmly clamp counter in place.



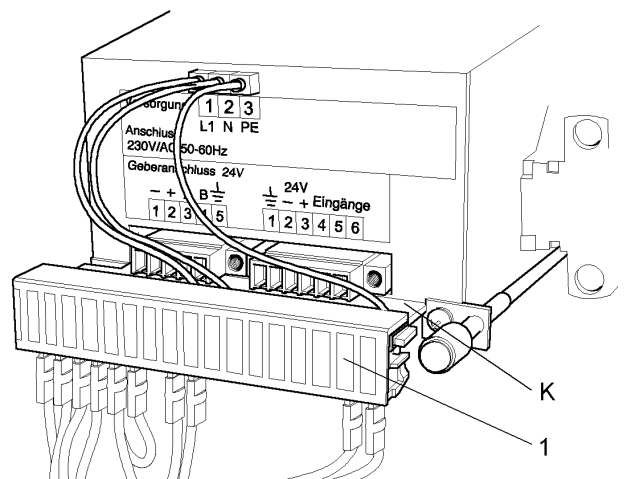
8.1.11 Connect earthing cable (E).



8.1.12 Connect cable adapter.

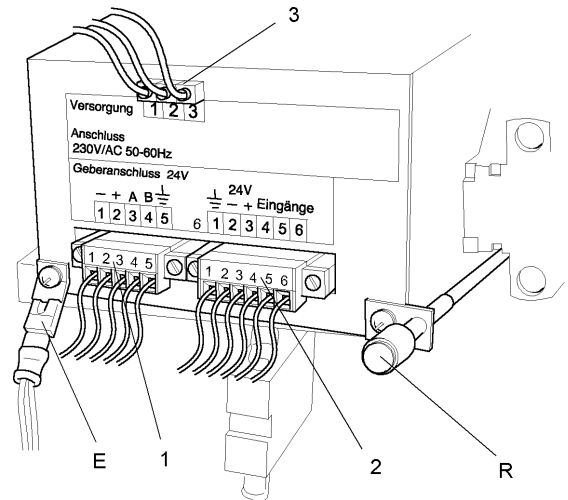
8.1.13 Push plug connector (1) onto cable adapter.

8.1.14 Plug black 3-pin plug into counter.



## 8.2 **Change counter** (from device no.: 511)

- 8.2.0 Disconnect mains plug.
- 8.2.1 Open command housing.
- 8.2.2 Disconnect plugs (1), (2) and (3).
- 8.2.3 Disconnect earthing cable (E).
- 8.2.4 Unscrew knurled nuts (R) from straps.
- 8.2.5 Undo straps and turn them so they are positioned behind rear panel of counter.
- 8.2.6 Pull counter (Z) out towards front.
- 8.2.7 Insert new counter.
- 8.2.8 Unscrew straps from rear panel.
- 8.2.9 Screw both knurled nuts (R) into straps and firmly clamp counter firmly in place.
- 8.2.10 Connect earthing cable (E).
- 8.2.11 Connect plugs (1), (2) and (3).



## **For fault no. 4**

### 9. **Replace limit switch** (see drawings 7150 and 7820)

- 9.1 Remove mains connection
- 9.2 Disconnect the cable no. 5 from the distributor box
- 9.3 Unscrew both screws M 5x25 and remove the limit switch and cable.
- 9.4 Fasten the new limit switch and connect it to the distributor box.
- 9.5 After replacing the limit switch, correct the set value
  - as described in points 10, 11 and 12.





**11. ENTERING THE CORRECTED REFERENCE VALUE** to pack no: 510**11.1. X-Axis**

11.1.1. Push the stop device a few centimeters away from the mandril to the right.

11.1.2. Unlock the left counter unit. (Turn the S1 key to the left.)



11.1.3. Press the T6 button. The reference value is displayed. For example:

in mm  

		2	0	1	.9
--	--	---	---	---	----

in inches  

		7	.9	4	9
--	--	---	----	---	---

11.1.4. Press button T1. The decimal point flashes after the first digit.

0	.	0	2	0	1	9
---	---	---	---	---	---	---

0	.	0	7	9	4	9
---	---	---	---	---	---	---

11.1.5. Move the decimal point to the digit to be altered with button T1 and enter the corrected value

0	0	2	0	2	.9
---	---	---	---	---	----

0	0	7	9	8	.8
---	---	---	---	---	----

 with the T2 button.

11.1.6. Move the decimal point with button T1 and enter the corrected value

0	0	2	0	2	.6
---	---	---	---	---	----

0	0	7	9	7	.6
---	---	---	---	---	----

11.1.7. Store the new value with the T6 button.

11.1.8. Then press the T1 button, the following value is displayed:

		2	0	2	.6
--	--	---	---	---	----

		7	.9	7	6
--	--	---	----	---	---

11.1.9. Push the stop device to the end stop (reference point). The X-axis is now set to the new reference value.

The following is displayed when the mandril touches the plastic stop (figure page 101):

		2	5	.0
--	--	---	---	----

		.9	8	4
--	--	----	---	---

 The X-axis is set correctly.
**11.2. Y-Axis**

11.2.1. Push the stop device back a few centimeters away from the mandril.

11.2.2. Unlock the right counting unit.



11.2.3. Press the T6 button. The reference value is displayed. For example:

		7	6	9	.3
--	--	---	---	---	----

		3	0	.2	8	7
--	--	---	---	----	---	---

11.2.4. Press the T1 button. The decimal point flashes behind the first digit.

0	.	0	7	6	9	3
---	---	---	---	---	---	---

0	.	3	0	2	8	7
---	---	---	---	---	---	---

11.2.5. Move the decimal point to the digit to be altered with the T1 button and enter the corrected value with the T2 button.

0	0	7	6	9	.1
---	---	---	---	---	----

0	3	0	2	7	.9
---	---	---	---	---	----

11.2.6. Store the new value with the T6 button.

11.2.7. Then press the T1 button. The value

		7	6	9	.1
--	--	---	---	---	----

		3	0	.2	7	9
--	--	---	---	----	---	---

 is displayed.

11.2.8. Push the stop device to its end limit at the back (reference point).

The Y-axis is now set to its new reference value.

11.2.9. When the mandril is touched by the stop rail (figure page 87) the value

		2	5	.0
--	--	---	---	----

		.9	8	4
--	--	----	---	---

 is displayed.

The Y-axis is set correctly.

## Control panel

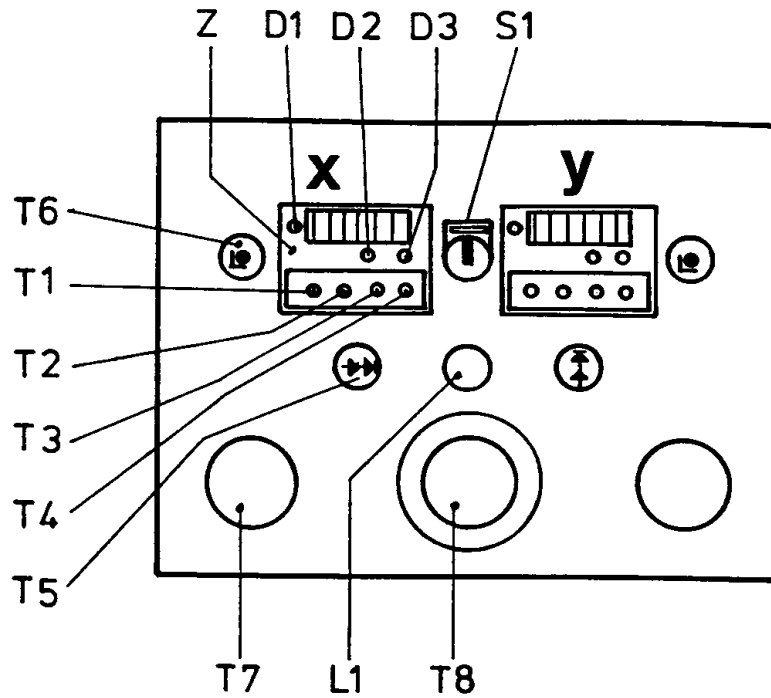


Figure 1

Z Counter unit

S1 Key-operated switch

- for punching

- keyboard for the right counter unit for Y-axis unlocked

- keyboard for the left counter unit for X-axis unlocked

T1 Selects figure display

T2 Enters the figure value

T3 Selects absolute or incremental value

T4 Selects unit of measure - millimeters or inches

T5 Sets the display to zero (only in incremental-value mode)

T6 Stores the reference size

T7 Two-hand control

T8 EMERGENCY - STOP

#### LED - DISPLAYS

D1 Negative X-axis sector

D2 Incremental dimensions

D3 Dimensions in inches

Remark regarding the key-operated switch S1:

Only the T3, T5, T7 and T8 keys will operate if the key-switch is set for punching or if the key has been removed.

All other buttons are blocked. The key can only be removed when the switch is in the "punching" position.



**12. ENTERING THE CORRECTED REFERENCE VALUE** from pack no: 511**12.1 X-Axis**

12.1.1 Push the stop device a few centimeters away from the mandril to the right.

12.1.2 Hold down all the four buttons T1 to T4 simultaneously for about 3 seconds. The word "CodE" will appear on the display.

C	o	d	E	
---	---	---	---	--

12.1.3 Hold down the button F for about 3 seconds. The digits "00000" will appear.

0	0	0	0	0
---	---	---	---	---

The first 0 will start flashing and can be changed

12.1.4 Enter the code 50565 as follows. Repeatedly press the button  $\hat{\uparrow}$  until the number 5 appears.

5	0	0	0	0
---	---	---	---	---

12.1.5 Press the button  $\Rightarrow$ . The second 0 will start flashing.

Press the button  $\Rightarrow$ . The third 0 will start flashing.

Repeatedly press the button  $\hat{\uparrow}$  until the number 5 appears.

5	0	5	0	0
---	---	---	---	---

12.1.6 Press the button  $\Rightarrow$ . The fourth 0 will start flashing

Repeatedly press the button  $\hat{\uparrow}$  until the number 6 appears.

5	0	5	6	0
---	---	---	---	---

12.1.7 Press the button  $\Rightarrow$ . The fifth 0 will start flashing

Repeatedly press the button  $\hat{\uparrow}$  until the number 5 appears.

5	0	5	6	5
---	---	---	---	---

12.1.8 Press the button F. This calls up the reference value stored in the memory. For example:

-	2	0	1.	9
---	---	---	----	---

The minus sign starts flashing.

12.1.9 Enter the new reference value.

Only the changed digits need to be corrected.

Proceed as described in 6.1.5 to 6.1.8.

To enter a minus sign, move the cursor to the first digit and press the button  $\hat{\uparrow}$  repeatedly until the minus sign appears. Delete the minus sign by setting the digit to 0.

-	2	0	2.	6
---	---	---	----	---

12.1.10 Press the button F.

Move the stop to its left-hand limit of travel (reference point).

The X-axis is now set to the new reference point.

As soon as the mandril makes contact with the plastic stop (Fig. 6) the display will show:

		2	5.	0
--	--	---	----	---

 $\pm 0.1$       The X-axis is now correctly set.
**12.2 Y-Axis**

12.2.1 Push the stop device back a few centimeters away from the mandril.

12.2.2 Hold down all the four buttons T1 to T4 on the Y-display simultaneously for about 3 seconds. The word "CodE" will appear on the display.

C	o	d	E	
---	---	---	---	--

12.2.3 Follow the steps described in 12.1.3 to 12.1.7.

12.2.4 Press the button F. This calls up the reference value stored in the memory . For example:

0 7 6 9. 3

The zero starts flashing.

12.2.5 Enter the new reference value as described in 12.1.5 to 12.1.8.

0 7 6 9. 1

12.2.6 Press the button F.

Move the stop to its rearmost limit of travel (reference point).

The Y-axis is now set to the new reference point.

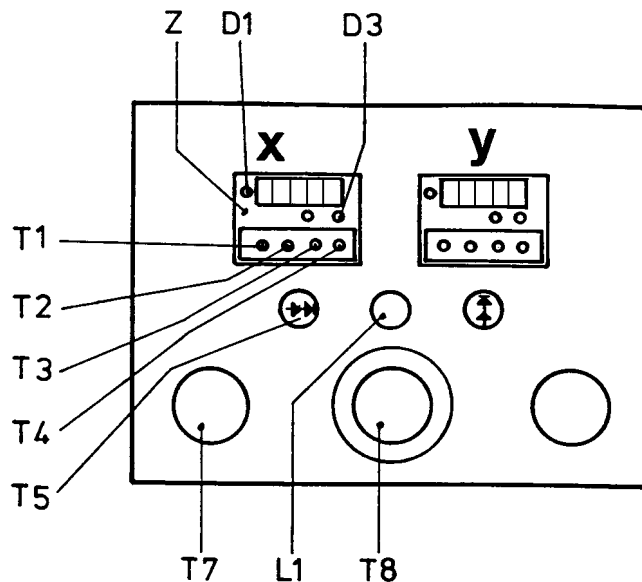
12.2.7 As soon as the mandril makes contact with the stop rail (Fig. 5) the display will show:

2 5. 0

$\pm 0.1$

The Y-axis is now correctly set.

## Control panel



Z	Counter unit
T1	F-button
T2	" $\Rightarrow$ " Selects figure display
T3	" $\uparrow$ " Enters the figure value
T4	Selects absolute or incremental value
T5	Sets the X-axis display to zero (only in incremental-value mode)
T7	Two-hand control
T8	EMERGENCY - STOP
	LED - DISPLAYS
D1	Negative X-axis sector
D3	Incremental dimensions

Repairs / Service

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