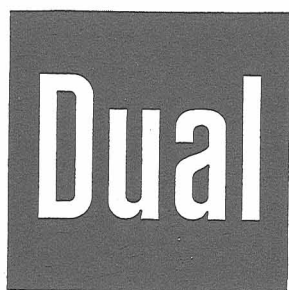




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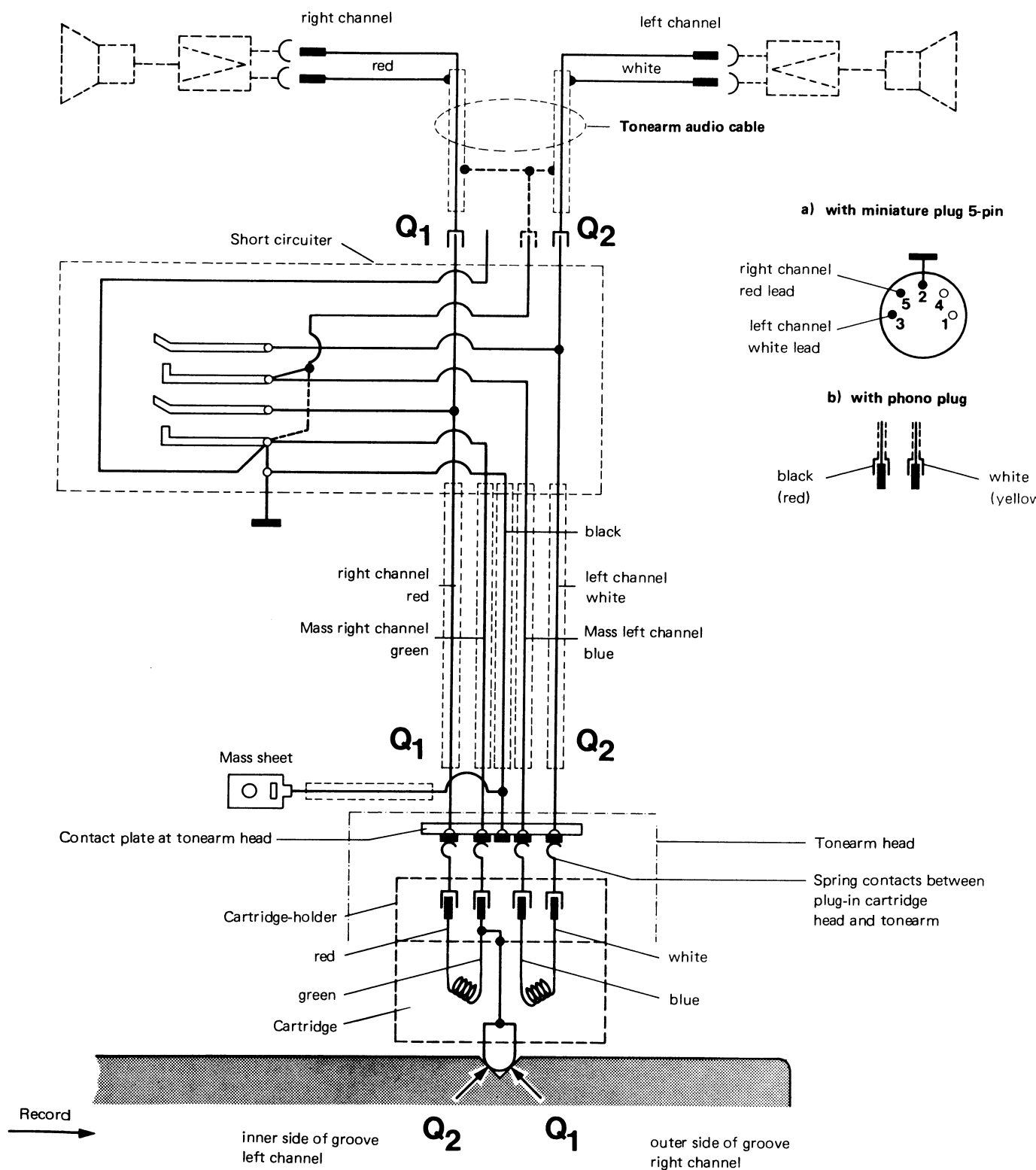
1237



Service Manual

Dual Gebrüder Steidinger 7742 St.Georgen/Schwarzwald

Fig. 1 Pick-up Connection Diagram



Contents

| | |
|---------|-------------------------------------------------------------------------|
| Page | |
| 2 | Pick-up Connection Diagram |
| 3 | Technical Data |
| 4 | Motor and Drive |
| 4 | Speed changeover |
| 4 | Platter / Sandwich platter |
| 4 | Flat Belt |
| 4 | Changing of Drive Pulley |
| 5 | Pitch Control |
| 5 | Tonearm and Tonearm Bearing |
| 6 | Removal of Tonearm from Bearing Frame |
| 6 | Removal of Tonearm assembly with Tonearm Bearing |
| 6 | Replacement of Spring Housing |
| 6 | Adjustment of Tonearm Bearing |
| 6 | Tonearm Control |
| 6 | Antiskating Device |
| 7 | Cue Control |
| 7 | Replacement of Cue Control assembly |
| 7 | Starting |
| 8 | Muting switch |
| 8 | Manual Start |
| 8 | Stopping |
| 8 | Record Drop |
| 8 | Shut-off and Change Cycle |
| 8 | Shut-off Mechanism |
| 9 | Adjustment points: Tonearm set-down point |
| 9 | Switch off position |
| 9 | Release rocker |
| 9 | Tonearm vertical lift |
| 9 | Tonearm does not set down or lowers onto record too quickly |
| 9 | Platter does not turn when unit is connected and start switch operated |
| 10 | Correct nominal speed obtained only at extreme setting of pitch control |
| 10 | Platter does not come up to speed |
| 10 | Stylus slips out of record groove |
| 10 | Motor will not shut-off |
| 10 – 13 | Replacement parts with exploded view |
| 14 | Lubricating Instructions |

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 Eight 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 | non magnetic 1 kg, 270 mm ϕ |
| Platter speeds | 33 1/3 and 45 rpm, automatic tonearm setdown coupled to speed selector |
| Pitch control | Adjustment of approx. 1 semi-tone (6 %) at both platter speeds. |
| Wow and flutter | $< \pm 0,1$ % rated in accordance with DIN 45 507 |
| Signal-to-noise-ratio | Rumble unweighted signal-to-noise-ratio > 40 dB |
| (according to DIN 45 500) | Rumble signal-to-noise-ratio > 60 dB |
| Tonearm | Torsion-resistant aluminium tonearm in four point gimbal suspension. |
| Tonearm bearing friction | vertical < 0.08 mN (0.008 g) horizontal < 0.16 mN (0.016 g) |
| Tracking force | 0 - 50 mN (0 - 5 p) 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

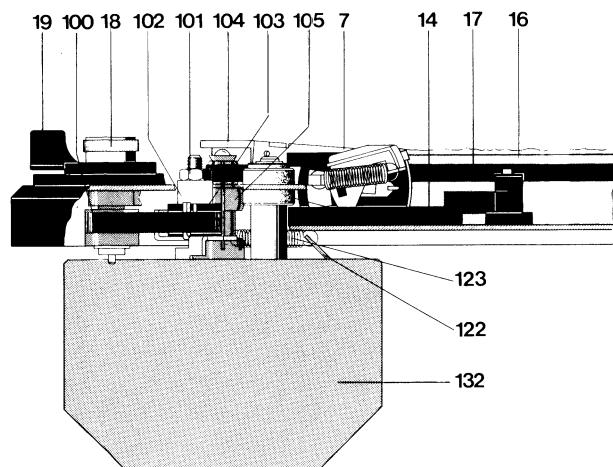


Fig. 3

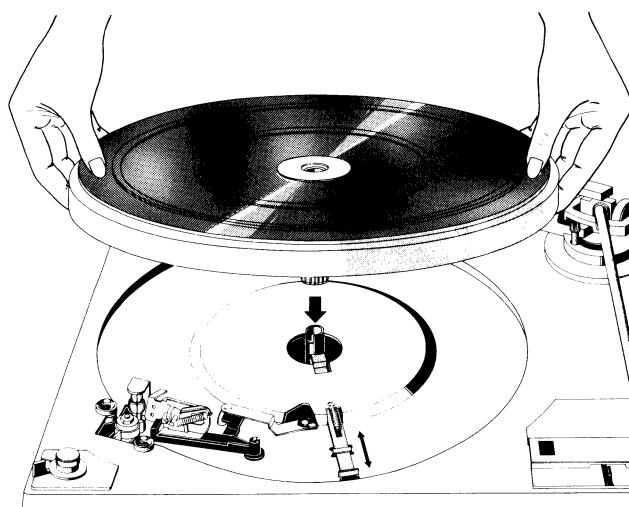
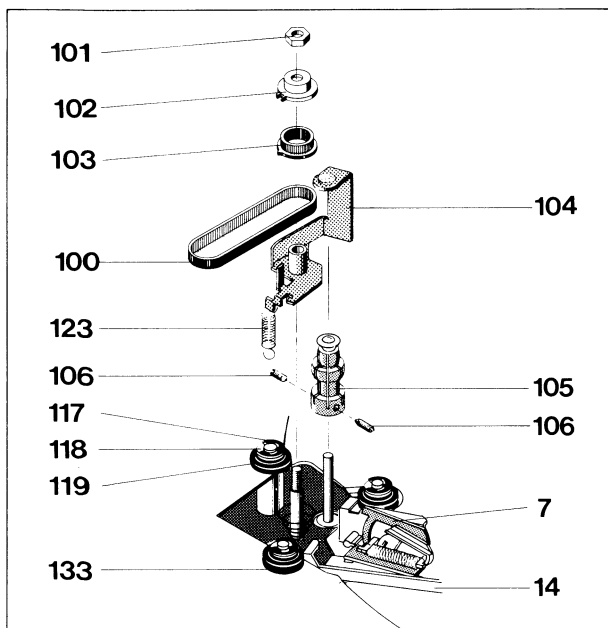


Fig. 4



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. 234 453

Pulley for 60 Hz Art.-No. 243 454

The drive is transmitted to the platter by means of the flat belt (17).

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 (16) turns. This then moves the flat belt (17) onto the required step of the drive pulley (105).

Platter

The platter (16) is held in position by the platter locking lever (155). 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 (17) 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 (155). Push this outward and lift the platter out.

Sandwich platter

The sandwich platter (16) is secured by means of a spring clip on the bearing tube of the bearing housing (164). This clip should be taken away when removing the platter.

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 (16).

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

1. Remove the flat belt (17) from the drive pulley (105) and take off the platter (16). Remove the toothed belt (100).
2. Detach tension spring (123) from screening sheet (122).
3. Remove the hexagonal screw (101), remove the adjustment cam (102), the belt pulley (112) as well as the counter bearing (104).

- Loosen set screws (106) and remove motor pulley (105). Place complete replacement motor pulley on motor axle. Remove conical sleeve. Be careful with the interior distance bushing. Adjust motor pulley vertically (see Fig. 5) and tighten set screws (106) uniformly. Place conical sleeve into the motor pulley (105).
- Outer counter bearing (104), belt pulley 2 (112) and adjustment cam (102) should now be fitted and the hexagonal head mounting screws tightened (101). Replace the tension spring and toothed belt (100). Install the platter (16). Fit the flat drive belt (17) onto the drive pulley (105).
- Setting up the rotational speed: set the regulator knob (18) to its central position. By loosening or tightening the hexagonal nut (101) adjust the rotational speed.

Fig. 6 Diagram for Motor Connection

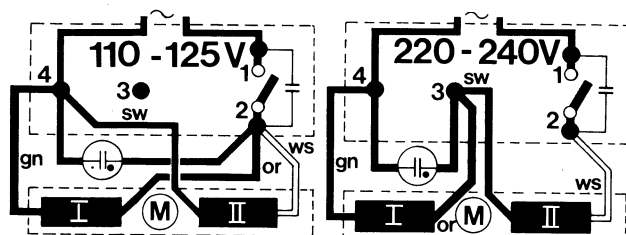


Fig. 5

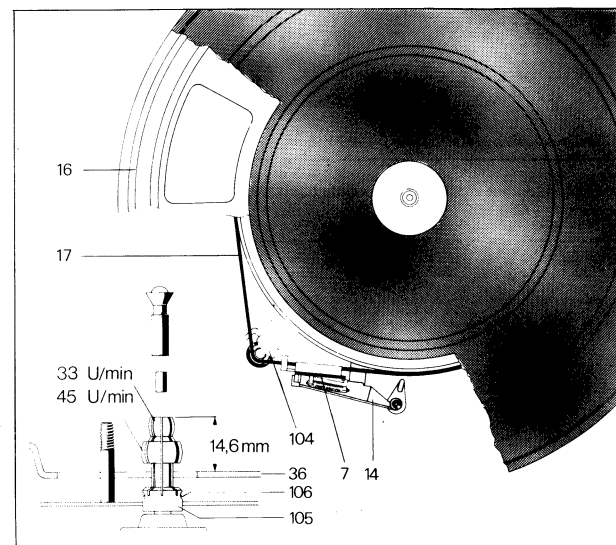
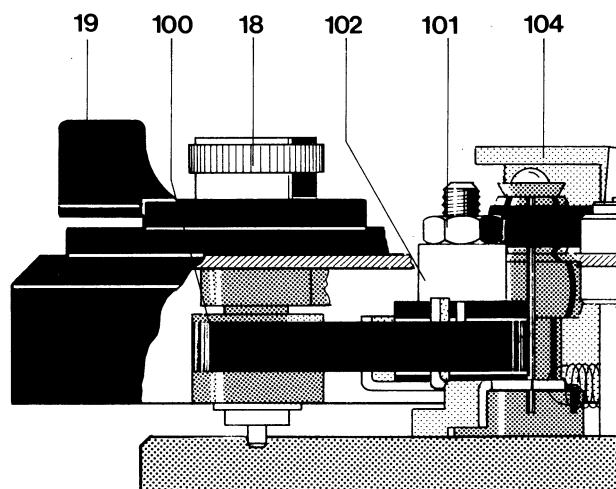


Fig. 7 Pitch control



Pitch Control

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

By turning the fine speed adjustment knob (18) the belt pulley 2 (112) is moved. This rotation is transferred by means of the toothed belt (100) to the drive pulley 1 (103). (Fig. 7) thus moving the counter bearing (104) upwards or downwards. The taper bush of the drive pulley is designed to vary the diameter of the drive pulley thus varying the nominal speed within the tolerance of $\pm 3\%$.

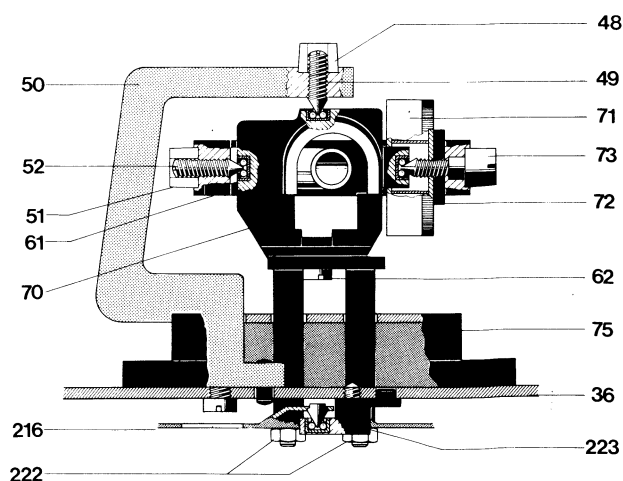
Tonearm and Tonearm Bearing

The Dual 1237 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 $< 0,08 \text{ mN}$ (0,008 p)
Bearing friction horizontal $< 0,16 \text{ mN}$ (0,016 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 (71) 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.

Fig. 8 Tonearm bearing



73
65
59
75
220
222
216
238
179

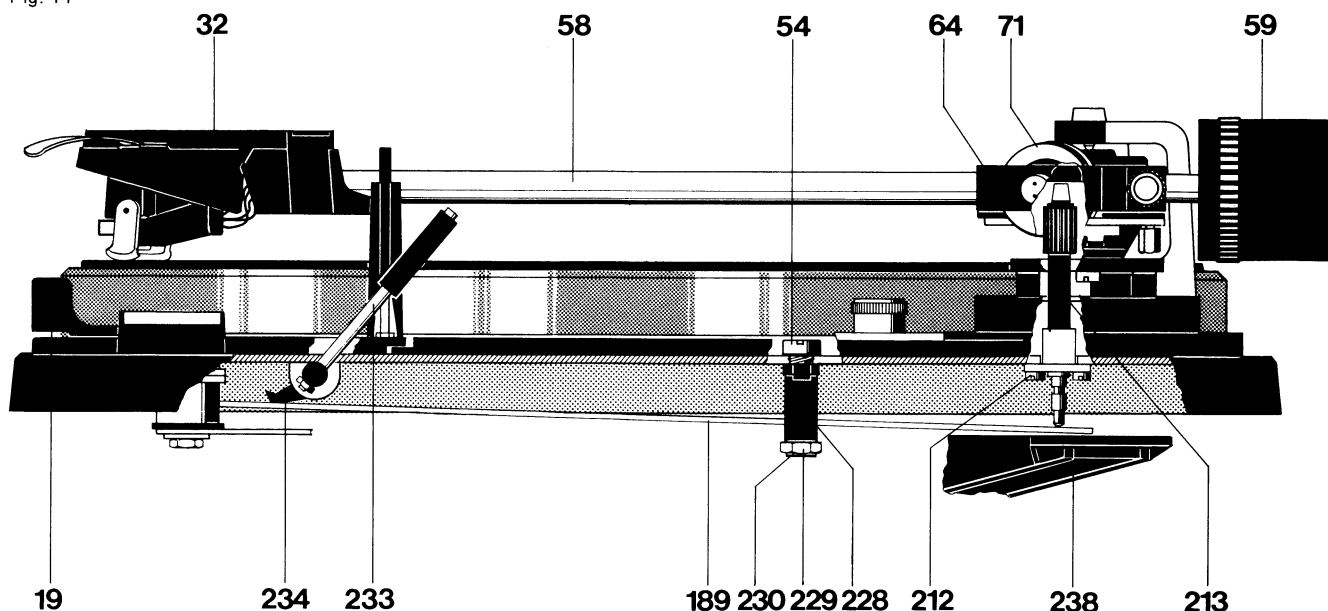
1. Clamp unit in the repair stand. Remove the counter-weight (59), remove clamp screw (65). Set spring housing scale (71) to zero.
2. Turn the unit over and remove the shield (194). Unsolder the tonearm connections on the muting switch (191).
3. Turn the unit back to normal position. Remove the two fixing screws (67) (SW 4.5) and the cable holder (66). Remove the tonearm (58).

1. Clamp unit in the repair stand. Secure the tonearm (58) and remove the counterweight (59). Set spring housing scale (71) 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 236) and the axle (198). Remove the main lever (238).
4. Remove the hexagonal nut (222). Hold the tonearm securely and remove the machine screw (53). Lift out the complete tonearm and bearing assembly.

164 AW AK 184 176 189 228

194 198 236 238 216 222 217 220

Fig. 11



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 (54) 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 (54) 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 (78) 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 (78) 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.

Fig. 12

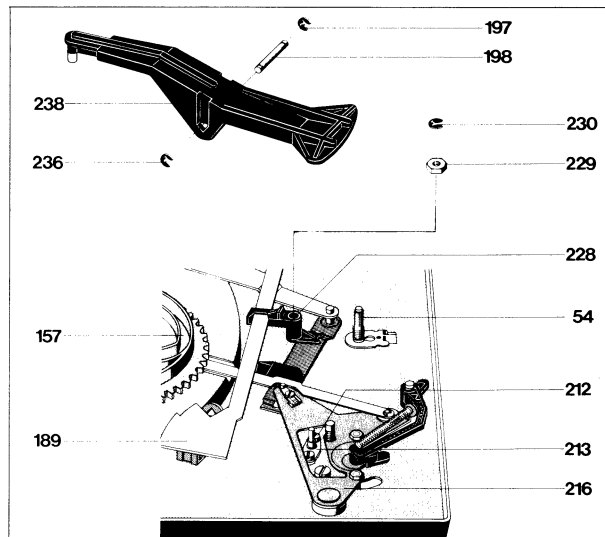


Fig. 13

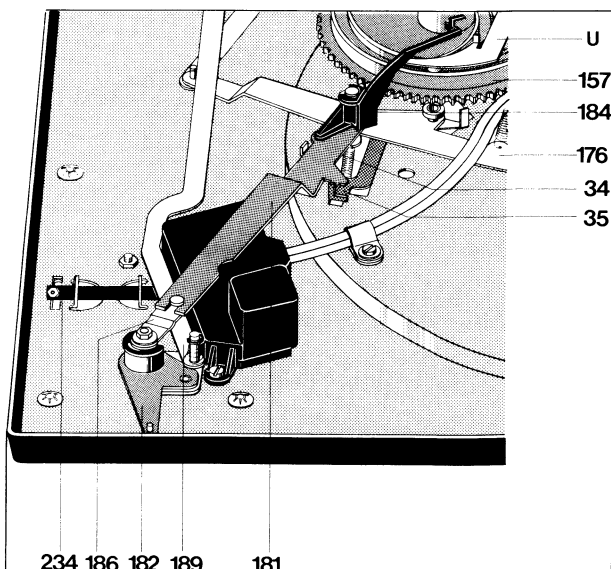
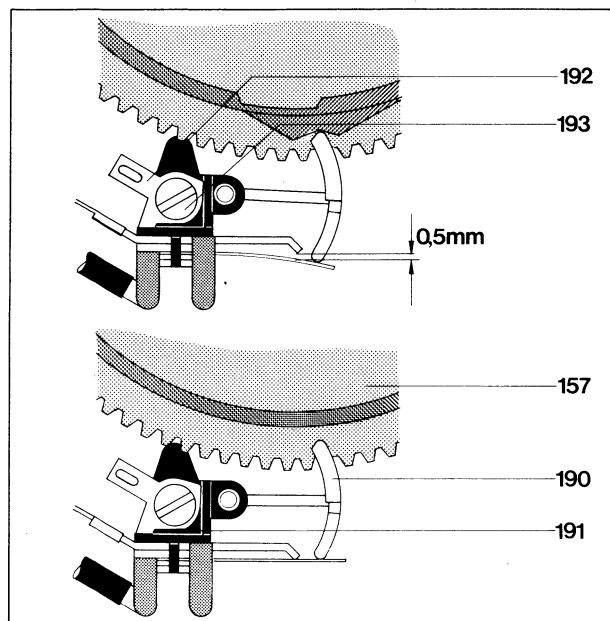


Fig. 14 Short circuit



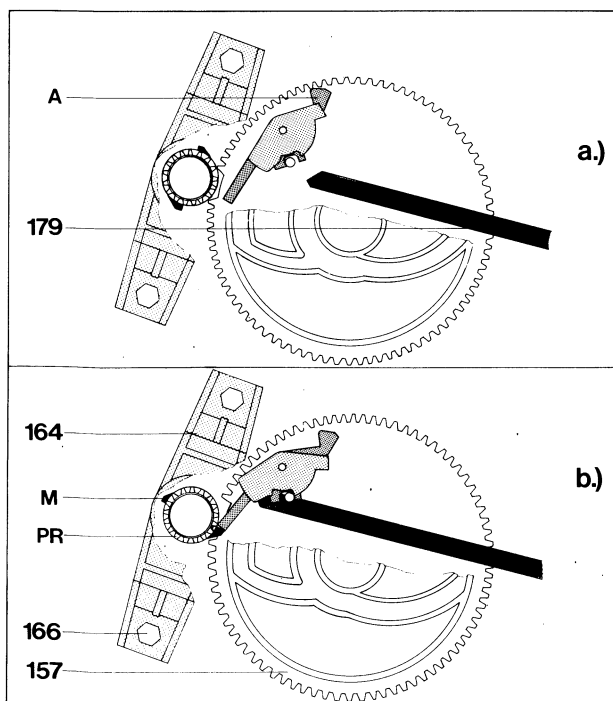
Short Circuiter

To prevent disturbing noises during automatic operation of the tonearm the unit is fitted with a short circuiter. 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 circuiter. This clearance should be adjusted by bending the short circuit contact. The contacts should be sprayed with a suitable cleaning agent.

Fig. 15



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.

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.

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 (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.

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.

Adjustment

Tonearm set-down point

After removing the stop plate (79) (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.

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 (75).

If the unit switches off too early or not at all, then the eccentric (B) should be turned to the right or left respectively (see Fig.17).

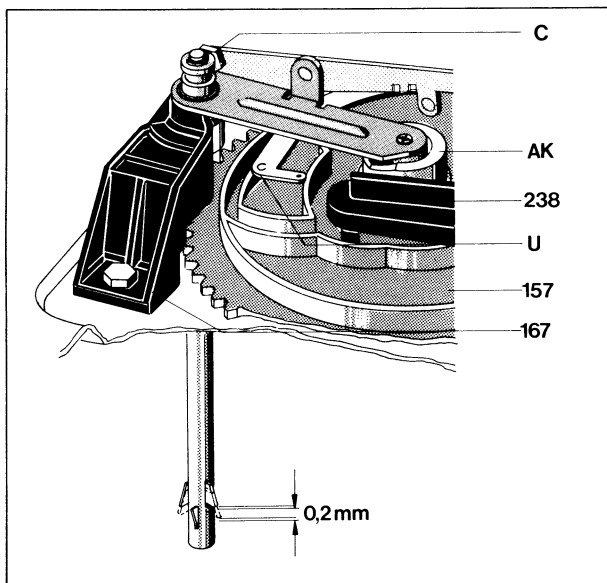
Release rocker

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 4 mm above the pillar stop (see Fig. 19). Adjust by means of sleeve (210).

Fig. 18



Defect

Tonearm does not set down or sets down too fast

Cause

Damping is too great or too small due to dirt in the silicone oil of the lift tube

Defect

Platter does not turn after machine is connected and "start" switch is pressed.

Cause

- Power supply is interrupted.
- Drive pulley is loose.

Fig. 16

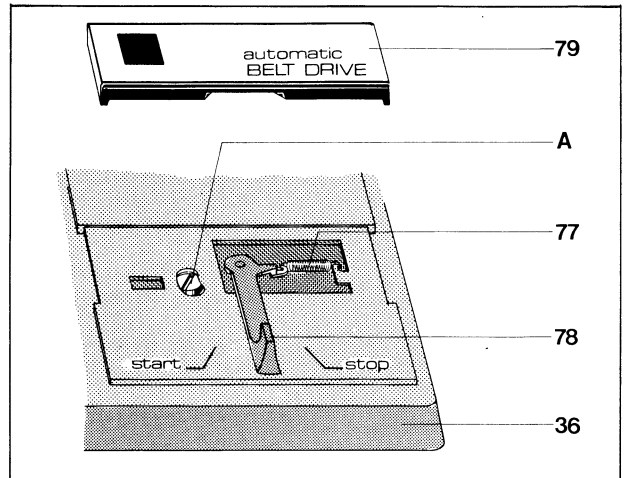


Fig. 17

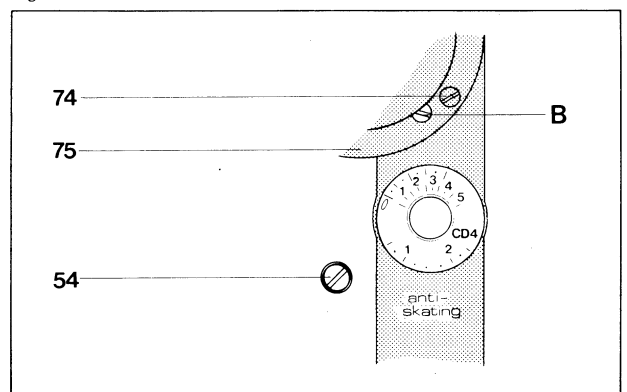
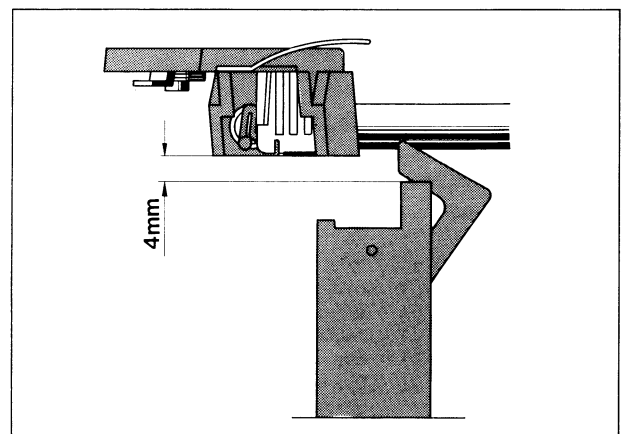


Fig. 19



Repair

Remove the lift plate assembly (213) as described on page 7. Remove the guide (208) on the lift rod, remove the lock washers (209 and 211) together with the adjustment sleeve (210). Take out the lift pin (215) and compression spring (214), clean rod and tube and then coat both rod and tube with "Wacker Silicone oil AK 300 000". Reassemble and wipe away any extraneous oil.

Repair

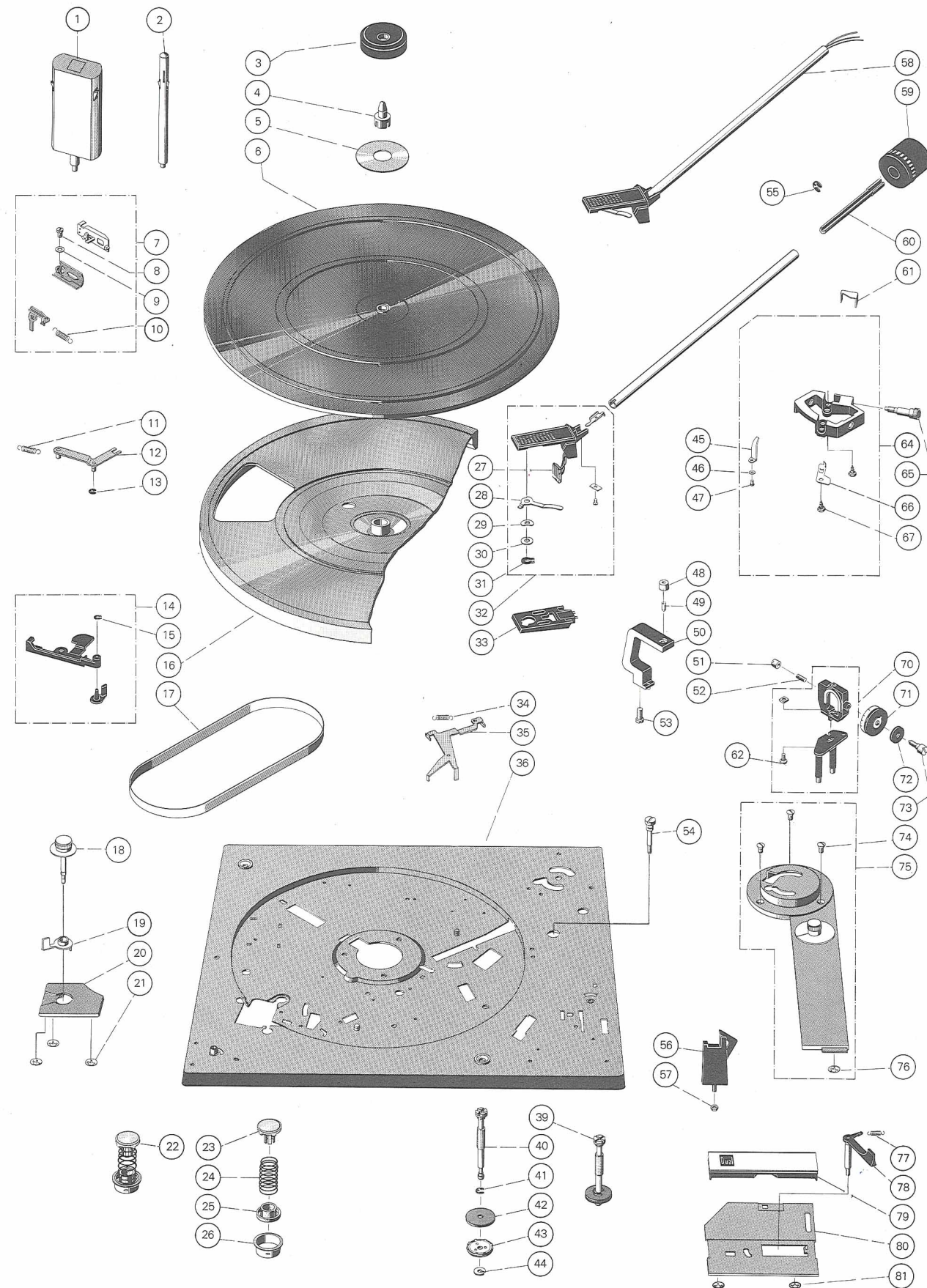
- Check connections on switching board and mains plug
- Tighten screws of drive pulley.

| Defect | Cause | Repair |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rotational speed lies at limit of adjustment range. | Bad adjustment of bearing. | Set control knob (18) to its central position, loosen or tighten the hexagonal nut (101) to set up the correct rotational speed. |
| Platter does not come up to speed. | a) Drive pulley incorrect for mains frequency. b) Slip between flat belt and drive pulley or flat belt and platter. | a) Change pulley to correct size for mains frequency. b) Clean the contact surfaces of the flat belt, drive pulley and platter. If necessary renew the flat belt. |
| Needle slides out of record groove. | a) Bearing friction in tonearm too high. b) Steel ball (180) for shut off rail missing. | a) Readjust tonearm bearing. b) Replace steel ball (180). |
| Motor does not switch off when tonearm is on the billar | Interference suppression capacitor (in mains switch) has short circuit. | Replace interference suppression capacitor in mains switch. |

Replacement parts

| Pos. | Part.-No. | Qty. | Description | Pos. | Part. No. | Qty. | Description |
|------|-----------|------|---------------------------------------------|------|-----------|------|-------------------------------------|
| 1 | 215 470 | 1 | Automatic spindle AS 12 | 39 | 239 414 | 2 | Shipping screw compl. |
| 2 | 213 895 | 1 | Automatic spindle AW 3 | 40 | 237 668 | 2 | Special screw |
| 3 | 220 213 | 1 | Centering piece | 41 | 210 146 | 5 | Lock washer 3.2 |
| 4 | 201 101 | 1 | Centering pin | 42 | 201 632 | 2 | Rubber washer |
| 5 | 238 434 | 1 | Washer | 43 | 237 117 | 2 | Washer |
| | 243 043 | 1 | Washer | 44 | 237 118 | 2 | Lock washer |
| 6 | 242 598 | 1 | Turntable mat compl. | 45 | 241 556 | 1 | Pointer compl. |
| | 243 518 | 1 | Turntable mat (model sandwich) | 46 | 211 673 | 1 | Washer 1.7/3.5/0.3 |
| | 242 939 | 1 | Turntable compl. (model G) | 47 | 237 672 | 1 | Nail |
| | 243 517 | 1 | Turntable (model W) | 48 | 234 635 | 2 | Lock nut |
| 7 | 241 549 | 1 | Support compl. | | 243 041 | 2 | Stop nut (model W) |
| 8 | 210 472 | 1 | Machine screw AM 3 x 4 | 49 | 230 063 | 1 | Threaded pin |
| 9 | 210 586 | 1 | Washer 3.2/7/0.5 | 50 | 242 602 | 1 | Frame compl. |
| 10 | 238 819 | 1 | Tension spring | | 243 508 | 1 | Frame compl. (model W) |
| 11 | 240 000 | 1 | Tension spring | 51 | 234 635 | 2 | Lock nut |
| 12 | 239 950 | 1 | Switch-off lever | | 243 041 | 2 | Lock nut (model W) |
| 13 | 210 145 | 6 | Lock washer 2.3 | 52 | 234 634 | 1 | Threaded pin |
| 14 | 241 551 | 1 | Stop lever compl. | 53 | 210 516 | 1 | Machine screw AM 4 x 8 |
| 15 | 210 194 | 1 | Grip Ring 2 x 0.6 | 54 | 239 809 | 1 | Locating screw |
| 16 | 242 599 | 1 | Platter with mat compl. | | 243 030 | 1 | Locating screw (model W) |
| | 242 938 | 1 | Platter with mat (model G) | 55 | 210 147 | 1 | Lock washer |
| | 242 940 | 1 | Platter with mat (model sandwich) | 56 | 232 978 | 1 | Support compl. |
| | 243 506 | 1 | Platter with mat (model W) | 57 | 210 362 | 1 | Hex nut |
| | 200 543 | 1 | Ring (for sandwich platter) | 58 | 241 560 | 1 | Tonearm compl. |
| 17 | 234 435 | 1 | Flat belt | | 243 509 | 1 | Tonearm compl. (model W) |
| 18 | 238 958 | 1 | Adjustment knob | 59 | 242 604 | 1 | Weight compl. |
| | 243 033 | 1 | Adjustment knob (model W) | | 243 511 | 1 | Weight compl. (model W) |
| 19 | 239 957 | 1 | Speed selector lever | 60 | 239 277 | 1 | Pin |
| 20 | 242 600 | 1 | Speed selector cover | | 243 044 | 1 | Pin (model W) |
| 21 | 200 444 | 3 | Spring washer | 61 | 233 744 | 1 | Bracket |
| 22 | 232 975 | 1 | Spring suspension compl. (motor side front) | 62 | 239 777 | 1 | Machine screw AM 3 x 7 |
| | 232 972 | 1 | Spring suspension compl. (motor side back) | 64 | 242 605 | 1 | Bearing frame compl. |
| | 234 815 | 1 | Spring suspension compl. (tonearm side) | | 243 512 | 1 | Bearing frame (model W) |
| 23 | 230 529 | 3 | Threaded part | 65 | 241 447 | 1 | Clamp screw |
| 24 | 230 523 | 1 | Compression spring (motor side front) | | 243 040 | 1 | Clamp screw (model W) |
| | 230 521 | 1 | Compression spring (motor side back) | 66 | 241 893 | 1 | Cable holder |
| | 234 109 | 1 | Compression spring (tonearm side) | 67 | 227 467 | 2 | Hexagon sheet metal screw 2.9 x 6.5 |
| 25 | 200 723 | 3 | Rubber damping | 70 | 242 606 | 1 | Bearing compl. |
| 26 | 200 722 | 3 | Steel cup | | 243 513 | 1 | Bearing compl. model (W) |
| 27 | 241 554 | 1 | Contact plate compl. | 71 | 241 565 | 1 | Spring housing compl. |
| 28 | 234 611 | 1 | Handler | | 243 514 | 1 | Spring housing compl. (model W) |
| 29 | 210 182 | 1 | Lock washer 4.2/8 | 72 | 237 563 | 1 | Washer |
| 30 | 210 630 | 1 | Washer 4.2/8/0.5 | 73 | 237 564 | 1 | Bearing screw |
| 31 | 210 197 | 1 | Ring 4 x 0.8 | | 243 051 | 1 | Bearing screw (model W) |
| 32 | 241 555 | 1 | Tonearm head compl. | 74 | 239 193 | 3 | Fillister sunk screw M 3 x 6 |
| 33 | 236 242 | 1 | Cartridge mount TK 24 | 75 | 242 607 | 1 | Supporting back compl. |
| 34 | 231 017 | 1 | Tension spring | | 243 515 | 1 | Supporting back compl. (model W) |
| 35 | 239 926 | 1 | Start slide | 76 | 200 444 | 1 | Spring washer |
| 36 | 242 601 | 1 | Mounting | 77 | 226 357 | 1 | Tension spring |
| | 243 507 | 1 | Plate | 78 | 239 938 | 1 | Switch lever compl. |

Fig. 21 Exploded view 1



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.

- 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. 22

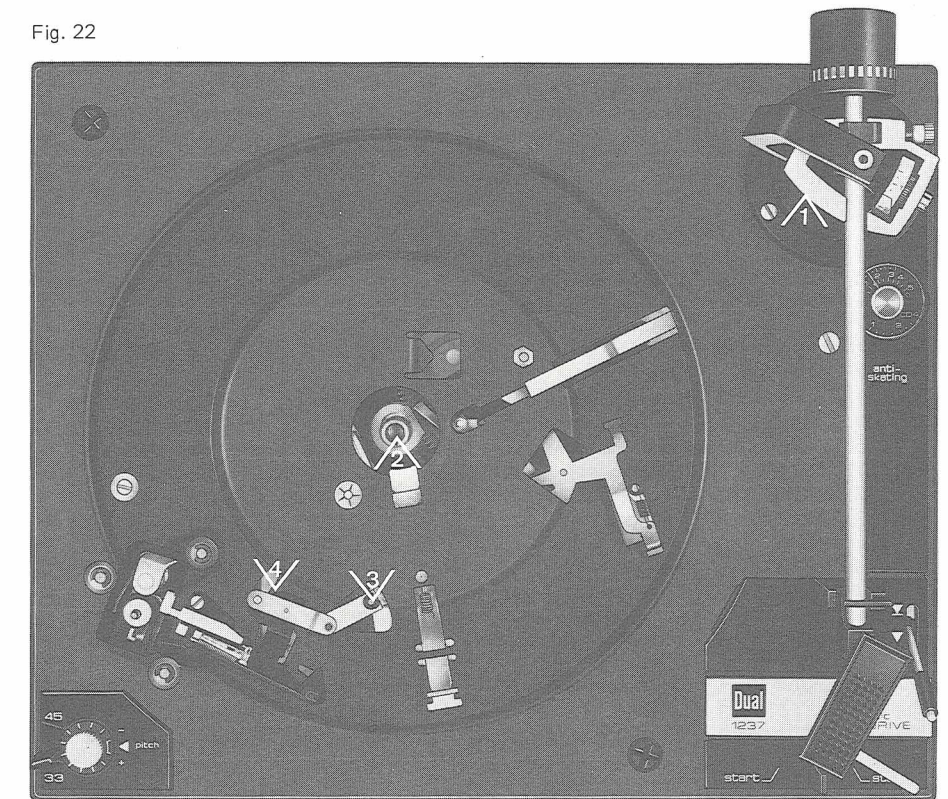
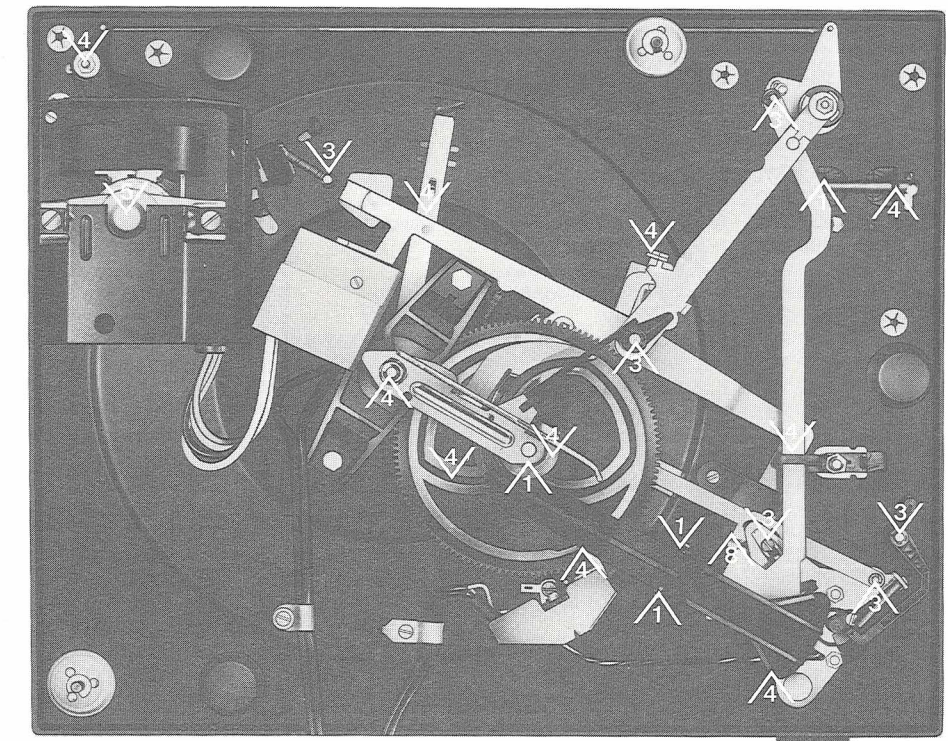


Fig. 23



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