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1246



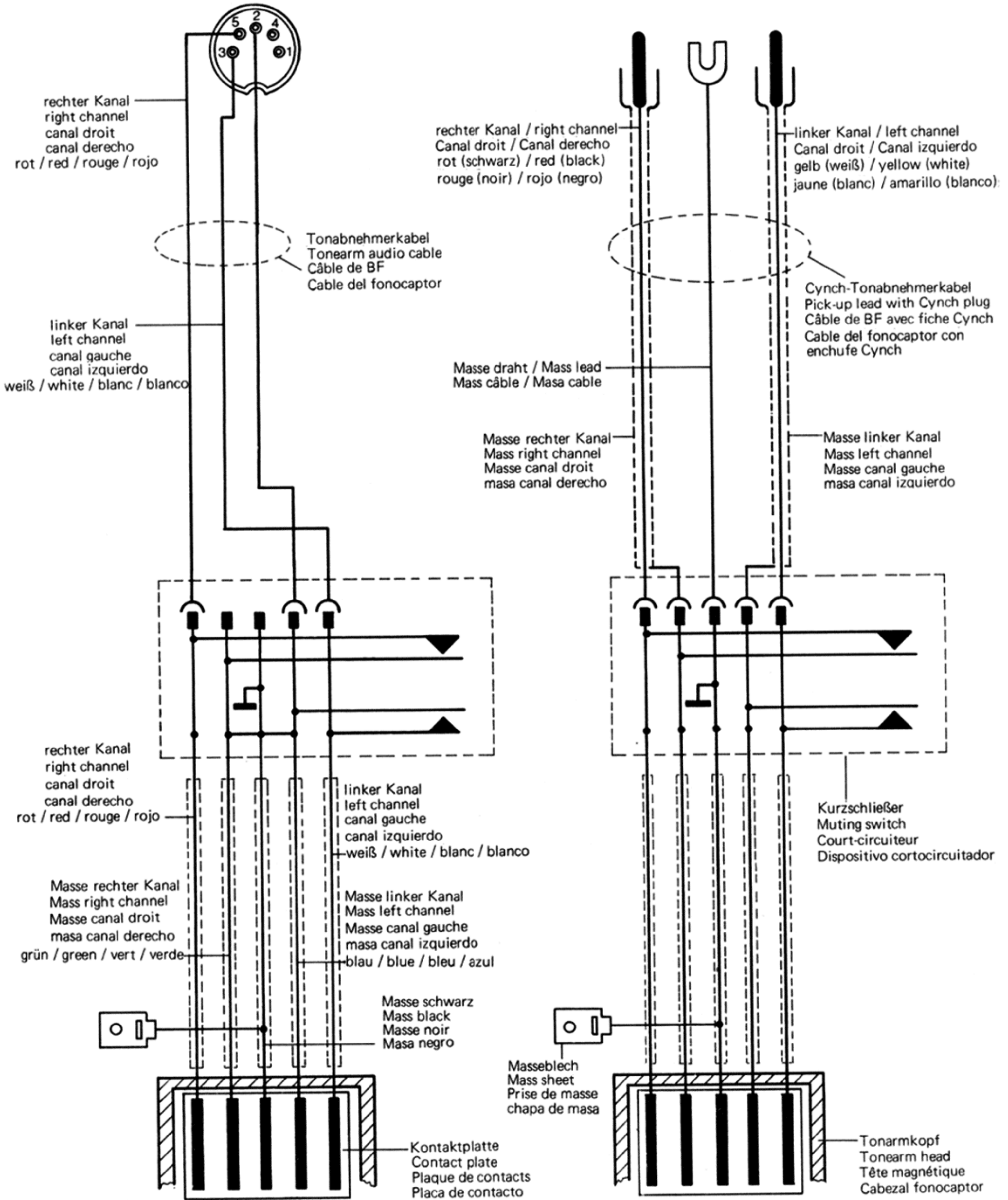
Service Manual

Dual Gebrüder Steidinger 7742 St.Georgen/Schwarzwald

Fig. 1 TA-Anschlußschema / Audio Connection Diagram / Schema de branchement / Esquema de conexion del fono captor

a) mit DIN-Stecker 5-polig / with DIN-plug 5 pin
avec fiche DIN 5 pôles / con enchufe DIN de 5 poles

b) mit Cynchstecker / with phono plug
avec fiche cynch / con enchufe Cynch



Contents

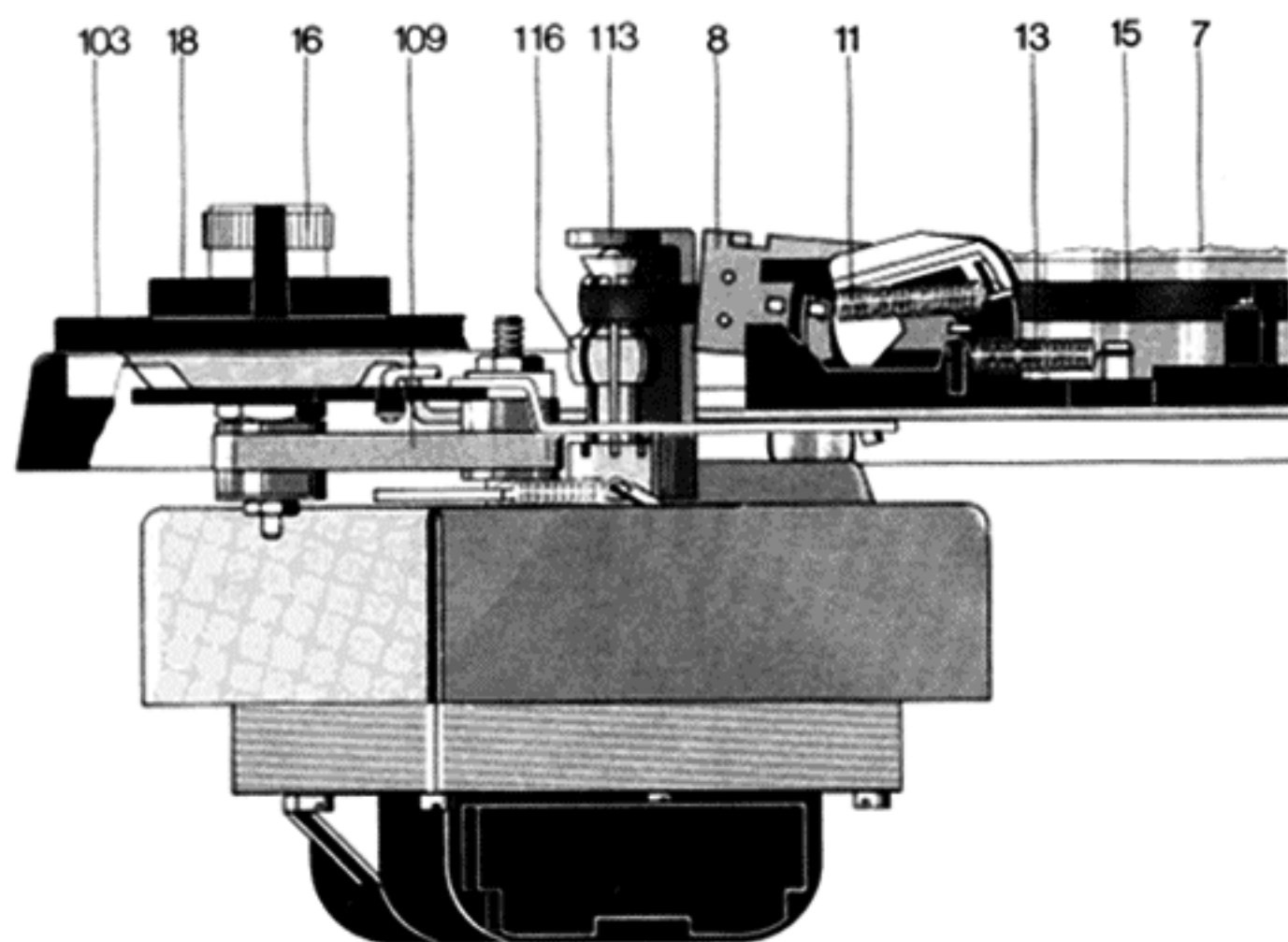
| | |
|---------|--|
| Page | |
| 2 | Pick-up Connection Diagramm |
| 3 | Technical Data |
| 4 | Motor and Drive |
| 4 | Speed Changeover |
| 4 | Platter |
| 4 | Flat belt |
| 4 | Replacement of Motor Pulley |
| 5 | Stroboscop |
| 5 | Pitch Control |
| 6 | Tonearm and Tonearm Bearing |
| 6 | Removal of Tonearm from Bearing Frame |
| 6 | Removal of Tonearm cpl. with Tonearm Bearing |
| 6 | Removal of Spring Housing |
| 6 | Adjustment of Tonearm Bearing |
| 7 | Antiskating Control |
| 7 | Tonearm Lift |
| 7 | Removal of Lift pin |
| 8 | Tonearm Control |
| 8 | Starting |
| 8 | Manual Start |
| 8 | Continuous Play |
| 9 | Muting Switch |
| 9 | Record to met drop |
| 9 | Stopping |
| 9 | Shut-off and Change Cycle |
| 10 | Shut-off Mechanism |
| 10 | Adjustment points: Tonearm set-down point |
| 10 | Set-down point for 30 cm records |
| 10 | Set-down point for 17 cm records |
| 10 | Shut-off point |
| | Release rocker |
| 11 | Release |
| 11 | Correct nominal speed obtained only at extreme settings. |
| 11 | Platter does not |
| 11 | Platter does not reach required speed |
| 11 | Stylus slips out of playing groove |
| 12 | Pick-up head not parallel to platter |
| 12 – 15 | Replacement parts and exploded views |
| 16 | Lubrication |

Specification

| | |
|------------------------------------|---|
| Current | AC 50 or 60 Hz. Changeable by changing motor pulley |
| Line Voltage | 110 – 130 V or 220 – 240 V, switchable |
| Drive | Dual 8-pole synchronous motor: Flat belt for flywheel drive |
| Power consumption | approx 10 watts |
| Starting Time | (to reach nominal speed) approx. 2 seconds at 33 1/3 rpm |
| Power consumption | at 220 V, 50 Hz: approx. 75 mA |
| | at 117 V, 60 Hz: approx. 140 mA |
| Platter Speeds | Non-magnetic, dynamically balanced, detachable, 1.3 kg, 304 mm ϕ , total speed load of drive system (Platter with flywheel drive) 2.1 kg |
| Platter Speeds | 33 1/3 and 45 rpm, Automatic tonearm set-down coupled with speed adjustment |
| Total Wow and Flutter | According to DIN 45 507 (German Industry Standard) $< \pm 0.09 \%$ |
| Rumble | Unweighted > 42 dB |
| (according to DIN 45 500) | Weighted > 63 dB |
| Tonearm | Torsion-resistant tubular aluminum tonearm in four-point gimbal |
| Effective Length of Tonearm | 221 mm |
| Offset Angle | $24^{\circ} 4'$ |
| Tangential Tracking Error | $0.16^{\circ} / \text{cm}$ |
| Tonearm Bearing Friction | Vertical < 0.07 mN (0.007 g) |
| (related to stylus tip) | Horizontal < 0.16 mN (0.016 g) |
| Stylus pressure | (0 - 30 g) operable from 2.5 mN (0.25g) stylus pressure up |
| Cartridge Holder | Removable, accepting any cartridges with 1/2" mounting and a weight from 5.5 to 10 g (including mounting hardware) |
| Adjustable Overhang | 5 mm |
| Weight | approx. 4.6 kg |

For dimensions and cutout refer to Installation Instructions

Fig. 2



Motor and Drive

The drive 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 magnetic stray 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 (116).

Pulley for 50 Hz Art.-No. 234 453

Pulley for 60 Hz Art.-No. 243 454

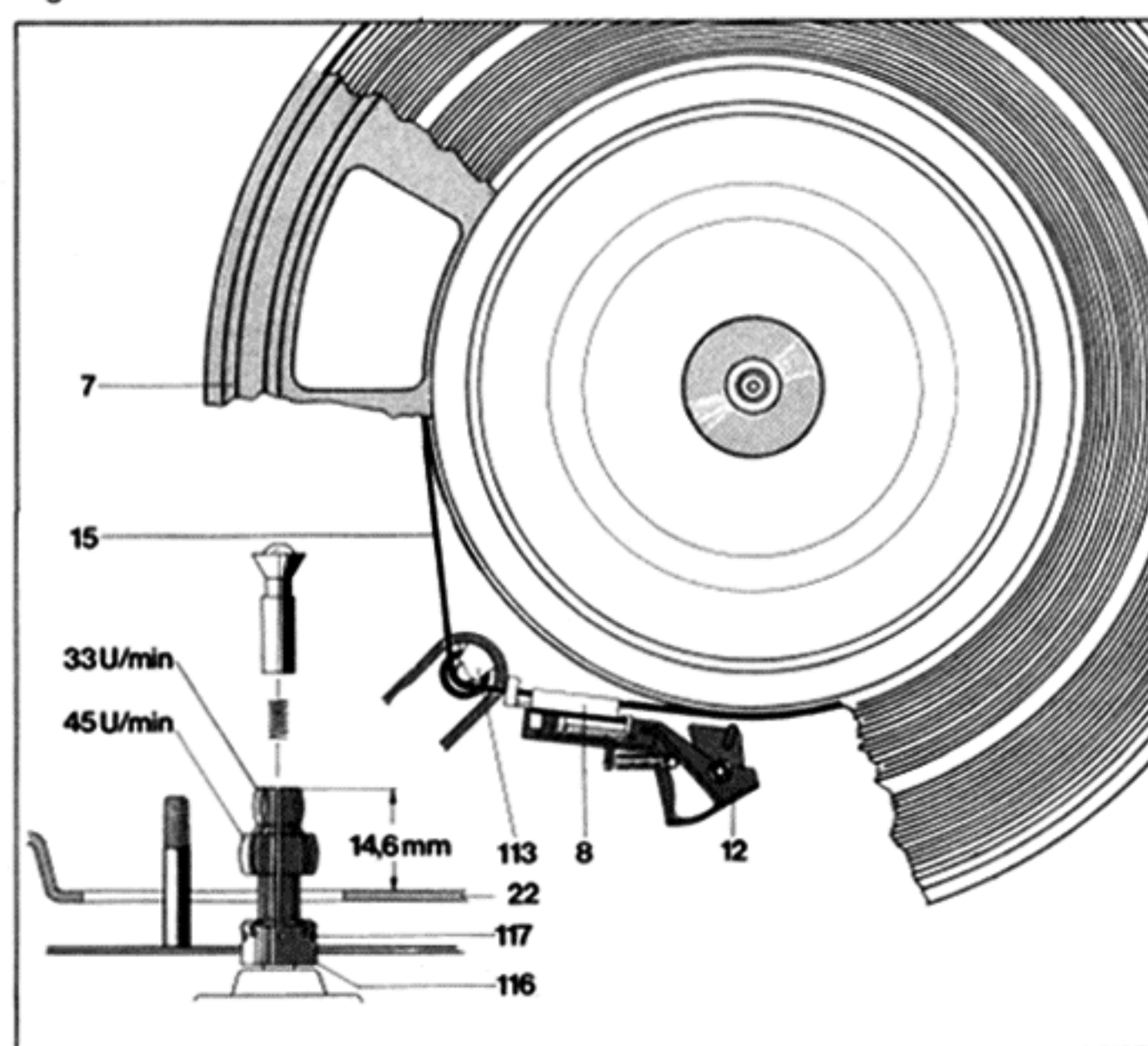
The drive is transmitted to the platter by means of the griuded flat belt (15).

Speed Changeover

Platter speeds of 33 1/3 and 45 rpm are adjusted by linking the flat belt (16) to the corresponding step of the drive pulley (116) (Fig. 3).

The speed switch lever is brought into the required position (33 or 45 rpm) by means of the speed selection lever (16), the switch lever (101) and the spring lever of the switch levers. If the device is switched off, the switch lever is interlocked by the stop lever. The speed is in this way only preselected. The stop lever (12) is only released when the platter (7) turns. This then moves the flat belt (15) onto the required step of the drive pulley (116).

Fig. 3



Platter

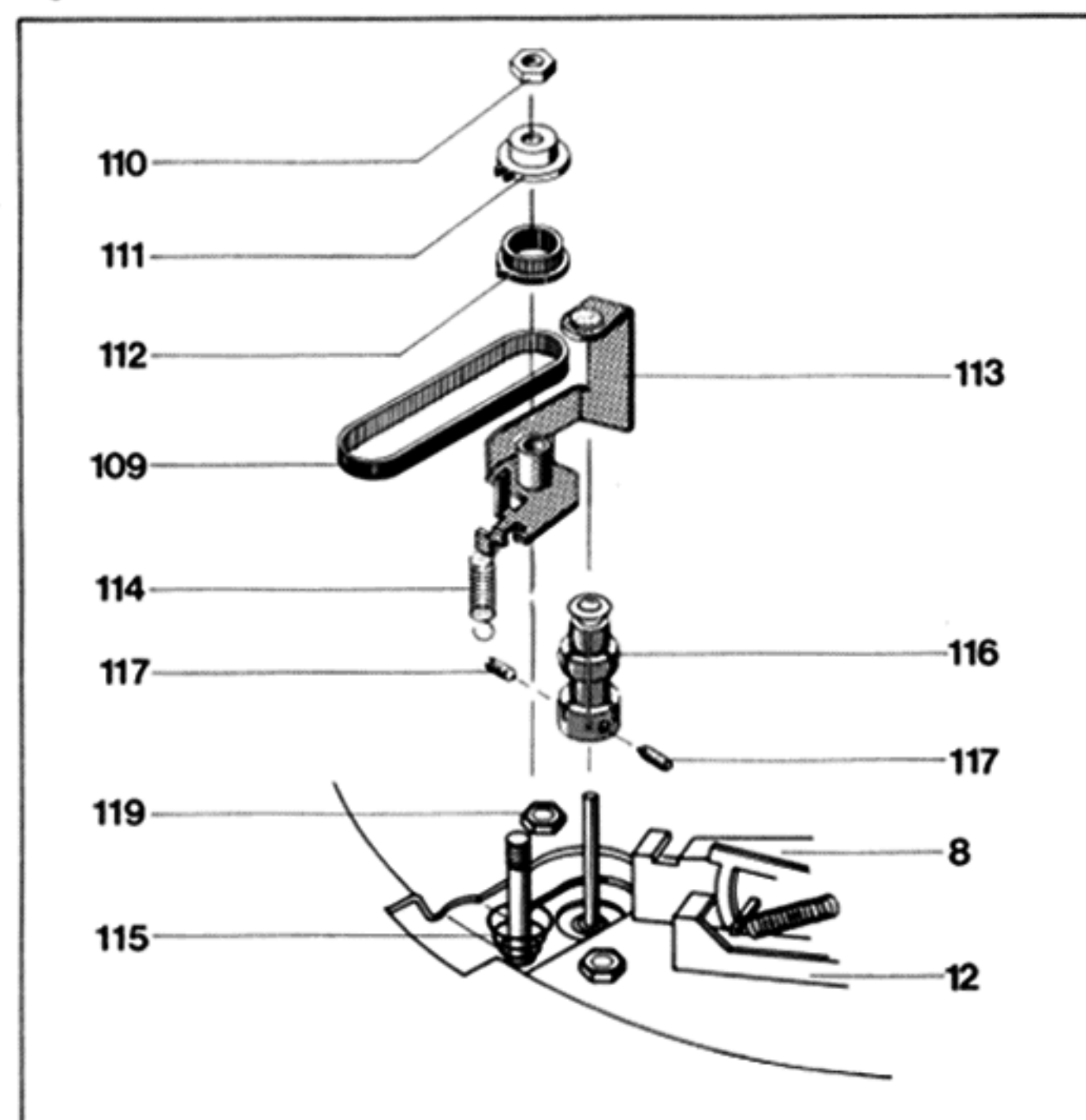
The platter (7) is held in position by the platter locking lever (28). When removing the platter, lift the platter covering over one of the cutouts and rotate the platter until the cutout is above the drive pulley. Detach the flat belt (15) from the drive pulley (116) and lay it on the running surface of the platter (7).

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.

Attention: The griuded (mat) side had to be on the running surface. Install the platter Put the flat belt onto drive pulley (116).

Fig. 4



Changing the drive pulley

1. Remove the flat belt (15) from the drive pulley (116) and take off the platter (7). Remove the toothed belt (109).
2. Detach tension spring (114) from screening sheet (122).
3. Remove the hexagonal screw (110), remove the adjustment cam (111), the belt pulley (112) as well as the counter bearing (113).
4. Loosen set screws (117) and remove motor pulley (116). Place complete replacement motor pulley on motor axle. Remove conical sleeve. Be careful with the interior distance bushing. Adjust motor pulley vertically (see Fig. 3) and tighten set screws (117) uniformly. Place conical sleeve into the motor pulley (116).
5. Outer counter bearing (113), belt pulley 2 (112) and adjustment cam (102) should now be fitted and the hexagonal head mounting screws tightened (111). Replace the tension spring and toothed belt (109). Install the platter (7). Fit the flat drive belt (15) onto the drive pulley (116).
6. Setting up the nominal speed: set the regulator knob (16) to its central position. By loosening or tightening the hexagonal nut (110) adjust the nominal speed.

Stroboscope

Exactly setting of the platter speed $33 \frac{1}{3}$ rpm can be checked during play with the aid of the stroboscope device.

When the platter (7) is rotating at exactly $33 \frac{1}{3}$ rpm the lines of the stroboscope appear to stand still. If the lines of the stroboscope move in the direction of rotation of the platter, the platter speed is too high. If the lines move backwards, the platter is rotating more slowly than the nominal speed.

Adjustment is carried out with the "pitch" knob (16).

Strobe markings for 50 or 60 Hz are provided on the platter rim. When exchanging the lamp the strobe must be removed from the base plate (22). After removal of the stroboscope housing (244) the lamp (215) may be exchanged.

Fig. 5

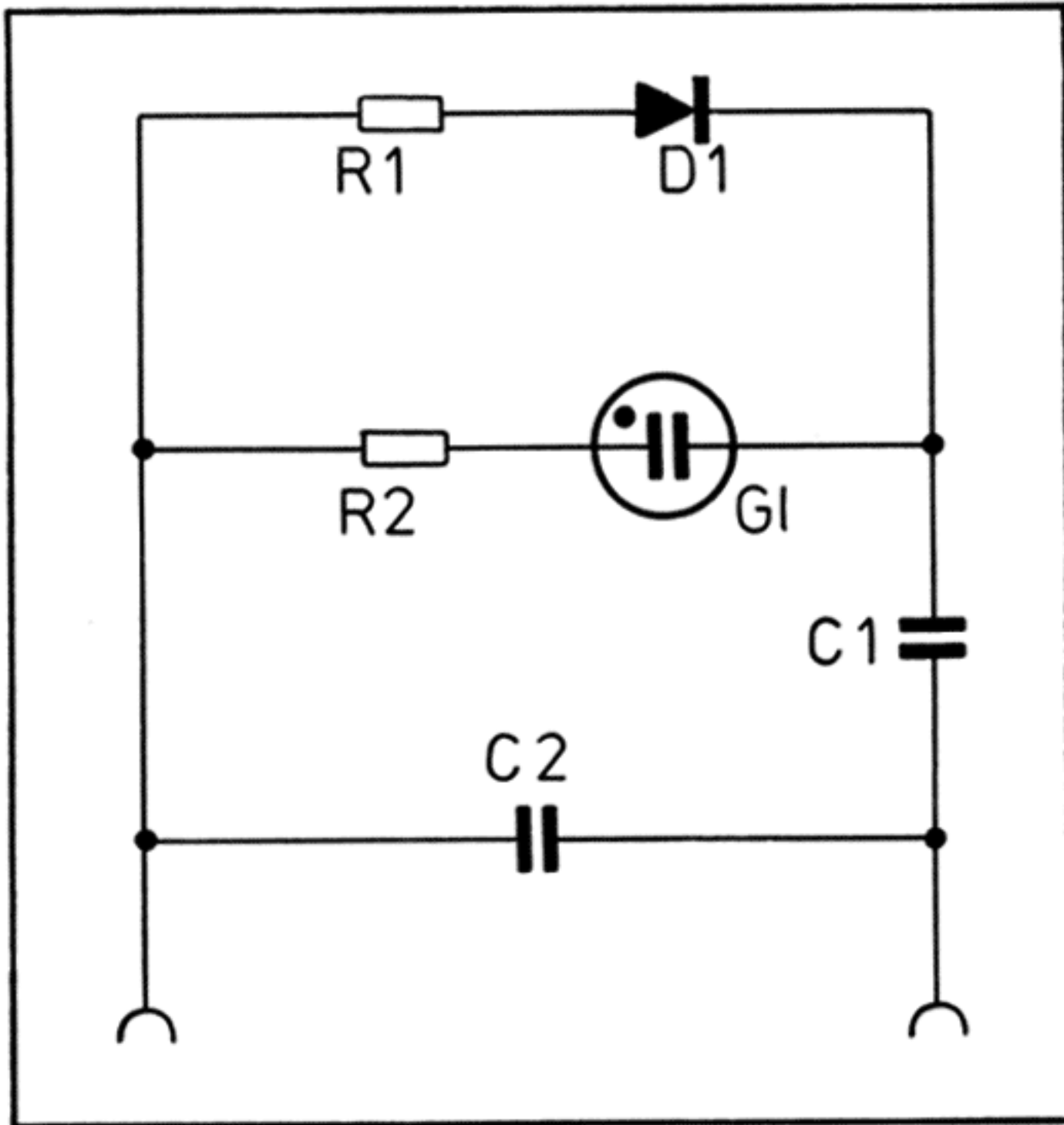
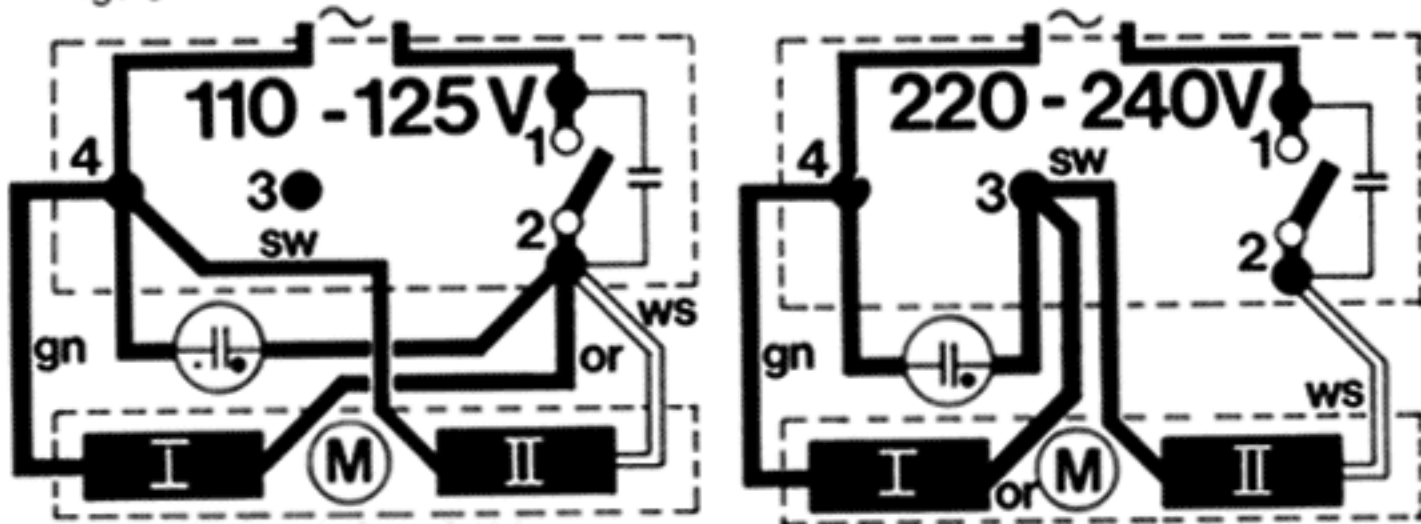


Fig. 6



Pitch Control

The unit has a separately adjustable pitch control the two standard speeds $33 \frac{1}{3}$ rpm and 45 rpm can be varied by approximately 6% (semitone).

By turning the fine speed adjustment knob (16) the belt pulley 2 (112) is moved. This rotation is transferred by means of the toothed belt (109) to the drive pulley 1 (105). (Fig. 9). Thus moving the counter bearing (113) upwards or downwards. The taper bush of the drive pulley designed to vary the diameter of the drive pulley thus varying the nominal speed within the tolerance of $\pm 3\%$.

Fig. 7

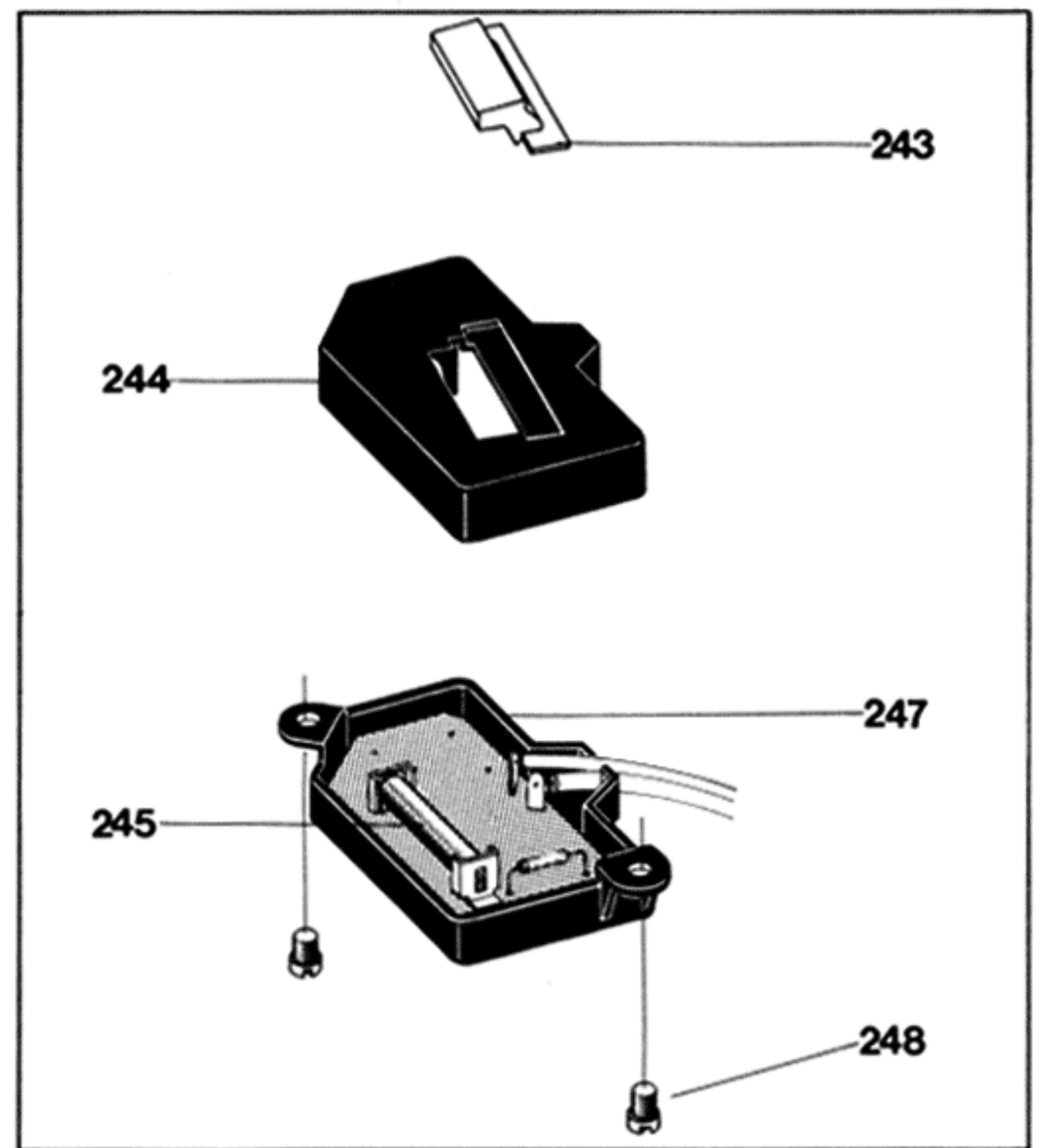


Fig. 8

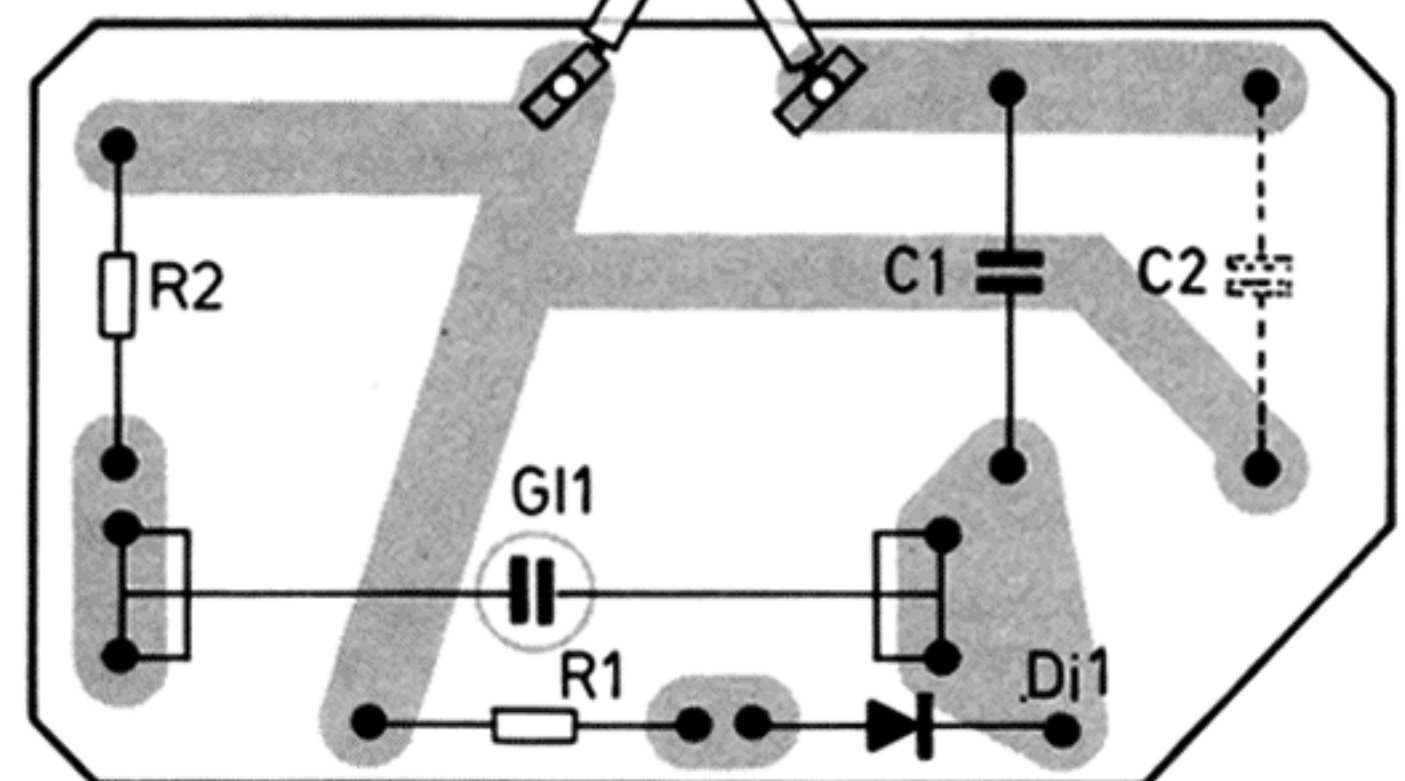


Fig. 9

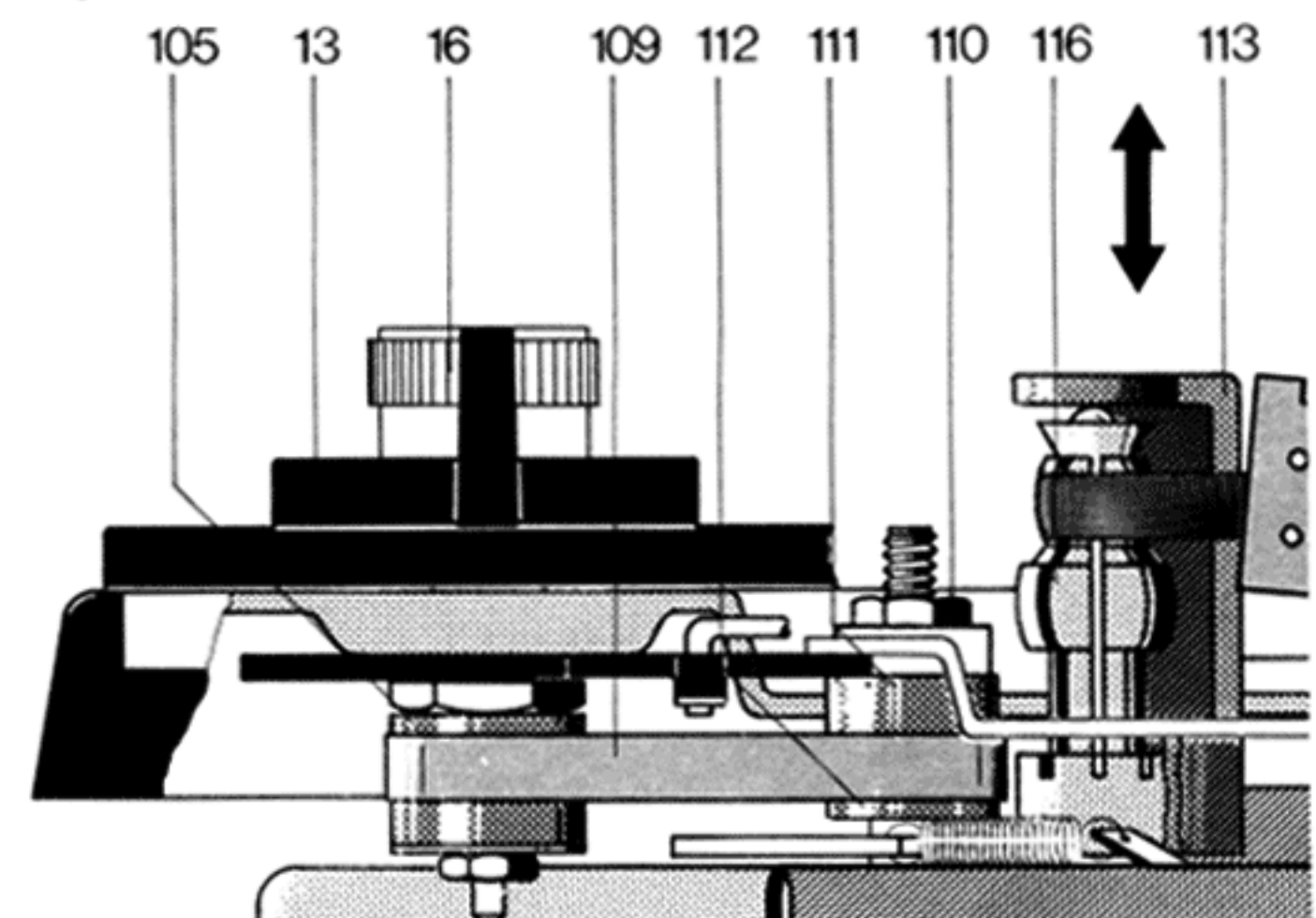
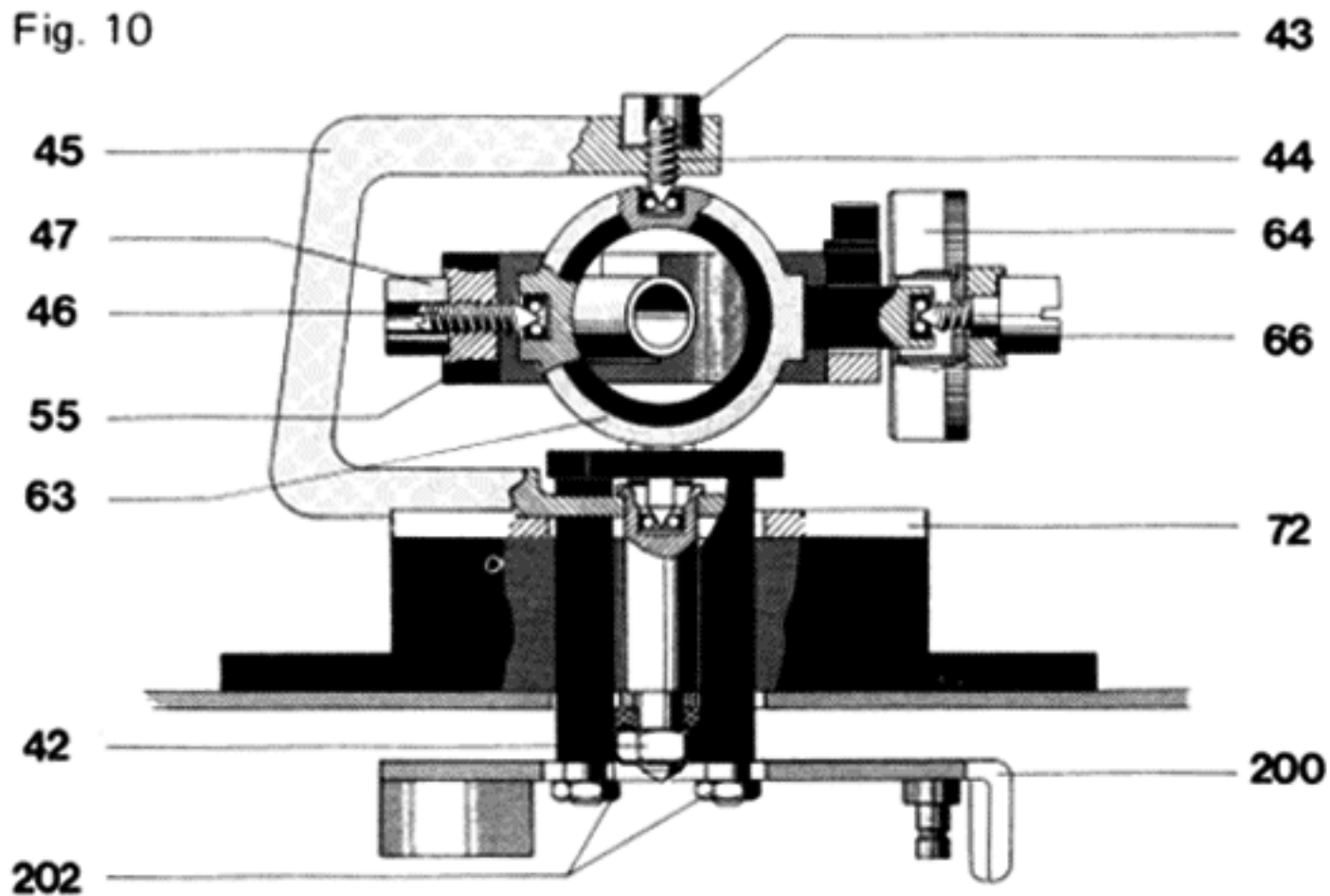


Fig. 10



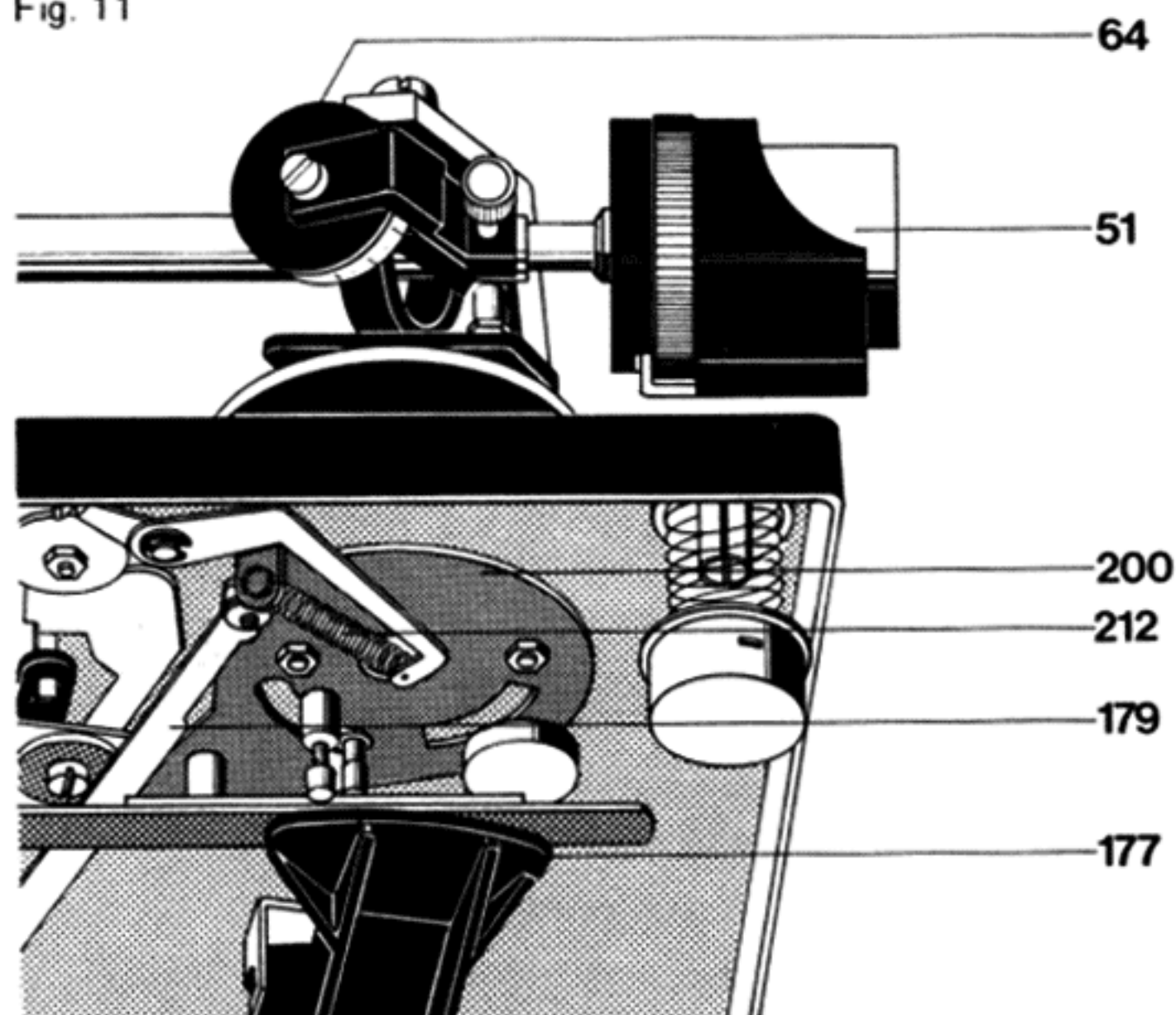
Tonearm and Tonearm Bearing

The Dual 1246 has a feather light, extremely torsion-resistant aluminum 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 < 0.07 mN (0.007 g)
 Bearing friction horizontal < 0.16 mN (0.016 g)

Ensures of pick-up. Before adjusting the pick-up force the tonearm is balanced with the scale set to zero. Coarse adjustment is carried out by moving the weight with the pin (51) the subsequent fine adjustment by turning the weight. The balance weight is designed, so that pick-up cartridges having a deadweight (incl. hardware) of 5.5 - 10 g can be balanced. The tracking force is adjusted by turning the graduated spring housing (64) incorporating a coil spring. The scale has markings for a range of adjustment from 0 to 30 mN (0 to 3 g) which permit accurate adjustment of the tracking force.

Fig. 11



Removing the tonearm from the bearing frame

1. Clamp unit in the repair jig. Remove the balance weight (51), remove clamp screw (58). Set spring housing scale (64) to zero.
2. Turn the unit over and remove the screening sheet (149). Unsolder the tonearm connections on the muting switch (146).
3. Turn the unit back to normal position. Turn the two fixing screws (75) – SW 5.5 – counter-clockwise into the bearing frame (68). Slide tonearm (63) backwards and lift tonearm from bearing frame (68).

Reverse this procedure when reassembling.

Removing the tonearm compl. and tonearm bearing

1. Clamp unit in the repair jig. Remove the balance weight (51), remove clamp screw. Set spring housing scale (64) to zero.
2. Turn the unit over and remove the shield (149). Unsolder the tonearm connections on the muting switch (146).
3. Remove main lever (177) and lock washer (242). Turn adjustment screw (40) until guide bearing (241) and positioning slide (204) are free. Remove lock washer (228) and positioning slide (204).
4. Unlock tension spring (212). Loosen lock washer (216) and remove skating lever (215).
5. Remove lock washers (205 + 206) and take stop lever (179) away from segment (200).
6. Remove hex nut (202) and take off segment (200).
7. Hold tonearm (50). Remove hex nut (42) and washer (41) as well as tonearm cpl. with tonearm bearing.

Reverse this procedure when reassembling.

Replacing spring housing

Remove tonearm (50) from bearing frame (55) as described above. Loosen lock nut (47) and threaded pin (46). Unscrew bearing screw (66). Lift bearing frame (55). Remove spring housing (64) and washer. When installing note that the helical spring catches the bearing frame. And tighten bearing screw (66). Reinstall tonearm (55). Set bearing play as described below using threaded pin (46) and lock nut (47).

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 (46).

Antiskating Device

The adjustment of the antiskating force is made by turning the indicator disc (73) located on the supporting back. The skating lever (215) is displaced from the tonearm fulcrum by an amount depending on the setting of this control. The antiskating force is transmitted to the tonearm (50) via the tension spring (212) and segment.

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

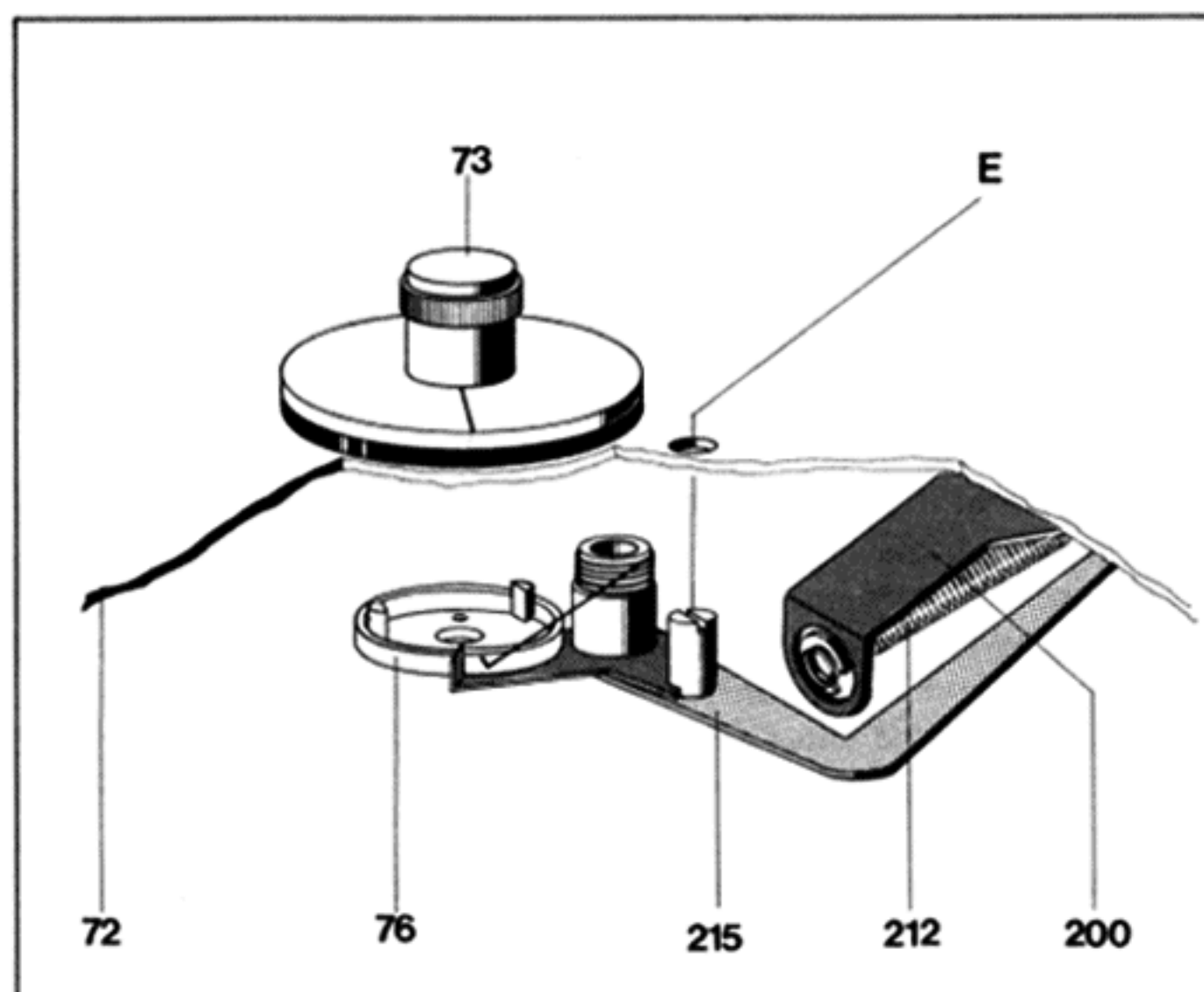
Any alteration can only be carried out with the aid of a Dual-Skate-0-Meter and a test record and should only be done by an authorized service station.

Any check may be carried out as follows:

Balance tonearm (50) exactly. Set pointer washer (73) to zero position. The tonearm is now to stop at any point of its turning range. The boring of the skating lever (215) is to vanish towards the center axle of the tonearm – adjustable with the eccentric (E). This part is accessible with the aid of the boring in the back cover (72) (Fig. 12).

Set pointer washer (73) to "0.5". Now the tonearm must slide back from the platter centre to its rest position (49) without braking.

Fig. 12



Tonearm lift

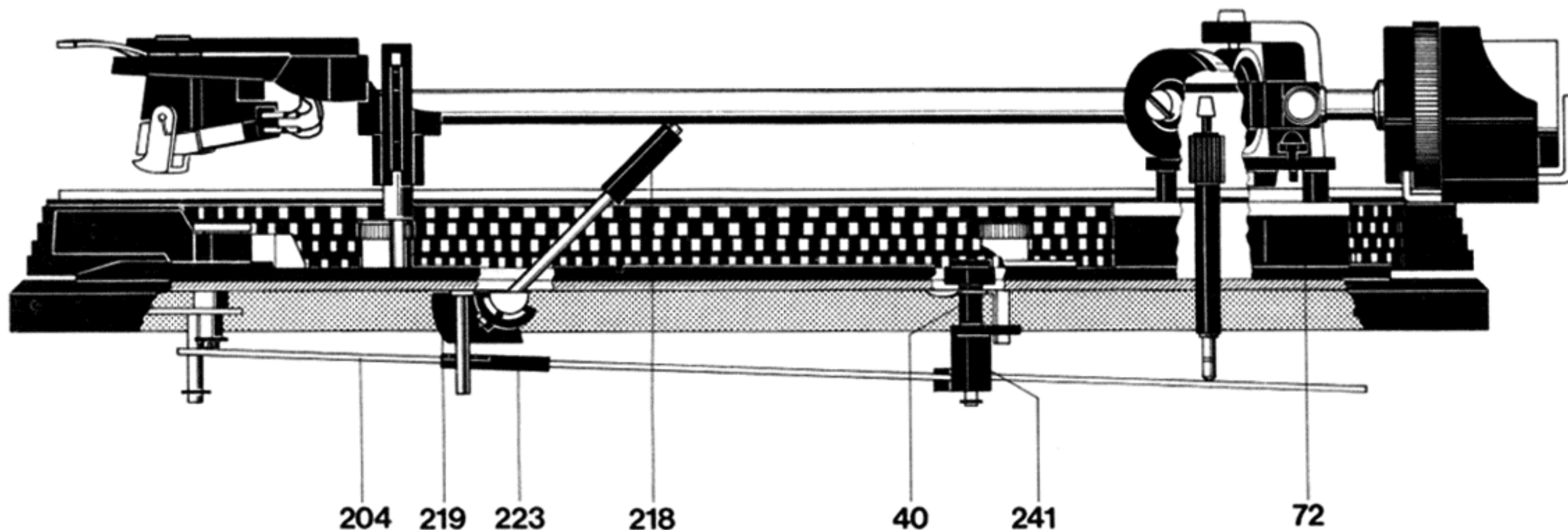
Raising the lever (218) to position "▼" or "▾" moves the lift cam (219) and the setting rail (204) so that the tonearm is raised from the record (or lowered onto it). If the unit is started with the arm lever in the "▼" position, then the tonearm is guided over the record by the set-down mechanism. Only when the lever (218) 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 (40) and should be 3 – 5 mm.

Adjustment of lifting Bolt

1. Remove tonearm cpl. with tonearm bearing as described on page 5).
2. Remove guide (68) on lifting bolt. Remove lock washer (51), adjusting sleeve (52) and second lock washer (68).
3. Remove lifting bolt (68) and compression spring.

Before reassembling clean lifting bolt and lift tube and smear constant with wacker silicone oil AW 300 000.

Fig. 13



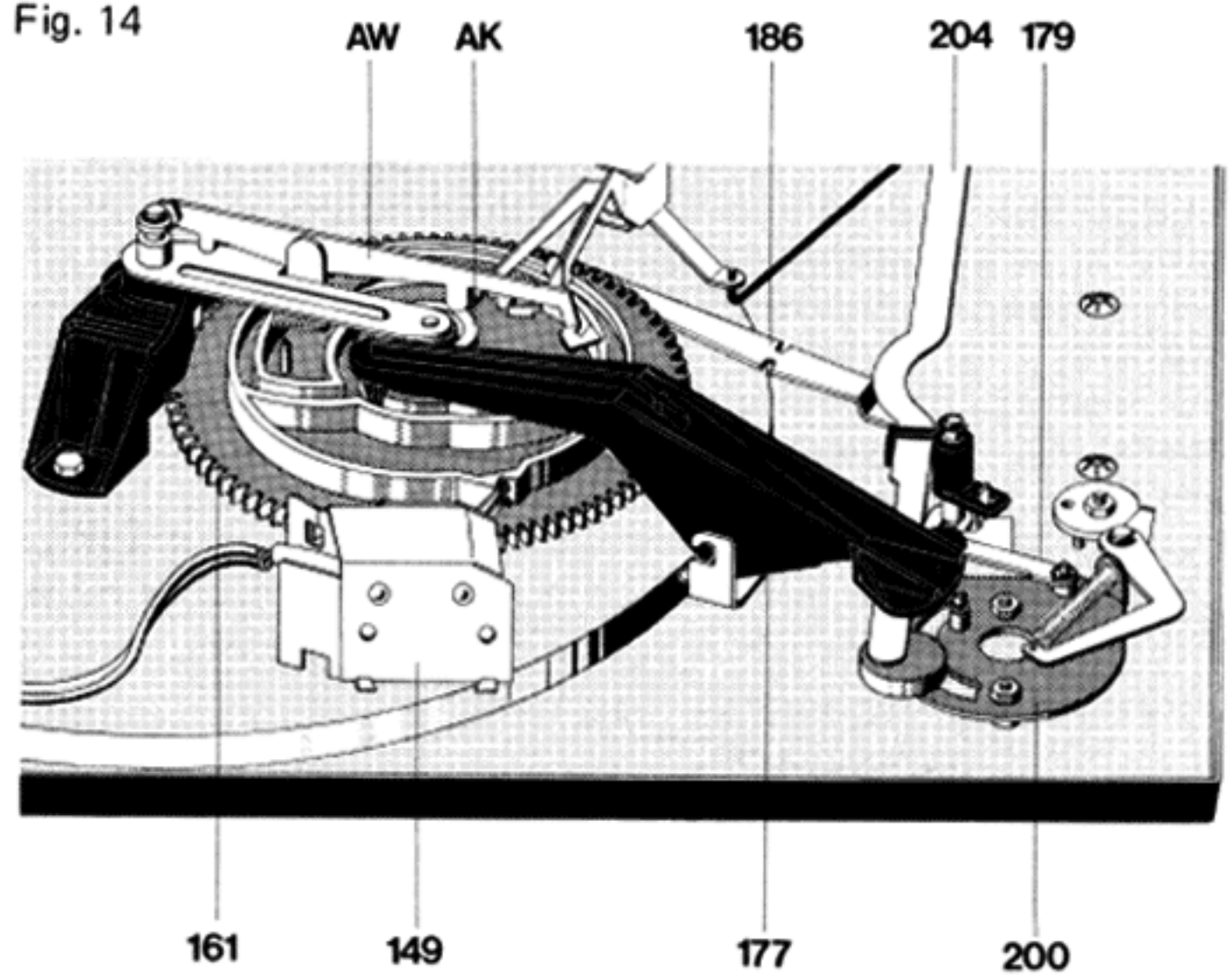
Tonearm Control

Automatic movement of the tonearm is initiated by the control cams on the inside of the cam wheel (161) on rotating through 360°.

The control elements for raising and lowering are the main lever (177) and lift pin (256), for horizontal movement the main lever (177) with segment (200).

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 (200) contacting the setting rail (204). Limitation of the horizontal movement of the tonearm is produced by the pin of segment contacting the stop attached to the setting rail. Only during set-down does main lever (177) lift the slide bar 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 (204) 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.

Fig. 14



Start

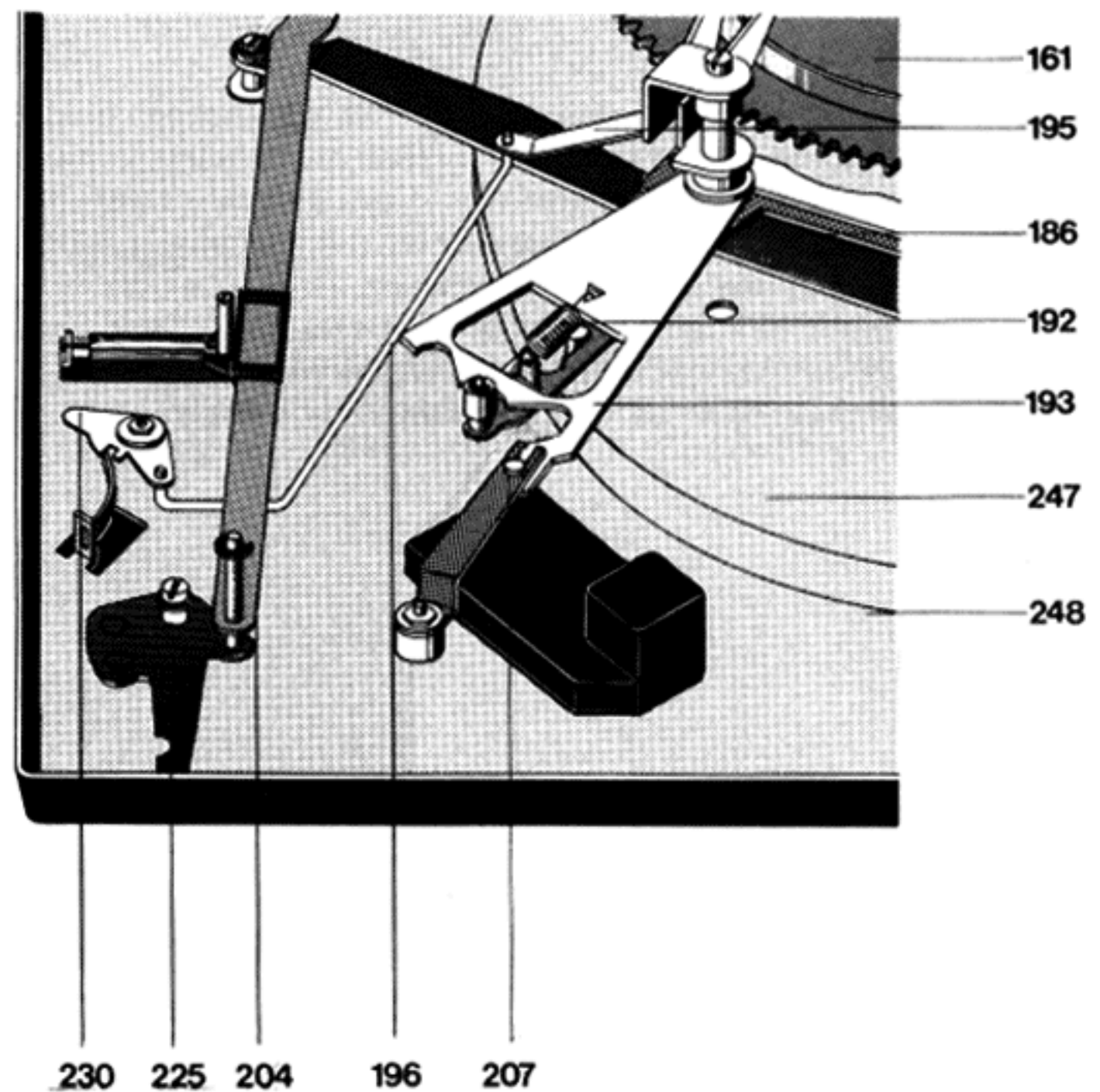
Switching the start/stop lever (48) into the "start" position initiates the following sequence:

- The start lever (207) rotates the switch lever (193) which is pivoted about the notched stud. At the same time, the switch arm is moved and the motor (132), via the mains switch (135), and the platter starts turning.
- Operating the start/stop lever (58) also releases the start slide (191) which is drawn toward the cam by means of the tension spring (192). This causes the shut-off lever to engage with the drive pinion and the cam turns.
- Moving the switch lever (48) releases the start angle (191) which is pulled towards the cam wheel by means of the tension spring (192). As a result, the shut-off lever is transported to the range of the dog on the platter (PR), thus driving the cam wheel.

Manual start

The latch (236) which is connected to the switch arm (186) engages in the four-sided plate when the tonearm is moved manually. The switch arm connects the mains supply to the motor via the power switch 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 (200) engages the latch (236) so that the switch arm is returned to its starting position. This switches off the mains supply.

Fig. 15



Continuous play

Continuous play is switched on by means of turning the rotary knob (76) which turns the switch angle (236). The switch lever (207) then forces the cam follower lever to start position. After the record has been played the tonearm is guided back and again set onto the record at its lead-in groove. This procedure is repeated — also when using the changer facility — until the switch lever (48) is taken to "stop" position or the rotary knob (78) to position "1".

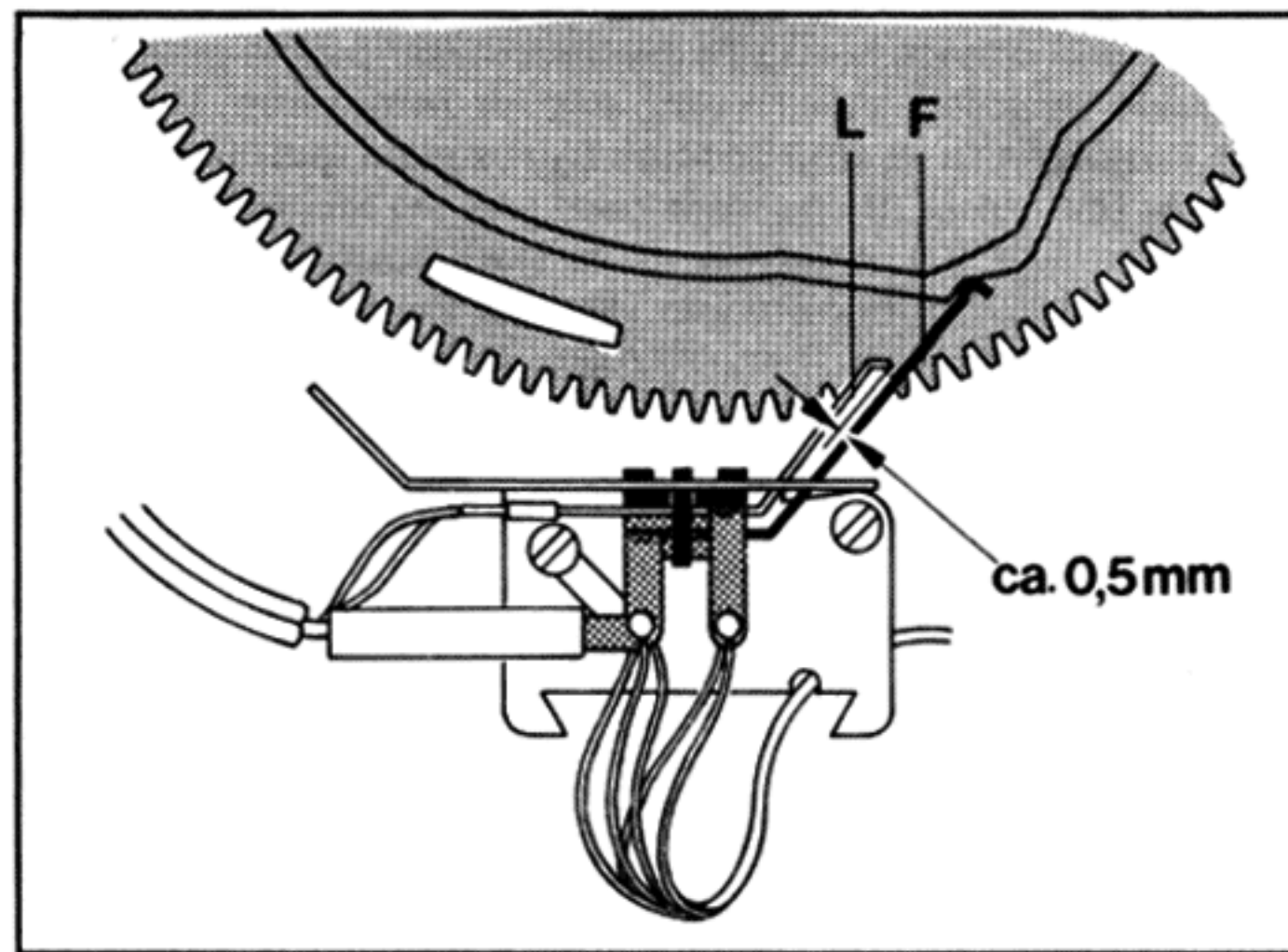
Muting switch

To prevent disturbing noises during automatic operation of the tonearm the unit is fitted with a muting switch. 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 distance of approximately 0.5 mm between the contacts of the muting switch. This distance should be adjusted by bending the muting switch contacts. The contacts should be sprayed with a suitable cleaning agent.

Fig. 16

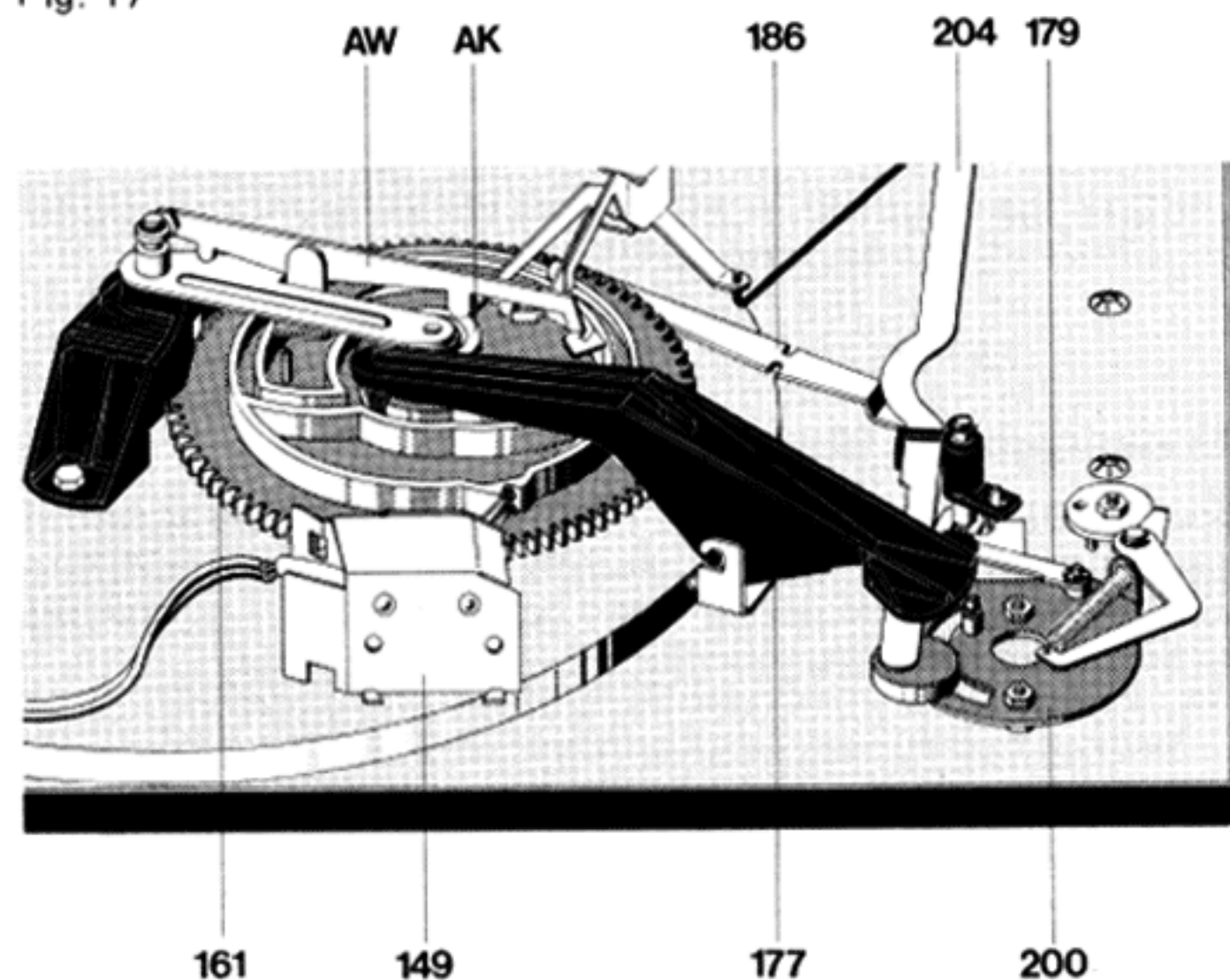


Record drop

Insert the changing 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 (161) whose drop cam surface (AK) controls the release rocker (AW) and the changer actuator rod.

Fig. 17



Stopping

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

Shut-off and change cycle

The dog (M) on the turntable platter gear (PR) 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. The shut-off bar (179) is guided along in proportion to the movement of the segment (200).

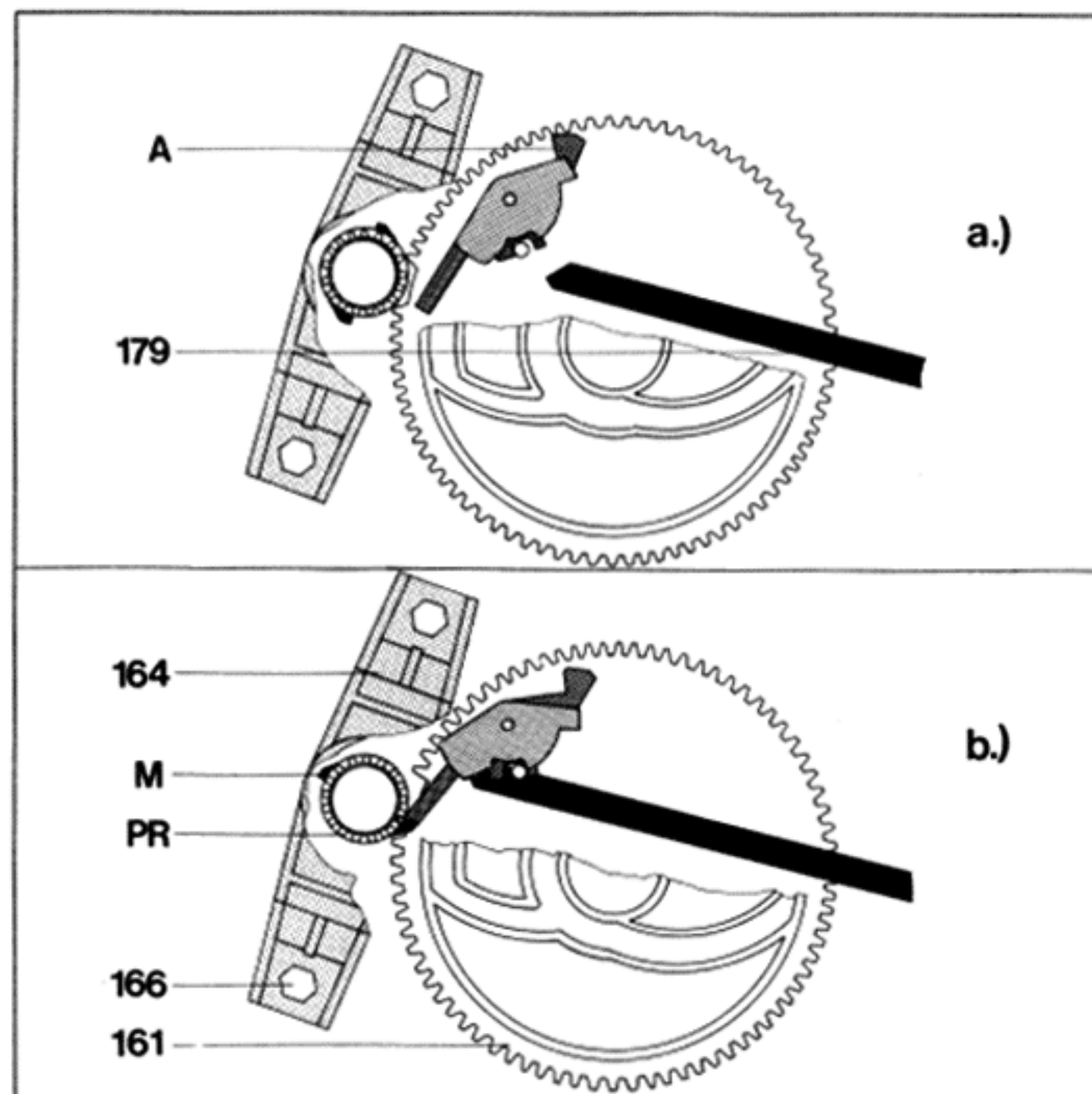
The shut-off procedure is initiated after a record has been played by the dog (M) of the platter and the shut-off lever (A).

The shut-off lever (A) is moved towards the dog (M) of the platter within the shut-off range (record diameter 116 mm to 122 mm) (Fig. 16 a).

The dog engages the shut-off lever (A). The cam wheel (16) is moved from 0 position and engage with the drive pinion of the platter (Fig. 16 b).

The main lever (177) guides the tonearm back and effected the tonearm to return to its rest position.

Fig. 18



Shut-off mechanism

Shut-off and change functions are determined by the position of the guide lever (U). After every start or record drop, the guide lever is brought to its stop position by the main lever (longer end towards the center of the main cam). As the record is dropped the guide 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 guide lever, the lever remains in its stop position and allows the tonearm to swing to its rest position.

When the main cam wheel (161) returns to its neutral position, the switch arm (186) drops into a cut-out in the main cam, opening the power switch (135) and disengaging the drive idler.

Tonearm set down point

Lift Dual logo slightly in left bottom corner and turn out-side. One of the adjustment screws in the opening now visible.

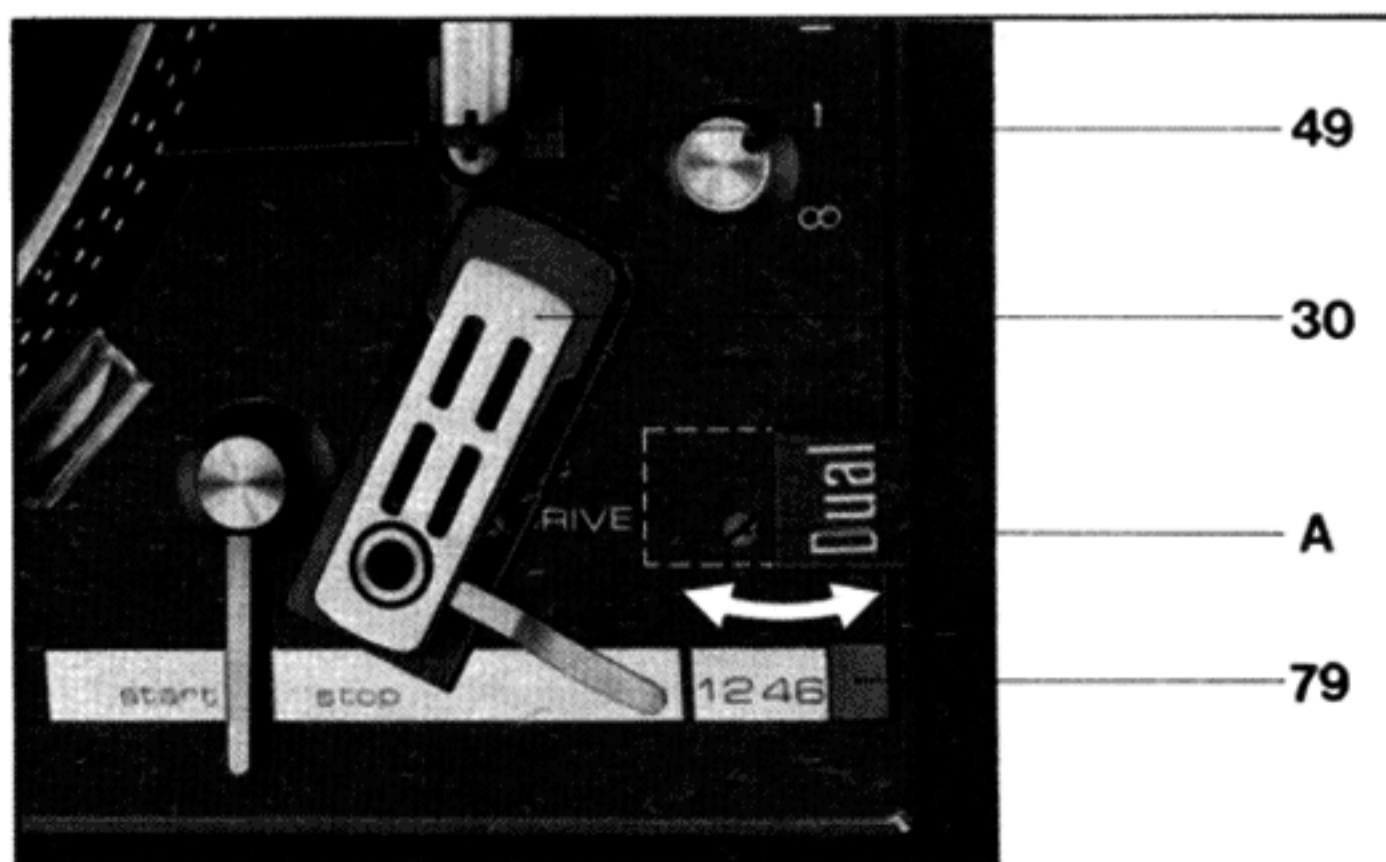
Set-down point for 30 cm records

Set adjustment knob (16) to "45" and adjust setting with a suitable screwdriver. If the stylus sets down too far inside, turn adjustment screw clockwise, if the stylus sets down outside the 30 cm record turn adjustment screw counter-clockwise.

Set-down point for 17 cm record

Set adjustment knob (16) to "33" and proceed by turning the screw as described above.

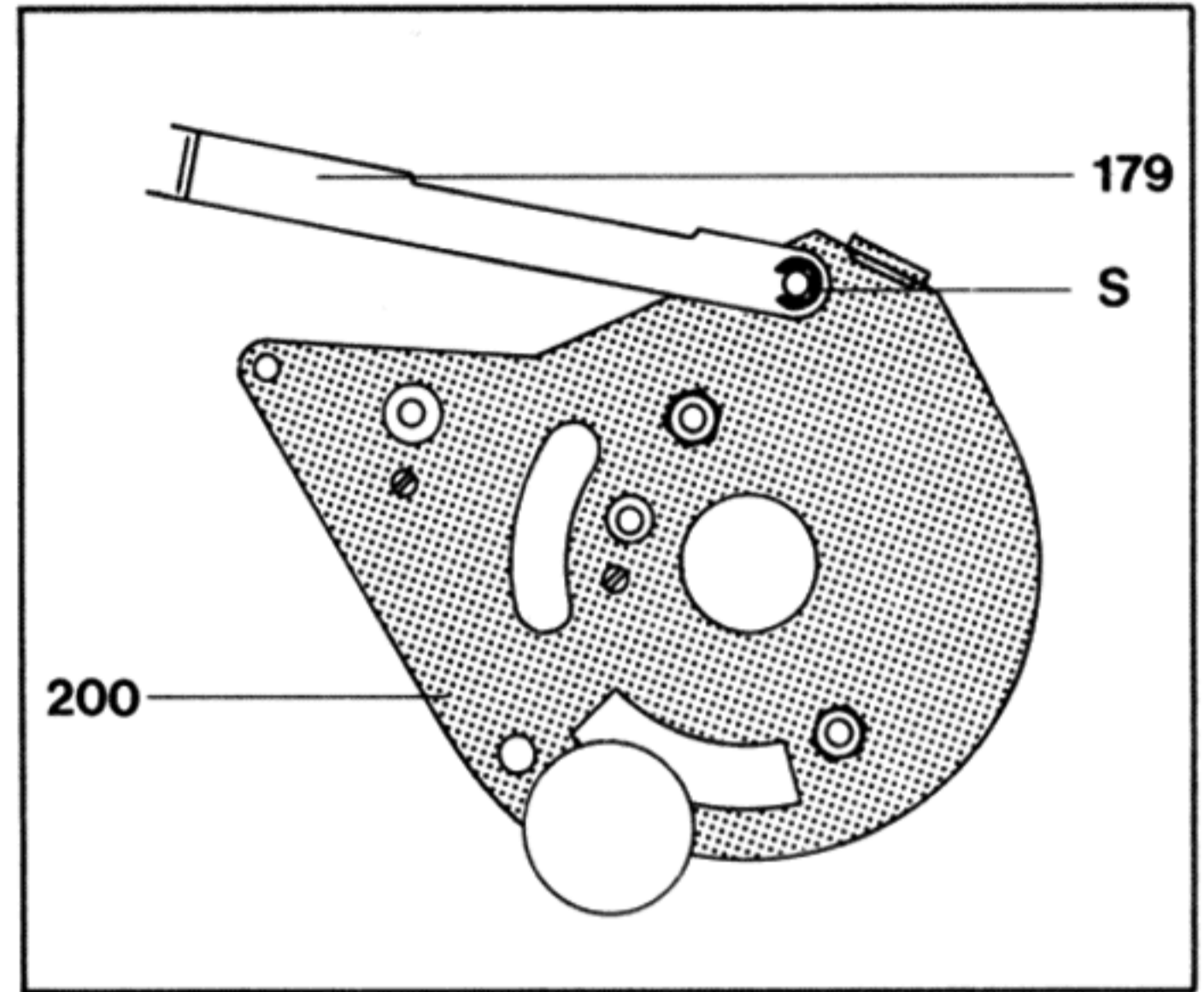
Fig. 19



The switch off position

With the tonearm on the pillar, the eccentric (B) can be adjusted to alter the switch-off position.

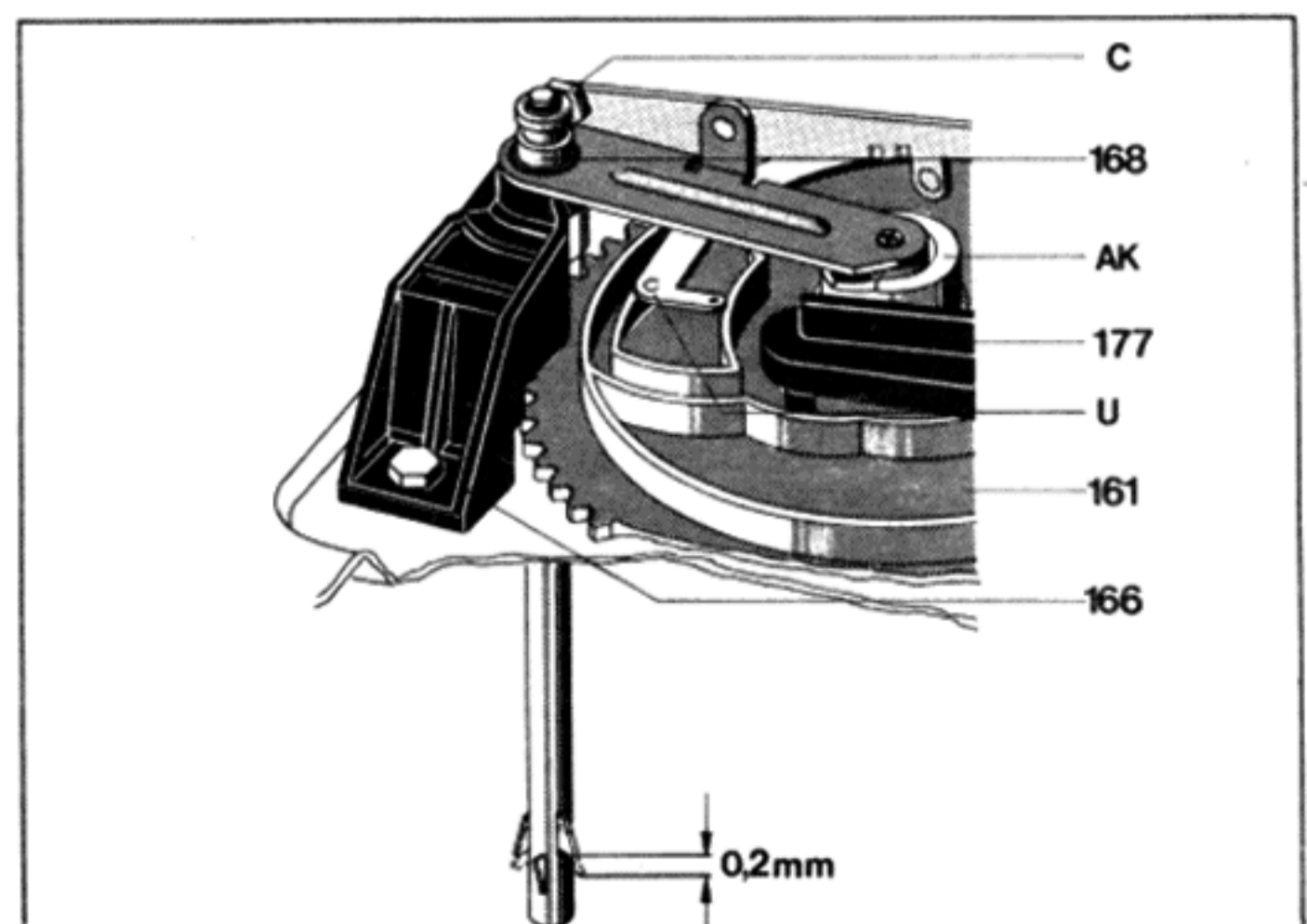
Fig. 20



Release rocker

The eccentric screw (c) is used to alter the travel of the changing bolt (168). The setting is correct when at the rest position of the cam wheel (161) and with interlocked changer spindle, the changing bolt (168) has a travel of 0.2 mm (Fig. 21).

Fig. 21

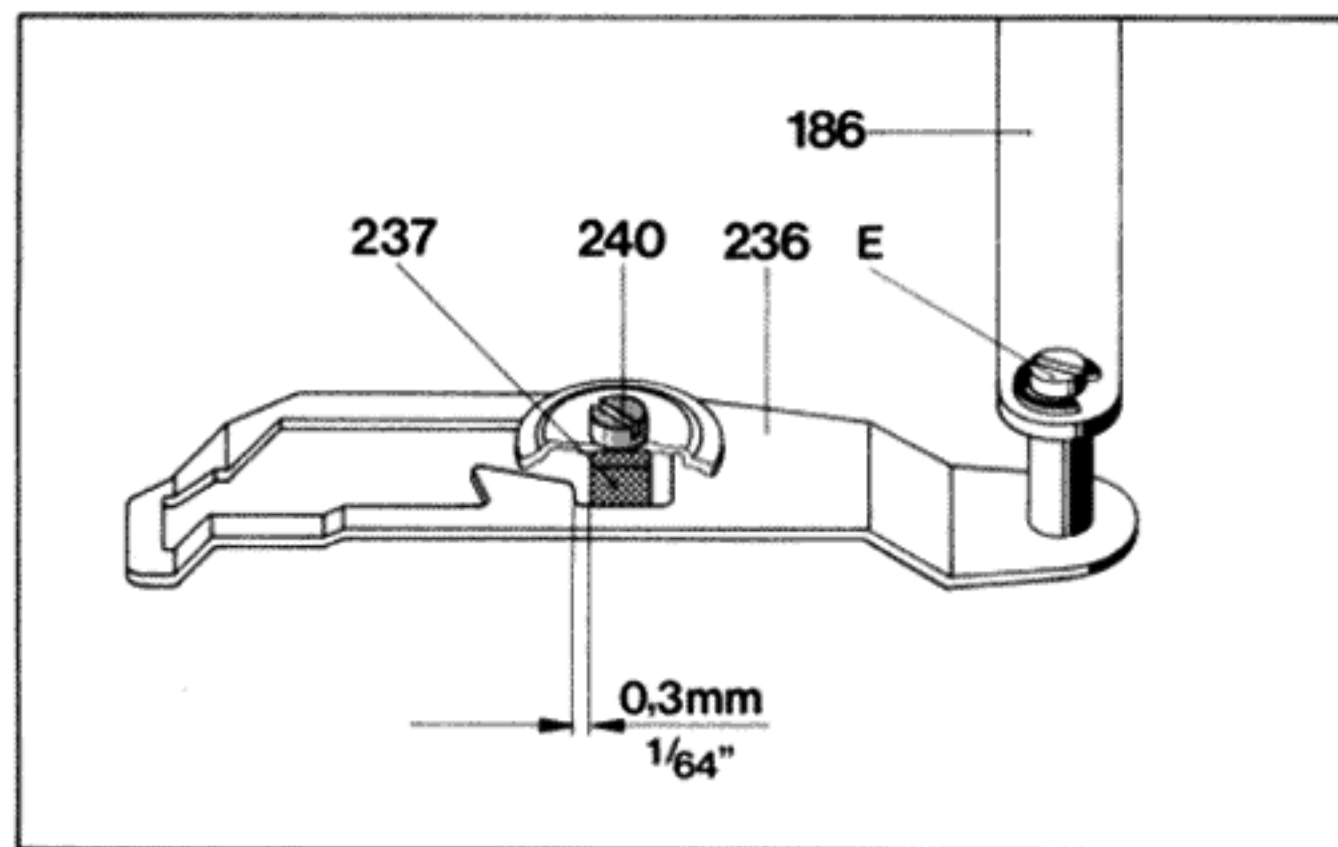


Pawl

The play of the pawl (236) may be adjusted with the eccentric screw (E).

Pull out mains plug and turn unit over. Turn tonearm in until pawl is caught. Turn cam wheel (161) out of "zero" position. There should be about 0.3 mm play between pawl (236) and square section. If necessary turn eccentric screw (E) to left or right.

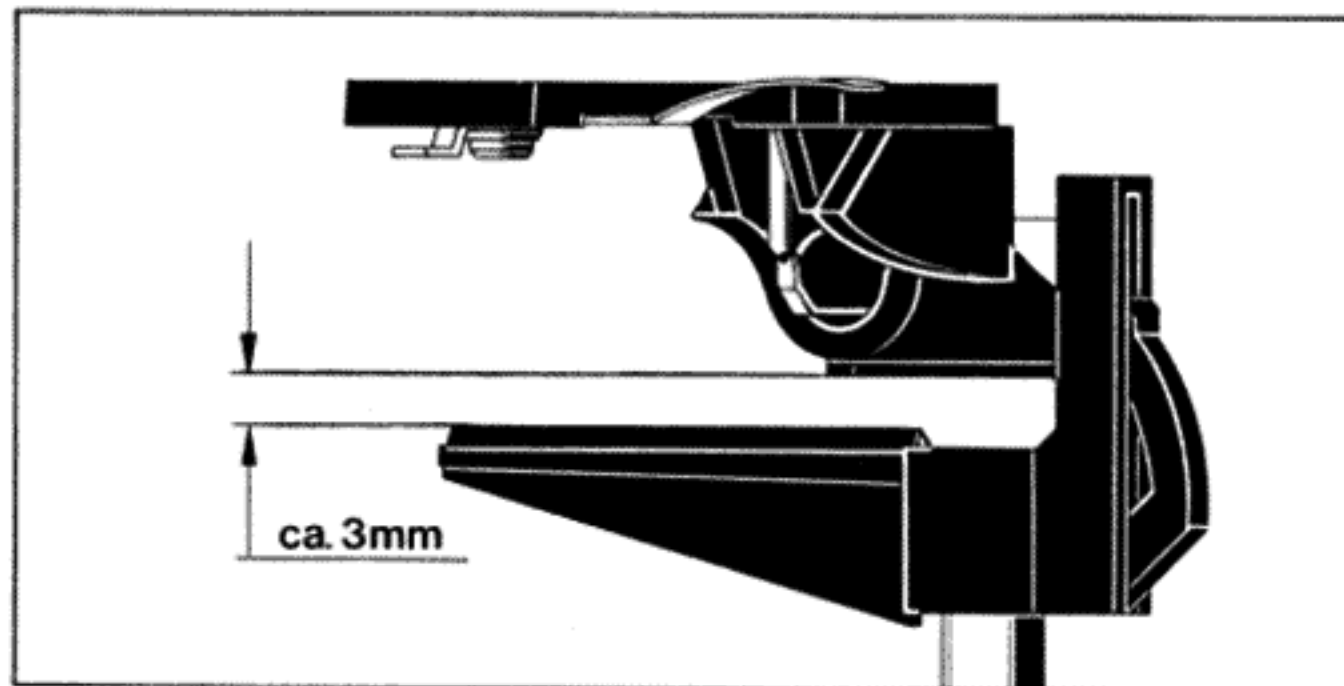
Fig. 22



Tonearm vertical lift

The adjustable sleeve (52) is used to adjust the tonearm vertical lift (for automatic operation). Pull out the mains plug, unlock the tonearm, turn the cam wheel (159) until the tonearm reaches its highest point. The tonearm should now be approximately 3 mm above the pillar stop (see Fig. 23). Adjust by means of sleeve (52).

Fig. 23



Defect

Nominal speed lies at limit of adjustment range.

Platter does not the after switching unit on and moving tonearm inside

Platter does not turn up to its required speed.

Stylus slips out of playing groove

Cause

Mal adjustment of bearing

- a) Belt not mounted
- b) Power supply to motor interrupted
- c) Motor pulley is loose
- a) Drive pulley is not correct for local line frequency
- b) Slippage between flat belt and drive pulley or between flat belt and platter
- c) Excessive friction in Motor bearing or bearing

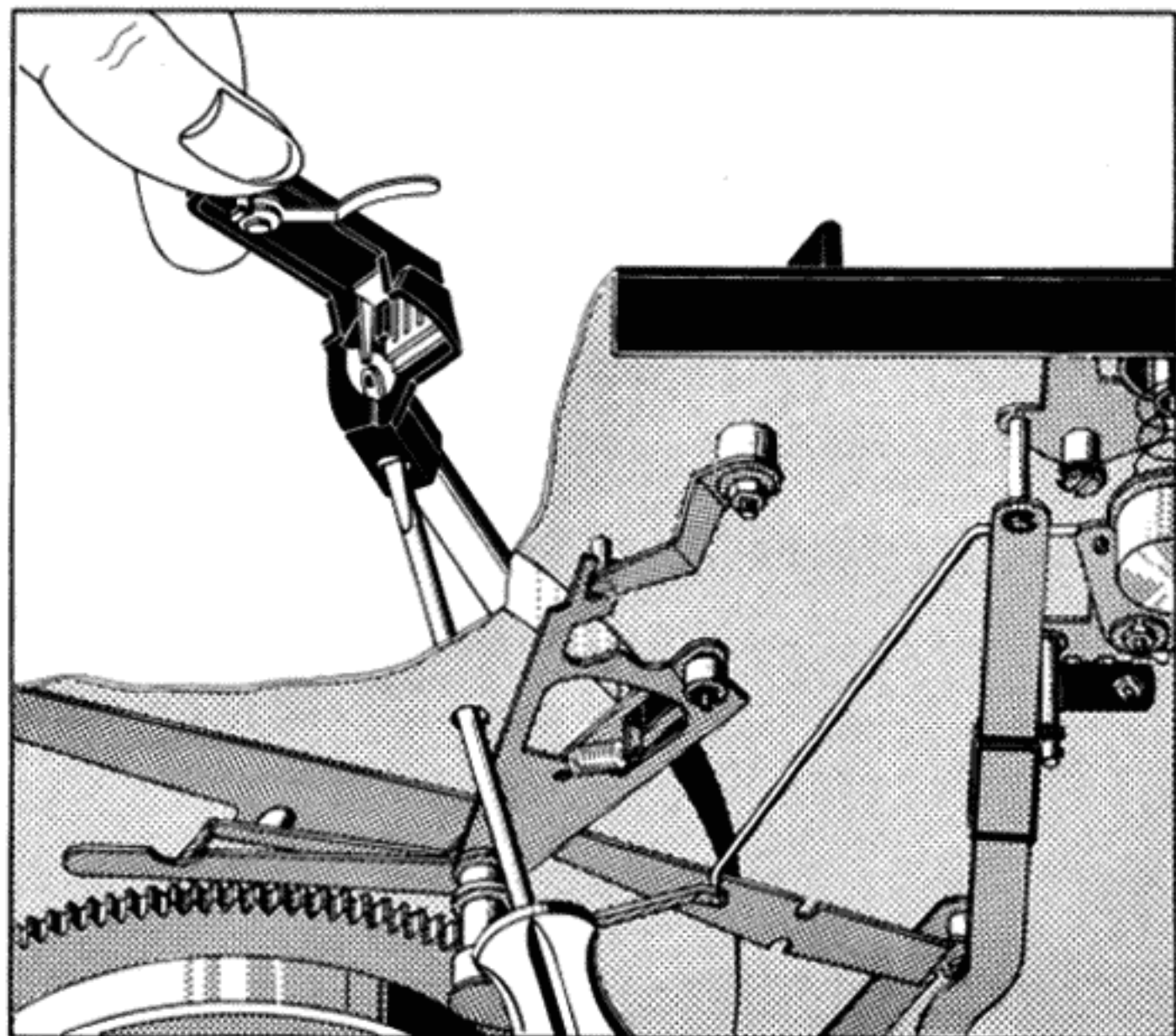
- a) Excessive bearings friction in tonearm bearing.
- b) Steel ball (178) of shut-off bar missing

Repair

Set control knob (16) to its central position, loosen or tighten the hexagonal nut (110) to set up the correct nominal speed.

- a) Mount belt
- b) Check connecting at switch plate and power play.
- c) Fix Motor pulley
- a) Renew drive pulley
- b) Clean friction surface of flat belt, drive pulley and platter. Renew flat belt if necessary. Once the platter, has been cleaned do not touch it with your fingers.
- c) Clean and oil bearings
- a) Check tonearm bearings
- b) Renew steel ball (178)

Fig. 24



Defect

Tonearm head not parallel to platter.

Cause

Seat of tonearm head on the tonearm tube has changed during transport

Remedy

Remove platter. Insert screwdriver through the hole in the chassis mounting plate. Align tonearm head and retighten screw.

Safety regulations

Servicing of electronic equipment should be performed only by authorized service personnel.

During service the unit has to be operated with an isolated transformer.

Safety requirements (e.g. VDE 0860 H) have to be strictly observed during repair.

In order to not reduce safety, the original design of the unit should not be changed, e.g. cover plates, mechanically secured wiring, tracking and creepage distance in air etc.

Use only factory replacement parts which must be reinstalled per original design.

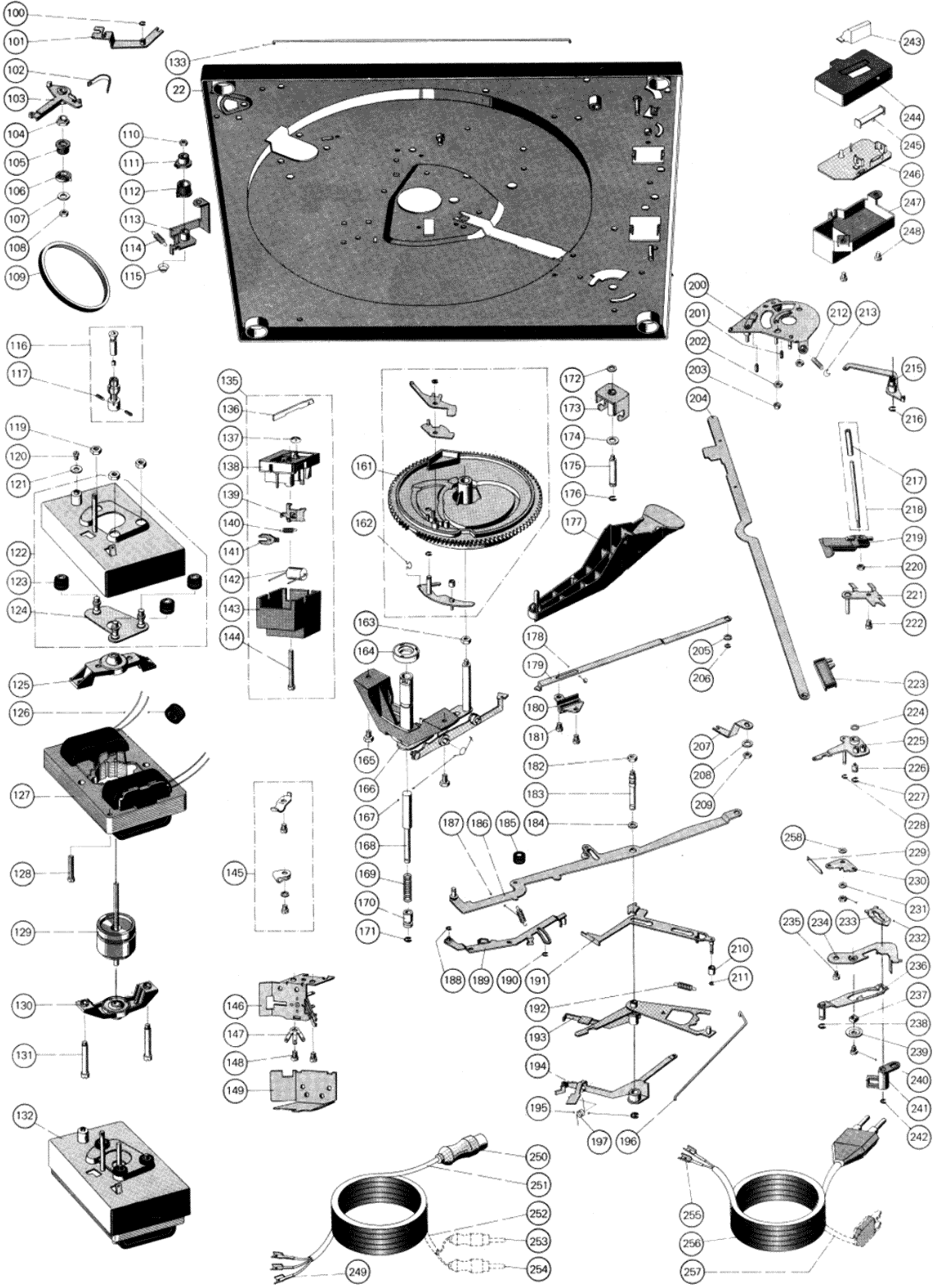
Upon completion of repair make shure that all accessible and conductive parts do not carry line voltage.

Replacement parts

| Pos. | Part No. | Qty. | Description |
|------|----------|------|--|
| 1 | 238 434 | 1 | Washer |
| 2 | 215 470 | 1 | Automatic spindle |
| 3 | 213 895 | 1 | Automatic spindle |
| 4 | 220 213 | 1 | Centering piece |
| 5 | 201 101 | 1 | Centering pin |
| 6 | 246 754 | 1 | Platter covering |
| 7 | 246 755 | 1 | Platter complete |
| 8 | 234 428 | 1 | Support complete |
| 9 | 210 472 | 2 | Machine screw M 3 x 4 |
| 10 | 210 586 | 1 | Washer 3.2 |
| 11 | 232 086 | 1 | Tension spring |
| 12 | 234 430 | 1 | Stop lever |
| 13 | 232 087 | 1 | Tension spring |
| 14 | 210 194 | 1 | Ring |
| 15 | 246 084 | 1 | Flat belt |
| 16 | 234 912 | 1 | Adjustment knob |
| 17 | 232 078 | 1 | Bearing bush |
| 18 | 234 910 | 1 | Speed lever |
| 19 | 237 222 | 1 | Speed cover |
| 20 | 213 260 | 3 | Pin 2 x 6 |
| 21 | 237 414 | 3 | Shipping screw |
| 22 | 246 756 | 1 | Mounting plate |
| 23 | 232 972 | 3 | Spring suspension |
| | 234 815 | 1 | Spring suspension (tone arm, side back) |
| 24 | 230 529 | 4 | Threaded piece |
| 25 | 230 521 | 3 | Compression spring |
| | 234 109 | 1 | Compression spring (tone arm, side rear) |
| 26 | 200 723 | 4 | Rubber damping |
| 27 | 200 722 | 4 | Steel cup |
| 28 | 200 543 | 1 | Lock washer |
| 30 | 246 741 | 1 | Tone arm head complete |
| 31 | 237 223 | 1 | Contact plate complete |
| 32 | 243 168 | 1 | Holder TK 25 |
| 38 | 210 472 | 1 | Machine screw M 3 x 4 |
| 39 | 234 599 | 1 | Pin |
| 40 | 240 069 | 1 | Adjustment screw |
| 41 | 210 643 | 1 | Washer 4.2/12/1 |

| Pos. | Part.No. | Qty. | Description |
|------|----------|------|-------------------------|
| 42 | 210 366 | 1 | Hex nut M 4 |
| 43 | 234 635 | 1 | Lock nut |
| 44 | 230 063 | 1 | Set screw |
| 45 | 242 590 | 1 | Frame complete |
| 46 | 234 634 | 1 | Set screw |
| 47 | 234 635 | 2 | Lock nut |
| 48 | 244 785 | 1 | Switch lever |
| 49 | 246 744 | 1 | Support complete |
| 50 | 246 743 | 1 | Tone arm complete |
| 51 | 239 420 | 1 | Balance weight |
| 55 | 242 595 | 1 | Bearing frame complete |
| 56 | 236 160 | 2 | Supporting plate |
| 58 | 236 051 | 1 | Clamp screw |
| 59 | 239 741 | 1 | Pointer |
| 60 | 234 617 | 2 | Holding screws |
| 63 | 242 596 | 1 | Frame complete |
| 64 | 236 907 | 1 | Spring housing complete |
| 66 | 234 637 | 1 | Bearing screw |
| 67 | 237 738 | 1 | Fillister screw |
| 68 | 237 660 | 1 | Guide |
| 69 | 210 143 | 2 | Block washer 1.5 |
| 70 | 218 318 | 1 | Adjusting sleeve |
| 71 | 241 930 | 2 | Fillister screw M 3 x 5 |
| 72 | 242 591 | 1 | Cover back complete |
| 73 | 239 582 | 1 | Pointer washer |
| 74 | 210 362 | 1 | Hex nut |
| 75 | 216 867 | 1 | Lock washer 5.2/10 |
| 76 | 225 176 | 1 | Curve washer |
| 77 | 210 362 | 1 | Hex nut |
| 78 | 240 151 | 1 | Rotary knob |
| 79 | 246 757 | 1 | Cover front complete |
| 80 | 200 444 | 2 | Spring washer |
| 100 | 210 146 | 6 | Lock washer 3.2 |
| 101 | 232 096 | 1 | Switch lever complete |
| 102 | 232 071 | 1 | Special spring |
| 103 | 232 094 | 1 | Connecting part |
| 104 | 232 079 | 1 | Special nut |

Fig. 26 Exploded View 2



| Pos. | Part No. | Qty. | Description |
|------|----------|------|-------------------------------|
| 105 | 232 097 | 1 | Belt pulley II |
| 106 | 240 035 | 1 | Washer |
| 107 | 210 607 | 1 | Washer 3.2/10/0.5 |
| 108 | 210 362 | 1 | Hex nut M 3 |
| 109 | 232 076 | 1 | Toothed belt |
| 110 | 244 104 | 1 | Hex nut M 3.5 |
| 111 | 241 641 | 1 | Locating curve |
| 112 | 241 642 | 1 | Belt pulley I |
| 113 | 241 644 | 1 | Counter bearing |
| 114 | 233 777 | 1 | Tension spring |
| 115 | 232 615 | 1 | Compression spring |
| 116 | 234 453 | 1 | Drive pulley 50 Hz |
| | 234 454 | 1 | Drive pulley 60 Hz |
| 117 | 233 137 | 2 | Set screw M 2.5 x 3 |
| 119 | 210 366 | 3 | Hex nut M 4 |
| 120 | 210 480 | 1 | Machine screw M 3 x 6 |
| 121 | 210 609 | 1 | Washer 3.2/10/1 |
| 122 | 241 328 | 1 | Screening plate |
| 123 | 232 841 | 3 | Damping |
| 124 | 232 840 | 1 | Insert |
| 125 | 241 570 | 1 | Top bearing bracket |
| 126 | 209 939 | 1 | Sleeve |
| 127 | 241 569 | 1 | Stator 110/220 V |
| 128 | 233 815 | 1 | Machine screw |
| 129 | 241 571 | 1 | Armature |
| 130 | 241 572 | 1 | Bottom bearing bracket |
| 131 | 210 525 | 2 | Machine screw M 4 x 25 |
| 132 | 242 076 | 1 | Motor SM 860/1 complete |
| 133 | 234 592 | 1 | Switch lever |
| 135 | 242 580 | 1 | Power switch (10 nF) |
| | 242 583 | 1 | Power switch (68 nF) |
| 136 | 236 335 | 1 | Slider |
| 137 | 200 444 | 1 | Spring washer |
| 138 | 233 012 | 1 | Switch plate complete (10 nF) |
| | 236 605 | 1 | Switch plate complete (68 nF) |
| 139 | 230 148 | 1 | Switch slide |
| 140 | 239 732 | 1 | Tension spring |
| 141 | 219 200 | 1 | Snap spring |
| 142 | 230 355 | 1 | Capacitor 68 nF/250 V/20 % |
| | 241 883 | 1 | Capacitor 10 nF |
| 143 | 242 095 | 1 | Cover |
| 144 | 210 498 | 1 | Machine screw M 3 x 28 |
| 145 | 231 079 | 1 | Cable clamp |
| 146 | 232 987 | 1 | Muting switch complete |
| 147 | 239 562 | 1 | Soldering lug |
| 148 | 210 472 | 8 | Machine screw M 3 x 4 |
| 149 | 232 084 | 1 | Screening plate |
| 161 | 236 912 | 1 | Cam wheel complete |
| 162 | 200 522 | 1 | Snap spring |
| 163 | 210 366 | 1 | Hex nut M 4 |
| 164 | 229 754 | 1 | Ball bearing |
| 165 | 218 155 | 2 | Hex screw M 4 x 6 |
| 166 | 242 100 | 1 | Bearing bridge |
| 167 | 234 576 | 1 | V-spring |
| 168 | 234 577 | 1 | Spindle complete |
| 169 | 213 920 | 1 | Compression spring |
| 170 | 213 921 | 1 | Bushing |
| 171 | 210 145 | 6 | Lock washer 2.3 |
| 172 | 210 587 | 1 | Washer 3.2/7/1 |
| 173 | 234 677 | 1 | Bearing |
| 174 | 210 667 | 1 | Washer 5.3/10/0.5 |
| 175 | 234 676 | 1 | Screw spindle |
| 176 | 210 147 | 2 | Lock washer 4 |
| 177 | 236 914 | 1 | Main lever |
| 178 | 211 718 | 1 | Ball $\phi 3$ |
| 179 | 234 668 | 1 | Stop lever |
| 180 | 234 558 | 1 | Ball bearing |
| 181 | 210 472 | 8 | Machine screw M 3 x 4 |
| 182 | 210 362 | 1 | Hex nut M 3 |
| 183 | 234 544 | 1 | Spindle |
| 184 | 210 586 | 1 | Washer 3.2/7/0.5 |
| 185 | 236 950 | 1 | Stop |
| 186 | 234 542 | 1 | Switch lever complete |
| 187 | 229 686 | 1 | Tension spring |
| 188 | 210 144 | 1 | Lock washer 1.9 |
| 189 | 234 579 | 1 | Shut off lever |
| 190 | 210 145 | 6 | Lock washer 2.3 |

| Pos. | Part No. | Qty. | Description |
|------|----------|------|---|
| 191 | 234 545 | 1 | Start-angle compl. |
| 192 | 229 698 | 1 | Tension spring |
| 193 | 244 784 | 1 | Switch assembly complete |
| 194 | 234 555 | 1 | Selector level complete (continuous play) |
| 195 | 210 146 | 6 | Lock washer 3.2 |
| 196 | 234 598 | 1 | Connecting piece |
| 197 | 236 095 | 1 | V spring |
| 200 | 242 597 | 1 | Segment |
| 201 | 234 026 | 2 | Set screw M 2.5 x 4 |
| 202 | 210 362 | 2 | Hex nut M 3 |
| 203 | 223 777 | 1 | Guide |
| 204 | 240 060 | 1 | Positioning slide |
| 205 | 201 187 | 1 | Slip plate |
| 206 | 210 145 | 6 | Lock washer 2.3 |
| 207 | 244 709 | 1 | Switch lever |
| 208 | 210 641 | 1 | Washer 4.2/10/1 |
| 209 | 210 362 | 1 | Hex nut M 3 |
| 210 | 234 548 | 1 | Roll |
| 211 | 210 143 | 3 | Lock washer 1.5 |
| 212 | 218 591 | 1 | Tension spring |
| 213 | 201 184 | 1 | Adjustment washer |
| 215 | 240 086 | 1 | Skating lever |
| 216 | 210 146 | 6 | Lock washer 3.2 |
| 217 | 237 543 | 1 | Rubber sleeve |
| 218 | 237 541 | 1 | Handle lever |
| 219 | 240 063 | 1 | Lift plate |
| 220 | 210 353 | 1 | Hex nut M 2 |
| 221 | 240 066 | 1 | Bearing plate |
| 222 | 210 469 | 2 | Machine screw M 3 x 3 |
| 223 | 234 674 | 1 | Stop piece |
| 224 | 210 587 | 1 | Washer 3.2/7/1 |
| 225 | 234 588 | 1 | Adjustment lever |
| 226 | 230 087 | 1 | Screw spindle |
| 227 | 210 146 | 6 | Lock washer 3.2 |
| 228 | 210 145 | 6 | Lock washer 2.3 |
| 229 | 232 545 | 1 | Securing spring |
| 230 | 234 593 | 1 | Intermediate piece |
| 231 | 203 477 | 1 | Washer 2.7/8/1 |
| 232 | 210 353 | 1 | Hex nut M 2 |
| 233 | 239 810 | 1 | Securing spring |
| 234 | 240 070 | 1 | Intermediate plate |
| 235 | 210 469 | 2 | Machine screw M 3 x 3 |
| 236 | 232 599 | 1 | Pawl |
| 237 | 240 071 | 1 | Square section |
| 238 | 210 146 | 6 | Lock washer 3.2 |
| 239 | 229 704 | 1 | Washer 3.2/13/0.5 |
| 240 | 210 472 | 8 | Machine screw M 3 x 4 |
| 241 | 229 362 | 1 | Guide bearing |
| 242 | 210 145 | 6 | Lock washer 2.3 |
| 243 | 243 621 | 1 | Stroboscope trim plate |
| 244 | 241 574 | 1 | Stroboscope housing complete |
| 245 | 225 321 | 1 | Glow lamp |
| 246 | 241 674 | 1 | Switch plate complete |
| C 1 | 225 322 | 1 | Capacitor 68 nF/400 V |
| C 2 | 224 886 | 1 | Capacitor 47 nF/250 V |
| D 1 | 225 247 | 1 | Diode BY 183/300 |
| R 1 | 232 401 | 1 | Resistance 22 k Ω /0.25 W/5 % |
| R 2 | 232 402 | 1 | Resistance 22 k Ω /0.125 W/5 % |
| 247 | 241 675 | 1 | Cover |
| 248 | 210 469 | 2 | Machine screw M 3 x 3 |
| 249 | 209 436 | 3 | Flat connector |
| 250 | 209 424 | 1 | Miniature plug |
| 251 | 207 303 | 1 | Audio cable 5 pole |
| 252 | 207 301 | 1 | Audio cable cynch |
| 253 | 209 425 | 1 | Cynch plug white |
| 254 | 209 426 | 1 | Cynch plug black |
| 255 | 214 602 | 1 | Lug |
| 256 | 232 996 | 1 | Power cable Europe |
| 257 | 232 995 | 1 | Power cable U.S.A. |
| 258 | 210 586 | 1 | Washer 3.2/7/0.5 |
| *** | 214 120 | 1 | Cartridge mounting material |
| *** | 245 548 | 1 | Operating instructions |
| *** | 246 906 | 1 | Mounting instruction |
| *** | 238 324 | 1 | Shipping carton |
| *** | 241 278 | 1 | Shipping carton CS 1246 |

*** not illustrated

Modification reserved!

Lubrication

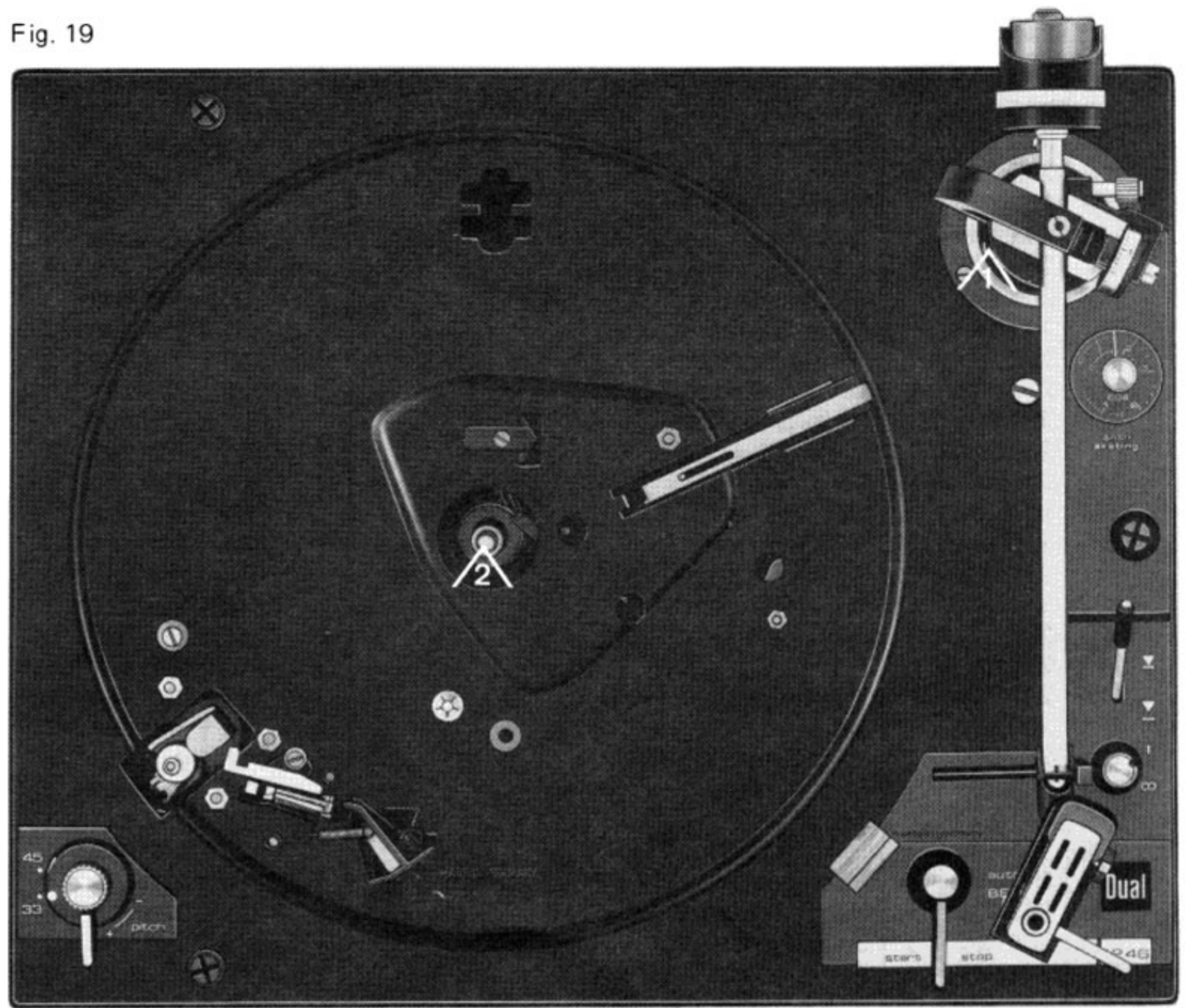
All bearing and friction points of the unit are adequately lubricated at the works. Replenishment of oil and grease is only necessary after approximately 2 years of normal use of the record player as the most important bearing points (motor bearings) have sintered metal bushes.

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

It is important that no oil or grease should come in contact with the friction faces of the flat belt, drive pulley and platter, 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 Siliconeoil
AK 300 000

2

Haftöl Renotac
NR. 342

3

BP Super Viskostatik
10 W/30

4

Shell Alvania Nr. 2

5

Isoflex PDP 40

6

Silikonöl
AK 500 000

8

Molykote

Fig. 20

