

CS 626

Edition February 1980

Service Manual



Technical Data

Measured values

Current

Line voltage

Drive

Power input

Power consumption

Time from start to rated speed

Platter

Platter speed

Pitch control

Speed control (monitoring)

Sensitivity of the illuminated strobe

(for 0.1 % speed deviation)

Total wow and flutter

(according to DIN 45 507)

Rumble

(according to DIN 45 500)

Tonearm

Effective length of tonearm

Offset angle

Tangential tracking error

Tonearm bearing friction

(related to stylus tip)

Stylus pressure

Cartridges

Weight

typical values, Rumble and wow and flutter values obtained with test record.
AC 50 to 60 Hz.

110 to 125 V, 220 to 240 V

electronically-controlled direct-drive system, Dual EDS 500

Motor at playing operation, approximately 2 watts < 50 mW

220 V 50 Hz: at start 35 mA at play 15 mA

110 V 60 Hz: at start 65 mA at play approximately 25 mA

2 - 2.5 s at 33 1/3 rpm

non-magnetic, 1.4 kg, 304 mm diameter

33 1/3 and 45 rpm, electronically adjustable

Separate for both speeds, each adjustable by means of variable resistor,

range of regulation: 10 %

with illuminated stroboscope for platter speeds 33 1/3 and 45 rpm, 50 or 60 Hz.

6 division markings per minute at 50 Hz,

7.2 division markings per minute at 60 Hz.

(German Industry Standard) ± 0.05 %

WRMS ± 0.03 %

Unweighted: 50 dB

Weighted: 75 dB

Torsionally rigid tubular aluminum tonearm in low-friction four-point gimbal suspension.

221 mm

24° 4'

0.16° /cm

vertical 0.07 mN (0.007 g)

horizontal 0.15 mN (0.015 g)

from 0 to 30 mN (0 to 3 g) infinitely variable with 1 mN- (1/10 g) calibrations

from 0 to 15 mN (0 to 1.5 g) operable from 2.5 mN (0.25 g) stylus pressure upwards.

with 1/2 inch screw-type attachment. These can be fitted with the special accessories

no. 262 186 which can be obtained from trade dealers.

ca. 7.2 kg

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Fig. 1 Audio Connection Diagram

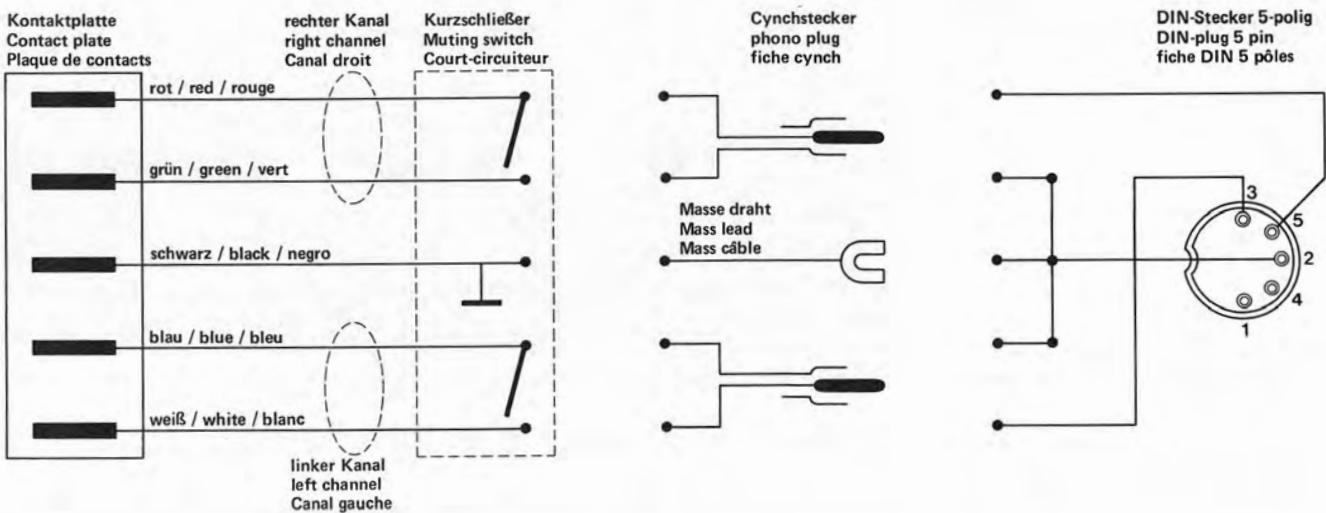
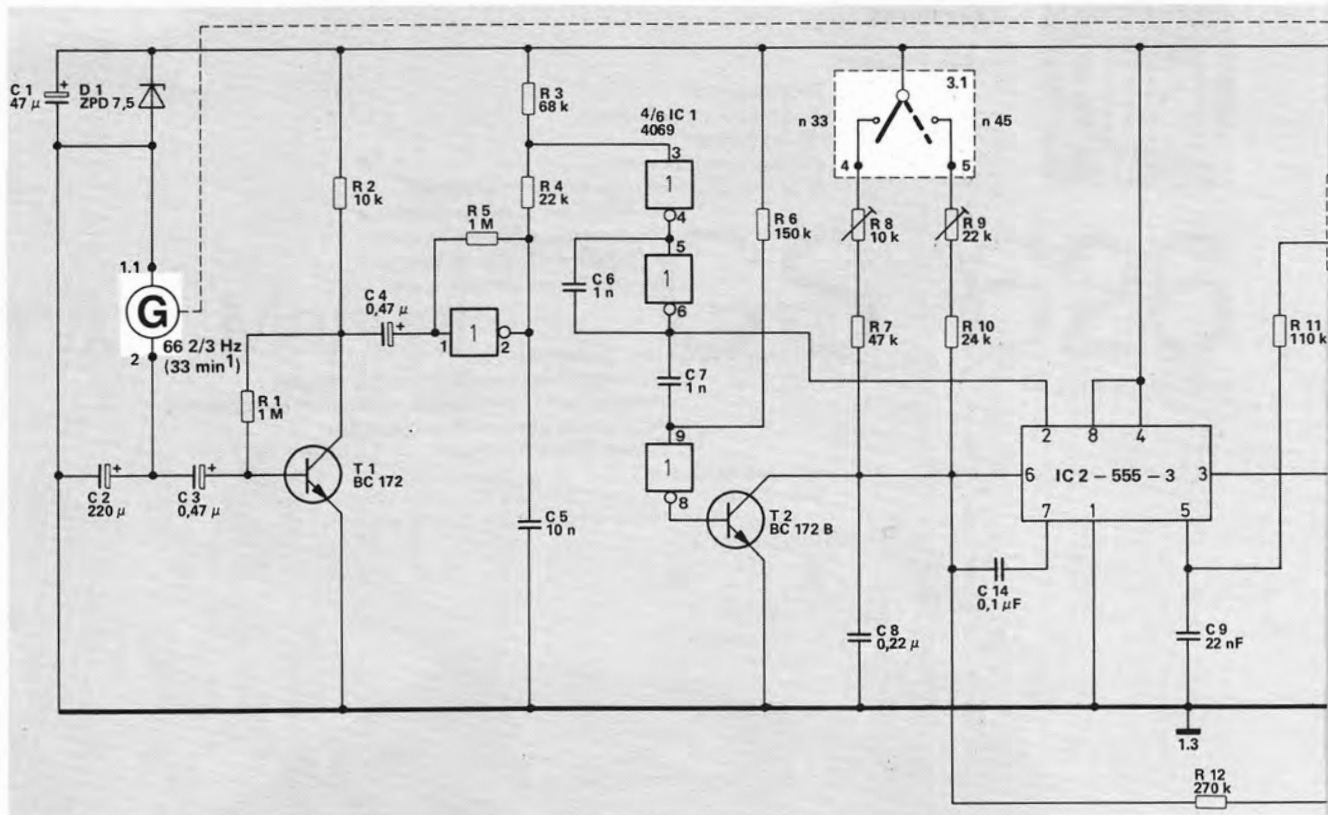
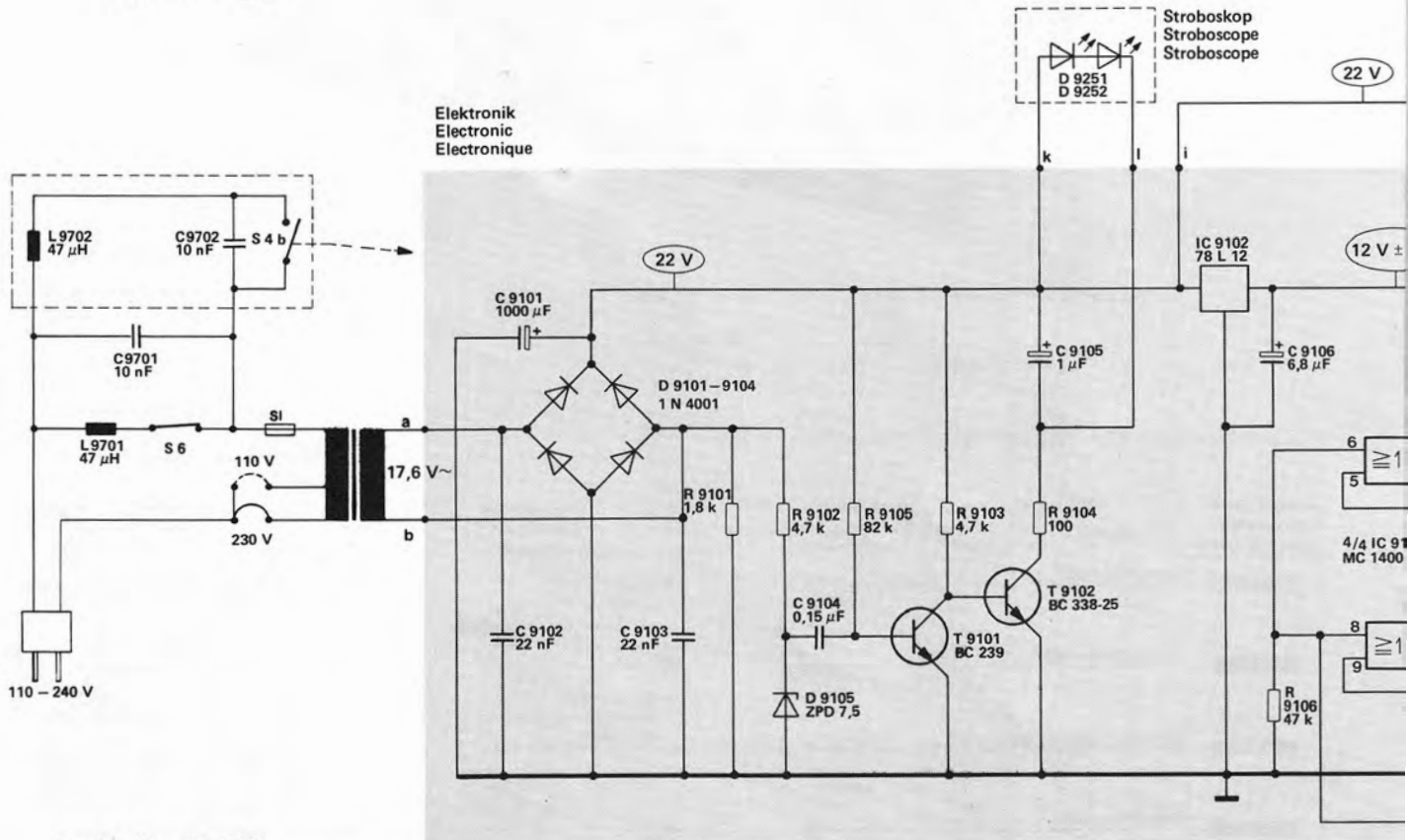


Fig. 2 Wiring Diagram



Motorelektronik
Motor electronic
Electronique de moteur

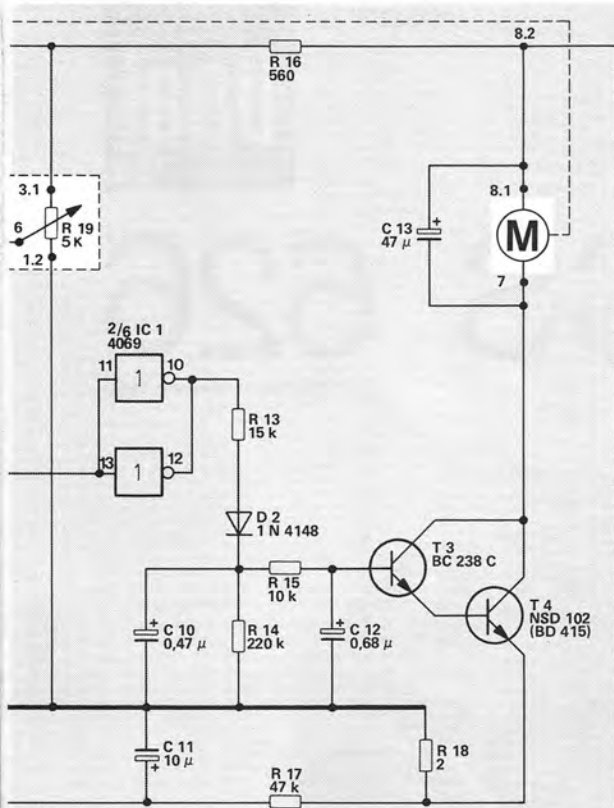


Elektronik
Electronic
Electronique

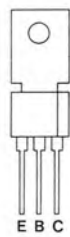
Stroboskop
Stroboscope
Stroboscope

Ausgabe 1/November 1979

R		1	2	5	3,4	6	8,7	9,10	12	11			
						9101	9102	9105	9103	9104	9106		
C	1	2	3	4	9101 9102	5	6	7	8	14	9	9106	91C



Transistoren von der Anschlußseite gesehen
 Transistors as seen from the connecting side
 Transistors vus du côté des connexions



BD 415

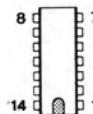


BC 172
 BC 238 C
 92 PU 45 NS
 BC 238-25
 BC 239 C

IC
 von der Bestückungsseite gesehen
 as seen from the top side
 vu du côté éléments



555

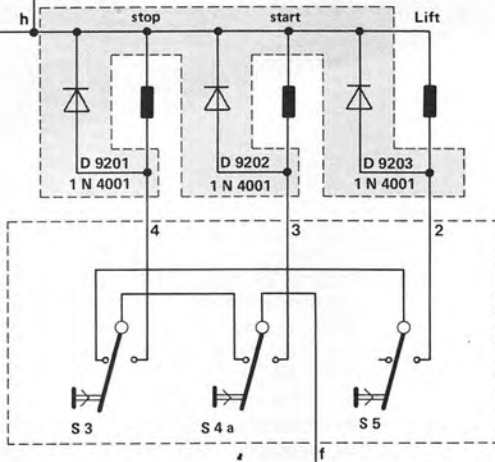


4069
 MC 14001 BCP

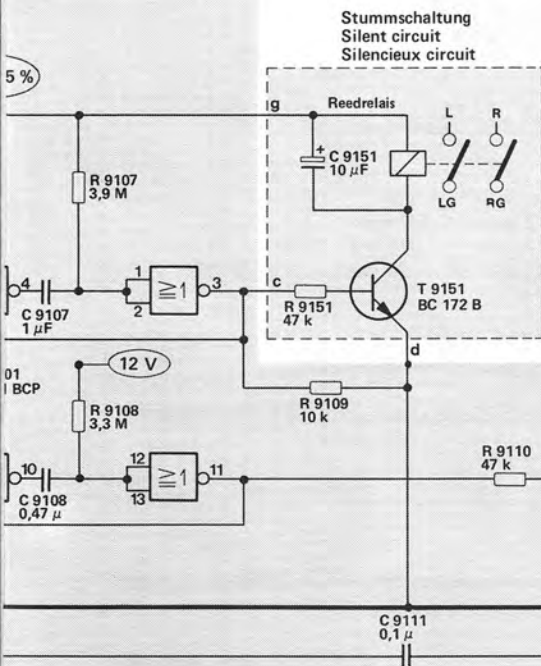


NS LM 78 L 12

Solenoid-Anschlußplatte
 Solenoid connection plate
 Solenoid plaque de connection



Frontbedienung
 Front control
 Réglage frontal



9107, 9108	13, 15, 16	14, 17	18	9110	9112	9111
10, 11	9151, 9109	12	13			
7, 9108	9151	9111		9110		

Änderungen vorbehalten.

Fig. 3 Motorelectronic (equipment side)

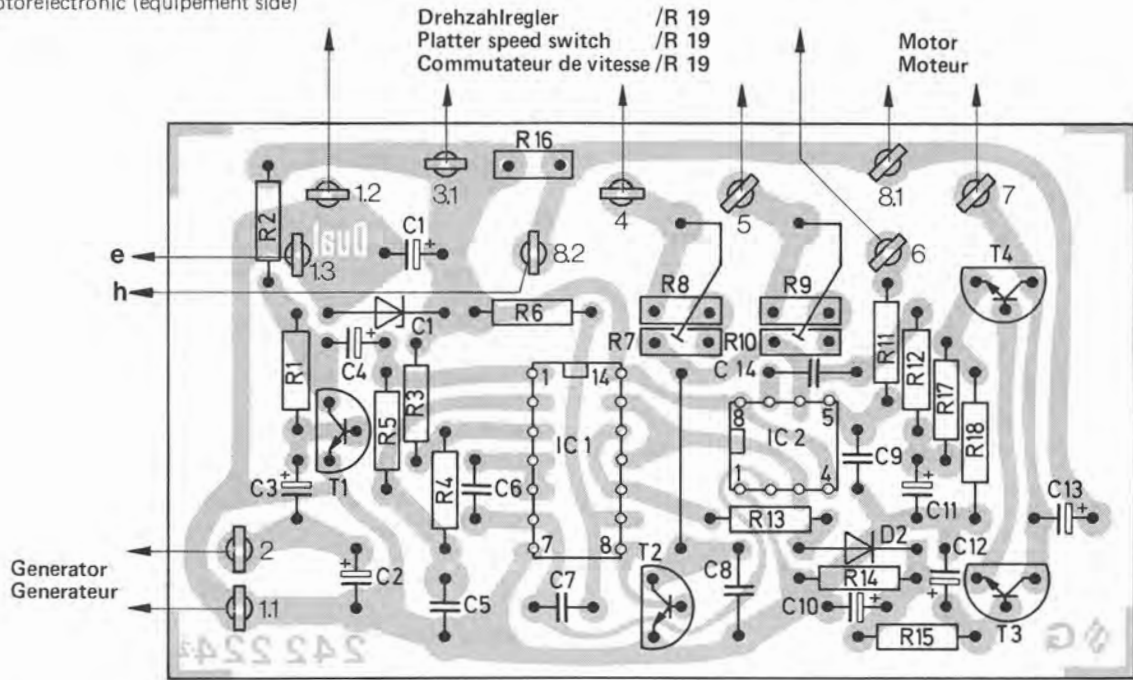


Fig. 4 Electronicplate (equipment side)

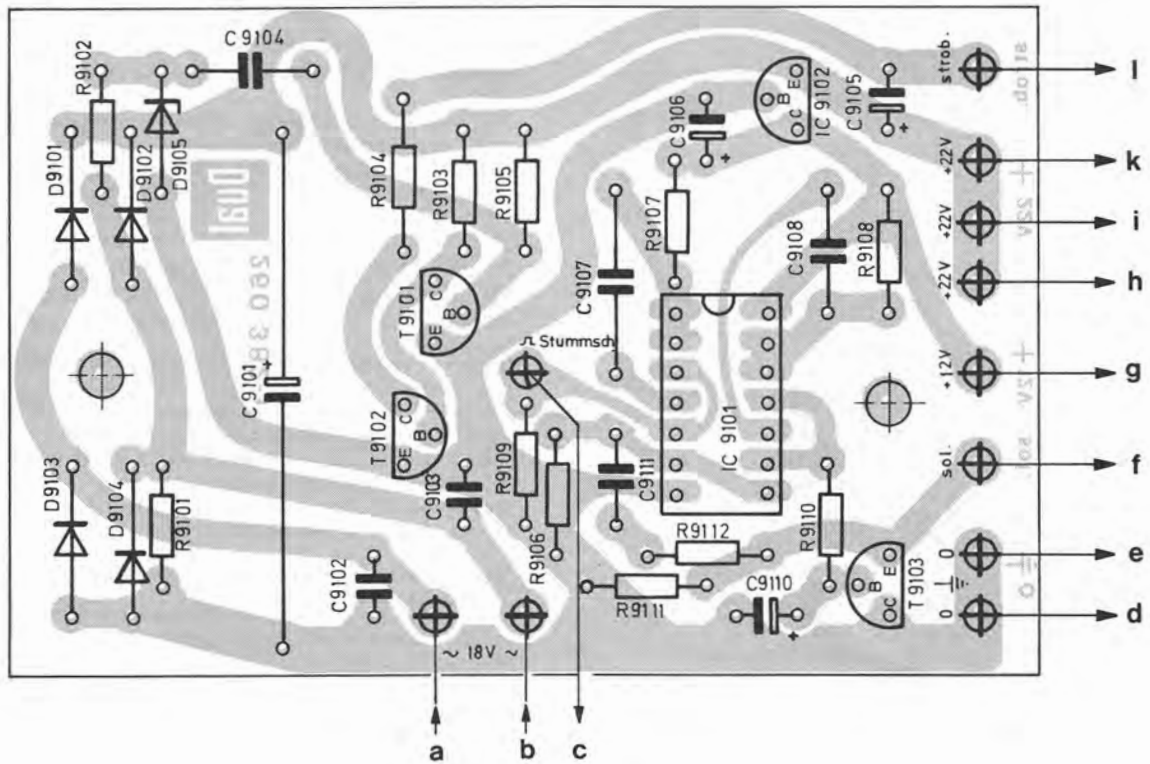


Fig. 5 Solenoid connection plate (equipment side)

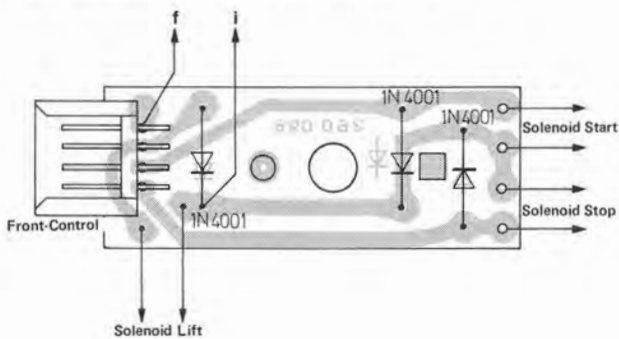
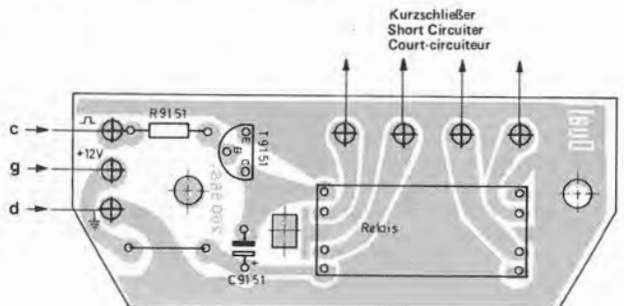


Fig. 6 Silent circuit (equipment side)



Direct Drive System Dual EDS 500

For repair of the Dual EDS 500 special tools and measuring means are required. Work on the motor or motor electronics system should, therefore, only be carried out by an authorized Dual service station.

Replacement of motor electronic

1. Extract unit plug from power line. Lift off platter **4**. Remove the machine screw and the mounting plate **27**. Loosen connection on solenoid plate **151**. Clamp unit in repair jig. Bring unit into head position.
2. Loosen connection for operating voltage on electronic plate **137**. Unsolder connecting leads on speed control **157**, turn switch **6** and generator. Open twists of holding angle **142** with flat pliers.
3. Pull off motor electronics **143** system from motor **141** carefully.
4. Fix replacement motor electronics.
Solder connecting cables (see connection diagram Fig. 8).
5. With the unit in normal position connect it to power line. Switch on unit and check power consumption on operation:
220 V/50 Hz approx. 15 mA
110 V/60 Hz approx. 25 mA
Check nominal speeds. If necessary, readjust as described below.
6. Bring unit in the base. Install the platter **4**. Mounting plate **27** fix it with machine screws.

Fig. 7

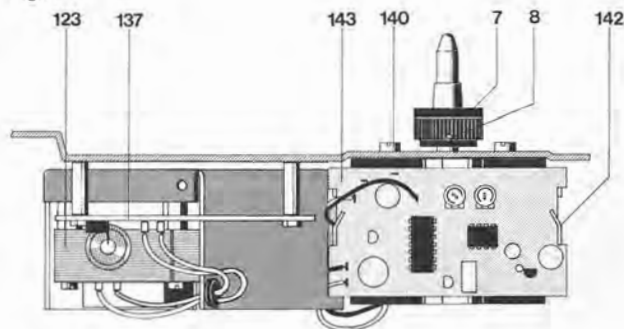
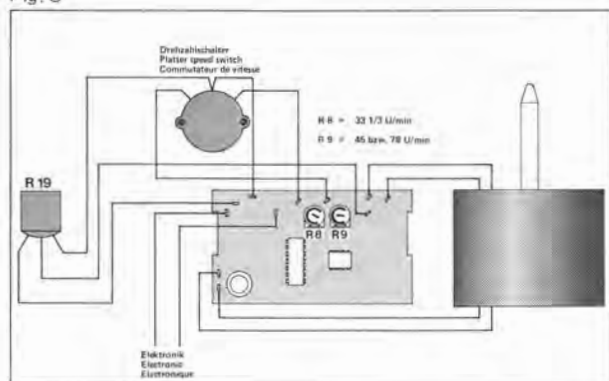


Fig. 8



Replacement of motor mechanic

1. See above. Clamp unit in repair jig.
2. Unsolder connecting leads to motor and the generator. Open twists of holding angle **142** with flat pliers. Lift off motor electronic **143**. Remove machine screw and holding angle **142**.
3. Loosen threaded pins **8** and remove platter cone **7**. Remove the three screws **140**. Lift off motor mechanics **141**.
4. Put platter cone **7** on new motor mechanics and fix it. Fix new motor mechanics with the three screws **140**. Fix holding angle **142** with screws. Insert motor electronics **141** and twist holding pieces.
Solder on resp. plug connecting leads (Fig. 8).
5. With the unit in normal position connect it to the power line. Switch on unit and check power consumption when operating:
220 V/50 Hz approx. 15 mA
110 V/60 Hz approx. 25 mA
Check nominal speeds. If necessary, readjust as described below.
6. Bring unit in the base. Install the platter **4**. Mounting plate **27** fix it with machine screws.

Setting nominal speeds

With knob **10** bring the fine speed control **157/R 19** into center position. With controls **R 8** and **R 9** on the motor electronic system adjust nominal speeds. Control **R 8** is used for 33 1/3 rpm, **R 9** for 45 rpm. Check with strobe disk.

Changeover to 78 rpm nominal speed

Instead of 45 rpm the can be changed to a nominal speed of 78 rpm.

To change the speed bring the fine speed control **157/R 19** in center position using knob **10**. Using control **R 9** on the motor electronics board **143** adjust for 78 rpm. Check with strobe disk.

Stroboscope

Accurate setting of the platter speeds 33 1/3 and 45 rpm can be checked during play with the aid of the stroboscope.

When the platter **4** is rotating at exactly 33 1/3 or 45 rpm the lines of the stroboscope appear to stand still. If the lines 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 of platter speeds 33 1/3 and 45 rpm can make with the "pitch" control **10**. Strobe markings are provided on the outer edge of the platter for 50 and 60 Hz line frequencies.

To replace LED **154** remove machine screws **156** and remove strobe cover **153**.

It can happen that the stroboscope lines appear to move slightly although the exact speed setting with stroboscope stationary has not been altered. This apparent contradiction is explained by the fact that the electronic central drive motor operates fully independently of line frequency whilst the only relatively accurate line frequency of the AC current supply is used for speed measurement with the light stroboscope. The constantly detectable fluctuations of line frequency by $\pm 0.2\%$ according to the information of the electricity supply companies brief frequency fluctuations up to 1% are possible — only effect the stroboscope indication and can cause the lines to "wander" although the platter speed is as constant and absolutely accurate as before.

Pitch Control

Each of the two standard speeds 33 1/3 and 45 rpm (78 rpm) can be varied by about 10%. The variable speed control **157/R 19** located in the voltage divider is adjusted by turning the pitch control knob **10**. By this the differential amplifier is altered and the motor speed accordingly.

Tonearm and Tonearm Suspension

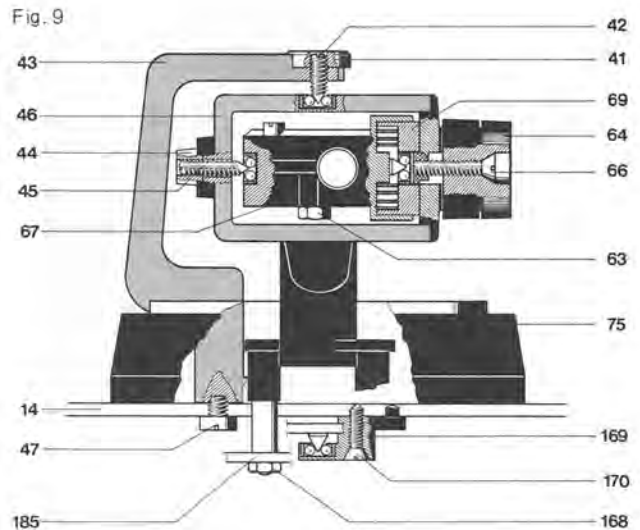
The feather-light, extremely torsion resistant all-metal tonearm is suspended in a gimbal. Suspension is by means of 4 hardened and precision polished steel points which rest in precision ball bearings. Tonearm bearing friction is thus reduced to a minimum.

Bearing friction vertical 0.07 mN (0.007 p)
 Bearing friction horizontal 0.15 mN (0.015 p)

as related to stylus point.

As a result, it ensures most favourable pick-up conditions. Before adjusting the tracking 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 stem **40**, the subsequent fine adjustment by turning the weight.

The tracking force is adjusted by turning the graduated rotary knob **64** incorporating a coil spring. The scale has markings for a range of adjustment from 0 to 30 mN (0 to 3 p) which permit accurate adjustment of the tracking force. One graduation in the range of 2 – 15 mN (0.2 – 1.5 p) corresponds to 1 mN (0.1 p) in the range of 15 – 30 mN (1.5 – 3 p) to 2.5 mN (0.25 p).

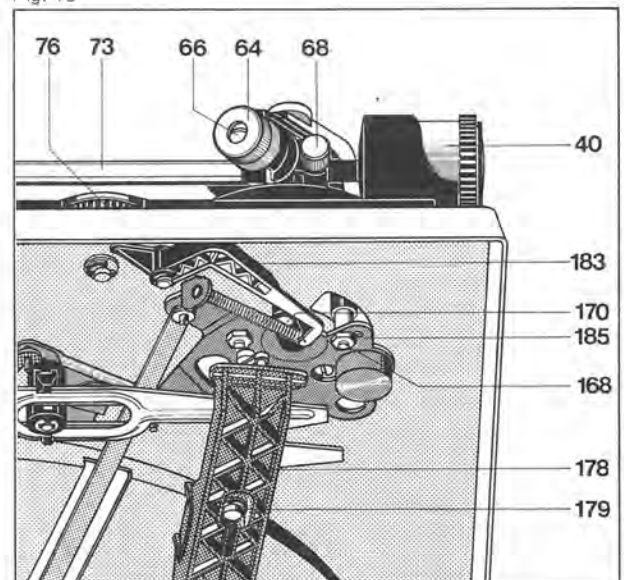


To remove the tonearm or the spring housing

1. Secure the unit in a repair stand. Turn the rotary turn switch **64** to the zero position. Lock the tonearm **73**. Remove the counterweight **40**.
2. Turn the unit over. Remove the screening sheet **217** and solder off the tonearm connections at the short circuiter **211**. Turn the unit the right way up.
3. Remove the fillister head screw **66**. Remove the rotary turn switch **64** and the washer **65**.
4. Loosen the nut **44** and the grub screw **45**. Draw the tonearm **73** complete with bearing **70** from the bearing race **46**. The spring housing **69** or the tonearm **73** may now be changed.

Reassembly involves the reverse procedure.

Fig. 10



Removal of tonearm assembly with tonearm bearing

We recommend the following procedure:

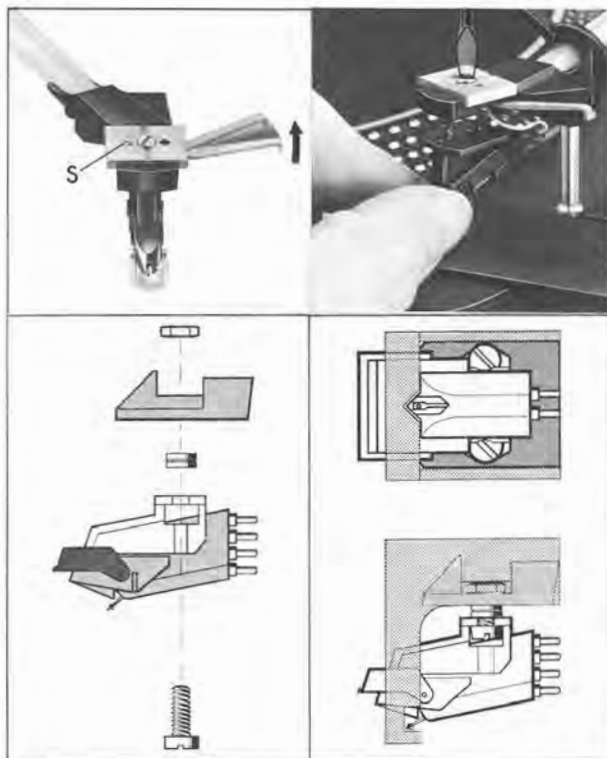
1. Clamp unit in the repair jig. Set the rotary knob **64** to zero. Lock tonearm **73**. Remove weight **46**.
2. Move unit into head position and remove the screening plate **217**. Unsolder the tonearm connections on the muting switch **211**.
3. Remove lock washer **179**. Lift off main lever **178** and bearing support **177**. Remove lock washer **191**. Lift off setting ratchet **191** and rotary bearing **189** and turn towards motor **141**.
4. Unlock tension spring **187**. Loosen lock washer **184** and remove skating lever **183**.
5. Remove lock washer **173** and slide bar **172**. Lift off shut-off bar **171** from segment **185**.
6. Remove hex nut **168**. Remove sink screw **170**. Hold tonearm **73** and lift off counter bearing **169** and segment **188**.
7. Remove tonearm complete with tonearm bearing.

Reverse this procedure when reassembling. Please bear in mind the threaded pin **42** is correctly positioned in the ball bearing.

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 **42** and that of the vertical tonearm bearing with threaded pin **45**.

Fig. 11



Fitting a 1/2 inch cartridge

If a cartridge with 1/2 inch standard mount is to be fitted, the conversion kit **39** Number 262 186 is necessary. The proper method of fitting is shown in fig.11.

Also the decorative cover should be removed from the counterweight **40** and should be fitted with the compensatory weight to be found in the conversion kit **39**.

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.

Anti skating Device

To compensate for skating force use the knurled ring **76**. The asymmetric cam plate displaces the skating lever **183** from the tonearm pivoting point. The anti-skating force is transmitted to the segment **185** and to the tonearm **73** by tension spring **187**. Optimum adjustment is carried out at the factory for stylus having a tip radius of 15 μm (conical), 5/6 and 18/22 μm (elliptical).

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.

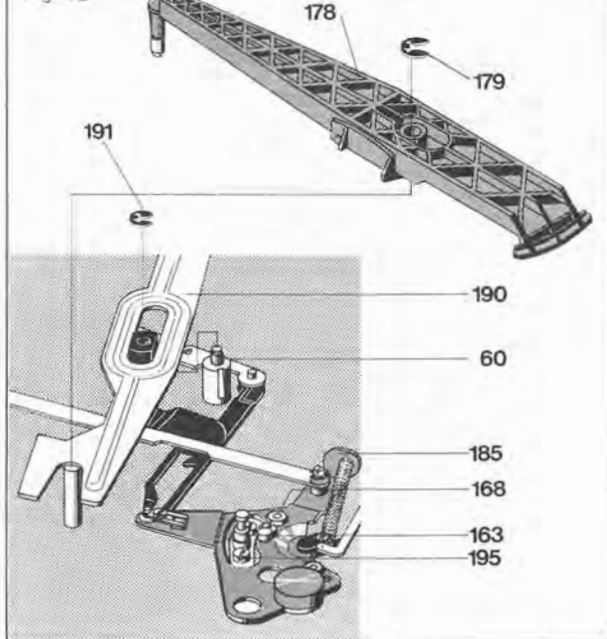
Cue Control

By moving the lever **203** forward (\blacktriangledown) lift cam **204** rotates. The slide bar **190** transmits the lifting movement to the lift pin, that raises the tonearm. As a result, the cue control permits raise up the tonearm at any desired point.

The lever is released by moving the cue control lever rear wards (\blacktriangledown). As a result of the action of compression spring **181** the lift pin is brought back to its normal position and the tonearm lowers slowly. Lowering of the tonearm is damped by silicone oil in the lift tube.

The lift can be varied by turning the sleeve **60**. The distance between the record and the needle should be 5 - 7 mm.

Fig. 12



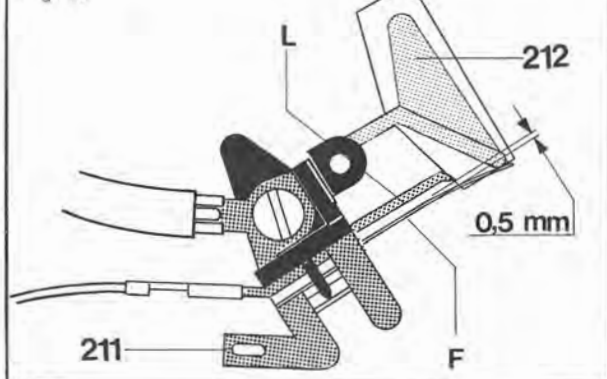
Replacement of Cue Control Plate

Replace cue control plate **163** as follows:

1. Clamp unit in the repair jig, and lock tonearm. Turn unit in head position.
2. Remove safety washer **179**. Lift off main lever **178** and bearing support **177**.
3. Remove safety washer **191**. Lift off positioning bar **190** and rotary bearing **189** and turn towards motor **141**.
4. Remove both machine screws **195**, remove lift plate compl. **163**.

For installation proceed in the reverse order.

Fig. 13



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 clearance of approximately 0.5 mm between the contacts of the muting switch. This clearance should be adjusted by bending the muting switch contacts. The contacts should be sprayed with a suitable cleaning agent.

Tonearm Control

Automatic movement of the tonearm is initiated by the control cams on the inside of the cam wheel **5** on rotating through 360° . The control elements for raising and lowering are the main lever **178** and lifting bolt for horizontal movement the main lever **178** with segment **185**.

The automatic tonearm set down mechanism is designed for 30 cm and 17 cm records and is coupled to the platter speed changeover. The setdown points of the tonearm are determined by the spring pin of segment **185** contacting the slide bar **190**. Limitation of the horizontal movement of the tonearm is produced by the pin of segment contacting the stop attached to the slide bar **190**. Only during set-down does main lever **178** lift the slide bar **190** 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) slide bar is released again and returns to its neutral position. As a result, the slide bar moves out of the swivel range of the pin, so that unimpeded movement of the tonearm is possible for playing.

Start

Switching the switch lever **68** into the "start" position initiates the following sequence:

- The Solenoid rotates the switch lever **147** which is pivoted about the notched stud. At the same time, the switch arm **53** is moved the motor **141**, via the power switch **125**, and the platter starts turning.
- Operating the switch lever **58** also releases the start slide which is drawn toward the cam by means of the tension spring **57**. By that the shut-off lever engage with the drive pinion and the cam turns.

Manual start

The latch **165** which is connected to the switch arm **53** engages in the four-sided plate when the tonearm is moved manually. The switch arm connects the mains supply to the motor **141** via the power switch **125** and the platter rotates.

When the run-out groove of the record is reached, the tonearm is lifted and returned, 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 **185** engages the latch **165** so that the switch arm is returned to its starting position. This switches off the mains supply.

Continuous Play

Continuous Play is switched on by turning the rotary knob **74** to "∞". The rotary knob **74** turns the switch angle **220**. The switch rod **219** keep the change lever **147** in starting position. After the record has been played the tonearm returns automatically to the lead-in groove of the record. This procedure is repeated until the switch lever is brought to the "stop" position or the rotary knob **74** to position "1".

Adjustment Point

Pull mains plug. Remove platter **4**. Bring rotary knob **74** to position "∞". Turn cam wheel to central position. The change lever **147** turns the guide lever **U** and the top of the guide lever must at least be brought to the cam range. Adjust by bending the switch rod **223**.

Stopping

When control lever is set to "stop position" the start slide **58** which is pulled towards the cam by means of tension **57**, becomes free. As a result, the shut-off lever is moved into the range of dogs cam. The lever remains in its stop position.

Fig. 14

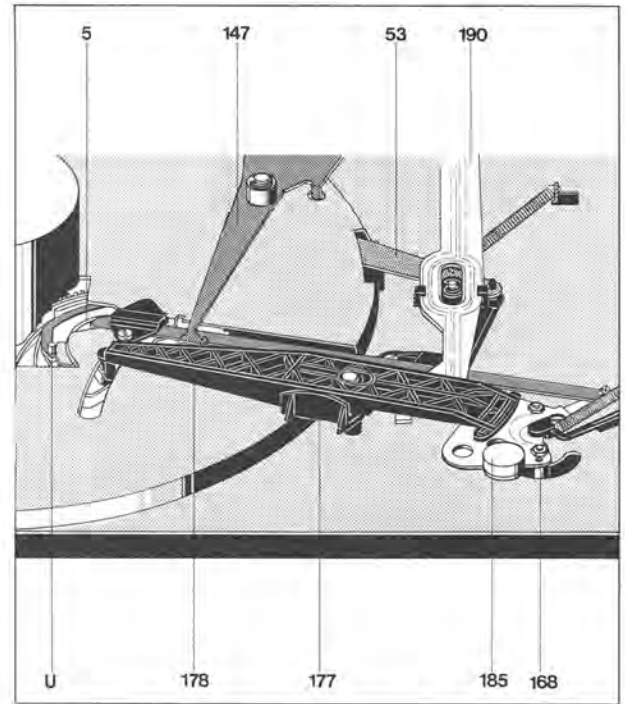
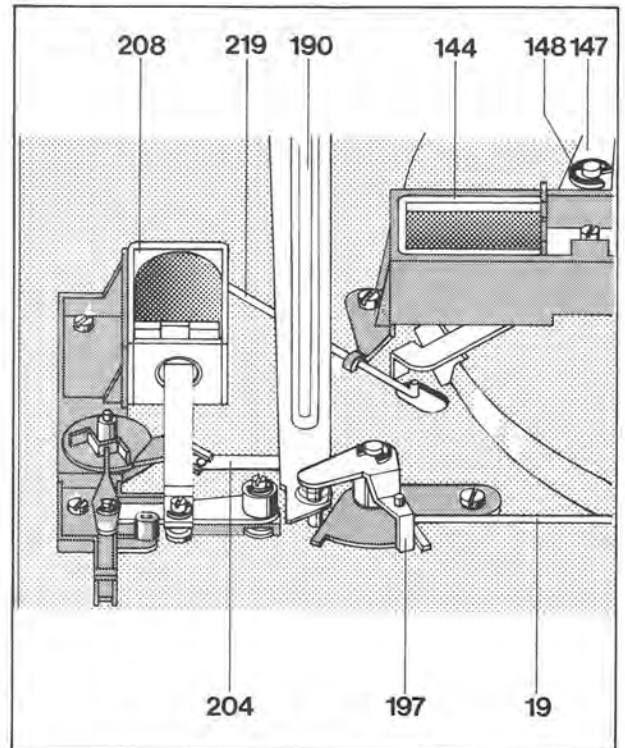


Fig. 15



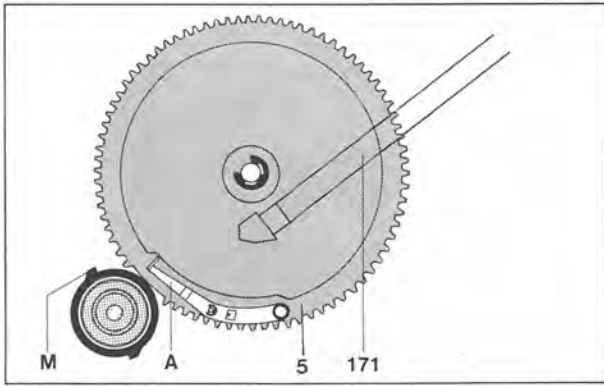
Shut-off

The shut-off and stop functions depend on the position of the guide lever **U**. The guide lever **U** is brought to stop position by the main lever **178** after every start (longer end of the guide lever towards cam wheel centre).

The shut-off bar **171** is guided along in proportion to the movement of the segment **185**.

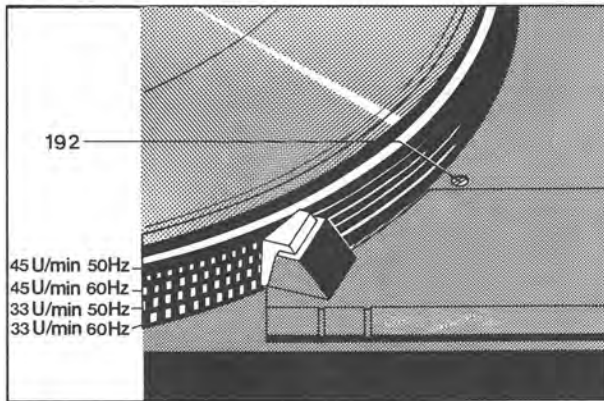
The shut-off procedure is imitated after a record has been played by the dog **M** of the platter and the shut-off lever **A**.

Fig. 16



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). The dog engages the shut-off lever **A**. The cam wheel **5** is moved from 0 position and engage with the drive pinion of the platter. The main lever **178** guides the tonearm back and effected the tonearm to return to its rest position. During the running in of the cam wheel into 0 position the roll **55** of the switch arm can run into the cut-out provided at the cam wheel and achate the power switch **125**.

Fig. 17



Adjustment Points

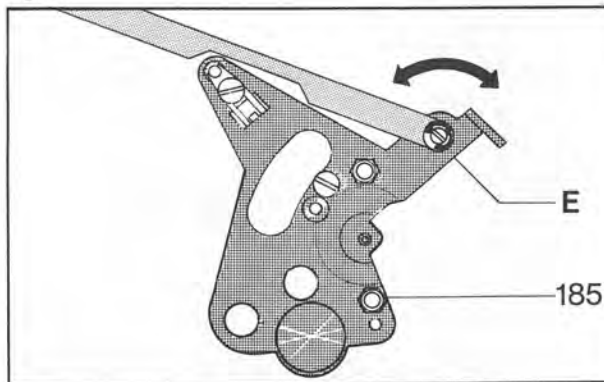
Tonearm set-down point

The set-down point can be varied with the eccentric bolt **192**. If the stylus sets down onto the record too far inside or outside turn eccentric bolt **192** in left or right direction.

Shut-off Point

The shut-off point (shut-off area of record diameter (116/122 mm) can be varied with the eccentric **E** mounted on the segment **185**.

Fig. 18



Tonearm lifting height

- Remove the mains plug. Guide the tonearm **73** towards the edge of the platter. The bottom edge of the cartridge housing should be parallel to the top edge of the platter cover. Carry out alignment by turning the adjusting sleeve **164**.
- Press the start button and turn the platter **4** in normal direction until the tonearm **73** reaches its highest position. The tonearm should now have a vertical play of approximately 1 – 2 mm (measured at the tonearm post). If necessary, slightly turn the adjusting sleeve **164**.

Power Switch

Turn in tonearm **73**. The slide **127** of the power switch **125** should have a play of 0.2 – 0.5 mm. Adjust by bending the switch arm **147**.

Fig. 19

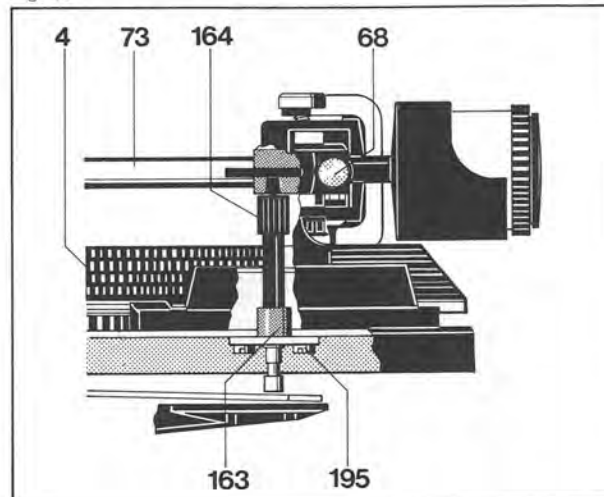


Fig. 20

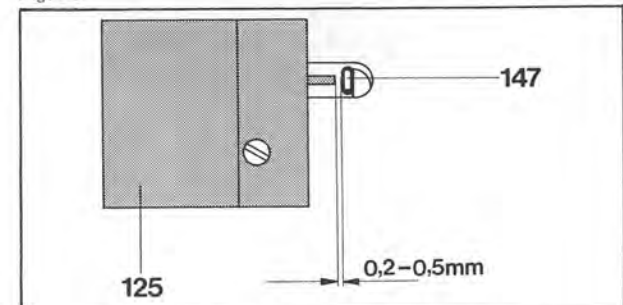
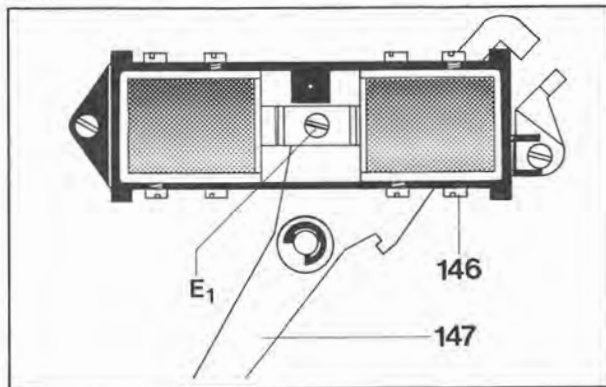


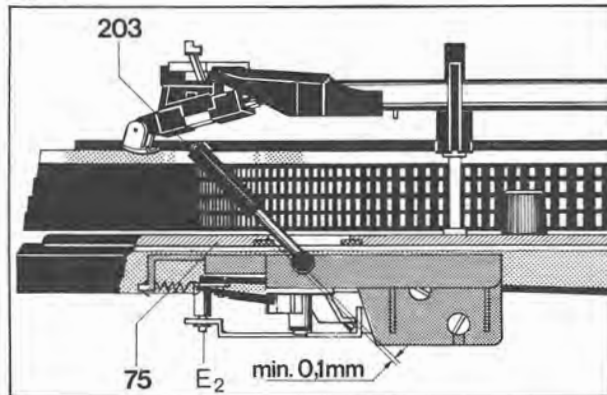
Fig. 21



Pull magnet "start/stop"

The stroke of the pull magnets can be altered with eccentric **E₁**. The stroke should be set so that during "start" operation a play of minimum 0.1 mm is present between the lap of the deflection lever **147** and the start slide **58**.

Fig. 22



Pull magnet "lift"

The stroke of the pull magnets can be altered with eccentric **E₂**. During operation of the pull magnet up to stop the lever **203** should still just evidence perceptible play (min. 0.1 mm).

Defect	Cause	Remedy
Tonearm does not set down on record or lowers too quickly when operating the cue control lever 203	Excessive or insufficient damping as a result of contamination of the silicone oil in the lift tube	Remove cue control plate 163 . Remove shaft pin 180 and washer 200 . Remove adjustment bush sleeve 164 . Remove washer 200 . Remove lift pin 181 and compression spring. Clean lift tube and lift pin. Smear lift pin evenly with "Wacker Silicon Oil AK 300 000". Reassemble components.
Vertical tonearm movement shows resistance	Excessive friction of Lift Pin in guide tube tube	See above, if necessary change the cue control plate 163 .
Speed lies at limit of the range of adjustment of the pitch control	Nominal speed is maladjusted.	Readjust nominal speed, described on page 8.
Platter does not turn after switching unit on and moving tonearm in side	Power supply to motor interrupted. Power fuse 122 defect	Replace the fuse 122

Defect	Cause	Remedy
Tonearm does not set down at the lead-in groove of the record	Tonearm set-down point is incorrectly set	The tonearm set-down point can be adjust with the eccentric bolt 192
Motor does not switch off when tonearm set down on rest.	Suppressor capacitor in power switch ist faulty (short circuit).	Replace suppressor capacitor in power switch
Acoustic feedback	a) Chassis components (e.g. connecting leads) rubbing on board cut out b) Connecting leads too tight.	a) Line up mounting board cut-out according to installation instructions b) Slacken or lengthen leads.

Replacement parts

Pos.	Part.No.	Qty	Description	Pos.	Part.No.	Qty	Description
1	220 213	1	Centering disc	52	261 744	1	Tension spring
2	214 056	1	Washer	53	242 765	1	Switch lever
3	263 254	1	Turntable mat	54	210 147	1	Lock washer 4
4	263 256	1	Turntable compl. with mat	55	242 785	1	Roll
5	246 035	1	Cam wheel compl.	56	210 146	2	Lock washer 3.2
6	238 034	1	Rotary switch	57	233 710	1	Tension spring
7	242 192	1	Platter cone	58	261 199	1	Start slider compl.
8	242 191	3	Threated pin M 3 x 3	59	200 650	1	Rubber sleeve
9	262 634	1	Washer	60	242 770	1	Adjustment screw
10	260 336	1	Rotary knob "Pitch"	61	263 334	1	Support compl.
11	260 335	1	Rotary knob	62	239 679	1	Nut M 3
12	263 357	1	Pitch control cover	63	262 294	1	Hexagon self-tapping screw 2.9 x 6.5
13	200 444	7	Spring washer	64	249 989	1	Rotary knob
14	263 960	1	Mounting plate compl.	65	261 798	1	Washer 5.2/10
15	236 843	2	Hinge compl.	66	249 097	1	Raised counter sunk head screw M 2.5 x 12
16	234 838	2	Adjusting wheel	67	236 069	1	Machine screw M 2.5 x 4
17	210 286	2	Cheese head self-tapping screw B 2.9 x 9.5	68	260 428	1	Clamp screw
18	231 767	2	Retainer plate	69	263 331	1	Spring housing compl.
19	210 146	2	Securing disc	70	263 330	1	Bearing compl.
20	210 668	1	Washer	71	248 979	1	Lifting plate
21	231 654	1	Hinge pin	72	263 259	1	Tonearm head compl.
22	234 145	2	Compression spring		261 929	1	Tonearm lead compl.
23	231 657	1	Hinge tongue	73	263 262	1	Tonearm compl.
24	231 656	2	Hinge cam	74	260 334	1	Rotary knob
25	236 092	1	Disc	75	263 332	1	Rear covering compl.
26	234 837	1	Adjusting nut	76	260 320	1	Cam disc
27	246 079	1	Mounting plate	77	242 298	1	Spring washer
28	237 548	2	Cable conduit	78	228 113	1	Washer 4.2/8/1
30	207 301	1	TA-cable compl. with cynch plug	79	210 146	1	Lock washer 3.2
31	209 425	1	Cynch plug white	80	260 328	1	Stroboscope prism
32	209 426	1	Cynch plug black	81	263 959	1	Front cover
33	243 750	1	Power cable Europe	82	239 414	3	Transport lock compl.
	232 995	1	Power cable USA	83	232 975	3	Spring mount compl. (Tonearm side front)
39	262 186	1	1/2 inch conversion kit cpl.		237 228	1	Spring mount cpl.
40	263 263	1	Weight compl.	84	230 529	4	Threated piece
41	249 383	1	Counter nut	85	230 523	3	Pressure spring
42	230 063	1	Threated pin		236 712	1	Pressure spring (Tonearm side front)
43	263 260	1	Frame compl.	86	200 723	4	Rubber damping
44	246 884	1	Counter nut	87	200 722	4	Steel cup
45	234 634	1	Threated pin	88	210 486	2	Machine screw M 3 x 8
46	263 329	1	Bearing frame	89	210 586	2	Washer 3.2
47	242 677	1	Machine screw	90	249 312	1	CK 70 walnut console
50	210 361	1	Hex nut M 3		249 314	1	CK 70 agate-black console
51	242 768	1	Bush		249 315	1	Cover CH 16

Pos.	Part.No.	Qty	Description
91	210 539	3	Hexagon self-tapping screw B 2.9 x 13
92	242 862	3	Mikroschitch
93	210 486	2	Machine screw M 3 x 8
94	210 147	3	Lock washer
95	210 366	4	Hex nut M 4
96	247 836	2	Hexagon self-tapping screw B 2.9 x 19
97	247 040	1	Mikroschitch
	241 646	1	Condenser 10 nF/250 V/20 %
	242 822	1	HF-choke 47 μ H
98	260 221	1	Housing compl.
99	210 472	6	Machine screw M 3 x 4
100	260 101	1	Switching plate
101	249 473	3	Ring
102	260 978	1	Fascia compl.
103	263 957	1	Bracket fascia compl. metallic-silver
	263 958	1	Bracket fascia compl. metallic-brown
104	235 150	3	Compression spring
105	249 474	3	Push-button
106	247 353	3	Cheese head self-tapping screw B 2.9 x 9.5
120	226 642	4	Machine screw M 3 x 33
121	246 133	1	Power plate compl.
122	209 699	1	Fuse T 0,1 A/250 V
123	263 956	1	Power transformer
124	210 361	4	Hex nut
125	260 228	1	Power switch
126	200 444	1	Spring washer
127	236 335	1	Slide
128	233 012	1	Switching plate
129	219 200	1	Snap spring
130	242 822	1	HF-choke
131	230 148	1	Switching angle
132	241 646	1	Condenser
133	239 732	1	Tension spring
134	247 547	1	Cover compl.
135	210 498	1	Machine screw
136	233 423	1	Single-pole plug
			Electronic plate
137	263 961	1	Electronic plate
D 9101	227 344	4	1 N 4001
D 9102	227 344	4	1 N 4001
D 9103	227 344	4	1 N 4001
D 9104	227 344	4	1 N 4001
D 9105	227 360	1	ZPD 7.5
T 9101	235 921	1	BC 239 C
T 9102	231 066	1	BC 338-25
T 9103	260 893	1	92 PU 45 NS
IC 9101	261 872	1	▲ MC 14 001 BCP
IC 9102	260 894	1	NS LM 78 L 12
138	210 362	2	Hex nut M 3
140	210 511	4	Machine screw M 4
141	244 476	1	Motor mechanic
142	242 233	1	Upholder
			Motorelectronic
143	244 477	1	Motorelectronic
D 1	227 360	1	ZPD 7.5
D 2	223 906	1	1 N 4148
T 1	229 511	2	BC 172 B
T 2	229 511	2	BC 172 B
T 3	244 715	1	BC 238 C
T 4	242 306	1	(NSD-102) BD 415
IC 1	242 303	1	NS 4069
IC 2	242 304	1	NS 555
144	263 962	1	Magnetset start/stop
145	262 685	1	Tension spring
146	210 469	2	Machine screw M 3 x 3
147	261 065	1	Changeover lever
148	210 147	1	Lock washer 4
149	247 118	2	Armature
150	248 266	2	Pullmagnet
151	263 964	1	Solenoid Connection plate compl.
152	210 283	1	Cheese head self-tapping screw B 2.9 x 6.5

Pos.	Part.No.	Qty	Description
153	263 336	1	Stroboscope housing cpl.
154	249 409	2	Diode LD 57 CA
155	260 319	1	Diodenplate
156	210 469	2	Machine screw M 3 x 3
157	238 073	1	Speed control potentiometer
157	237 782	1	Nut for potentiometer
158	242 187	1	Contact
159	210 469	1	Machine screw M 3 x 3
160	242 195	1	Contact piece
161	210 587	1	Washer 3.2/7/1
162	210 362	1	Hex nut M 3
163	246 043	1	Lift plate
164	218 318	1	Sleeve
165	242 764	1	Pawl
166	239 915	1	Square plate
167	210 472	1	Machine screw M 3 x 4
168	210 362	2	Hex nut M 3
169	242 615	1	Counter bearing
170	203 475	1	Sunk screw M 3 x 8
171	242 763	1	Shut-off lever
172	201 187	1	Washer
173	210 145	1	Lock washer 2.3
174	209 357	1	Ball
175	232 104	1	Ball bearing
176	210 472	1	Machine screw M 3 x 4
177	242 789	1	Bearing
178	246 042	1	Main lever
179	210 147	1	Lock washer
180	216 844	1	Control stud
181	234 798	1	Compression spring
182	242 298	1	Lock washer
183	244 331	1	Skating lever
184	210 146	1	Lock washer 3.2
185	263 335	1	Segment compl.
186	218 591	1	Tension spring
187	201 184	1	Adjustment disc
188	244 834	1	Compression spring
189	237 498	1	Rotary bearing
190	242 769	1	Positioning rail
191	210 145	1	Lock washer 2.3
192	242 751	1	Excenter pin
193	242 748	1	Plate
194	210 155	1	Washer
195	210 472	1	Machine screw M 3 x 4
196	243 706	1	Conical spring
197	242 771	1	Rotary plate
198	210 146	1	Lock washer 3.2
199	242 741	1	Switch slide
200	210 143	2	Lock washer
202	237 543	1	Rubber sleeve
203	247 509	1	Lever compl.
204	247 289	1	Curve
205	210 353	1	Hex nut
206	247 313	1	Compression spring
207	209 353	1	Ball
208	260 230	1	Magnet set lift compl.
209	247 417	1	Armature
211	242 612	1	Muting switch
212	242 790	1	Contact arm
213	239 806	1	Base shet
214	210 486	1	Machine screw
			Silent circuit
215	263 965	1	Silent circuit
T 9151	247 775	1	Reed-Relais
T 9151	229 511	1	BC 172 B
216	247 515	1	Threaded pin
217	247 516	1	Screening shut
218	210 362	2	Hex nut
219	242 774	1	Switch slide
220	247 288	1	Switch angle
221	210 549	1	Washer 2.1/5/0.5
222	210 353	1	Hex nut M 2
223	237 383	1	Spring
	260 790	1	Operating Instructions
	260 796	1	Shipping carton

▲ Caution! Delicate component using MOS technology.

Modification reserved!

Fig. 23 Exploded view 2

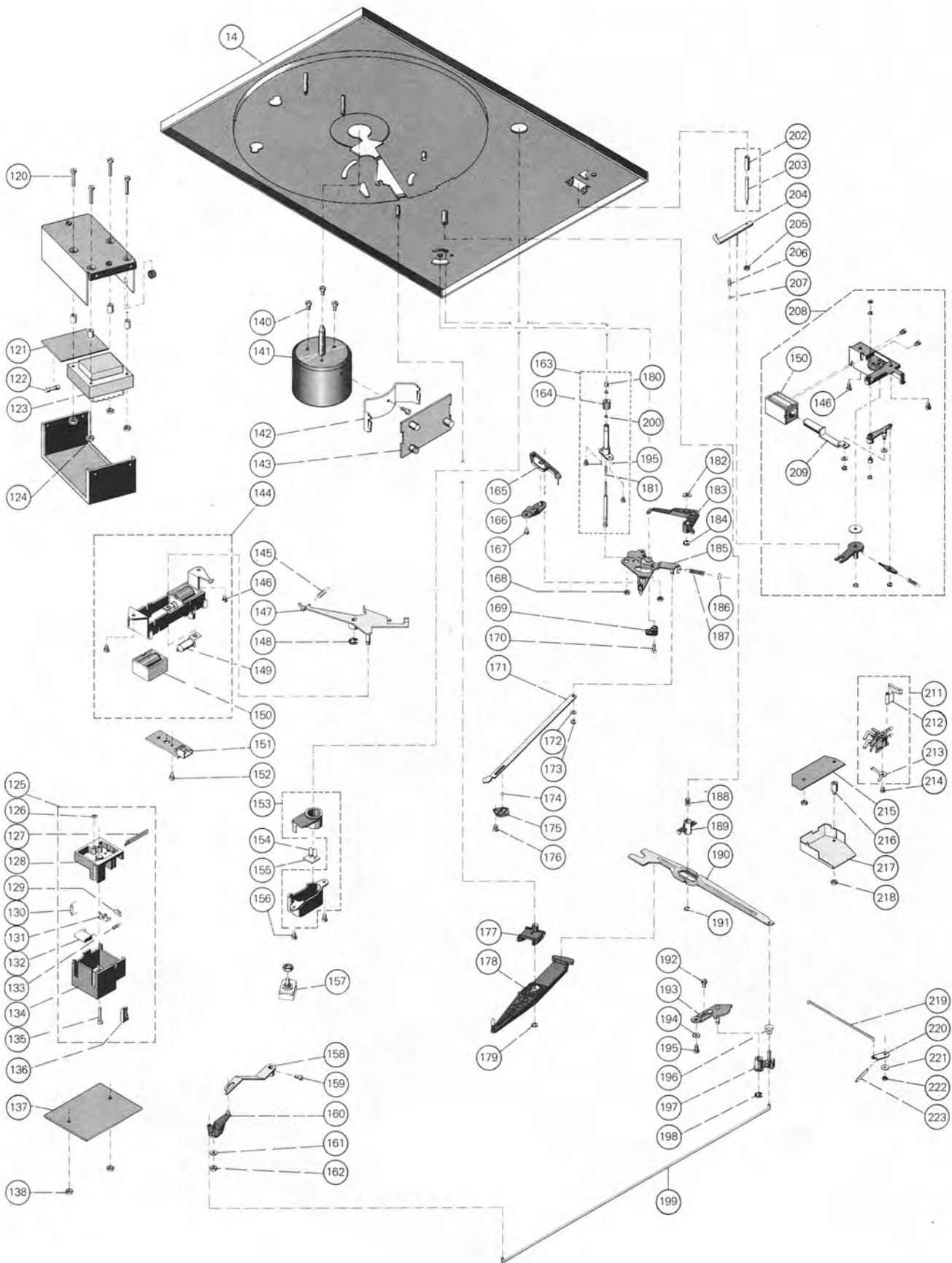
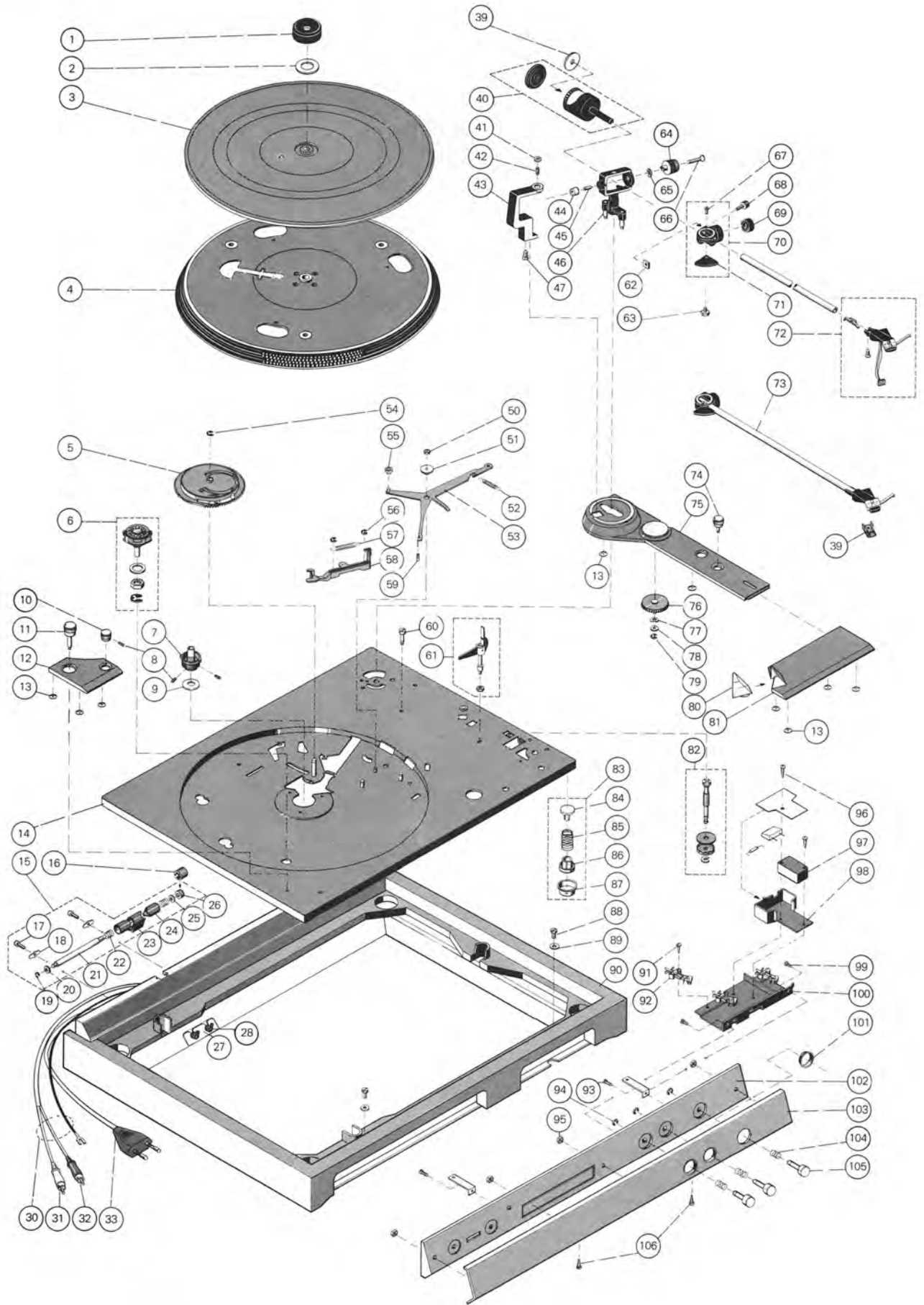


Fig. 24 Exploded view 1



Lubricating instructions

All bearing and friction points of the unit are adequately lubricated at the factory. Replenishment of oil and grease is only necessary after approx. 2 years of normal use as the most important bearing points have sintered metal bushes. The motor bearings have long-life sintered metal bushings and thus should not be lubricated. Bearing points and friction faces should be lubricated sparingly rather than generously. When using different lubricants, chemical decomposition can often take place. To prevent lubrication failure, we recommend using the original lubricants shown below.



Wacker silicon oil
AK 300 000



BP super viscotatic
10 W/40

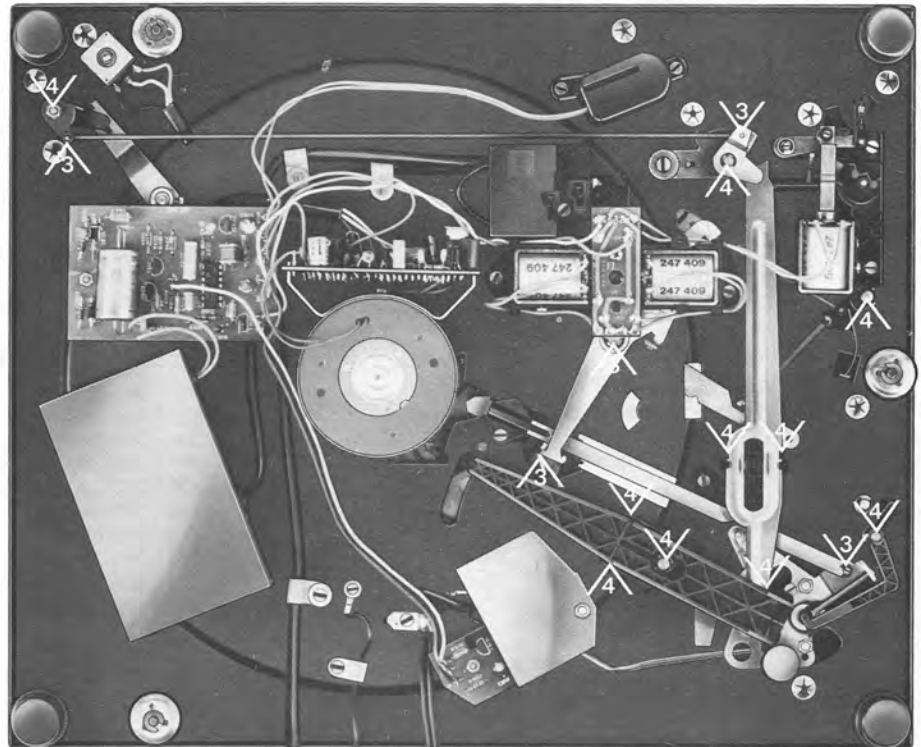


Shell alvania No. 2

Fig. 25



Fig. 26



Dual Gebrüder Steidinger · 7742 St. Georgen/Schwarzwald