

Dual

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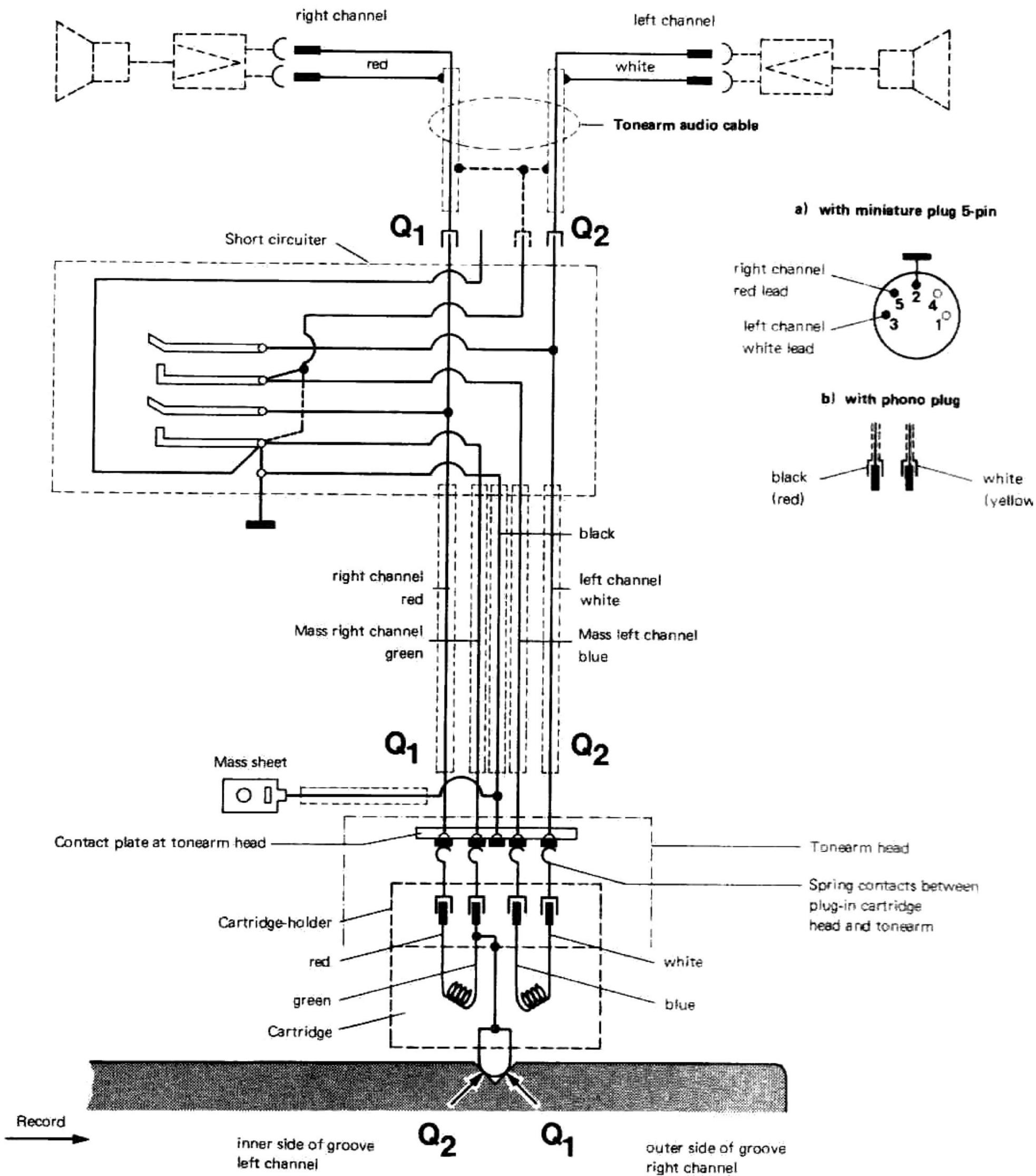
1236



Service Manual

Dual Gebrüder Steidinger 7742 St.Georgen/Schwarzwald

Fig. 1 Pick-up Connection Diagram



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Technical data

Current Type	AC 50 or 60 cycles, with appropriate motor pulleys
Line Voltage	110 – 125 V and 220 – 240 V, selector
Drive	Dual four Pole Synchronous Motor via Flat Belt to Flywheel Rotor
Power consumption	approx. 10 watts
Current requirements	at 220 V, 50 Hz: approx. 75 mA at 117 V, 60 Hz: approx. 140 mA
Platter	1.4 kg, 270 mm ϕ
Platter speeds	33 1/3 and 45-rpm, automatic tonearm setdown coupled to speed selector
Wow and flutter	$< \pm 0.1$ % rated in accordance with DIN 45 507
Signal-to-noise-ratio (according to DIN 45 500)	Rumble unweighted signal-to-noise-ratio > 37 dB Rumble signal-to-noise-ratio > 56 dB
Tonearm	Torsion-resistant aluminium tonearm in four point gimbal suspension.
Tonearm bearing friction	vertical < 0.10 mN (0.010 g) horizontal < 0.80 mN (0.080 g)
Tracking force	0 – 50 mN (0 – 5 g) continuously variable reliable as from 5 mN (0.5 g) tracking force
Pick-up head	Detachable, suitable for all pick-up cartridges with Dual catch mounting and 1/2" mounting and a deadweight of 4.5 – 10 g (including hardware)
Weight	approx. 3.8 kg

For dimensions and cutout refer to Installation Instructions.

Fig. 2 Motor and drive

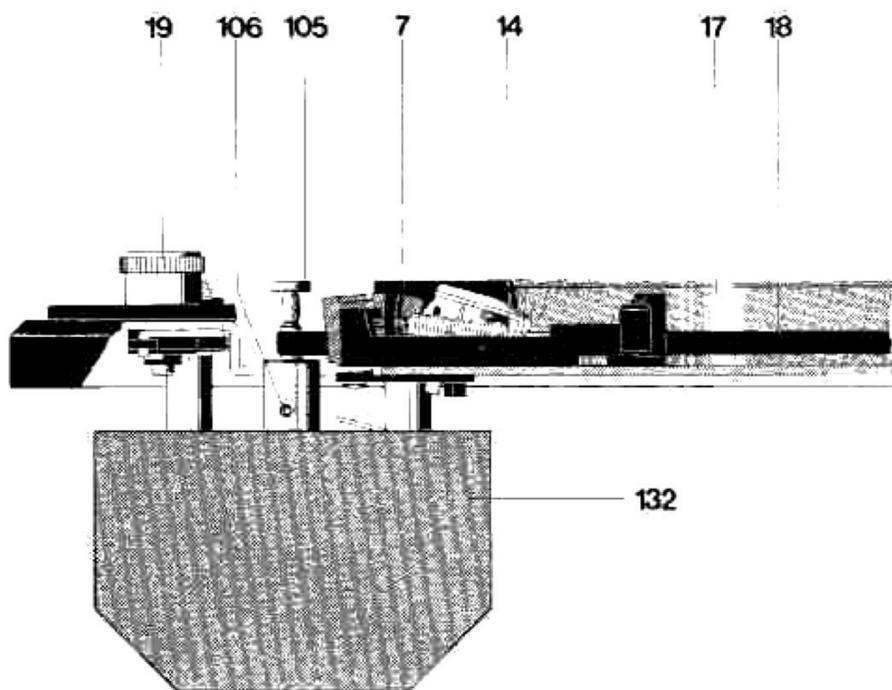


Fig. 3 Motor connection schematic

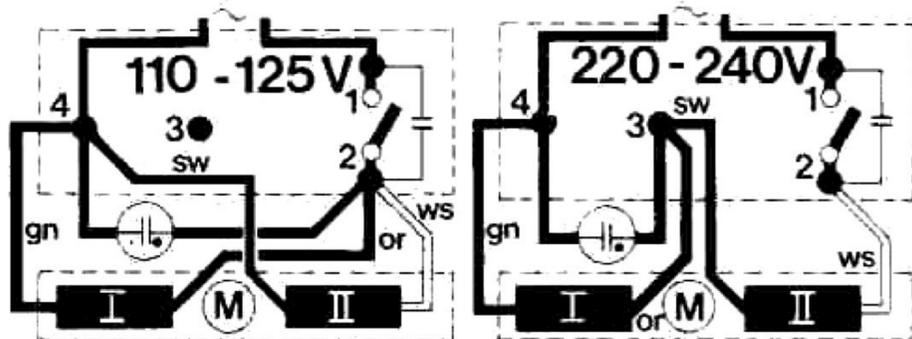


Fig. 4

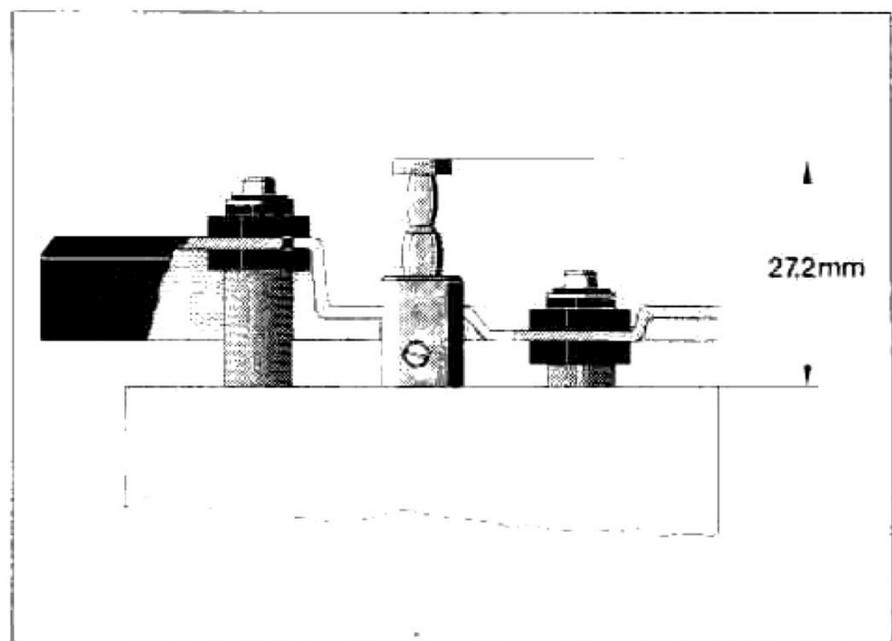
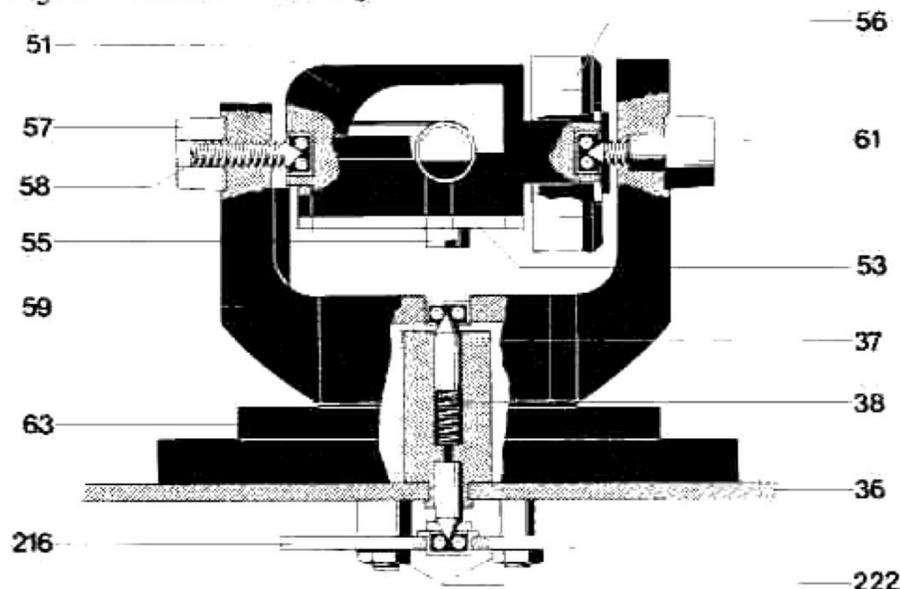


Fig. 5 Tonearm bearing



Note: The numbers listed above refer to the below spare parts lists and exploded views.

Motor and Drive

Power for the turntable platter and the changing mechanism is supplied by a split eight pole synchronous motor suspended by radially located elastic mounts and having a very small stray magnetic field as well as little vibration.

The speed of the motor is independent of line voltage, temperature or load variations. Speed is dependent on and proportional to power line frequency. The motor is adapted to 50 or 60 cycle (Hz) power line frequencies by the correct choice of the motor pulley.

Pulley for 50 Hz Art.-No. 243 815

Pulley for 60 Hz Art.-No. 243 816

The drive is transmitted to the platter by means of the flat belt (18).

Speed Changeover

Platter speeds of 33 1/3 and 45 rpm are adjusted by linking the flat belt (17) to the corresponding step of the drive pulley (105) (Fig. 5).

The speed switch lever is brought into the required position (33 or 45 rpm) by means of the speed selection lever (19), the switch lever (108) and the spring lever of the switch levers. If the machine is switched off, then the switch lever is interlocked by the stop lever (14). The speed is only preselected in this way. The stop lever (14) is only released when the platter (17) turns. This then moves the flat belt (18) onto the required step of the drive pulley (105).

Platter

The platter (17) is held in position by the platter locking lever (164). When removing the platter, lift the platter covering over one of the cutouts and rotate the platter until the cutout is above the drive pulley. Detach the flat belt (18) from the drive pulley (105) and lay it on the running surface of the platter.

Rotate the platter until the cutout is above the platter locking lever (164). Push this outward and lift the platter out.

Flat Belt

The exchanging of the flat belt is described above with the platter to be removed. Fit the new belt to the running surface of the platter (17).

Warning: The ground (matt) side of the belt must be in contact with the running surface of the platter. Reinstall the platter and lay the flat belt back over the drive pulley (105).

Changing the drive pulley

Remove the flat belt (18) from the drive pulley (105) and take off the platter (16).

Loosen set screws (106) and remove motor pulley (105). Place complete replacement motor pulley on motor axle. Adjust motor pulley vertically (see Fig. 4) and tighten set screws (106) uniformly.

Install the platter (16). Fit the flat drive belt (18) onto the drive pulley (105).

Tonearm and Tonearm Bearing

The Dual 1236 has a feather-light, extremely torsion-resistant all-metal tonearm which is suspended in a gimbal. Suspension is by means of 4 hardened and precision polished steel points which rest in precision ball bearings. Tonearm bearing friction is thus reduced to a minimum.

Bearing friction vertical < 0.10 mN (0.10 p)

Bearing friction horizontal < 0.80 mN (0.80 p)

As a result, it ensures most favourable pick-up conditions. Before adjusting the pick-up force to suit the built-in pick-up cartridge the tonearm is balanced with the scale set to zero. Coarse adjustment is carried out by moving the weight with the pin (60), the subsequent fine adjustment by turning the weight. The balance weight is designed such that pick-up cartridges having a deadweight (incl. hardware) of 4.5 – 10 g can be balanced.

The tracking force is adjusted by turning the graduated spring housing (56) incorporating a coil spring. The scale has markings for a range of adjustment from 0 to 50 mN (0 to 5 p) which permit accurate adjustment of the tracking force.

Removing the tonearm from the bearing frame

1. Clamp unit in the repair stand. Remove the counter-weight. Set spring housing scale (56) to zero.
2. Turn the unit over and remove the shield (194). Unsolder the tonearm connections on the muting switch (191).
3. Loosen lock unit (57) and threaded pin (58). Remove bearing screw (61). Warning, left-handed thread! Lift bearing (51) and remove spring housing (56). Lift off tonearm cpl. with bearing.
4. Loosen screw (55). Lift off bearing (51) plate (53) as well as clamping piece (52).

Reverse this procedure when reassembling.

Reverse this procedure when reassembling

Removal of the complete tonearm and bearing assembly. We recommend the following procedure.

1. Clamp unit in the repair stand. Secure the tonearm (48) and remove the counterweight (49). Set spring housing scale (56) to zero.
2. Turn the unit over and remove the shield (194). Unsolder the tonearm connections on the muting switch (191).
3. Remove lock washers (197) and the axle (198). Remove the main lever (238).
4. Remove the hexagonal nut (222). Hold the tonearm securely. Lift out the complete tonearm and bearing assembly.

When reassembling the tonearm proceed in the reverse order, taking care that the threaded pin (49) is correctly seated in the bearing when fastening the frame (50) (see Fig. 8)

Replacing spring housing

Remove tonearm (58) from bearing frame (64) as described above. Loosen lock nut (51) and threaded pin (52). Unscrew bearing screw (73). Lift bearing frame (64). Remove spring housing (71) and washer (72). When installing note that the helical spring catches the bearing frame. Slide in washer (72) and tighten bearing screw (73). Reinstall tonearm (58). Set bearing play as described below using threaded pin (52) and lock nut (51).

Adjusting the tonearm bearing

First balance tonearm exactly. Both bearings must have slight, just perceptible play.

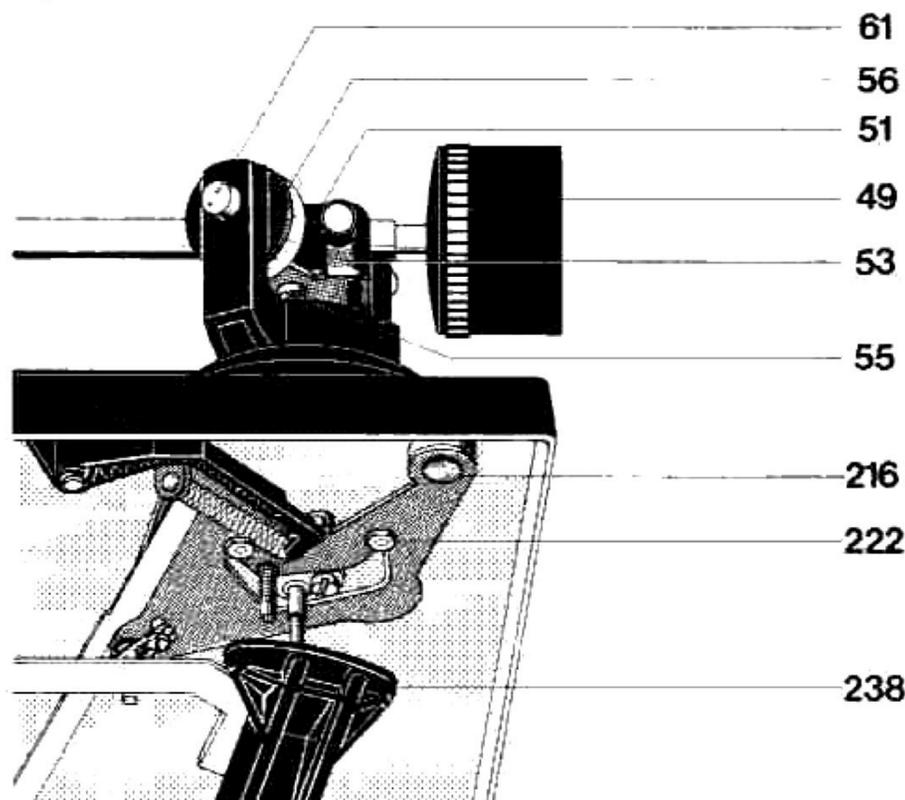
The horizontal tonearm bearing is correctly adjusted when at anti-skating settings "0.5" and being touched it slides in without resistance. The vertical tonearm bearing is correctly adjusted when it swings in after being touched. The play of the horizontal tonearm bearing should be adjusted with threaded pin (52).

Tonearm Control

Automatic movement of the tonearm is initiated by the control cams on the inside of the cam wheel (157) on rotating through 360°.

The control elements for raising and lowering are the main lever (238) and lift pin (215), for horizontal movement the main lever (238) with segment (216).

Fig. 6 Diagram for Motor Connection



The automatic tonearm set down is designed for 30 cm and 17 cm records and is coupled to the platter speed changeover. The set-down points of the tonearm are determined by the spring pin of segment (216) contacting the setting rail (189). Limitation of the horizontal movement of the tonearm is produced by the pin of segment contacting the stop attached to the setting rail (189). Only during set-down does main lever (238) lift the slide bar (189) and the stop attached to it which, as a result, moves into the swivel range of the stop pin fitted on the segment. After completion of set down (lowering of the tonearm onto the record) the setting rail (189) is released again and returns to neutral position. As a result the stop moves out of the swivel range of the stop pin so that unimpeded horizontal movement of the tonearm is possible for playing.

Antiskating Device

The adjustment of the antiskating force is made by turning the indicator disc located on the supporting back (63). The skating lever (226) is displaced from the tonearm fulcrum by an amount depending on the setting of this control. The antiskating force is transmitted to the tonearm (48) via the tension spring (217) and segment (216).

Optimum adjustment is carried out at the works for styli with a tip radius of 15 μm (spherical), 5/6 and 18/22 μm (elliptical), and CD 4-cartridges.

Any alteration can only be carried out with the aid of a Dual-Skate-0-Meter and a test record and should only be done by an authorized service station.

Fig. 7 Pitch control

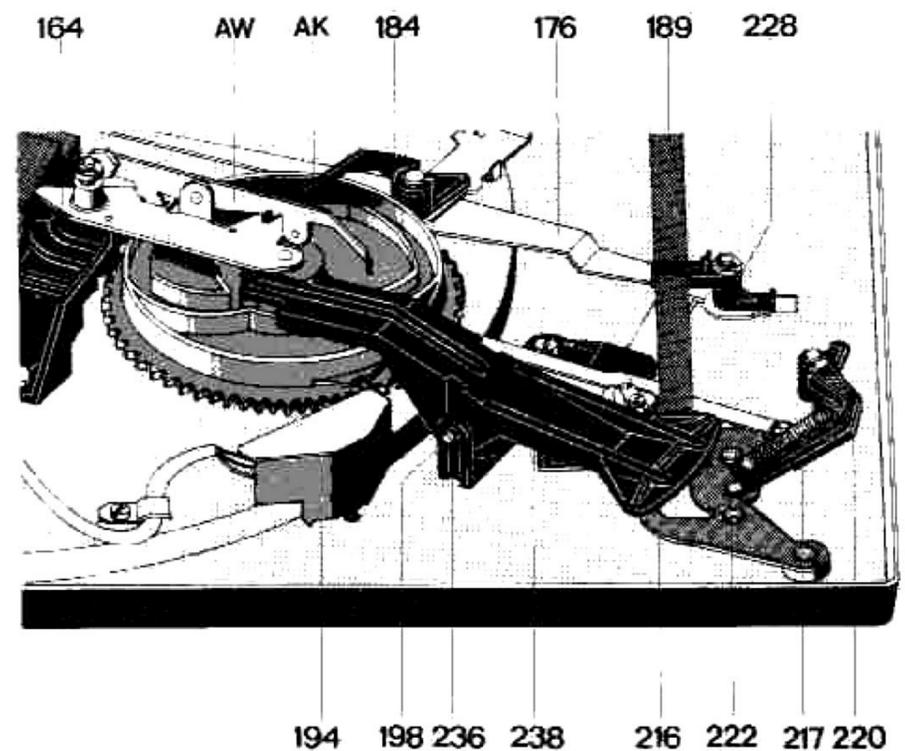


Fig. 8

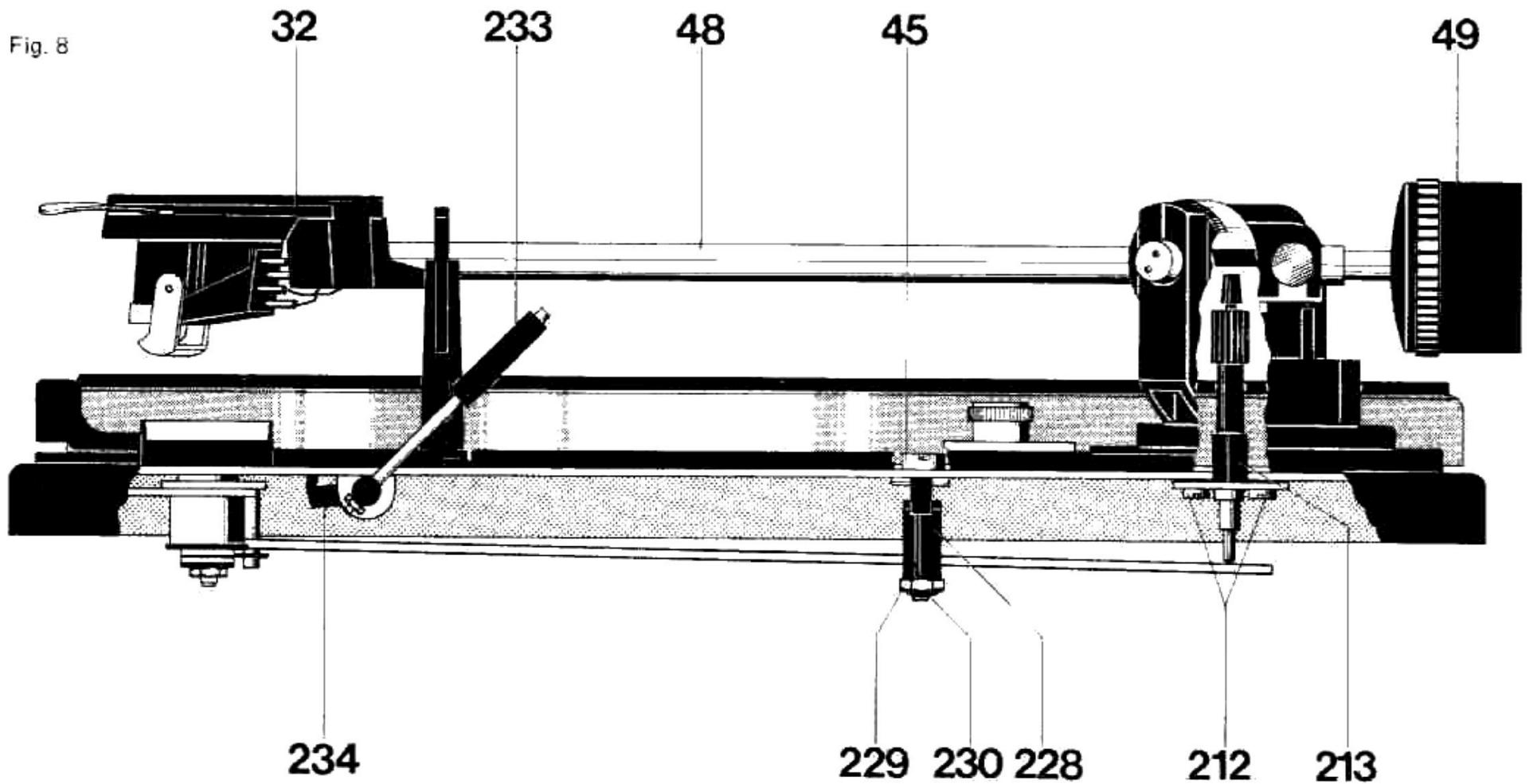


Fig 9

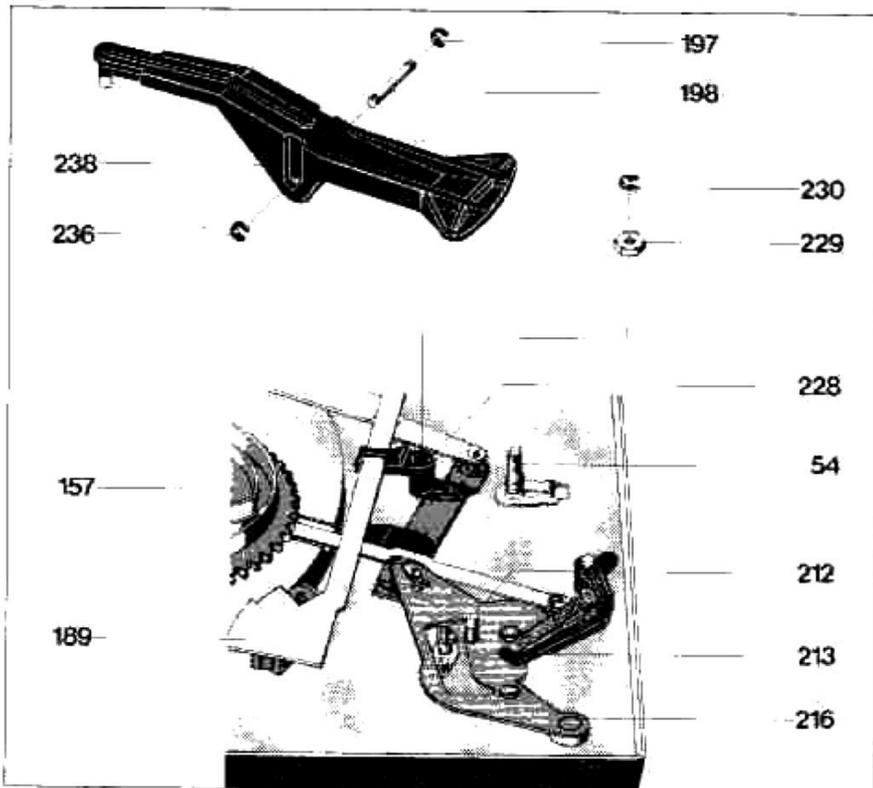
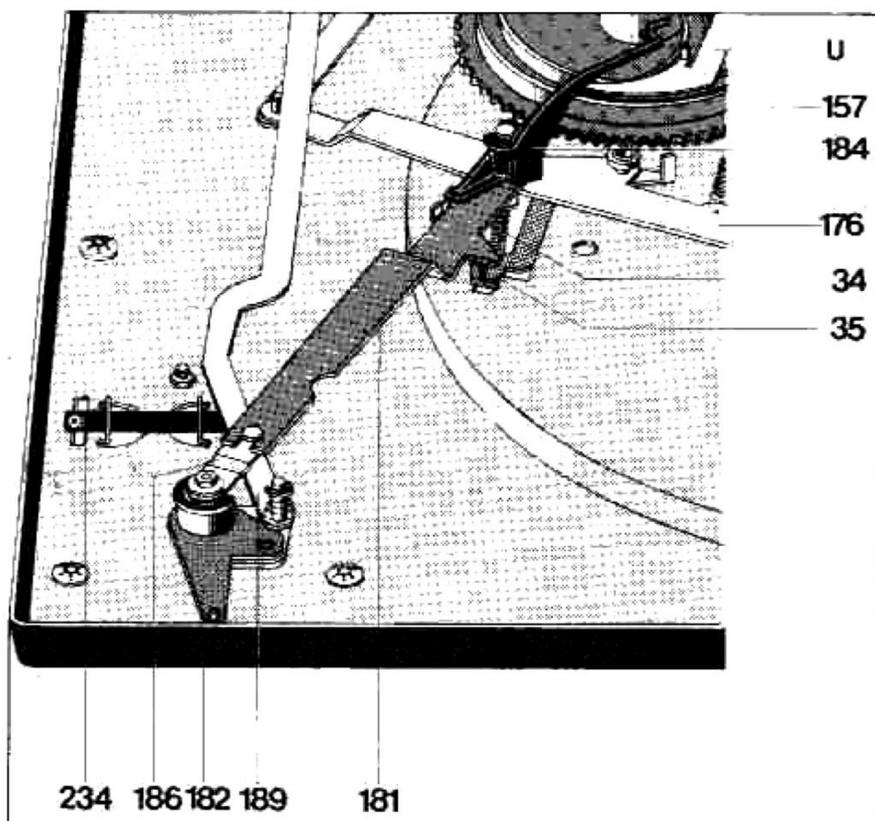


Fig. 10



Tonearm lift

Raising the lever (233) to position "▼" or "▲" moves the lift cam (234) and the setting rail (189) so that the tonearm is raised from the record (or lowered onto it). If the unit is started with the arm lever in the "▼" position, then the tonearm is guided over the record by the set-down mechanism. Only when the lever (233) is brought to the position "▲" will the tonearm be lowered onto the record. The vertical lift height can be adjusted by means of the locating screw (45) and should be 3 – 5 mm.

Exchanging the lift plate

When changing the lift plate (213), we recommend the following procedure:

1. Clamp the unit in a repair stand and lock the tonearm in rest position. Turn the unit over
2. Remove lock washers (197 and 236) and the axle (198). Remove the main lever (238).
3. Remove lock washer (230). Turn the locating screw (45) until the hexagonal unit (229) can be removed. Lift the setting rail (189) and the guide bearing (228) and pivot toward the cam wheel (157).
4. Remove the two machine screws (212) and take out the lift plate (213).

Reverse this procedure when reassembling.

Start

Switching the start/stop lever (68) into the "start" position initiates the following sequence:

- a) The start lever (186) rotates the switch lever (181) which is pivoted about the notched stud. At the same time, the switch arm (176) is moves and the motor (132), via the mains switch (138), and the platter starts turning.
- b) Operating the start/stop lever (68) also releases the start slide (35) which is drawn toward the cam by means of the tension spring (34). This causes the shut-off lever to engage with the drive pinion and the cam turns
- c) This switch lever (181) is coupled to the switch angle (184) and this is brought into the range of the shift lever so that the next rotation of the cam forces this into its starting position.

Short Circuriter

To prevent disturbing noises during automatic operation of the tonearm the unit is fitted with a short circuriter. Control of the switch springs for both channels is effected by the camwheel. With the unit in neutral state the short circuit of the pick-up leads is eliminated.

Adjustment

In zero position of the cam there should be a clearance of approximately 0.5 mm between the contacts of the short circuriter. This clearance should be adjusted by bending the short circuit contact. The contacts should be sprayed with a suitable cleaning agent.

Manual start

The latch (171) which is connected to the switch arm (176) engages in the four-sided plate when the tonearm is moved manually. The switch arm (176) connects the mains supply to the motor (132) via the power switch (138) and the platter rotates. When the run-out of the record is reached, the tonearm is lifted and the motor is switched off automatically. If the tonearm is lifted off the record before the run-out, and returned by hand to the pillar, then the bolt on the segment (216) engages the latch (171) so that the switch arm is returned to its starting position. This switches off the mains supply.

Record drop

Insert the appropriate spindle – AW 3 for standard records (7 mm or 1/4" center hole) or AS 12 for 45 rpm records (38 mm or 1 1/2" center hole).

The record drop is initiated by the cam wheel (157) whose drop cam surface (AK) controls the release rocker (AW) and the changer actuator rod.

Shut-off and change cycle

The dog (M) on the turntable platter gear (FR) and the shut-off lever (A) actuate both the change cycle at the end of the record as well as the shut-off after the last record in a stack is played.

At the end of a record, the tonearm moves towards the center at an accelerated rate due to the increased pitch of the grooves. This motion carries the shut-off lever (A) towards the dog by means of the stop lever (179). The eccentric dog pushes the shut-off lever (A) back at each revolution as long as the tonearm advance is only one normal record groove (Fig. 15).

The run-out groove with its steeper pitch moves the shut-off lever against the dog with greater force, engaging the shut-off lever (A) and causing the main cam wheel (157) to be driven out of its neutral position by the turntable platter gear (Fig. 15 b).

Shut-off mechanism

Shut-off and change functions are determined by the position of the cam follower lever (U). After every start or record drop, the cam follower lever is brought to its stop position by the main lever (238) (longer end towards the center of the main cam). As the record is dropped the cam follower lever (U) is turned to its start position by the cam rocker, so that the tonearm can swing in toward the record and be lowered on to it. If there are no more records on the spindle, and the cam rocker cannot turn the cam follower lever, the lever remains in its stop position and allows the tonearm to swing to its rest position.

When the main cam wheel (157) returns to its neutral position, the switch arm (176) drops into a cut-out in the main cam, opening the power switch (138) and disengaging the drive idler.

Fig. 11 Short circuriter

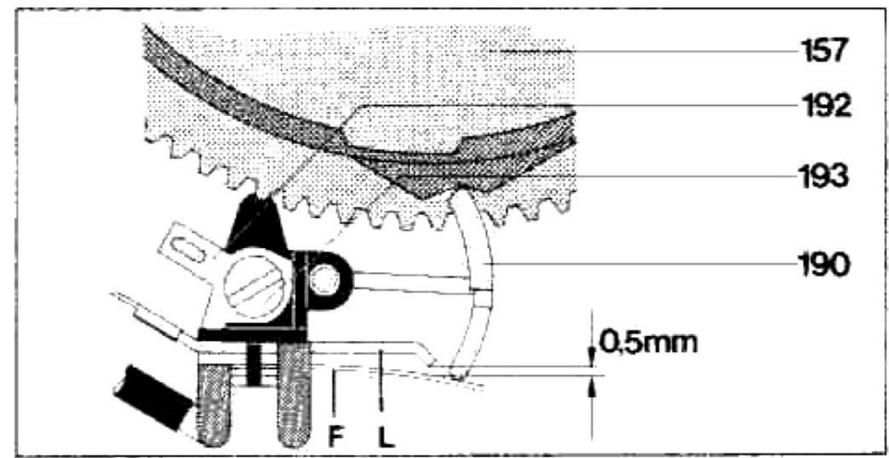
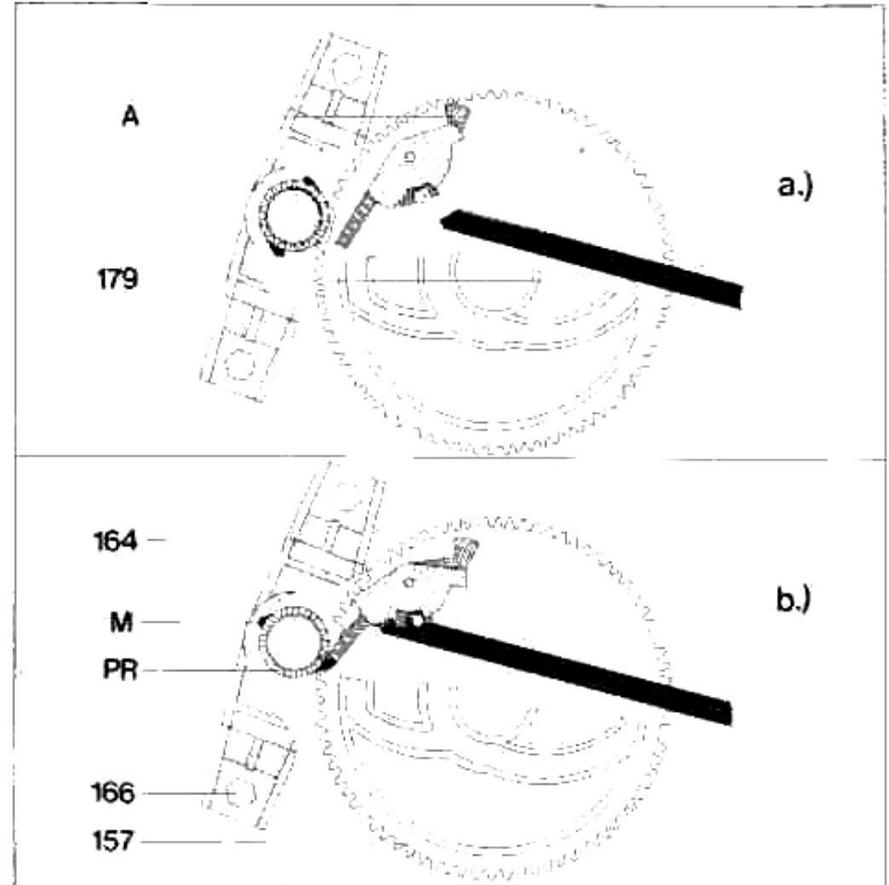


Fig. 12



Stopping

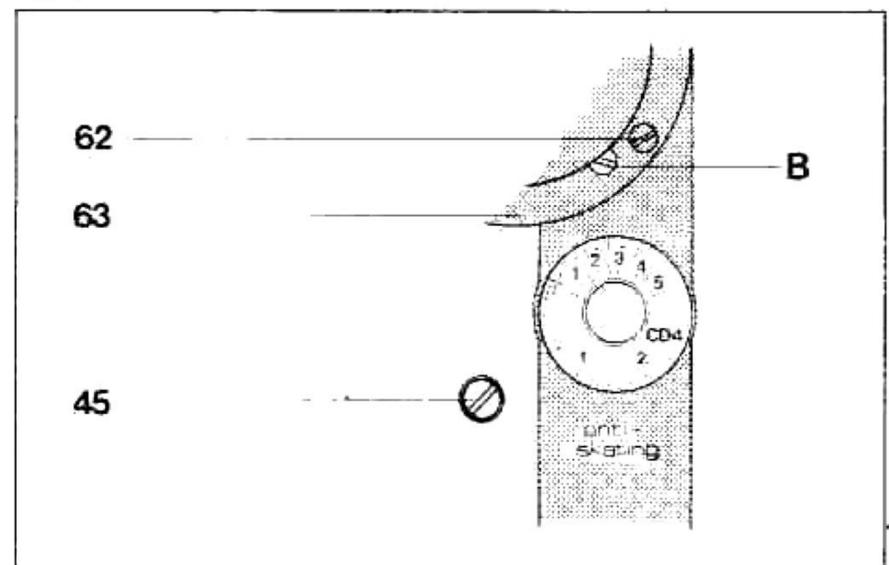
When control lever is set to "stop" position the start lever (35) which is pulled towards the cam by means of tension, is feed. As a result, the shut-off lever is moved into the range of dogs cam. The cam follower lever remains in its stop position.

The switch off position

With the tonearm on the pillar, the eccentric (B) can be adjusted to alter the switch off position. The eccentric is accessible through the supporting back (63).

If the unit switches off too early or not at all, then the eccentric (B) should be turned to the right or left respectively.

Fig. 13



Adjustment

Tonearm set-down point

After removing the stop plate (66) (by pressing it forward and lifting the rear edge first) the adjustment screw (A) is accessible. The needle set-down point can be varied toward the centre or the outside by turning the adjustment screw to the right or left respectively.

Release rocker

The eccentric screw (c) is used to alter the travel of the changing bolt (167). The setting is correct when at the rest position of the cam wheel (157), and with interlocked changer spindle, the changing bolt (167) has a travel of 0.2 mm.

Tonearm vertical lift

The adjustable sleeve (210) is used to adjust the tonearm vertical lift (for automatic operation). Pull out the mains plug, unlock the tonearm, turn the cam wheel (157) until the tonearm reaches its highest point of travel. The tonearm should now be approximately 2 mm above the pillar stop (see Fig. 19). Adjust by means of sleeve (210).

Fig. 14

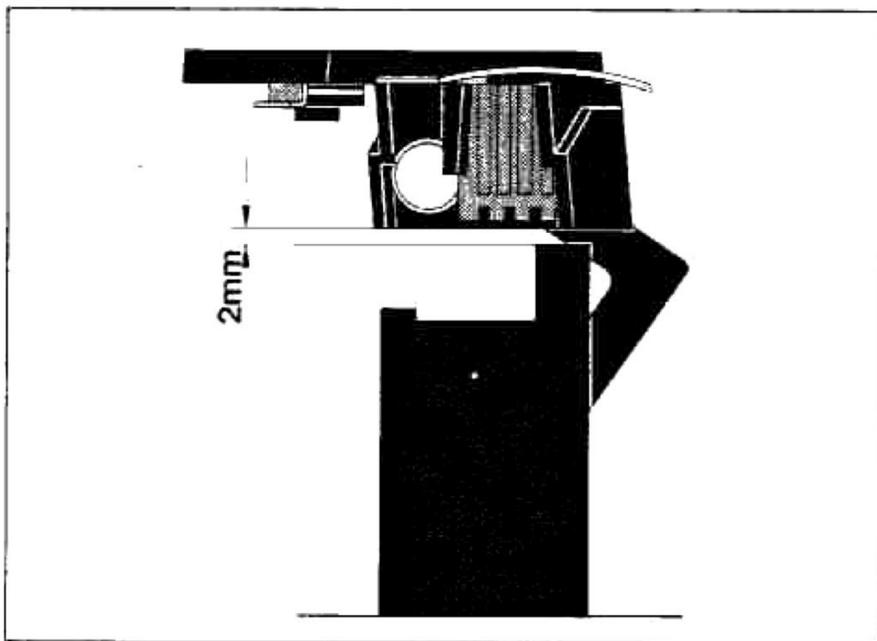


Fig 15

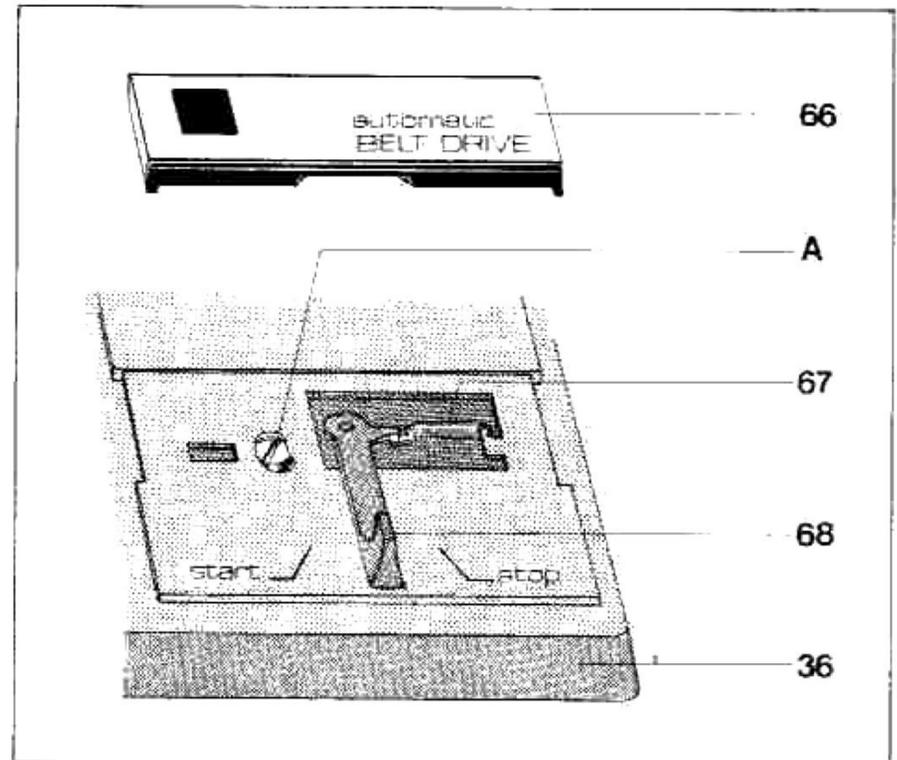
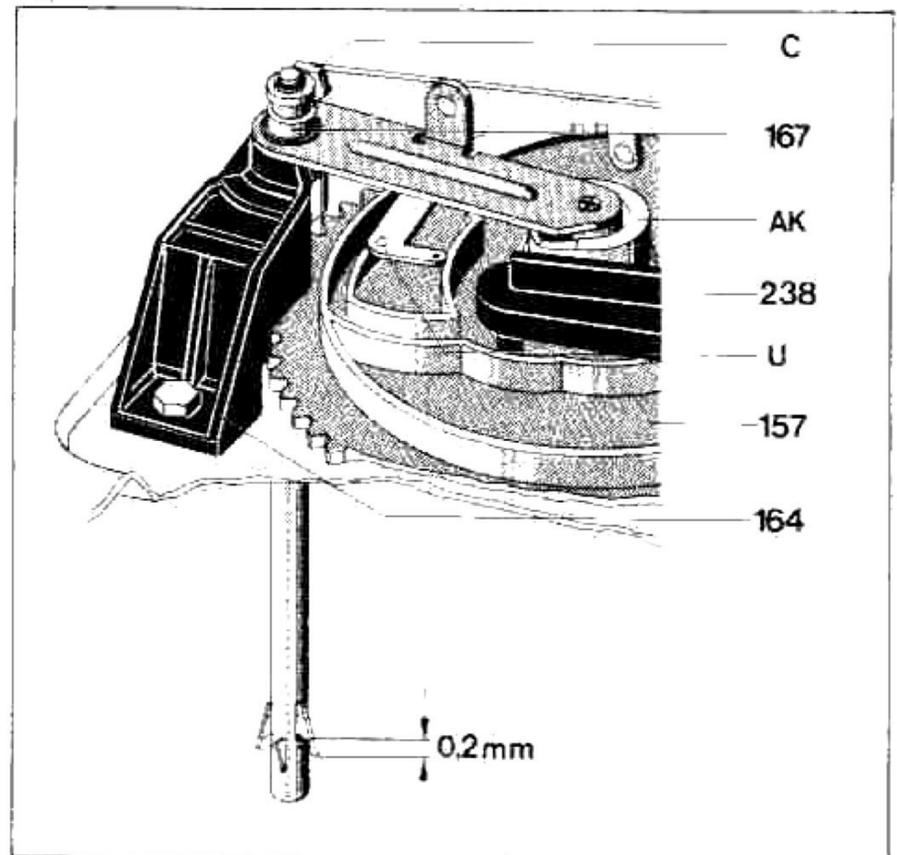


Fig 16



Replacement part

Pos.	Part.No.	Qty.	Description
1	215 470	1	Automatic spindle AS 12
2	213 895	1	Automatic spindle AW 3
3	220 213	1	Centering piece
4	200 709	1	Plate pin
5	200 543	1	Retaining ring
6	242 643	1	Washer
	241 885	1	Washer model G
	241 886	1	Ring model G
7	241 549	1	Support compl.
8	210 472	1	Machine screw AW 3 x 4
9	243 581	1	Washer 3.2/7/0.5
10	238 819	1	Tension spring
11	240 000	1	Tension spring
12	239 950	1	Switch-off lever
13	210 145	8	Lock washer 2.3
14	241 551	1	Stop lever compl.
15	210 194	1	Grip Ring 2 x 0.6
16	243 518	1	Platter mat compl.
	243 775	1	Platter mat compl. model G
17	242 940	1	Platter with mat compl.
	243 776	1	Platter with mat compl. model G
18	234 435	1	Flat belt
19	242 208	1	Speed changeover

Pos.	Part.No.	Qty.	Description
20	243 777	1	Speed cover
21	200 444	1	Spring washer
22	200 581	1	Spring suspension compl. (motor side front)
	232 972	2	Spring suspension compl.
23	230 529	3	Threaded part
24	200 728	1	Compression spring (motor side front)
	230 521	2	Compression spring
		2	Compression spring (tonearm side)
25	243 582	3	Rubber damping
26	200 722	3	Steel cup
27	231 992	1	Contact plate compl.
28	234 611	1	Handler
29	210 182	1	Lock washer
30	210 630	1	Washer 4.2/8/0.5
31	210 197	1	Ring
32	241 555	1	Tonearm head compl.
33	236 242	1	Cartridge mount TK 24
34	231 017	1	Tension spring
35	239 926	1	Start slide
36	243 779	1	Mounting plate compl.
37	229 655	1	Bearing peak
38	229 685	1	Compression spring
39	239 414	2	Shipping screw compl.

Fig. 17 Exploded view 1

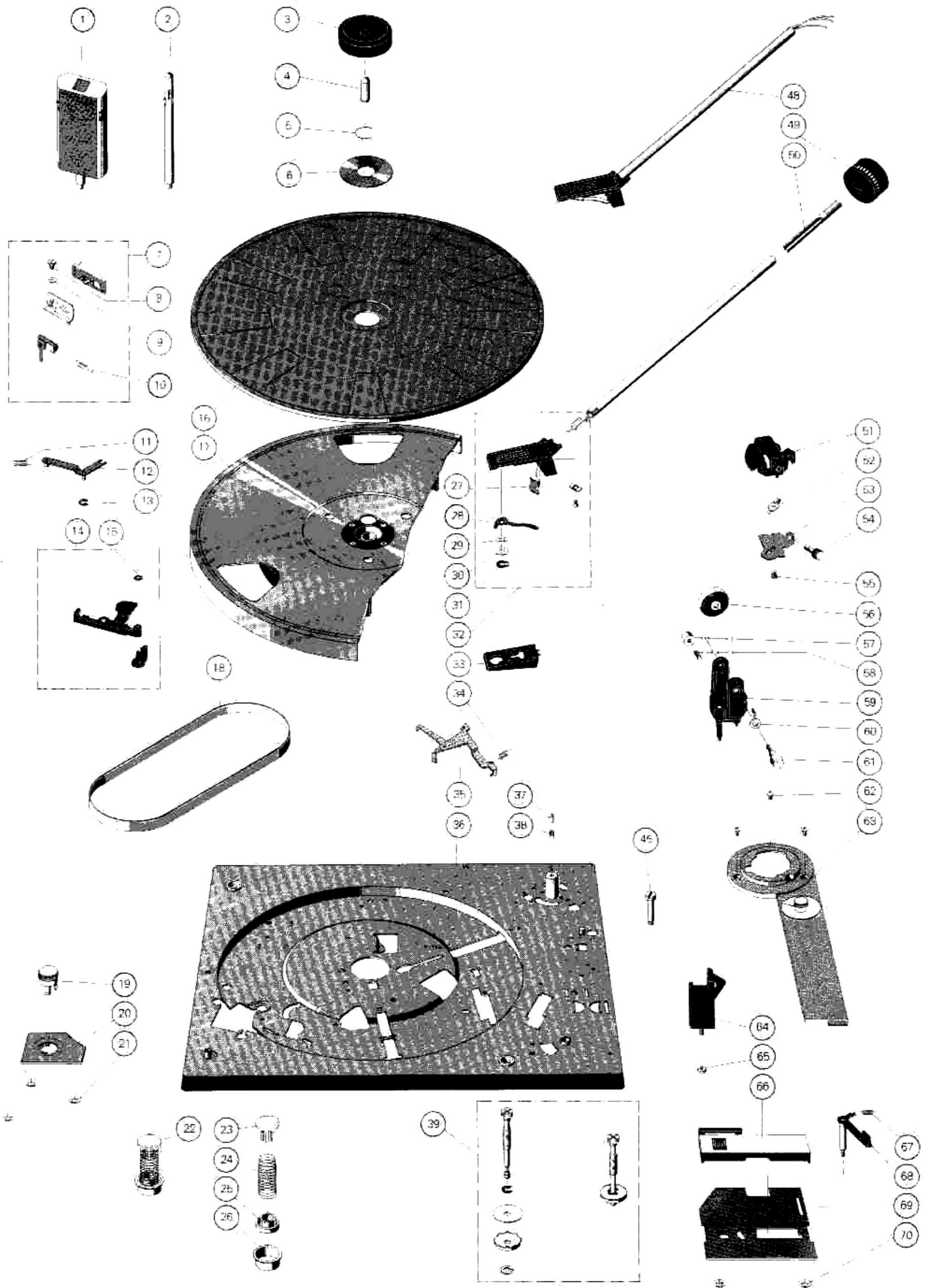
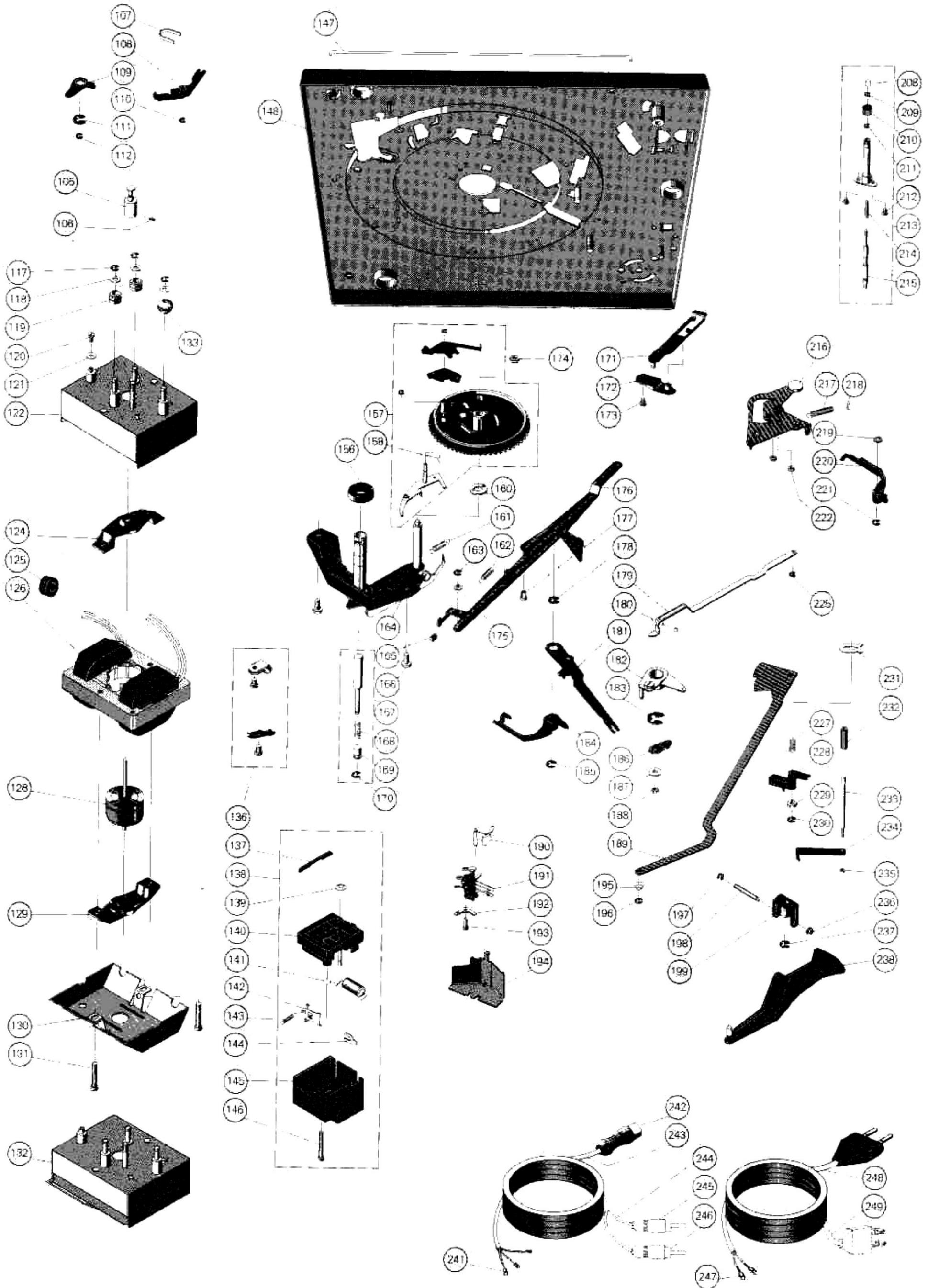


Fig. 18 Exploded view 2



Pos.	Part.No.	Qty.	Description
44	237 118	2	Lock washer
45	239 809	1	Locating screw
48	243 782	1	Tonearm compl.
49	243 780	1	Weight compl.
50	242 234	1	Pin
51	233 239	1	Bearing compl.
52	236 220	1	Clamp part
53	236 691	1	Plate
54	227 569	1	Clamp screw
55	210 472	1	Machine screw AM 3 x 4
56	233 244	1	Spring housing compl.
57	229 721	1	Lock nut
58	217 438	1	Threaded pin
59	243 783	1	Bearing shut compl.
60	229 720	1	Pointer
61	229 738	1	Bearing screw
62	239 193	3	Fillister sunk screw
63	243 784	1	Supporting back compl.
64	229 744	1	Support compl.
65	210 362	1	Hex nut M 3
66	243 785	1	Stop plate compl.
	243 811	1	Stop plate compl. model G
67	226 357	1	Tension spring
68	240 478	1	Switch lever compl.
69	243 812	1	Supporting front compl.
70	200 444	2	Spring washer
105	243 815	1	Drive pulley compl. 50 Hz
	243 816	1	Drive pulley compl. 60 Hz
106	233 137	1	Threaded pin M 2.5 x 3
107	238 828	1	V-spring
108	238 827	1	Switch lever
109	238 826	1	Change over part
110	210 144	1	Lock washer 1.9
111	210 149	1	Lock washer 6
112	210 146	6	Lock washer 3.2
117	210 146	6	Lock washer 3.2
118	210 641	3	Washer
119	242 285	2	Sleeve
120	210 480	1	Machine screw AM 3 x 6
121	210 609	1	Washer 3.2/10/1
122	242 214	1	Screening sheet compl.
124	233 038	1	Top bearing bracket
125	209 939	1	Sleeve
126	243 818	1	Stator 110/220 V compl.
128	243 943	1	Armature compl.
129	233 039	1	Bottom bearing bracket compl.
130	243 093	1	Screening sheet
131	239 992	2	Centering screw
132	243 944	1	Motor
133	242 111	1	Sleeve
136	231 079	1	Cable holder
137	236 335	1	Slide
138	242 581	1	Power switch compl. 10 nF
	242 582	1	Power switch compl. 68 nF
	236 999	1	Power switch compl.(single-pole) 10 nF
139	200 444	1	Spring washer
140	233 012	1	Switch plate compl. 10 nF
	236 606	1	Switch plate compl. 68 nF
141	241 883	1	Capacitor 10 nF / 250 V
	230 355	1	Capacitor 68 nF / 250 V/20 %
142	230 148	1	Switch angle
143	239 732	1	Tension spring
144	219 200	1	Snab spring
145	242 102	1	Cover
	233 421	1	Cover (single-pole)
146	210 498	1	Machine screw M 3 x 28
147	239 925	1	Switch rod
156	229 754	1	Ball bearing
157	242 610	1	Cam wheel compl.
158	200 522	1	Snab spring
160	239 789	1	Slip washer
161	227 045	1	Tension spring
162	226 357	1	Tension spring
163	210 145	8	Lock washer 2.3
164	242 941	1	Bearing housing compl.
165	200 650	1	Rubber sleeve

Pos.	Part.No.	Qty.	Description
166	218 155	2	Machine screw M 4 x 6
167	240 426	1	Changing bolt compl
168	213 920	1	Compression spring
169	213 921	1	Sleeve
170	210 145	8	Lock washer 2.3
171	239 913	1	Latch compl.
172	239 915	1	Square plate
173	210 472	1	Machine screw AM 3 x 4
174	210 366	1	Hex nut M 4
175	210 602	1	Washer
176	239 927	1	Switch arm
177	239 931	1	Roll
178	210 147	3	Lock washer 4
179	239 916	1	Stop lever
180	209 358	1	Ball ϕ 4.0
181	239 932	1	Switch lever
182	239 919	1	Adjustment lever
183	232 621	1	Lock washer 8
184	239 933	1	Switch angle
185	210 147	3	Lock washer 4
186	239 941	1	Start lever
187	210 642	1	Washer 4 2/10/1.5
188	210 361	1	Hex nut M 3
189	239 936	1	Setting rail
190	239 807	1	Contact arm
191	242 612	1	Muting switch compl.
192	239 806	1	Ground shut
193	210 486	1	Machine screw M 3 x 8
194	239 808	1	Shield
195	234 106	1	Cone spring
196	210 145	8	Lock washer 2.3
197	210 145	8	Lock washer 2.3
198	200 528	1	Axle
199	239 947	1	Bearing support
208	216 844	1	Guide
209	210 143	2	Lock washer 1.5
210	218 318	1	Sleeve
211	210 143	2	Lock washer 1.5
212	210 472	2	Machine screw AM 3 x 4
213	243 945	1	Lift plate compl.
214	234 798	1	Compression spring
215	240 434	1	Lift pin
216	243 946	1	Segment compl.
217	218 591	1	Tension spring
218	201 184	1	Adjustment washer
219	242 298	1	Lock washer
220	239 917	1	Skating lever compl.
221	210 146	1	Lock washer
222	210 362	2	Hex nut BM 3
225	210 144	1	Lock washer 1.9
227	235 150	1	Compression spring
228	239 934	1	Guide bearing
229	210 366	1	Hex nut BM 4
230	210 145	8	Lock washer 2.3
231	239 810	1	Fuse spring
232	237 543	1	Sleeve
233	237 541	1	Lever compl.
234	239 909	1	Lift cam
235	210 353	1	Hex nut BM 2
236	210 145	8	Lock washer 2.3
237	210 147	3	Lock washer 4
238	242 616	1	Main lever
241	209 436	2	Pick flat plug shell
242	209 424	1	Live pole plug
243	207 303	1	Pick-up lead compl.
244	207 301	1	Pick-up lead compl.
245	209 425	1	Cynch plug white
246	209 426	1	Cynch plug black
247	214 602	2	AMP connector
248	232 996	1	Power cable europe compl.
249	232 995	1	Power cable america compl.
***	214 120	1	TA mounting parts
***	242 364	1	Operating instruction
***	241 158	1	Mounting instruction
***	241 083	1	Shipping carton
***	242 627	1	Shipping carton CS

*** Parts not illustrated

Modification reserved

Lubrication

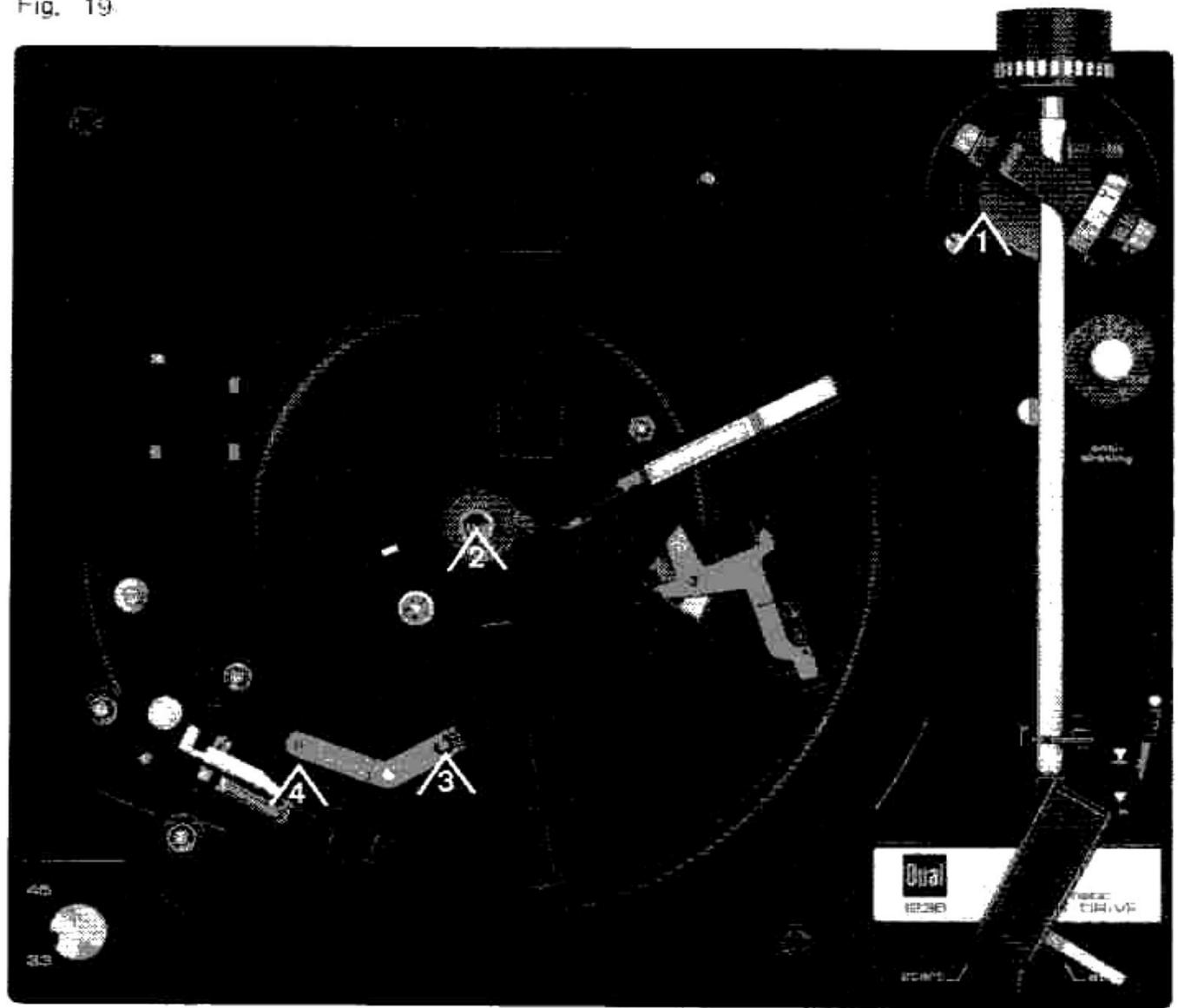
All bearing and friction points of the unit are adequately lubricated at the works. Replenishment of oil and grease is only necessary after approximately 2 years of normal use of the record player as the most important bearing points (motor bearings) have sintered metal bushes.

Bearing points and friction faces should be lubricated sparingly rather than generously.

It is important that no oil grease should come in contact with the friction faces of the flat belt, drive pulley and flywheel rotor, otherwise slip will occur.

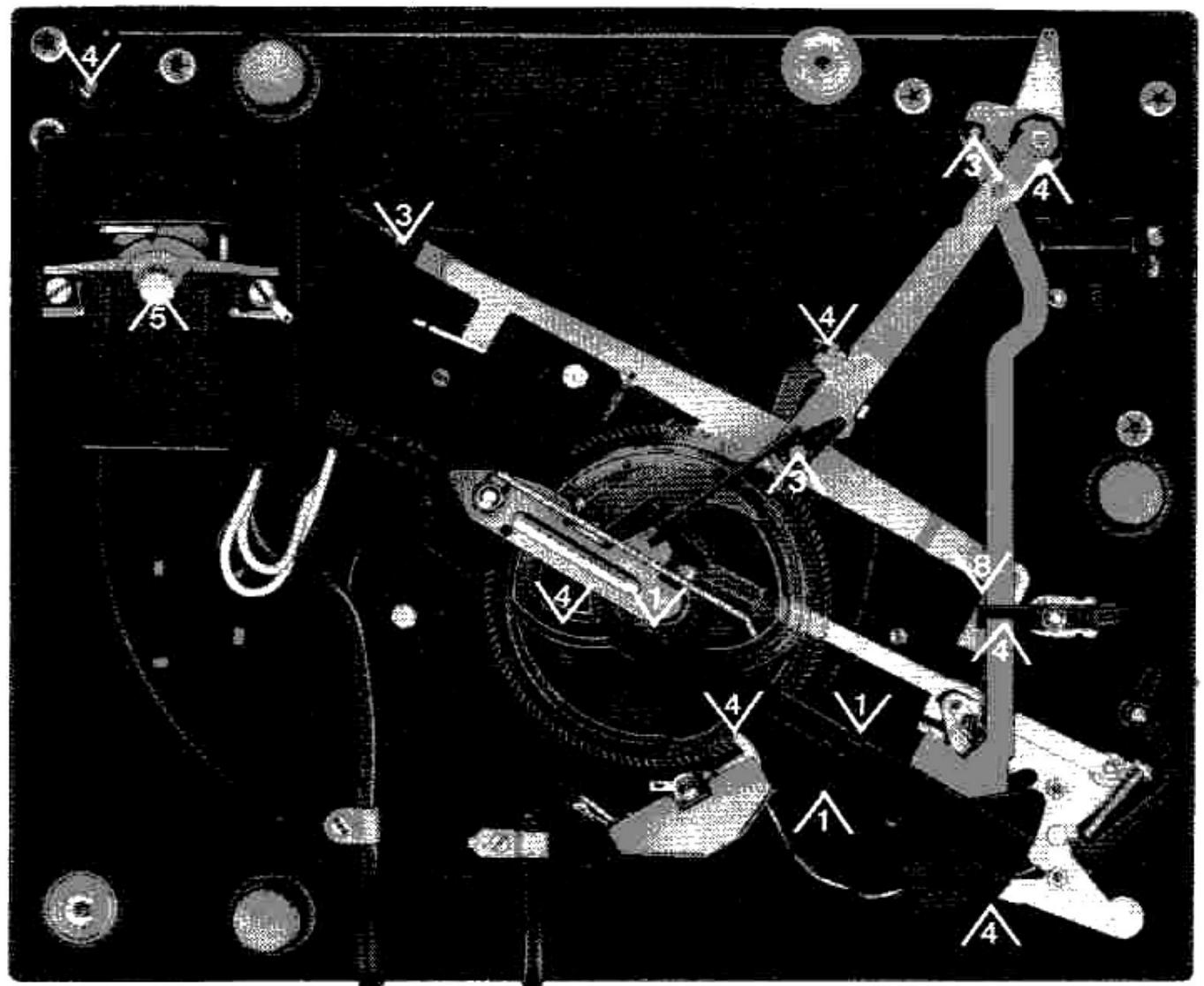
When using different lubricants, chemical decomposition can often take place. To prevent lubrication failure we recommend using the original lubricants stated below

Fig. 19



- 1 Wacker Siliconöl
AK 300 000
- 2 Haftöl Renotac Nr. 343
- 3 BP Supper Viscostatik
10 W/40
- 4 Shell Alvania Nr. 2
- 5 Isoflex PDP 40
- 8 Molykote

Fig. 20



Dual Gebrüder Steidinger · 7742 St. Georgen/Schwarzwald