

Repair Instructions

PRAKTICA LLC

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LIST OF ABBREVIATIONS

GrM = Maximum distance
KIM = Minimum distance
TGL = GDR - Standard
DKS = Standard of Dresden camera works
EST = Group of exponential voltage divider

IMPORTANT: ALL DIMENSIONS IN MILLIMETERS

The five-digit numbers used in this article to designate camera parts (e.g., cocking lever 00057, switching plate 00901) refer to the Exploded View of the Praktica LLC shown on pages 24 and 25. Also included with this Manual are exploded views of the Super L, pages 22 and 27), TL (pages 20 and 29), LTL (pages 18 and 31). These pages are arranged in this manner, with the backs left blank, so that they can be pulled out of the center of the magazine and used as two-page sections.

Price lists for spare parts accompany each of the exploded views. The manuals for the Praktica Super L, TL, and LTL are being prepared for microfiche.

We are also preparing for microfiche the following:

Praktica-Mat - Manual, Exploded View, Parts List
Praktica-Nova - Manual
Praktica-Nova B - Manual, Parts List
Praktica-Nova I - Manual, Parts List
Praktica-Nova IB - Manual

PRAKTICA LLC

NOTE: All dimensions are in millimeters.

1 - GENERAL

This repair manual is based on the state of production of July 1, 1970. Knowledge of the relevant instructions for use is assumed.

The designations "front," "left," "right," etc., mentioned in this Repair Manual refer to the camera in the following position: the camera stands on its base, the camera back or film track is directed to the repair mechanic.

Before assembly, all bright and burnished parts, groups and standardized parts have to be rinsed in pure benzene and subsequently in a 20:1 benzene-oil mixture (20 parts of benzene, 1 part of oil).

Lubricants to be used: Oil - (resin-free), pourpoint -40° C., flash point 140° C. Grease - (acid-free), usable between -20° and 80° C.

When using retaining washers (TGL 0 - 6799 x) take care that their smooth face touches the functioning part.

When screws have been secured by lacquer, dissolve it with the aid of nitro diluting agent or butyl acetate for dismantling purposes. After assembly has been finished, all previously lacquered screws and functioning points must be secured again by lacquer.

All joints have to be soldered with C No. 23 soldering fluid (manufacturer: Messrs. Otto KG, Megdeburg GDR) or colophony, only.

When for dismantling purposes the covering means (used for avoiding incidence of light) have to be removed, they must be remounted at the same place during reassembly.

The exploded view shows the arrangement of the individual parts or groups in general. The connecting lines between the individual parts or groups show the correct order of assembly or dismantling.

After each repair for which, for example, the speed-setting disk, camera top, or the EST-group, have been dismantled, the exposure meter must be checked according to instructions.

When dismantling, put aside all parts in that order in which they have been dismantled. That is of special importance for all disks, particularly all washers which must be assembled in the same order.

All numbers of parts or groups underlined in the exploded view, represent spare parts or parts subject to wear.

The camera has the article No. 182 006 and the drawing No. 97 99 11 01000. In the exploded view, all parts and groups are designated with the complete drawing number. When ordering parts or groups, please specify the complete drawing number.

For convenience, in the following text of this Repair Manual, only those parts and groups are designated with the complete drawing number which belong to the work's standardized parts. Parts and groups designated with the drawing Nos. 97 01 11 ... or 97 99 11 ... are specified with their part or group numbers only.

2 - DISMANTLING THE CAMERA

Dismantling the Operating Elements

Remove disk 00058 (glued), loosen retaining disk 1.5 TGL 0 - 6799, unscrew screw 00047, and remove cocking lever 00057.

Loosen the (glued) exposure-time setting dial 00086. Unscrew screw 00087, remove disk 00085, film-speed disk 00083, dog 00084, and helical compression spring.

Remove knob 00080.

Unscrew rewind knob 002217 - 5.00 and slotted nut 00264, remove re-

taining ring 00269 and setting ring 00270 with ball.

Unscrew bolt 00246.

Remove cover plate 00236, loosen two countersunk screws 00244, remove bayonet shoe 00020.

Unsolder intermediate element 00922.

Unscrew camera top 00930.

Dismantling the Camera Bottom and Camera Back

Unscrew the camera bottom, remove the rewind button.

Unscrew the camera back.

When dismantling the film guide 00174, take care that during assembly these washers are inserted again.

Dismantling the Support from the Camera Body

Unscrew bushing 00308 with knob 00305 and remove lever 00313.

Loosen front covering and metal-foil linings from the camera.

Remove EST groups 00805 or 00822 ... 00824 after having loosened three flat-head screws BM 1.4 x 4 DKS 2010.

Turn spring with toothed wheel 00808 so that the screw heads become exposed which are below the bores in the toothed wheel. Mark point of mesh of spring between toothed wheel and step-up wheel 00803.

Loosen three flat-head screws BM 1.4 x 3 DKS 2010.

After having unsoldered the blue cable 00368, remove spring with toothed wheel and shaft element 00807. Loosen slotted nut 00263, remove switching plate 00901.

Unsolder mass connection 00467 from printed circuit plate 00790 (see soldering diagram), and remove the latter without damaging the cables.

Clean with spirit the contact paths of the printed circuit plate.

Loosen four countersunk screws BM 2 x 5 TGL 5683; remove support from the camera body.

Dismantling the Counting Mechanism

Unhook the tension and torsion springs. Remove retaining lever 00165 and counting lever 00852.

Loosen screw from counting disk, put on cocking lever, and cock the camera to the stop. Retain the cocking lever in this position. Unhook the spring eye from the rivet in the cam of the slow-speed mechanism, remove counting disk. Release slowly the cocking lever.

Dismantling the Slow-Speed Mechanism

Loosen threaded cone 00077, remove dog 00076.

Loosen three cylindrical head screws BM 1.6 x 3 TGL 0 - 84 and remove slow-speed mechanism.

Dismantling the Cocking Mechanism

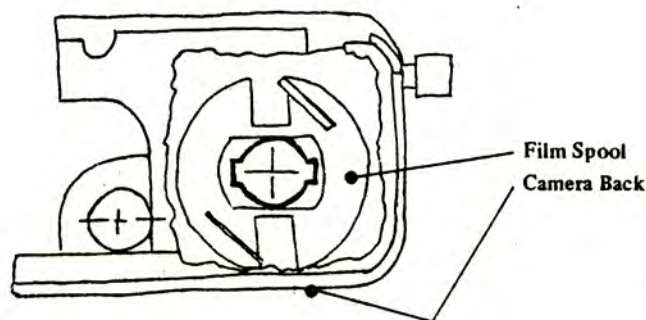
Cock the cocking mechanism.

Turn the film spool so that its bows show to the front and back sides of the camera.

Unhook cocking band from shutter. Loosen gear plate.

(Two cylindrical head screws, one shaft 00171.) Lift off cocking mechanism so far that the shafts of the film spool and transport roller project from their bearings in the bottom of the body.

Remove dog 00440, perhaps also ball and compression spring from the transport roller. Remove cocking mechanism from the body.



Dismantling the Shutter Mechanism

Unscrew X-contact 00817. Release successively E1 and E2. Unscrew the shutter mechanism.

Lift off somewhat the shutter mechanism from the body by seizing it at the spring mount of the E2 tension spring, pull it upwards so far that the lower edge of the shutter plate projects from the bottom of the body, and take it out forwards of the body.

The shutter mechanism can be dismantled from the body even without dismantling the cocking lever:

Unscrew the X-contact 00817, cock the camera, unhook the cocking band from the shutter mechanism. Release E1 and subsequently E2 from the shutter mechanism (the cocking mechanism remaining cocked).

Unscrew the shutter mechanism.

Remove the shutter mechanism as described previously.

For assembly of the shutter mechanism see Section 3.

Dismantling the Support

Dismantling the Electrical Component Parts

Unsolder all cables from the printed circuit plate and mark them.

Loosen two flat-head screws BM 1.4 x 2 DKS 2010 and remove mount 00451.

Remove two hoses 00366 and hose 00438.

Force out the insulation ring 00761 through the reamed bore right above in the mirror chamber (for this purpose hinge the mirror to the Fresnel lens).

Remove the corresponding photo resistors 00752...00759 and filters 00384 or 00503, and put them aside in pairs.

Dismantling the Prism Mount, Complete, and S1 - Switch

Loosen three cylindrical head screws BM 1.6 x 10 TGL 0 - 84 and remove prism mount with measuring mechanism.

Unscrew lens carrier 00233 with pressed-on front cap 00005.

Unscrew delayed-action device 00730.

Unscrew S1 - switch.

Remove cable with bushing 00258 and leaf spring 00230.

Screw off release knob 00461.

Dismantling the Mirror Bottom and Mirror Mechanism

Unhook torsion spring 00329.

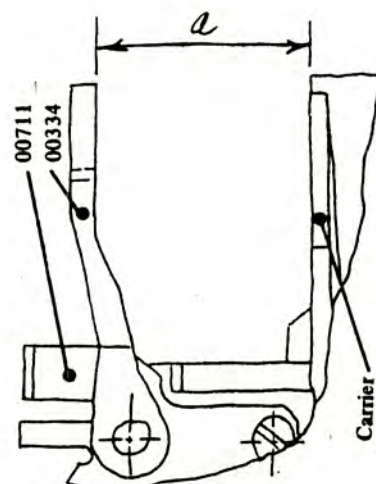
NOTE! Before dismantling the mirror bottom 00705 from the support, mark at the left and right sides of the support the position of the bottom above the hinge.

Observe these marks for assembly.

Unscrew the mirror bottom.

Before dismantling the mirror mechanism 00710, determine the dimension "a" between lever 00334 and support.

Observe this dimension for assembly. Unscrew the mirror mechanism.



Dismantling the Rocker

Remove gears 00709 and 00717.

Knock out the pins 00499 from the mirror chamber to the outside by means of a nail set.

Remove segment 00434, bushing 00452 and rocker 00287.

Unscrew cover plate 00231.

Dismantling the Slow-Down Mechanism 00860

Loosen the low-head screw AM 1.4 x 4 DKS 2010.

Remove torsion spring with bushing 00130.

Unhook torsion spring 00159 and remove stop lever.

Remove spring 00459.

Remove bushing 00872, time-setting cam 00873, segment cam 00149, armature cam 00433 in this order from the riveted bushing.

Remove lever 00129.

Loosen the securing lacquer at the plate slot (spiral-spring suspension), pull out the end of the spring.

Remove carefully spiral spring 871 000-71.00 from the gear.

Unscrew plate 00139.

Remove carefully short shutter-speed setting-lever 00865, segment 00866, gears 00867, 00868, 00871 and armature lever 00862 from the plate, and do not damage the pins, gears, and wheel disks.

Dismantling the Cocking Mechanism 00830

ATTENTION! Before starting dismantling, mark exactly the suspension of torsion spring 00111 in the slot of stop lever 00092 as well as the position of the flat head screw BM 1.4 x 3 DKS 2010 in the longitudinal hole of the stop lever.

When assembling, the spring has to be hooked in the same position, and the stop lever has to be assembled in the same position.

Dismantle in the order as follows:

Unscrew stop lever 00092. Remove in this order spring box below it, torsion spring, release lever, release disk, bushing and latch.

Unhook torsion spring 00060 from bearing bushing 00838.

Draw off upwards the bearing bushing from the shaft.

Unscrew nut 00063. Loosen locking washer 1.2 TGL 0 - 6799 from cocking lever 00831.

Remove cocking lever together with bushing 00832.

Loosen locking washer 2.3 TGL 0 - 6799 from transport shaft. Draw off upwards the transport shaft from the plate.

Loosen locking washer 1.2 TGL 0 - 6799 from shaft 00029, draw off downwards the shaft and upwards the toothed wheel from the plate.

Dismantling the Delayed-Action Device 00730

ATTENTION! Mark the tensioning position of spiral spring 00738.

Disengage the spiral spring and remove it.

Unscrew plate 00302.

Remove successively all gear groups from plate 00736.

Unscrew leaf spring 00307.

Dismantling the Mirror Mechanism 00710

Unhook both the upper tensioning springs.

Remove locking washers 1.5 TGL 0 - 6799 from the shaft riveted in the plate (one from upper groove of the shaft, and one between lever 00275 and lever 00713).

Draw off release lever 00712, lever 00713, and lever 00275 all together from the riveted shaft. Take care for washer 2 x 4 x 0.3 TKS 2001!

Loosen shoulder screw 00335. Remove torsion spring, washer, and both the levers.

3 - ASSEMBLY AND ADJUSTMENT

Assembly of the Prism Mount, Complete

All parts of the viewfinder system should be free from dust.

Put two springs 00249 - the camber directed towards the Fresnel lens - on the cast-iron lugs in the prism mount 00751. Insert Fresnel lens 159 006 - 17.16 after having deionized it with an antistatic cloth, and adjust the lens with the aid of shims 159 006 - 17.18 in order to guarantee its correct position. Screw on the frame

00232, and check cleanliness of the assembled parts.

Screw on indicating lever 00292 and washer 1.6 x 3 x 0.2 DKS 2001 by means of shoulder screw 00228 so that the lever is easily adjustable. Screw on two plates 00253 with shackle 00762.

Screw carefully the measuring mechanism 00007 with the aid of two low-head screws BM 1.4 x 4 DKS 2010 on the prism support and adjust it so that the indicator of the measuring mechanism stands in the center of the setting circle when the camera is in its normal position. The joints between prism support and measuring mechanism body should be sealed with glue against dust.

Assembly of the Mirror Mechanism 00710

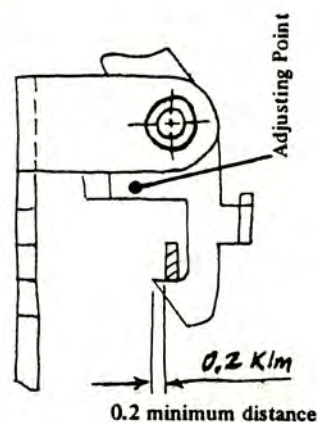
Put the torsion spring 00296 over the lug of the threaded bushing, the leg of the spring contacting the plate. Mount lever 00334, stop lever 00278, washer 1.6 x 4 x 0.2 DKS 2001, and torsion spring 00336 in this order on to the threaded bushing and fasten them by shoulder screw 00335.

Cock torsion spring 00296 and join it to the stop lever.

Cock torsion spring 00336 and join it to lever and stop lever.

Mount torsion spring 00295 on the shaft of plate, cock it transversely, join one leg of the spring to the upper angle of the buffer lever.

Insert lever 00713, washer 2 x 4 x 0.3 DKS 2001, and lever 00275 into



THIS SECTION PULLS OUT FOR EASY REFERENCE.

EXPLODED VIEW OF THE PRAKTICA LTL

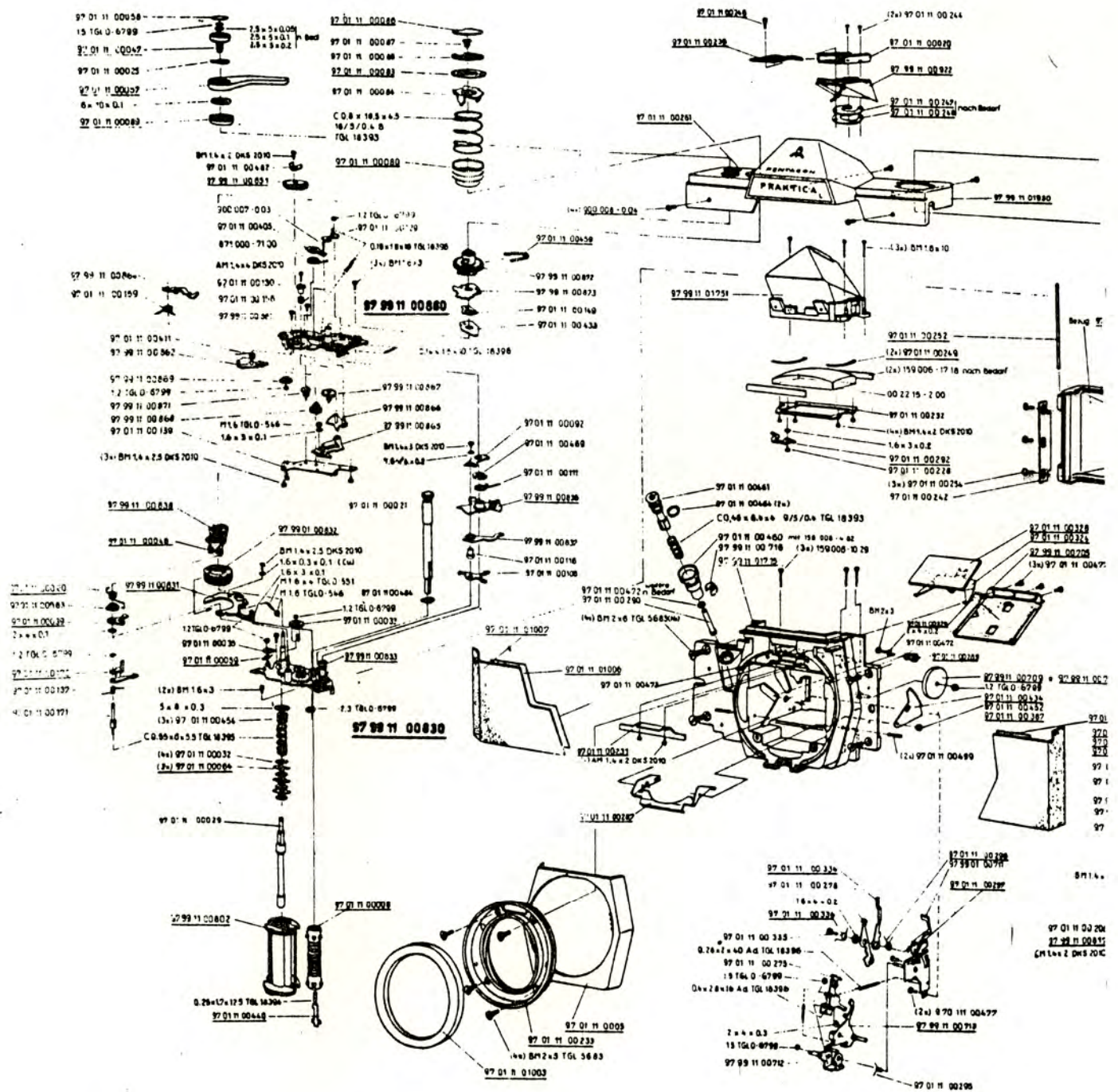
August, 1974

Hanimex Praktica LTL No. 182.004

PRICE LIST FOR SPARE PARTS FOR LTL

(Prices subject to change.)

970.111			40.36	Tube	.10
40.01	Housing	13.05	40.37	Cable, 130 mm	.10
40.02	Carrier	7.55	40.38	Additional part	.10
40.03	Mounting ring	.80			
40.04	Top cover	2.95			
40.05	Front cap	2.05	979.911		
40.06	Bottom cap	1.95	47.15	Carrier, rivet group	9.60
40.07	Metering mechanism	9.75	47.50	Prism holder, compl.	51.00
40.08	Cover	.30	47.52	Photoresistance, compl.	4.75
40.12	Spring	.10	47.90	Conductor plate, compl.	2.50
40.15	Lever	.25	48.01	Housing, rivet group	13.60
40.16	Lever	.10	48.03	Gear, die-casting group	.20
40.20	Swing	.35	48.08	Spring with toothed wheel,	
40.22	Resistance plate	.55		compl.	.60
40.23	Toothed wheel	.05	49.02	Axle, compl.	.30
40.24	Grinder	.45			
40.29	Cable, 150 mm	.10	979.911		
40.30	Cable, 110 mm	.10	49.30	Topcap, compl.	3.75
40.31	Cable, 140 mm	.10	49.43	Soldering terminal, compl.	.10
40.32	Cable, 150 mm	.10		Soldering group	
40.33	Tube, 15 mm	.10	49.43	Resistance, compl.	1.95
40.34	Tube, 40 mm	.10	49.45	Entry key, die-casting	
40.35	Pin	.10		group	.35



Pentacon Praktica L 182 007 97 99 11 02000

97 99 11 00910

EXPLODED VIEW OF THE PRAKTICA L

August, 1974

Hanimex Praktica L No. 182.007

PRICE LIST FOR SPARE PARTS FOR L

(Prices subject to change.)

970.111

10.01	Bottom cover	2.15
10.02	Prism holder	1.80
10.03	Insulating ring	.10
10.04	Holding ring	.55
10.06	Additional part	.10
10.07	Covering	.05

979.911

17.15	Carrier, rivet group	8.90
17.50	Prism holder	25.00
18.01	Housing, rivet group	12.35
19.30	Top cap, compl.	3.70

EXPLODED VIEW OF THE PRAKTICA LLC

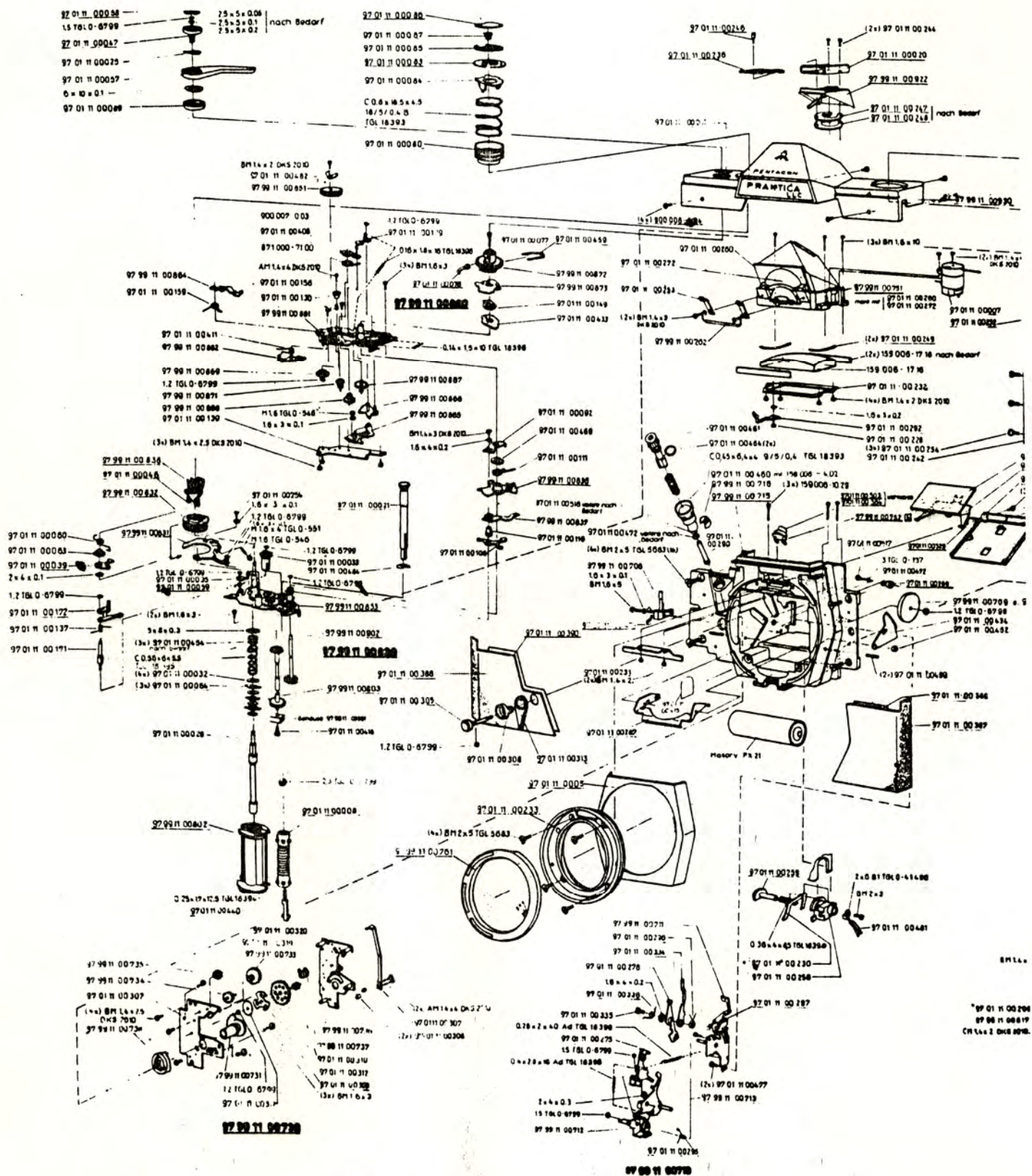
(See also pages 24, 25 and 26.)

August, 1974

Hanimex Praktica LLC Nr. 182.006 PRICE LIST FOR SPARE PARTS FOR LLC (Prices subject to change.)

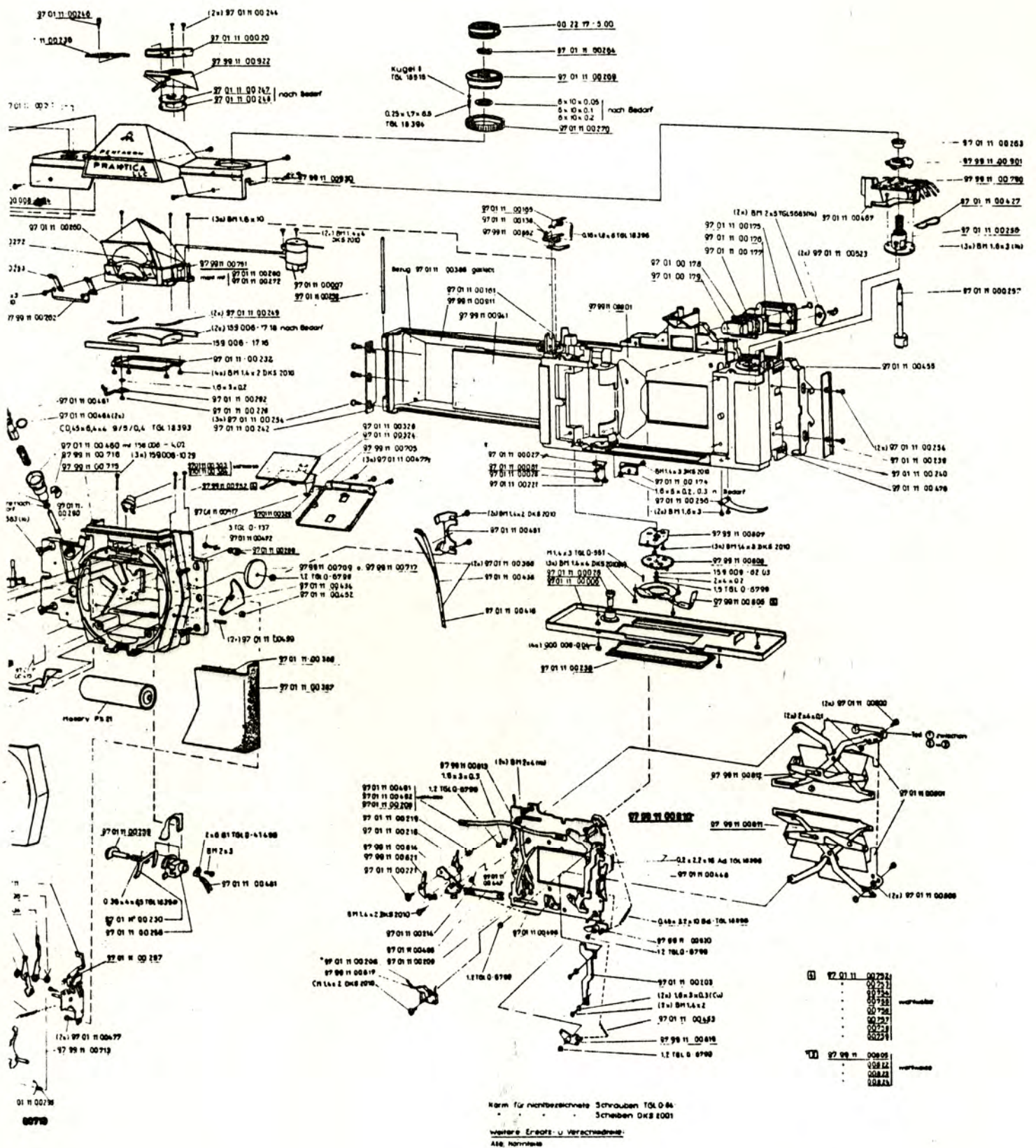
970.111

0.01	Housing	11.90	1.29	Lever	.10
0.02	Carrier	8.30	1.30	Bush	.05
0.05	Front cap	2.00	1.49	Segmental curve	.10
0.06	Bottom cap	2.20	1.53	Stop curve	.10
0.07	Metering mechanism	10.50	1.61	Axle	.20
0.08	Transport sprocket	.10	1.65	Carrying lever	.10
0.02	Accessory shoe	.80	1.71	Axle	.20
0.21	Transport axle	.60	1.72	Lever	.05
0.25	Spring disc	.10	1.74	Film advance mechanism	.10
0.26	Rewind button	.35	1.75	Mount	.10
0.27	Lever	.15	1.76	Disc	.10
0.28	Additional screw	.10	1.77	Mask	.10
0.29	Axle	.30	1.78	Frame	.10
0.32	Disc	.10	1.79	Magnifier	.30
0.33	Toothed wheel	.25	2.03	Slide E 2	.25
0.35	Stop spring	.10	2.06	Cable	.10
0.39	Lever	.15	2.09	Tube	.10
0.40	Axle	.20	2.14	Torsion spring	.10
0.43	Rivet	.10	2.16	Stop lever	.05
0.44	Bush	.65	2.19	Torsion spring	.10
0.45	Ratchet	.10	2.20	Rivet	.10
0.47	Screw	.50	2.21	Additional screw	.10
0.51	Toothed wheel	.10	2.28	Additional screw	.10
0.57	Wind lever	.85	2.30	Leaf spring	.10
0.58	Disc	.10	2.31	Additional sheet	.10
0.63	Nut	.25	2.32	Frame	.10
0.64	Disc	.10	2.33	Lens carrier	1.55
0.73	Axle	.55	2.35	Contact	.10
0.75	Bush	.25	2.36	Torsion sheet	.30
0.76	Driver	.20	2.37	Intermediate piece	.05
0.80	Button	.70	2.38	Cover	.10
0.81	Toothed disc	.10	2.39	Covering sheet	.25
0.83	Film speed dial	.50	2.40	Bolt	.50
0.84	Driver	.10	2.43	Contact	.15
0.85	Disc	.35	2.44	Countersunk screw	.10
0.86	Time dial	.50	2.46	Bolt	.10
0.87	Screw	.10	2.47	Disc	.10
0.89	Sleeve	.10	2.48	Disc	.10
0.92	Stop lever	.05	2.49	Spring	.10
0.93	Axle	.10	2.52	Hinge pin	.05
1.06	Ratchet	.10	2.53	Holding sheet	.10
1.16	Bush	.10	2.54	Stop screw	.10
			2.55	Rewind bush	1.00
			2.56	Leaf spring	.05
			2.57	Rewind axle	.35
			2.58	Bush	.10
			2.59	Contact bolt	.40
			2.60	Diaphragm	.10
			2.61	Viewing screen	.15
			2.63	Slotted nut	.10



Pentacon Praktica LLC
182 006

97 99 11 01000



Norm für nichtbezeichnete Schrauben TOL 0-84
Schrauben DKS 2001
weitere Ersatz- u. Verschleißteile:
siehe Handbuch

KOMPAGNE VON PENTAX DRESDEN

Stand vom 17.10.1970
3. Auflage

PRAKTICA LLC SPARE PARTS PRICE LIST (from page 23)

2.64	Slotted nut	.10	4.55	String for housing	.10	8.07	Axle, compl.	.20
2.69	Holding ring	2.00	4.59	Spring	.05	8.08	Spring with toothed wheel,	
2.70	Setting ring	.10	4.60	Bush	.55		compl.	.95
2.72	Light guiding segment	.20	4.61	Release button	.70	8.09	Grinder, compl.	.95
2.73	Lever	.50	4.64	Sheet	.10	8.10	Shutter, compl.	17.95
2.78	Stop lever	.15	4.67	Angle	.10	8.11	E 1 Curtain, rivet group	1.95
2.81	Bolt	.10	4.69	Spring housing	.10	8.12	E 2 Curtain, rivet group	1.95
2.82	Bolt	.10	4.73	Damping	.10	8.13	Platine, rivet group	6.05
2.87	Swing	.25	4.77	Stop screw	.10	8.14	Stop lever E1, rivet group	.25
2.89	Eccentric	.05	4.81	Cable, 150 mm	.10	8.15	Slide E 1, rivet group	.65
2.90	Plunger	.10	4.82	Indicator	.20	8.17	X-Contact, die-casting	
2.95	Torsion spring	.10	4.91	Tightening strap	.10		group	.50
2.97	Torsion spring	1.05	4.92	Tightening strap	.10	8.19	Transmission lever,	
3.05	Button	.25	4.94	Holder	.05		rivet group	.30
3.08	Bush	.35	4.99	Pin	.10	8.20	Transmission lever, E 2,	
3.09	Driver	.10	5.00	Additional screw	.10		rivet group	.30
3.13	Lever	.25	5.01	Additional piece	.10	8.21	Counter lever, rivet group	.15
3.24	Leaf spring	.10	5.03	Filter	.10	8.30	Winding gear, compl.	11.10
3.25	Hinge pin	.10	5.05	Disc	.10	8.31	Wind lever, rivet group	.90
3.26	Mirror	1.10				8.32	Bush, rivet group	1.15
3.34	Lever	.05	97 99 11			8.33	Platine, compl.	2.05
3.35	Additional screw	.10	7.03	Contact bush, compl.	.70	8.34	Tensioning disc,	
3.36	Torsion spring	.10	7.04	Release button, compl.	1.60		rivet group	.30
3.66	Tube, 40 mm	.10	7.05	Mirror base, compl.	.80	8.35	Toothed wheel, compl.	.30
3.68	Cable, 310 mm	.10	7.06	S1 - Switch, compl.	.80	8.36	Release disc, rivet group	.50
3.84	Filter	.10	7.07	S1 - Switch,		8.37	Release lever, rivet group	.15
3.86	Cover	.15		die-casting group	.35	8.38	Bearing bush, compl.	1.10
3.87	Cover	.05	7.09	Drive, compl.	.30	8.51	Counting disc,	
3.88	Cover	.05	7.10	Mirror drive, compl.	5.00		rivet group	.65
3.89	Base	.05	7.11	Platine, rivet group	.70	8.52	Counting disc,	
4.05	Plate	.10	7.13	Lever, rivet group	.80		rivet group	.15
4.09	Additional piece	.10	7.15	Carrier, rivet group	9.25	8.60	Braking mechanism,	
4.15	Disc	.10	7.17	Drive, compl.	.40		compl.	13.35
4.16	Tube, 15 mm	.10	7.30	Delayed action mechanism,		8.62	Anchor lever, rivet group	.40
4.18	Screw	.10		compl.	7.55	8.64	Stop lever, rivet group	.05
4.27	Stop spring	.10	7.37	Anchor, compl.	.50	8.72	Sleeve, compl.	1.30
4.28	Pot	.15	7.38	Spiral spring, compl.	.40	8.73	Timing curve, rivet group	.15
4.31	Contact spring	.20	7.50	Prism holder	48.50	9.00	Housing with braking	
4.33	Anchor cam	.10	7.51	Prism holder,			mechanism	72.50
4.34	Segment	.15		pasting group	24.45	9.01	Switch board, compl.	.75
4.38	Tube	.10	7.52	Photo resistance, compl.	7.10	9.02	Axle, compl.	.65
4.40	Driver	.10	7.61	Insulating ring, compl.	1.25	9.10	Back, compl.	3.50
4.47	Leaf spring	.10	7.90	Conductor plate, compl.	3.50	9.11	Back, pasted group	3.05
4.48	Leaf spring	.10	8.01	Housing, rivet group	12.45	9.22	Intermediate piece,	
4.51	Holder	.10	8.02	Film spool, compl.	.50		rivet group	.35
4.52	Bush	.10	8.03	Gear, die-casting group	.40	9.30	Top cover, compl.	3.75
4.53	Tension spring	.10	8.04	X-Contact, compl.	.60	9.41	Film pressure plate,	
4.54	Disc	.10	8.05	Electronical control	3.70		rivet group	.55

EXPLODED VIEW OF THE PRAKTICA SUPER TL

August, 1974

Praktica Super TL No. 159.006

PRICE LIST FOR SPARE PARTS

FOR SUPER TL

(Prices subject to change.)

159.006

0.11	Shield	.50	21.00	Axle, compl.	2.65
10.07	Bottom sheet	1.35	21.03	Insulating disc	1.30
10.08	Covering	.10	22.00	Curve, rivet group	1.00
10.16	Disc	.10	23.00	Top cap, compl.	17.05
10.22	Disc	.10	23.01	Additional part	.10
10.23	Disc	.10	24.00	Front cap, compl.	2.60
10.24	Disc	.10	25.00	Toothed wheel,	
10.27	Cover	.05		die-casting group	.15
11.00	Setting disc, rivet group	1.90	26.00	Conductor plate	2.55
12.00	Battery housing, rivet group	1.35	27.00	Photo resistance	4.05
12.04	Cable	.10	27.02	Photo resistance	2.85
13.00	Button, compl.	1.30	30.00	Carrier, compl.	1.40
13.03	Leaf spring	.05	31.00	Smoothing resistance	1.00
14.00	Frame, pasted group	7.90	31.02	Eyelet	1.15
14.03	Cap	2.50	31.04	Cable	1.50
15.00	Film reference disc	.50	32.02	Cable	.10
16.00	Top cap, rivet group	4.70	34.00	Contact spring	.35
16.01	Top cap	2.95	40.01	Screw	.10
16.13	Disc	.80	48.00	Spring, rivet group	.15
17.00	Prismholder, compl.	1.00	50.02	Cover foil	.10
17.01	Prismholder	3.20	60.00	Shutter, compl.	15.25
17.03	Metering mechanism	9.85	68.00	Platine, rivet group	2.70
17.07	Mask	.10	102.00	Mirror gear, compl.	3.65
17.08	Frame	.10	104.00	Lever	.35
17.09	Frame	.10	108.00	Bearing, compl.	1.20
17.15	Fresnel lens (now DKS 2215 - 3.00)	3.50	108.01	Bearing	.15
17.16	Fresnel lens	3.50	108.02	Lever	.60
17.17	Tube	.10	108.03	Axle	.10
18.00	Mount, compl.	1.70	111.00	Contacts, compl.	.75
19.00	Prism, compl.	18.00	111.01	Cable	.10
20.01	Film gate	1.25	111.02	Cable	.10
20.02	Cover sheet	.35	120.03	Pressure lever	.20
20.07	Cover sheet	.30	120.05	String	.10
20.15	Bush	.10	121.00	Lever, rivet group	.85
20.17	Insulating tube	.10	122.00	Setting lever, compl.	.25
			125.00	Housing, rivet group	14.55

PRAKTICA SUPER TL SPARE PARTS PRICE LIST (from page 19)

158.009

0.01	Reminder dial	.30
0.02	Shaft spring	.10
0.03	Setting ring	.25
0.17	Bush	.10
5.00	Rapid wind lever	1.05
5.01	Grip – plastic	.10
10.10	Pin	.10
10.14	Guiding rail	.45
10.21	Bottom nut, new	.35
60.13	Tension spring	.10
60.14	Return catch	.35
60.20	Shanked spring	.10
60.29	Stop spring	.10
60.31	Control sheet	.10
102.01	Tensioning spring	.10
130.00	Back striped	6.90
130.01	Covering striped	.05
130.02	Covering (small back)	.10

DKS 2208

1.00	Flash light nipple	.25
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DKS 2218 Carrying eyelet

DKS 2217

1.00	Rewind button	1.65
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159.009

0.10	Light protecting cap, rubber	.15
0.04	Cap	.80
4.06	Mirror	.65
4.07	Accessory clip	.10
4.17	Cover	.10
4.12	Shaded cone	.10
4.23	Cover	.10

158.007

10.01	Time dial	.30
23.00	Braking mechanism	6.15
28.00	Sprocket, compl.	.80
52.00	Toothed wheel, rivet group	.50
53.00	Shutter, rivet group	1.00
76.00	Spur wheel	1.15

158.004

10.15	Leaf spring	.55
15.00	Protecting ring	1.65
42.00	2nd curtain	2.10
46.00	1st curtain	2.30
60.37	Driver	
61.00	Double lever	.50
64.00	Counting disc	1.25

156.000

0.07	Bearing disc	.10
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155.000

0.47	Lens plate, spared	.65
0.58	Spring	.10

156.009

0.02	Indicating lever	.10
0.03	Tensioning spring	.10
0.53	Grub screw	.10
90.01	Additional ring	.10
90.02	Safety lever	.10
90.03	Tensioning spring	2.00
94.00	Ratchet group	.50
65.02	Shanked spring	

183.000

15.14	Stop disc	.10
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the release lever 00712, center them by means of the auxiliary mandrel and assemble them on the shaft.

Fasten by two locking washers 1.5 TGL 0 - 6799. Hook torsion spring 00295 in the release lever. Hook in tension spring. Adjust 0.2 minimum distance of the stop lever.

Assembly of the Delayed-Action Device 00730

Mount on plate 00736 the gear groups as follows:

97 99 11 00731, 97 99 11 00733 (gear upwards), 97 99 11 00735 (gear upwards), 97 99 11 00737 (anchor downwards), 97 99 11 00734 (gear downwards), 97 99 11 00732 (gear downwards).

The group 00732 comprises 00309, 00310, 00311, 00312 and 1.2 TGL 0 - 6799.

Insert pins of the gear groups into the bores of the plate 00302, fasten the plate by screwing. Hook in torsion springs 00319 and 00320.

Functional Test: After deflection the levers have to be returned easily into their starting position by the appropriate spring.

Assemble leaf spring 00307.

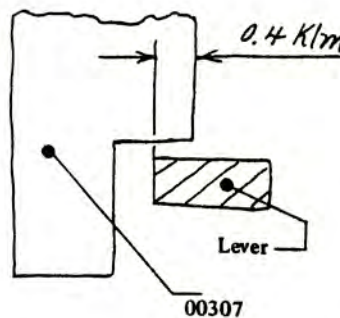
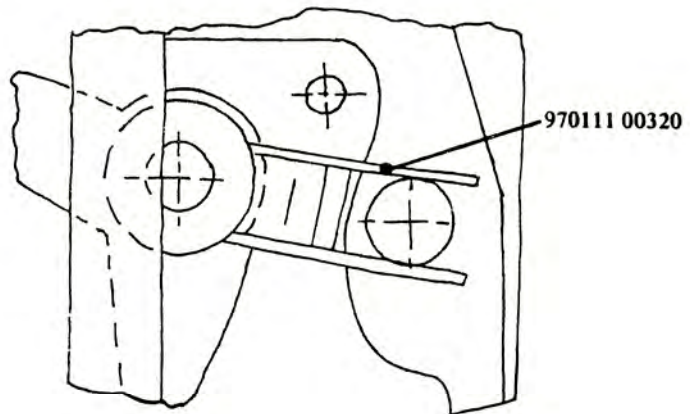
Adjust the leaf spring with screwing so that the levers after the spring has been lifted is allowed to engage with a minimum distance of 0.4 (lever is moved by the torsion spring 00319).

The leaf spring is lifted by pressing the knob 00305 (Screw in the knob together with lever 00313 and bushing 00308.).

When the leaf spring is lifted, the minimum distance of 0.2 above lever and a maximum distance of 10.5 (see drawing) has to be observed.

In case of these distances not being attained, adjust them by bending the leaf spring above the point of application of the knob. After the lever having released the leaf spring the latter has to bear unobjectionably on the armature wheel.

Put on spiral spring 00738, cock it to the marking (see Dismantling the Delayed-Action Device) and engage it.

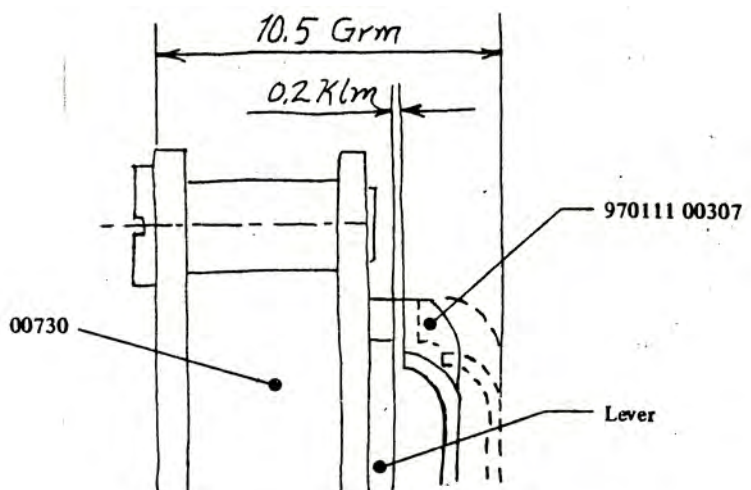


Functional Test: Cock the delayed-action device (leaf spring must retain the gear chain properly). Lift the leaf spring by pressing the assembled knob and allow the delayed-action device to run down.

After the lever having released the leaf spring, the delayed-action device should be stopped immediately.

Subsequently, lift again the leaf spring. Delayed-action device should then still run somewhat (excessive lift).

If required, re-adjust the leaf spring as to this text.



Assembly of the Cocking Mechanism 00830

All bearing points and toothed wheels should be lubricated.

Check the toothed wheels of plate 00833 for proper running.

Assemble stop cam 00035. Assemble spring disk 00484 (camber upwards) with transport shaft 00021. Insert toothed wheel 00033 into the plate. Put on the shaft 00029 component parts as follows:

Four disks 00032 and three disks 00064 alternately. (Disks 00032 should be completely free from grease and any burrs.)

Compression spring C 0.5 x 6 x 5.5 TGL 18395, disk 00454 (as required), washer 5 x 8 x 0.3 DKS 2001.

Push from below the shaft pre-assembled in this manner through the bore of the toothed wheel and secure it by locking washer 1.2 TGL 0 - 6799.

Check the moment of friction $M_d = 200 \text{ pcm} + 50 \text{ pcm}$ (Static friction).

Adjust the friction by washers 00454.

Insert cocking lever 00831 between washer and toothed wheel of bushing 00832 and put it assembled in this manner on the shaft of the plate. Put on lever 00039 (angle upwards), fasten nut 00063 by screwing. Check free run of the lever. Put on torsion spring 00060, slip over bearing bush-

ing 00838, cock the return spring by half a revolution.

Assemble latch 00106 and bushing 00116, bear the spring below it on the latch.

Assemble release lever 00837, torsion spring 00111, and spring box 00469. Put on stop lever 00092, and hook the short end of the spring ling (see Dismantling the Cocking Mechanism).

Screw on the stop lever in the position marked during dismantling (see Dismantling the Cocking Mechanism).

Assembly and Adjustment of the Slow-Down Mechanism 00660

Put torsion spring 00411 on armature lever 00862, subsequently insert it into the plate. Insert the gears 00871, 00867, and 00868 into the plate. Insert segment 00866 into the lever for short shutter-speed setting 00865, insert them all together into the plate.

Put on plate 00139 and fasten it by screwing. Put gear 00869 on the shaft of the plate and secure it by locking washer 1.2 TGL 0 - 6799.

Assemble lever 00129.

Put armature cam, segment cam, shutter-speed setting cam on the bushing.

Assemble locking lever 00864.

Slip torsion spring 00156 on bushing 00130, the short end of the

spring engaging the slot of the bushing; fasten it to plate by means of the flat-head screw AM 1.4 x 4 DKS 2010.

Bear the long end of the spring on the bolt of the setting lever for short shutter-speeds.

Put sleeve 00872 on bushing and secure it by spring 00459.

Hook in two tension springs.

Order of Adjustment: Adjust slow-down mechanism to indexed position 1 sec. Press on spiral spring 871 000 - 7100 prestressed with an angle of 180° .

Hook the end of the spring in the slot of the plate, load it and secure it by lacquer. Load the torsion spring 00156.

Setting lever for short shutter-speeds 00865 must bear properly on the shutter-speed cam by elasticity.

Adjust free run of the armature wheel (adjusting point "Z"), relating to indexed position $1/30 \dots 1/125 \text{ sec}$.

Adjust free run to "A" (adjusting point "Y"), with respect to indexed position $1 \dots 1/15 \text{ sec}$.

If the armature engagement (adjusting point "X") is changed once more, check again free run "a" and adjust it, if necessary.

Assembly of the Support

Assembly of the Rocker

Assemble cover plate 00231. Insert rocker 00287 into the support. Insert pin 00499 (with knurled brim to the outside) into the right bore and secure the position of the rocker.

Insert the second pin 00499 into the left bore, attach subsequently bushing 00452 and segment 00434, and fasten the position of the rocker.

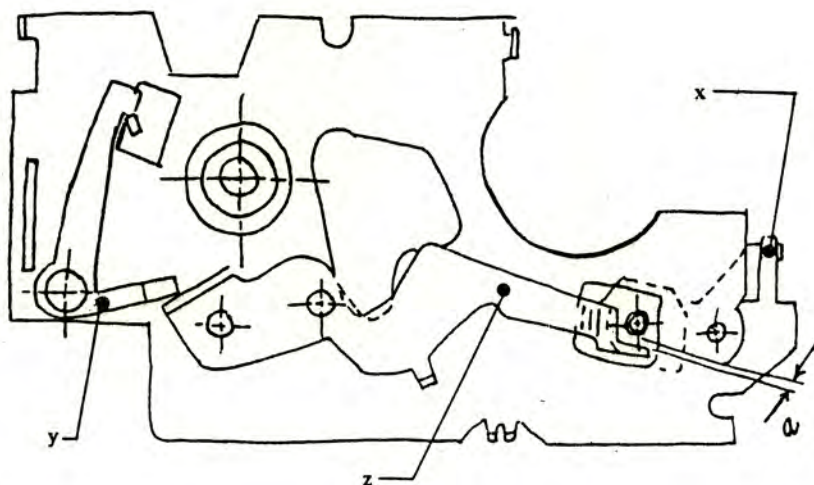
Drive in both pins according to the circumference.

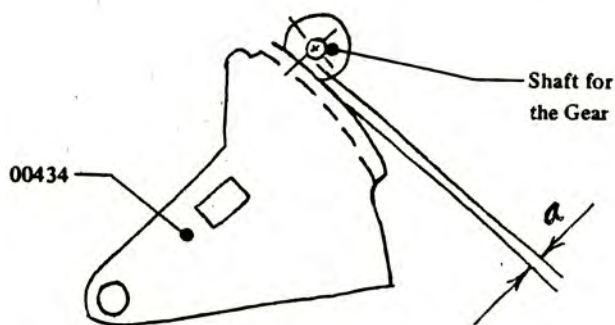
Assemble the gears 00709 and 00717. Grease slightly the bearing points for gear and teeth at the segment.

Distances for the gear between shaft and segment:

$a = 0.65 = 00709$ (10 teeth)

$a = 0.65 = 00717$ (11 teeth)





ATTENTION! The gear which perhaps has been replaced should have at the pinion the equal number of teeth (10 or 11) as compared with the original gear.

Assembly of the Mirror Mechanism and Mirror

Assemble the mirror mechanism 00710. Grease slightly the contact points between the mirror mechanism and rocker or release lever. Insert the lower bolt of the mirror mechanism in the fork of the rocker. Then check the distance "a" (see Dismantling the Support, above) of the lever 00334. If required adjust the lever 00334 below the bend by bending.

Insert mirror 00326 into the mirror bottom 00705 and fasten it by leaf spring 00324.

Insert mirror bottom with mirror into the support, push it towards the marks (see Dismantling the Support) and fasten it by screwing.

Slip torsion spring 00329 on hinge

Slip torsion spring 00329 on hinge pin of mirror bottom and load it.

Assemble bushing 00460 with release button 00461.

Functional Test:

(a) Release button should be properly lockable.

(b) Check distance $1 = 0.3$ (equals distance between pressure point and release point). Adjust by washers 00472 and 00510.

(c) Push lever 00275 forward to the stop.

Release mirror mechanism by means of the release button.

Mirror bottom must be hinged upwards and retained unobjectionably

by bounce lever by moving the rocker forward.

Return mirror into its starting position and the rocker, too, by shifting the stop lever at plate 00711 to the left side.

Check repeatedly, also with the camera upside-down.

Check the 45° position of the mirror. Adjust it by turning the eccentric 00289. Turn the eccentric only in clockwise direction.

Assembly of the Lens Carrier

Assemble the lens carrier 00233 (pressed to front cap 00005).

When exchanging lens carrier or front cap, adjust both the parts by centering them, put them on the carrier and fasten the lens carrier on the front cap with a long countersunk screw. Exchange long countersunk screws.

Optical Adjustment

Adjust with the aid of the autocollimator. Check the setting of the autocollimator. Insert the support into the mount and put the plane mirror on the three setscrews.

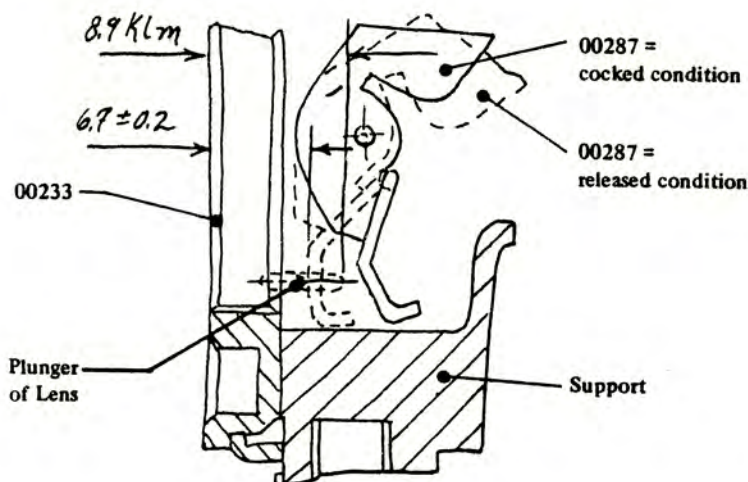
By turning the setting screws, adjust the position of the plane mirror so that (1) reticule (for parallel measurements) is within the small tolerance circle, and (2) maximum distinctness of the second reticule — its distance is not adjustable — is obtained at the collimator value 47.5 ± 1 division mark.

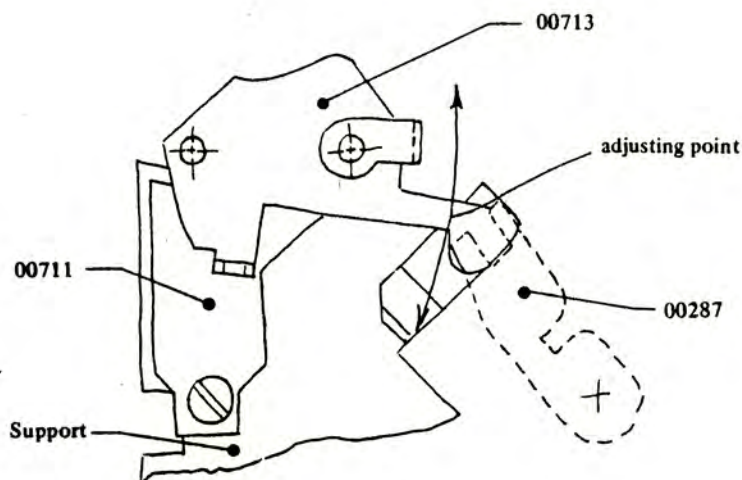
Check the adjusted value at the collimator by turning the setting knob. If the reticule of the collimator is indistinct (deformed mirror), measure separately the vertical and horizontal marks. Admissible difference between the marks: 3 division marks in the collimator. The mean value should be within the tolerance admissible for the Infinity value. Secure the setting screws by lacquer.

Optical Checking with the Complete Camera

For this purpose, the complete prism mount and the viewfinder have to be assembled.

Put in the lens with focal length $f = 50$ mm. With the lens setting of Infinity, the collimator value should be 50 ± 6 division marks.





Checking the Rocker Dimensions

8.7 minimum distance in cocked condition;

6.1 ± 0.2 in released condition.

If these values are not obtained, adjust the lever 00713 of the mirror mechanism by bending it.

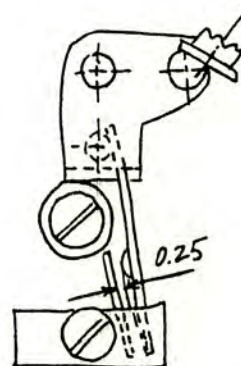
position by 0.5 mm and 0.5 mm before it reaches the pressure point.

Adjust by changing the location of the S1 switch.

Assembly of the Prism Mount, Complete, in the Support

When inserting, take care that the indicating lever 00292 is introduced into the opening of the lever 00275 when the mirror mechanism is cocked.

Screw the prism mount in assembled condition on the support. Lay the red cable of the measuring mechanism upwards between the casing of the measuring mechanism and the support.



Shutter Release in rest position.

Assembly of the S1 Switch

When dismantling the S1 switch 00706, the contacts must be closed. Contact force about 30 p. If required, adjust at the thick contact spring.

Cock the mirror mechanism at lever 00275, release the mirror bottom at lever 00334. Insert the cast dog of the S1 switch into the bore of the support.

Fasten the S1 switch by cylindrical head screw BM 1.6 x 5 TGL 0 - 84 together with washer 1.6 x 3 x 0.1 DKS 2001.

When the shutter release is in its rest position the contact is opened. The contact becomes closed when the shutter release has left its rest

Assembly of the Battery Connection

Insert both the cables of S1 switch and cable 00368 (blue) into the groove of the support so that the thick red cable is positioned at the top. From the right wall of the mirror chamber the length of the cable is about 68 mm.

Insert bushing 00258 with screwed-in contact bolt 00259, compression spring and soldering lug with leaf spring 00230 into the recess of the support.

Solder the red cable 00374 (of the S1 switch) and one cable 00481 (red) to the soldering lug of the contact bushing.

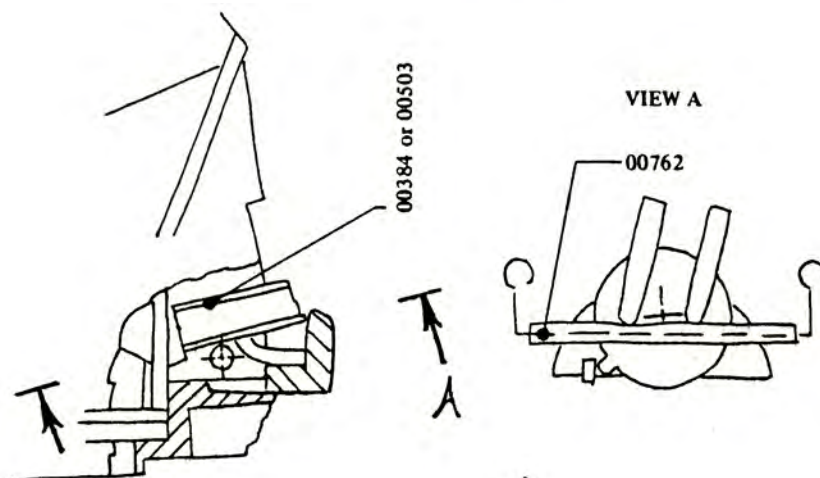
Lay both the red cables in a bend to prevent their disruption when the battery contacts are actuated. Cover the cables 00368, 00375, 00481 by one hose 00416 (15 mm long).

Assembly of Photoresistor and Insulation Ring

Lift the cover and put filter 00384 (light) or 00503 (dark) in the upper recess of the light guiding segment. Insert photoresistor 00752 or 00753 ... 00759 into the light guiding segment.

ATTENTION! Don't bend immediately at the photoresistor the cables which are emerging from it.

Designation of the photoresistors and EST groups:



EST group	Marking Color	Photo-resistor	Filters		Designation
			(light) 00384	(dark) 00503	
00805	red	00752	x		A1
		00753		x	A2
00822	yellow	00754	x		B1
		00755		x	B2
00823	white	00756	x		C1
		00757		x	C2
00824	blue	00758	x		D1
		00759		x	D2

The photoresistors are marked on their back sides.

The group of the photoresistor (e.g., A) for selecting the appropriate EST-group (see Assembly of the Spring with Toothed Wheel and EST-Group) is marked on the support beside the lower left setting screw by means of a copying pencil. This marking should be given again after any change.

Draw both the cables of the photoresistor through the 4 mm diameter bore of the lens mount. Draw all three cables of the insulation ring 00761 through the bore of the lens carrier and place the pin of the insulation ring in the bore of the lens carrier.

Press the insulation ring into the lens carrier, taking care that all five cables are not jammed!

ATTENTION! When pressing-in the insulation ring place the carrier so that it is neither bent nor the hinge damaged.

The insulation ring together with its contact paths must recede against the lens face.

Cable Wiring

Push one hose 00366 (40 mm long) between prism and measuring mechanism to the upper edge of the carrier, and push all the eight cables (except the cable of the measuring mechanism) through the hose.

Place mount 00451 over the hoses 00366 and 00416 and fasten it by two flat-head screws BM 1.4 x 2 DKS 2010.

Push over the outgoing cables one hose 00438 (5 mm long). Push one hose 00366 (40 mm long) over six cables (except the yellow and blue cables).

Assembly of the Delayed-Action Device and Adjustment of the Release Mechanism

Slightly grease the joint between delayed-action device (running sur-

face) and riveted bolt in the release lever 00712 (mirror mechanism). Wire blue cable between the medium cast dog and battery wall adjacent to the right side of the lower cast dog so that it emerges downwards.

Assemble the delayed-action device 00730 in the support.

Lever of the delayed-action device must be placed above the bolt in the release lever (don't jam the blue cable).

Fasten the delayed-action device by three cylindrical head screws BM 1.6 x 3 TGL 0-84.

Cock the mirror mechanism and delayed-action device. Release the delayed-action device with button 00305. The delayed-action device should release properly the mirror mechanism.

The mirror mechanism should be released with a distance of maximum 1 mm (see drawing). If required, adjust by bending the lever.

After the delayed-action device has run down and the mirror mechanism has been released, the bolt should leave the lever.

Check the running time of the delayed-action device = 8 . . . 15 s., using a stop watch.

Assembly and Adjustment of the Camera

Assembly of the Shutter

Check the paths for the lamina as well as the points of contact for the plate of the shutter to be free from damage and contamination (e.g., grease).

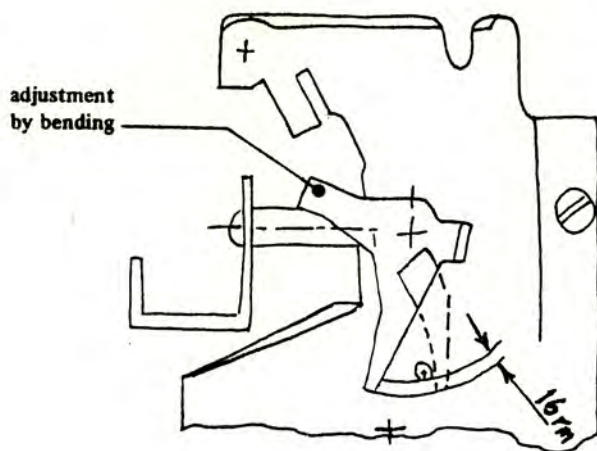
Check the shutter to be provided with the leaf springs 00447 and 00448.

Insert the shutter 00810 only in its released condition into the body!

Simultaneously place the cable 00206 of the X-contact.

ATTENTION! The stop bolts of both the curtains must protrude from below through the slots of the plate and should not be jammed by switching lever or leaf spring of the X-contact.

Screw on the shutter. The screws must be nickel-plated.



Successively, with the aid of an adjusting wrench, check the curtain E 2 00812 and the curtain E 1 00811 for their good running qualities within the body by slowly cocking and releasing them.

Assembly of the Shutter with the Previously Assembled Cocking Mechanism 00830

(See Dismantling the Shutter Mechanism.)

Cock the cocking mechanism, release the shutter.

Hold the shutter at the spring mount of the E 2 tension spring and insert it with the stop latches ahead in the body.

Observe with this process the position of the cocking bands 00208 and 00491 or 00492 as well as the position of the release lever 00837 regarding the switching lever 00821 of the shutter.

Place the shutter plate into the bottom of the body by taking care for the stop latch of the curtains as mentioned above.

After having screwed on the shutter by means of the adjusting wrench, successively cock E 2 and E 1.

Hook the cocking band into the shutter.

Assembly of the X-Contact

Hook the long leg of the spring of the torsion spring into the switching lever. Simultaneously with the insertion of the X-contact 00817 cock the spring of the switching lever by placing the X-contact on the short leg of the spring.

ATTENTION! Take care for the correct position of the element mounted to prevent distortions of the contact as well as its position regarding the riveted leaf spring of the shutter plate. For supporting the plate while screwing on the contact, use the assembly tool.

Assembly of the Cocking Mechanism

Lubricate the bearing points in the bottom of the body for the transport-roller and film-spool shafts. Insert the film spool 00802 into the body (the brackets are directed towards the front and back sides of the camera).

Mount transport roller 00008 (slotted front face below).

Lubricate at the cocking mechanism 00030 the bearing points for film spool and transport roller at both the shafts of the mechanism as well as the driving chain.

Cock the cocking mechanism.

ATTENTION! To avoid jamming of the latch 00106 swivel it out somewhat during the first half of the cocking process.

According to the marks of the shutter on the plate, hook the cocking band true to side into the cocking mechanism within the range between image and lower plate edge.

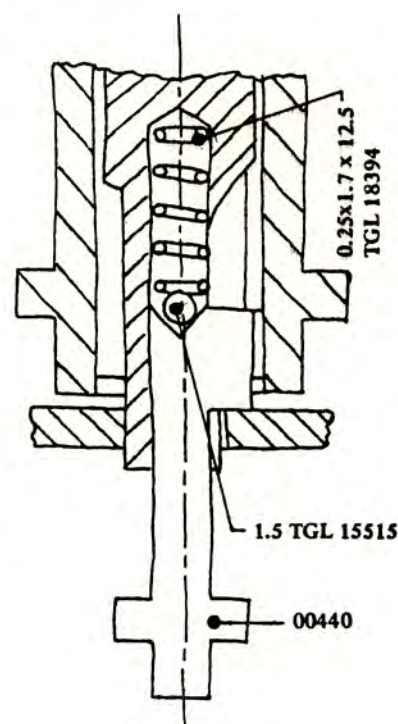
Turn the driving lugs of all three operational disks of the film-spool shaft in longitudinal direction of the plate.

Insert the cocking mechanism with the shafts through the body into

the transport roller and film spool so that the operational disks are introduced into the film spool.

From the bottom of the camera put the compression spring 0.25 x 1.7 x 12.5 TGL 18394 into the bore of the transport roller shaft.

In case of cameras where the operational point of the dog 00440 to the compression spring — contrary to the exploded view — is provided with a recess, put a ball 1.5 TGL 15515 on the compression spring in the transport roller shaft before assembling the dog.



SHUTTER TYPE	I	II	III
CONFIGURATION OF THE COCKING BAND			
COCKING BAND NUMBER	00491	00203	00492
EFFECTIVE LENGTH	SHORT	MEDIUM LENGTH	LONG

Turn one slot of the transport roller so that it coincides with the slot of the shaft below it, push the dog through the bearing points in the bottom of the body and into the transport roller shaft.

Continue pushing the cocking mechanism and insert the shaft into the bearing points of the body, taking care for the position of cocking band and release lever 00837 to the switching lever 00821 of the shutter.

Fasten the plate of the mechanism by two cylindrical head screws and one shaft 00171.

Check the operation of the film spool:

$$M_d = 200 \text{ pcm} + 50 \text{ pcm}$$

If required, re-adjust as explained in Assembly of the Cocking Mechanism.

Adjustment of the Cocking Path of the Shutter

Preparing the Adjustment

With the aid of the adjusting wrench cock successively curtain E 2 and curtain E 1.

Lubricate the cocking band bearing point at the shutter.

Hook the cocking band into the shoulder rivet of the shutter,

Release the shutter by swivelling out the latch 00106 at the shutter mechanism.

Adjusting Requirements

When cocking the camera take care for the locking bolt of the E 1.

In case of maximum cocking path, the bolt should run to the end of the plate slot. If at this point the bolt is already tilted, then the cocking path is too long. In case of minimum cocking path, the locking bolt of the E 1 should have a maximum distance of 0.2 mm from the end of the slot of the plate.

Performance of Adjustment

Cock the camera so that the outer edge of the lever in which the cocking band is suspended from the cocking mechanism is about parallel to the back side of the body.

By this, the adjusting point becomes accessible.

Loosen the cylindrical head screw 00254. Loosen by means of the screwdriver with sleeve the contact nut of the threaded pin M 1.6 x 4 TGL

0-551 and adjust the cocking path by changing the position of the threaded pin according to requirement.

Then retighten the contact nut and the cylindrical screw.

If in case of repair of the shutter the adjusting range at the cocking mechanism is not sufficient, then use another cocking band with another element number.

When by exchanging a complete shutter, a shutter with another designation has been mounted, also the cocking band must be replaced.

In both the cases, the cocking mechanism has to be dismantled.

Checking the Shutter Function

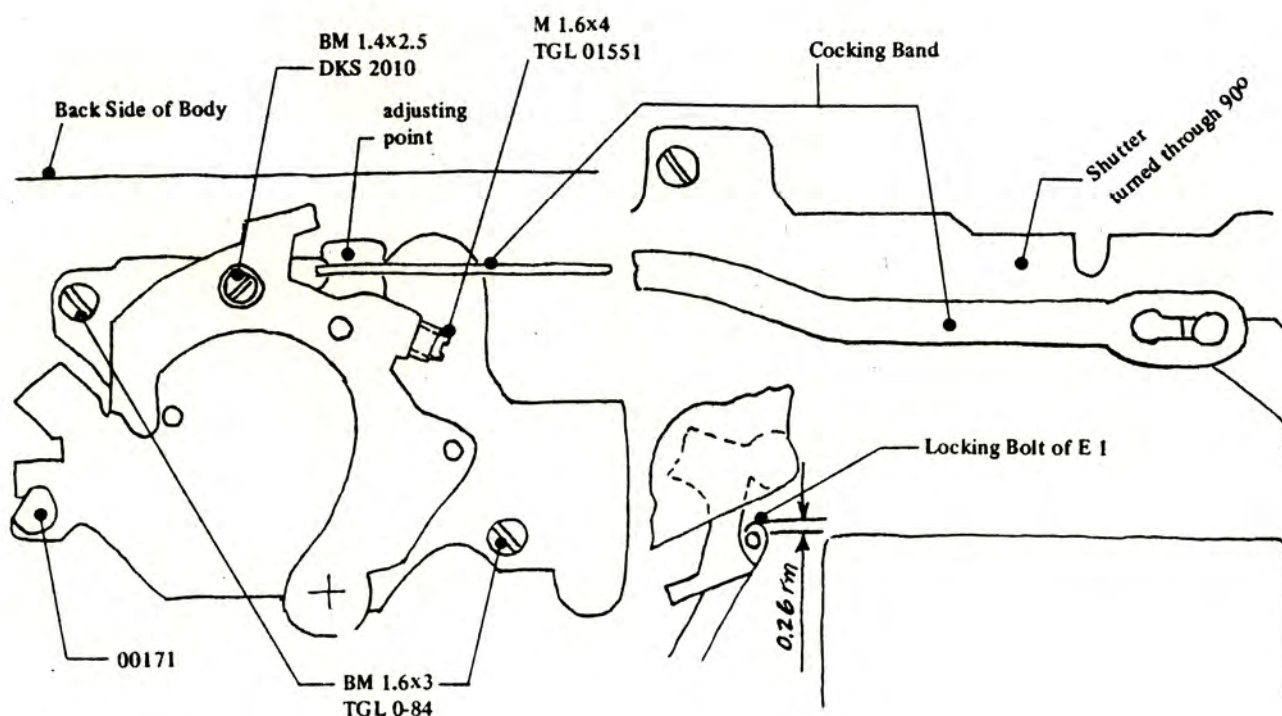
Cock repeatedly the camera and release it again in order to check the proper operation of levers, latches, springs, and laminas.

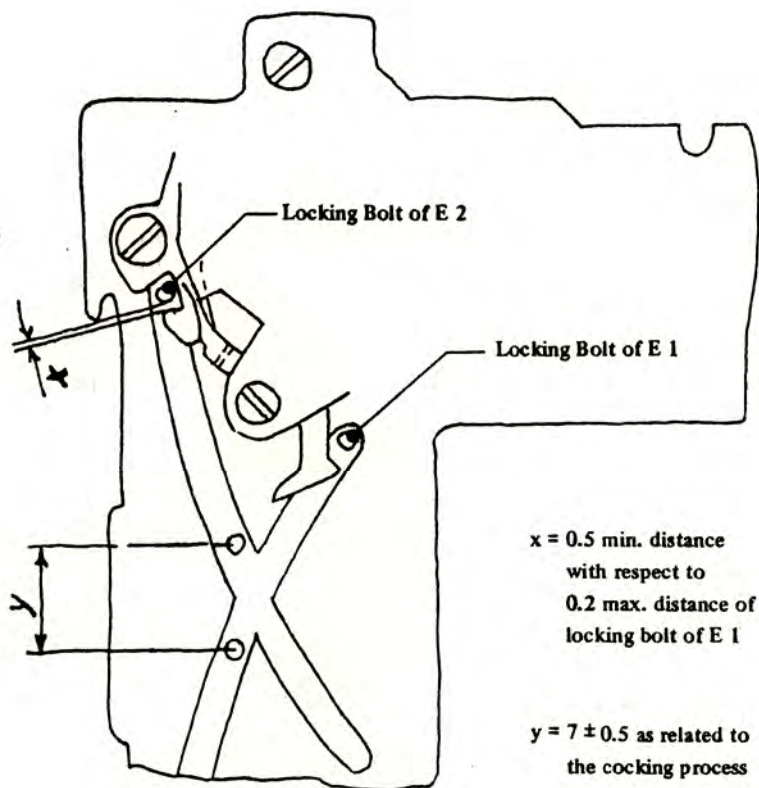
During the cocking process no "hard points" should be felt.

Overlapping of the curtains during the cocking processes measured over the vertical distance between both the locking bolts:

$$7 \text{ mm} \pm 0.5$$

When cocking, please check visually whether the overlapping of the cur-





tains is not reduced even up to the upper edge of the image window.

In maximum cocking position:

- E 1 – measure of locking bolt
0.2 max distance
 - E 2 – measure of locking bolt
0.5 min distance
- (See drawing below, right.)

Adjustment of the Flash Contact

Contact Forces

In its cocked condition the contact gap of the shutter between the cast-in contact springs of the flash contact has a minimum distance of 0.3. In its released condition the contact is closed without having been pre-cocked provided the insulation hose 00209 has not been assembled. This insulation hose effects the necessary pre-cocking.

Contact force of the leaf spring at the upper contact point with the shutter cocked is 15 ... 20 p.

Contact

Release slowly E 1 with the aid of the adjusting wrench. In the direction of release the contact must be closed within a range of 1 mm before and 2 mm behind the edge of the

image window. (2 mm = top point of bore in the shutter plate).

In released condition of the curtain E 1, the contact must be available permanently. When cocking the shutter, the lower contact must be open before the upper one is closed.

Adjustment of the Curtain Speeds

General

Before adjusting the shutter speeds the curtain speeds must be adjusted.

Technical Requirements

The speeds of both the curtains are measured based on a height of 22 mm of the window at the center line of the window.

The width of both the light gaps of the measuring device must not exceed 0.15 mm with respect to the level of the curtain.

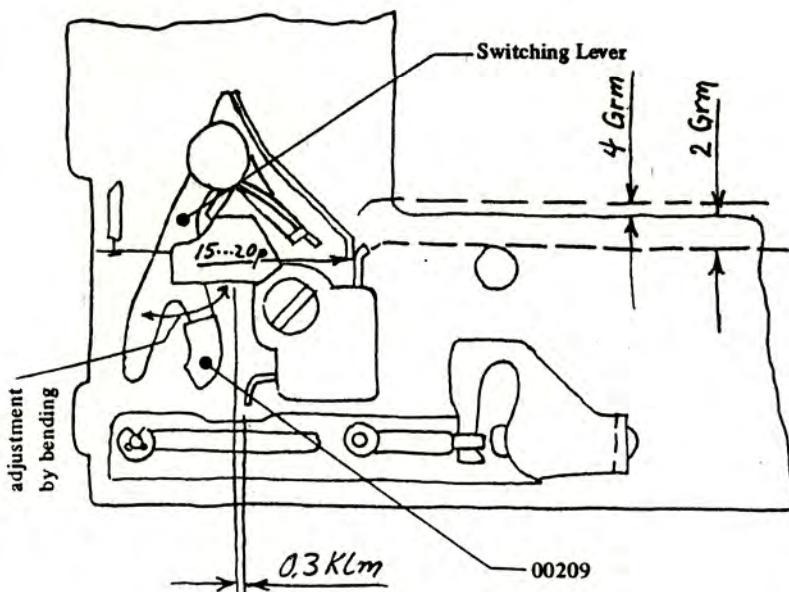
Performance of Adjustment

In principle, the speed of the curtain E 1 must be adjusted without spring 00496

(t_{E1oF})

and with this spring

(t_{E1mF}) .



With unhooked tension spring 00496:

$$t_{E1_{OF}} = 7.2 \text{ ms} \pm 0.1 \text{ ms}$$

Adjustment by varying the spring load of the tension spring 00453 of E 1 by bending the upper mount of the spring.

With hooked-in tension spring 00496:

$$t_{E1_{mF}} = \text{nominal value } t_{E1_{OF}} + 0.2 \dots 0.3 \text{ ms.}$$

Adjusting point: Adjustment by bending the mount of the tension spring 00496:

Speed of E 2:

$$t_{E2} = \text{nominal value } t_{E1_{mF}} + 0.1 \text{ ms.}$$

Adjusting point: Upper mount of the tension spring 0.45 x 3.2 x 10 Bd - TGL 18396 of the E 2.

After adjustment, the mount must not protrude over the upper edge of the body (to allow insertion of the cover).

ATTENTION! Adjustment by bending must be possible within a range of about $\pm 5^\circ$; otherwise inadmissible friction will occur.

Adjustment of the Shutter Speed 1/1000 sec.

General

Adjustment of the shutter speed 1/1000 sec. must only be done by adjusting the speed of the E 2 and the engaged position of the E 1 with respect to the image window. Adjustment at other points is not permissible because adjustment of the longer shutter speeds then will be questioned.

Technical Requirements

For scope of measurements, tolerances of the rated value and the degree of difference please see Adjustment of the Shutter Speeds – Technical Requirements.

Performance of Adjustment

Measure the shutter speed 1/1000 s. in the "starting" and the "end" position. If necessary, improve the parallelism by correcting the speed of the E 2 (as mentioned under Adjustment of the Curtain Spring), i.e., providing equal measuring values.

Adjust the rated value by adjusting the locking lever of E 1 0 0814.

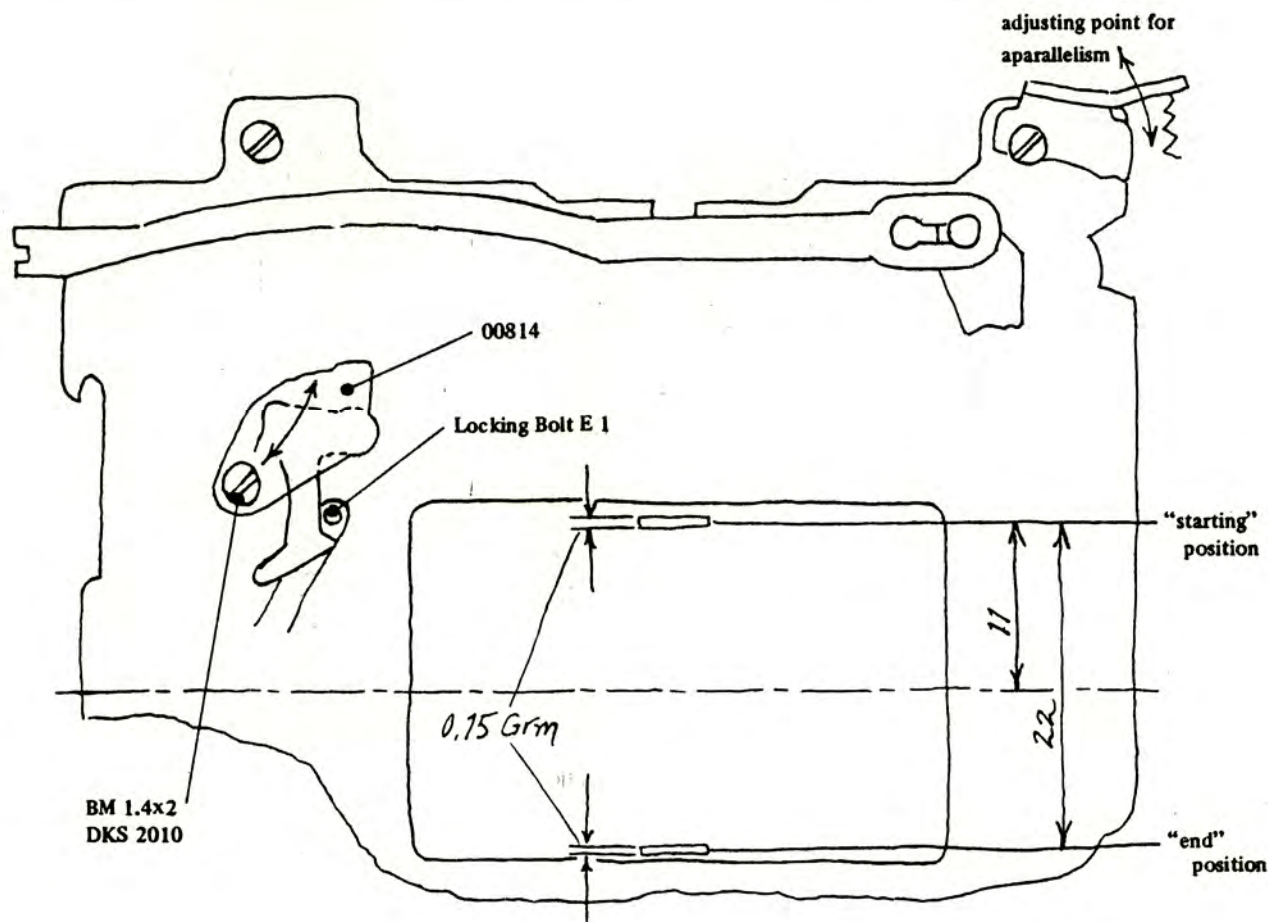
ATTENTION! In order to prevent deformation of the shutter plate, support the screwing point by means of the assembly tool.

Insert the assembly tool when the shutter is released.

Loosen flat-head screw BM 1.4 x 2 DKS 2010.

Swivel plate of the locking lever E 1. Tighten the flat-head screw, remove the assembly tool.

NOTE! Adjustment downwards results in a prolongation of the exposure time. Adjustment upwards results in shortening the exposure time.



After adjustment has been terminated, check the excessive lift of the E1 locking bolt during cocking. Check for parallelism.

Assembly of the Slow-Down Mechanism

Cock the camera, set the slow-down mechanism 00860 to shutter speed "B", insert it into the body and fasten it by screwing.

Adjustment of the Shutter Speeds

Technical Requirements

The measuring device must be so adjusted that the light gap is reproduced distinctly in the curtain level.

Take care that the starting and the "end" position (path of the curtains) are by 0. . . 1 mm distant from the edge of the image window.

Order of Adjustment

Cock the camera, set to shutter speed 1/15 sec. Stop running-down of the release disk by means of an auxiliary tool, thus bearing the lever for setting short shutter speeds 00865 and segment 00866 of the slow-down mechanism against the release disk of the shutter mechanism (W).

See drawing.

TABLE OF SHUTTER SPEED VALUES*
(TGL 7708)

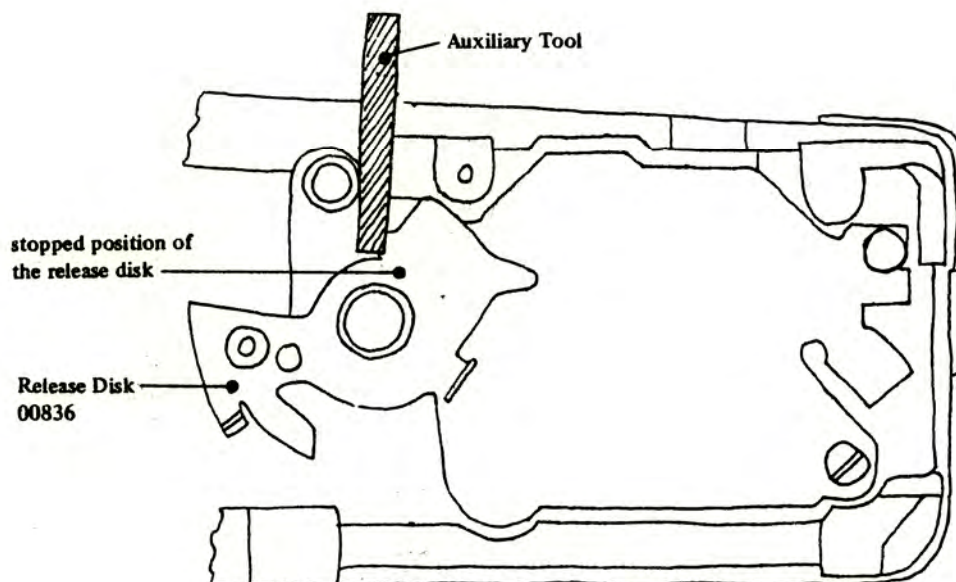
Time (sec.)	Rated Value (ms)	Tolerance (%)	Points of Measurement
1/1000	0.98		Starting position
1/500	1.95	+36.6	Central position
1/250	3.91	-26.8	End position
1/125	7.81		
1/60	15.63		
1/30	31.30		
1/15	62.50	+23.1	Central position only
1/8	125		
1/4	250	-18.8	
1/2	500		
1	1000		

*Measure points in running-down direction of the curtains.

ATTENTION: The degree of difference (relation between the longest and the shortest actual average value from the measurements at "starting," "central," and "end" positions) of

$$\frac{t_{\max}}{t_{\min}} \leq 1.5$$

must not be exceeded.



(Drawn without slow-down mechanism)

Check the proper running by a play of "b" = 0.1 . . . 0.2 mm between lever for setting the short shutter speeds and rivet at the segment.

If required, loosen the slotted nut from the lever for setting short shutter

speeds and displace the segment in the longitudinal hole of that lever (adjusting point "V").

Adjust the shutter speed 1/1000 sec. (See Adjustment of the Shutter Speed 1/1000.)

Adjust the shutter speed 1 sec. by changing the engagement of the armature (bending point "N").

Adjust the shutter speed 1/15 sec. at the lever for setting short shutter speeds (bending point "Z").

When the lever for setting short shutter speeds has been adjusted by bending, the play of 0.1 mm...0.2 mm between that lever and the rivet at the segment must be checked or re-adjusted.

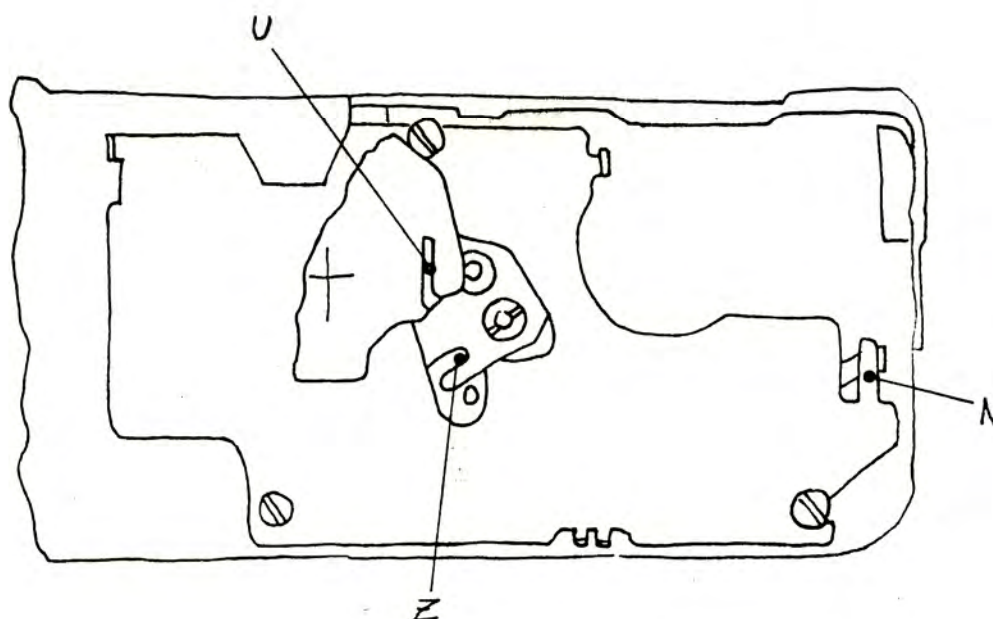
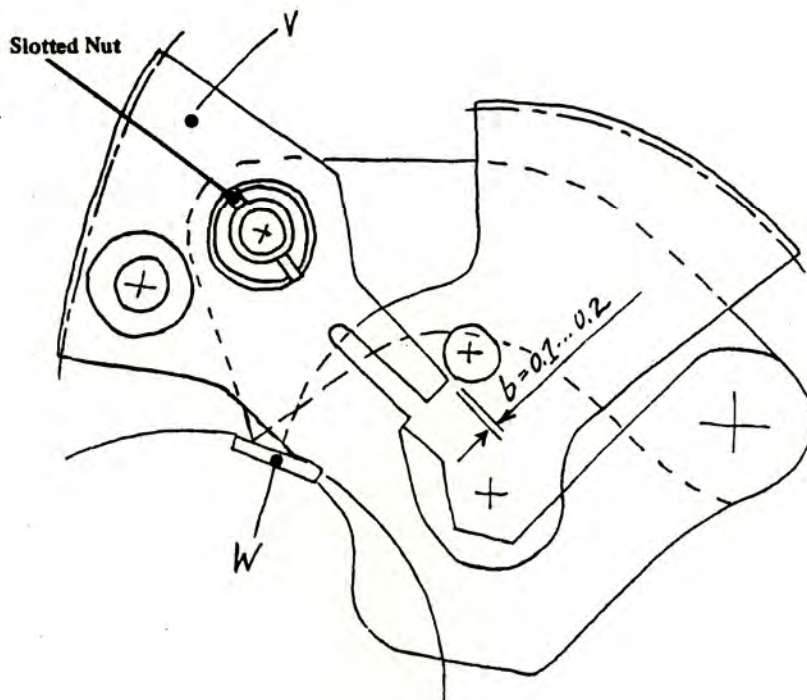
After the adjustment of the shutter speeds 1 sec. and 1/15 sec., all other shutter speeds must be within the tolerance.

Duration of Full Flash Aperture

Check at the completely assembled camera after having performed Covering the Camera. Expose the film with the flash-light unit. If necessary, re-adjust the time cam (adjusting point "U").

Assembly of the Camera Back

Screw on the camera back centered with the labyrinth of the body. The front edge of the camera back must not be spaced from the angular edge



of the cover plate 00239 on the side of the locking bar.

The force of the film-pressing plate in service condition must be 550 ± 200 p.

Assembly and Adjustment of the Counting Mechanism

Assembly of the Counting Mechanism

Screw the shaft 00161 into the body. Push counting lever 00852 on the shaft, hook in torsion spring 00138. Put on retaining lever 00165. Hook tension spring in retaining and counting levers. Put on the tension lever and cock the camera to the

end stop. In this position retain the tension lever.

Push counting disk 00851 on the threaded bushing of the slow-down mechanism. Return slowly the cocking lever. Hook the spring lug of the counting-disk spring into the rivet on the slow-down mechanism plate.

Screw on counting disk and pointer. Insert the counting and retaining levers in the locking gear system of the counting disk.

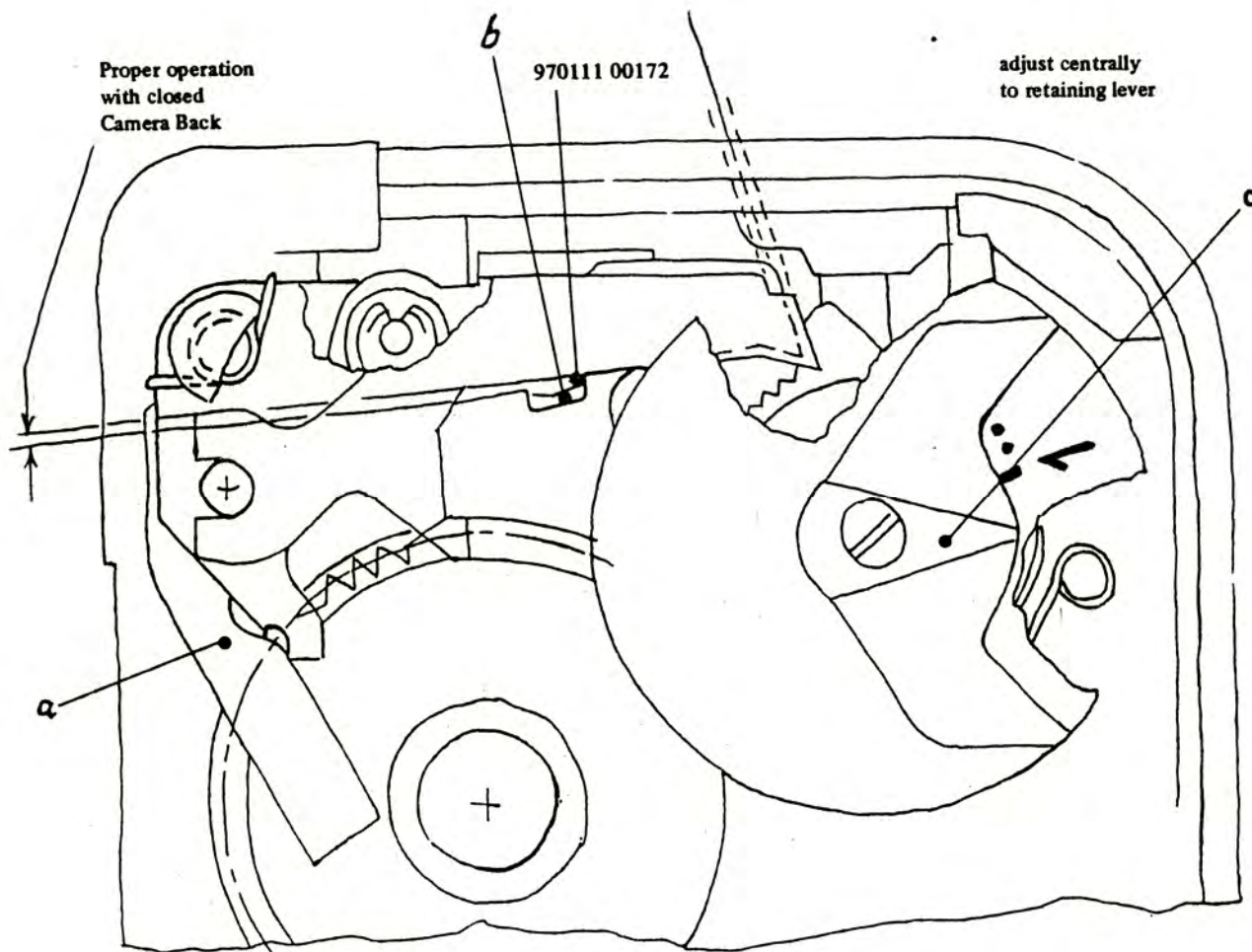
Cock the counting disk through about $2\frac{1}{2}$ revolutions. The counting disk must be advanced to image 36 without any hindrance.

Adjustment of the Counting Mechanism

Set the counting lever centrally to the recess of the retaining lever at adjusting point "a".

With closed camera back, adjust the proper operation of lever 00172 with respect to counting and retaining levers (adjusting point "b"). When opening the camera back the counting disk must return immediately from any position into its initial position.

After threefold advance adjust the pointer 00482 to mark the counting-disk division "1" (adjusting point "c").



Adjustment of the Support in the Body

Set at the body the shutter speed "B" and cock the cocking mechanism. Cock the mirror mechanism at the support by actuating lever 00275.

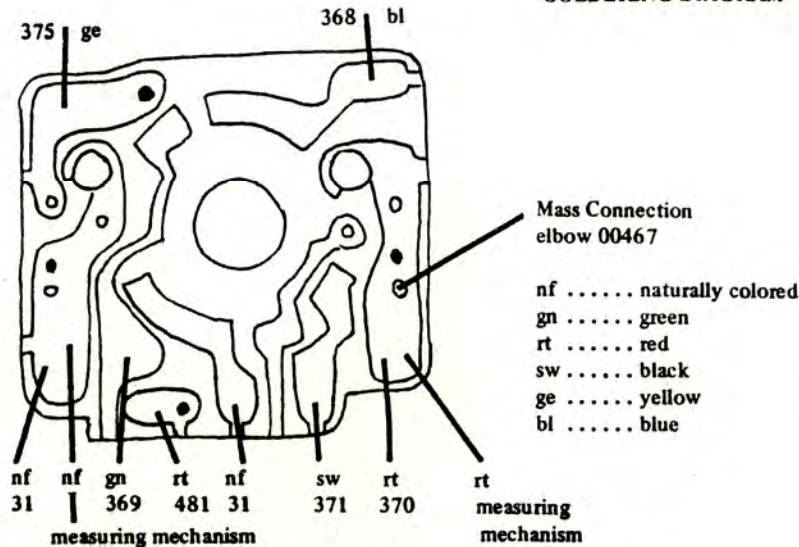
Insert the support into the body.

ATTENTION! Clamp the blue cable for the EST-group. Pass lever 00334 of the mirror mechanism into the slot of the plate of the slow-down mechanism.

Fasten the support by four counter-sunk screws BM 2 x 5 TGL 5683.

Functional Test: Cock and release repeatedly the camera at various shutter speeds (also "B"). Check the distance between the lens face and face of film-pressure plate to be 45.65 ± 0.02 mm and the depth of the film channel to be 0.25 ± 0.02 mm.

SOLDERING DIAGRAM



Assembly of the Printed Circuit Plate

Slip printed circuit plate 00790 and switching plate 00901 on the rewriter bushing and tighten it by slot nut 00263.

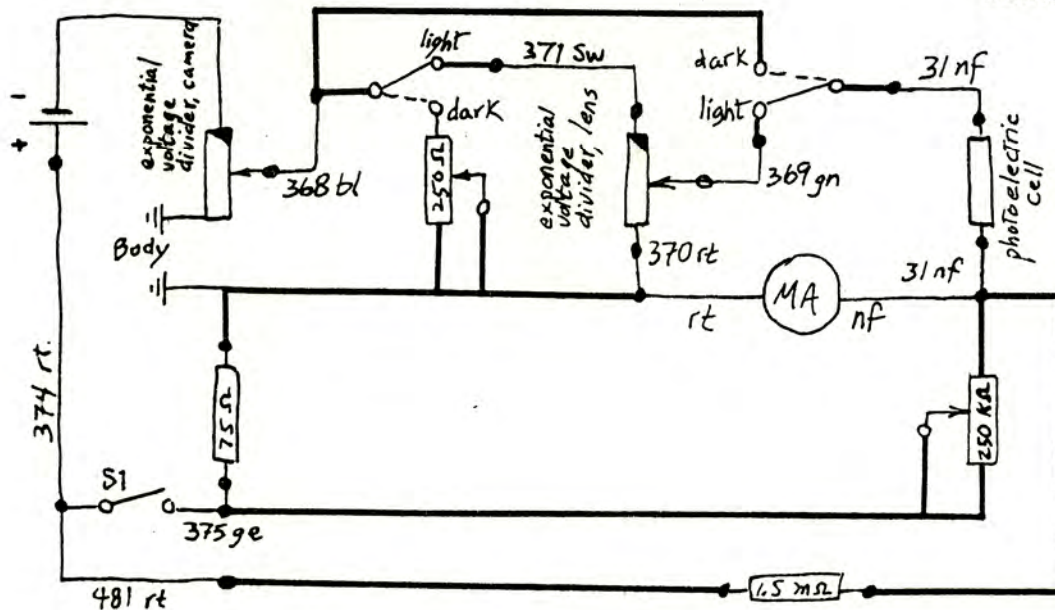
Adjust the printed circuit plate in parallel with the outer edges of the body.

Solder the mass connection terminal and cable as to drawing.

Assembly of the Spring with Toothed Wheel and EST-Group

The contact face of the spring must have a distance of 1.5 mm from the toothed wheel in order to attain the appropriate pressing force in the assembled condition.

WIRING DIAGRAM



The full lines (—) represent the path of circuit of the integrated circuit board.

Solder the cable 00368 (blue) to axle 00807 and lay the cable around the cast latch.

Fasten slightly the shaft by three flat-head screws BM 1.4 x 3 DKS 2010.

Mount the spring with toothed wheel on the shaft. (Don't lubricate the bearing point!)

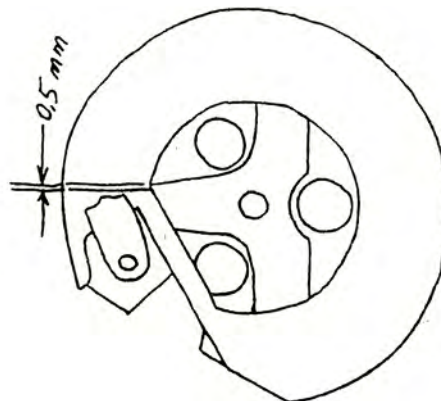
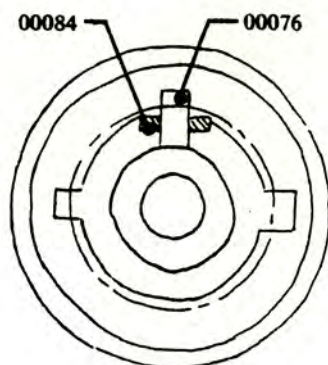
Push the spring with toothed wheel onto the transmission gear 00803, observing the marked mesh (See Dismantling the Support from the Camera Body.) and the lowest play of gear; tighten the spring by means of the flat-head screws screwed-in through the bore of the toothed wheel. (Don't jam the cable 00368.) The shaft 00807 and the spring with toothed wheel 00808 can also be mounted in the body in their assembled conditions.

Screw to the body the EST-groups 00805 and 00822 . . . 00824, by means of three flat-head screws BM 1.4 x 4 DKS 2010.

The EST-group must be connected with the appropriate photoresistor according to the table above.

Assembly of Mount and Cover Cap

Insert the magnifier 00179 into the body, insert the disk 00176 into the mount 00175, put on mask 00177 and frame 00178; put the mount pre-assembled in this manner on the mag-



nifier and screw it with two plates 00523 to the body.

Screw on cover cap 00930.

Adjustment of the EST-Group

Set to shutter speed 1 sec. Mount button 00080.

Insert compression spring, insert cam 00084 so that the cam 00076 is driven by the fork.

Mount film speed disk 00083.

Mount disk 00085 and fasten it by screw 00087. Center the graduation 18° of the film-speed disk to the recess of the disk. Loosen the threaded cone for the cam 00076 in shaft 00902. Mount the spring with toothed wheel according to drawing.

Tighten the cam with the threaded cone, check the correct setting. When tightening the threaded cone, prevent distortion of the spring with the toothed wheel in the bores.

ATTENTION! The transmission gears are made of polysterene.

Screw on the bottom cap 00006.

Adjustment of the Exposure Meter

Check the position of the pointer of the exposure meter.

Without inserted battery the pointer must be in the inner third of the setting ring. (See Assembly of the Prism Mount.)

With loaded battery, the pointer must be below the setting ring. In

this case, the battery voltage must be 4.2 ± 0.3 v.

Adjustment of the Measurement at Full Aperture

Insert the appropriate lens into the camera, set aperture to 5.6 and distance to ∞ .

Place the camera in the camera mount and apply the DC voltage of 4.2 ± 0.3 v. from a generating device or a flat battery of 4.5 v. for the camera mount.

The face of the lens should be adjacent to the pane of the illuminating device EG 40. Set the light density to 250 asb. Set the knob of the camera to 17° DIN and shutter speed to 1/8 sec., the switching plate to full-aperture measurement.

Cover the opening in the cover cap for the accessory shoe.

Move the shutter release to the pressure point and adjust by means of the insulated screwdriver the variable layer resistor W 3 so that the pointer of the exposure meter is in the center of the setting ring.

Subsequently check the camera with settings as follows:

Light Density	Shutter Speed	Tolerance
32 asb	1 sec.	$\pm$ one aperture
1000 asb	1/30 sec.	
16000 asb	1/500 sec.	

By varying the aperture, the pointer of the exposure meter is adjusted to the center of the setting ring. Then from the aperture the variation is read.

In case of unilateral variation of the values, the calibration point at 250 asb must be so displaced that all four measuring values are within the tolerance.

Checking the Measurement at Reduced Aperture

Set the switching plate to measurement at reduced aperture. Check this measurement in the same order as the measurement at full aperture.

When checking, the lens must be stopped down by pressing the lateral key.

When the tolerance is exceeded, the variations at the measurements at full and at reduced apertures must be averaged by varying the W 3.

Assembly of the Operating Elements

Put on setting ring 00270 with compression spring and ball.

If necessary, put on washers 6 x 10 x 0.05, 0.1, 0.2 DKS 2001 and tighten by screwing the retaining ring 00269 with slotted nut 00264.

Check switching over from measurement at full aperture to such at reduced aperture.

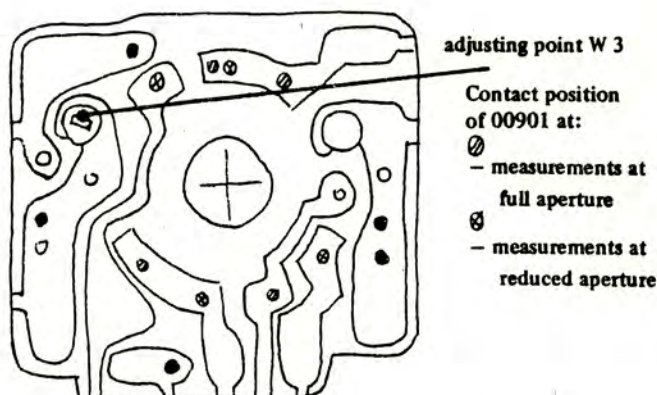
Mount cocking lever 00057, balance the axial play of 0.05... 0.1 mm by means of washers.

Solder the intermediate piece 00922 to the cable of the X-contact.

Secure the intermediate piece by inserting washers 00247 and 00248. Screw on the accessory shoe by two countersunk screws 00244.

The screwed-on accessory shoe must clamp the intermediate piece firmly on to the cover cap. With this, cover cap and intermediate piece should not be deformed. Insert cover plate 00236 into the accessory shoe and tighten it by bolt 00246.

Paste on disk 00058 and aperture disk 00086. When pasting on the disk



for setting of the film speed observe the set film speed.

Covering the Camera

In order to prevent penetration of glue below the interlocking mechanism of the rear wall, paste an adhesive tape of 5 mm width on the gap between body and cover plate 00239 before covering the camera body.

Secure button 00305 in the bushing 00308 by washer, and screw in tightly lever 00313 with the pre-assembled parts.

4 – REMEDY OF FAULTS

Function of the Shutter

General

Functional tests at the shutter are allowed only when it is screwed to the body.

The shutter should be repaired with greatest care! As the perfect assembly of a dismantled shutter requires many devices and gauges, only repair work is recommended as follows: After having terminated any repair, the shutter function as to Assembly of the Shutter, Adjustment of the Cocking Path of the Shutter, Checking the Shutter Function, and Adjustment of the Curtain Speeds must be checked.

ATTENTION! When checking as to Checking the Shutter Function,

check the required adjustments or perform them according to recommendations below prior to the general functional tests.

Recommendations for Adjustment

The minimum distance of 0.5 is adjustable by varying the slide of E 2 00235. Subsequently check the measure 7 ± 0.5 as well as the steady overlap during cocking up to upper edge of the image window. If these requirements are not met, then check the transmission lever of E 2 00820 and the transmission lever of E 1 00819 for wear at the functional points.

Fault:

Curtain E 1 00811 and curtain E 2 00812 are damaged.

Remedy:

Replace the curtains as follows:

Unhook tension spring 00496. Remove from guide bolts of the curtains the locking washers 1.2 TGL 0 - 6799 as well as washers and braking slide 00495. Unscrew shoulder screws 00500. Remove intermediate element 00501 and washers 00505.

Lift curtains from the bolts of the transmission lever 00819 and 00820. (Attention: Interferences fit!)

Take care for washer 2 x 4 x 0.1 DKS 2001 below the bearing points of the curtains. Check the new curtains for proper operation, damages and cleanliness.

Assemble the curtains in reverse order.

ATTENTION! Ensure the insertion of the curtains in the bolts of the transmission lever without play. Observe the parallelism between curtain and the plate. If necessary, replace the transmission lever, too.

Fault:

Curtain E 1 does not engage.

Remedy:

Check the transmission lever of E 1 00819. In case of wear at the functional points replace it.

Fault:

Curtain E 2 does not engage.

Remedy:

Check transmission lever of E 2 00820. Replace it in case of wear at the functional points.

Check at slide of E 2 00203 the functional point with the transmission lever of E 2. If necessary, replace it.

ATTENTION! A new slide of E 2 must first be screwed centrally in its longitudinal holes in order to avoid tilting of the locking bolt of the E 2 at the end of the plate slot (See Adjustment of the Cocking Path of the Shutter—Adjusting Requirements).

Fault:

Tension springs 00453 and 0.45 x 3.2 x 10 Bd - TGL 18396 or tension spring 00496 are damaged.

Remedy:

After having replaced these springs, re-adjust the speeds of the curtains and the shutter speed 1/1000 sec., according to instructions.

LIST OF TOOLS REQUIRED

Flat mirror, wrench, assembly wrench, screwdriver with sleeve, adjusting wrench, assembly tool, assembly support, wrench for slotted nuts, setting gauge, wrench for pins, camera mount, illumination device, auto-collimator with flat plate, mirror gauge 45°, insulated screwdriver, contact tester,

short time meter, Hirth's minimeter, dial indicator, stop watch.

COUNTING DEVICE ALTERATIONS

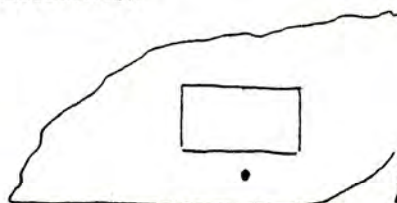
The counting device described in this Repair Manual and represented

by this exploded view refers to the latest design. A small quantity of cameras were still manufactured according to another design.

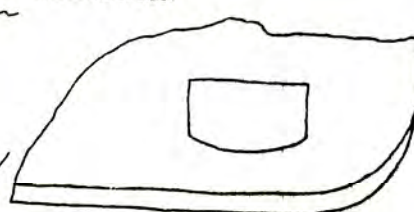
For the alterations please compose both the type represented here:

BEFORE ALTERATION

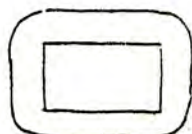
AFTER ALTERATION



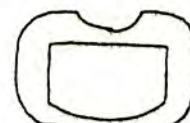
00930



00930



00261 Index d



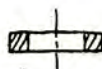
00261 Index e



AM 1.4x2 DKS 2010



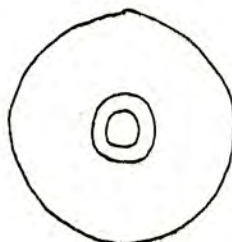
BM 1.4x2 DKS 2010



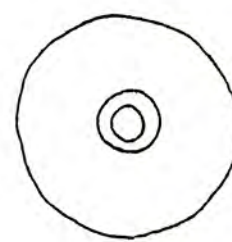
1.6x2.5x0.1 DKS 2001



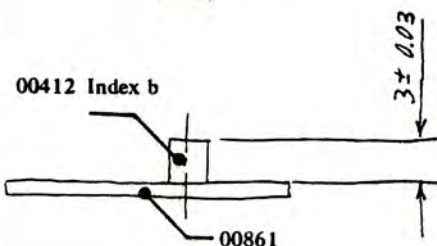
00482



00851

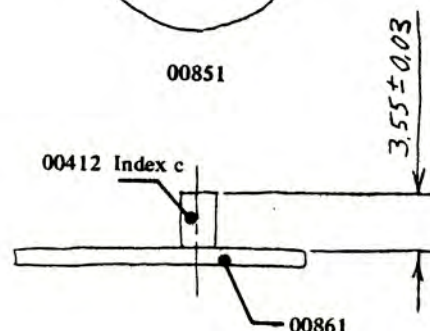


00851



00412 Index b

00861



00412 Index c

00861