135

Dual

621

Edition August 1978

Service - Manual

Dual Gebrüder Steidinger · 7742 St. Georgen/Schwarzwald

Dual 621

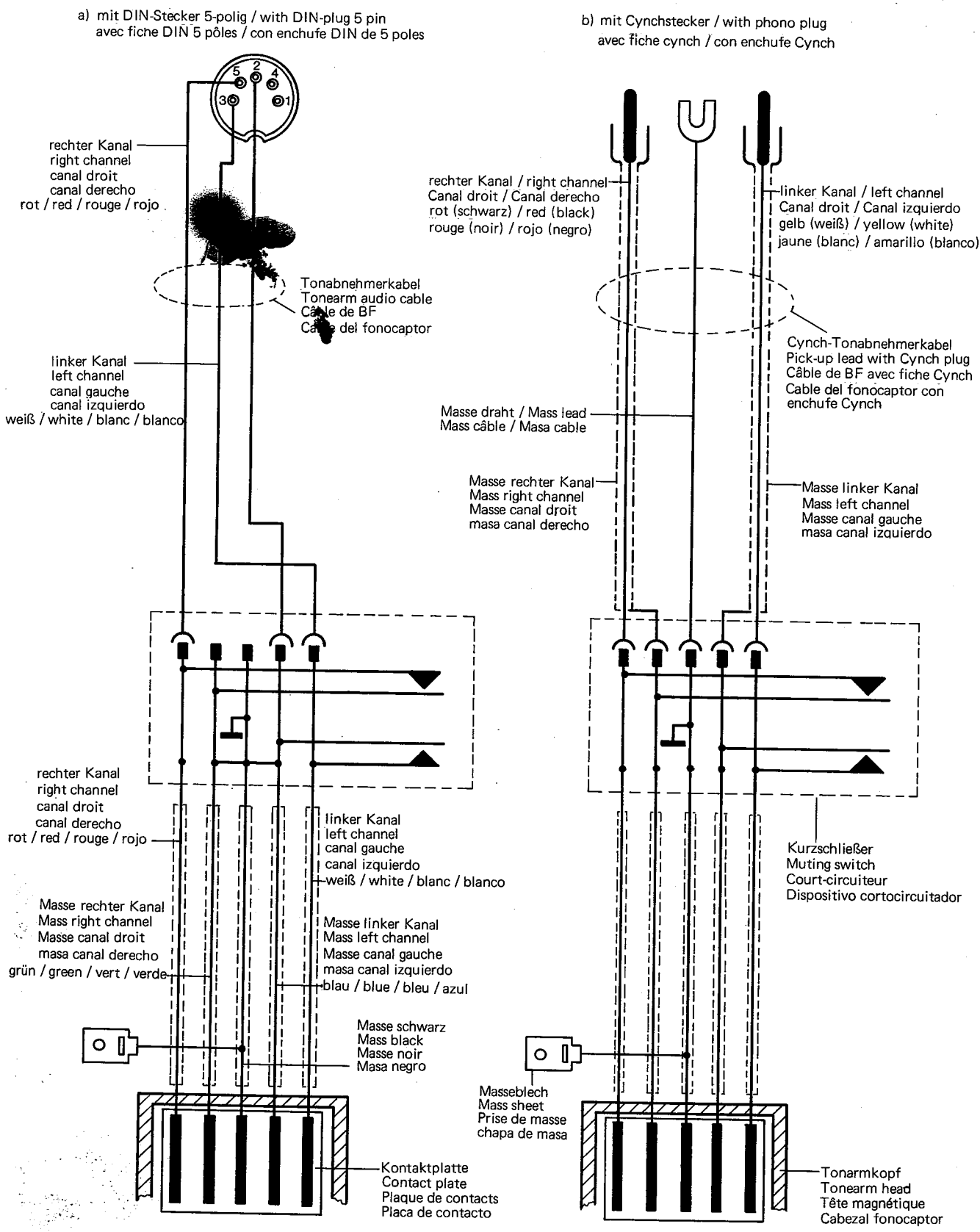
Contents

Technical Data

Current	AC 50 to 60 Hz
Line voltage	110 to 125 V, 220 to 240 V
Drive	electronically-regulated direct-drive system, Dual EDS 500
Power input	approximately 2 watts, Motor at playing operation < 50 mW
Power consumption	220 V 50 Hz: at play 15 mA 110 V 60 Hz: at play approximately 25 mA
Time from start to rated speed	2 – 2.5 s at 33 1/3 rpm
Platter	non-magnetic, dynamically balanced, detachable 1.3 kg, 304 mm diameter
Platter speed	33 1/3 and 45 rpm, electronically adjustable
Pitch control	Separate for both speeds, each adjustable by means of variable resistor, with calibration scale; range of regulation: 10 %
Speed control (monitoring)	with illuminated stroboscope for platter speeds 33 1/3 and 45 rpm, adjustable to 50 or 60 Hz.
Sensitivity of the illuminated strobe (for 0.1 % speed deviation)	6 division markings per minute at 50 Hz, 7.2 division markings per minute at 60 Hz,
Total wow and flutter	according to DIN 45 507 (German Industry Standard) <± 0.06 %
Rumble (according to DIN 45 500)	Unweighted: > 45 dB Weighted: > 65 dB
Tonearm	Torsionally rigid tubular aluminum tonearm in low-friction four-point gimbal suspension, tonearm counterbalance with two mechanical anti-resonance filters.
Effective length of tonearm	222 mm
Offset angle	25° 20'
Tangential tracking error	0.16°/cm
Tonearm bearing friction	vertical < 0.07 mN (0.007 g) (related to stylus tip) horizontal < 0.16 mN (0.016 g)
Stylus pressure	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 up.
Cartridge holder	removable, accepting any cartridges with 1/2" mounting and a weight from 4.5 to 10 grams (including mounting hardware).
Adjustable Overhang	5 mm
Cartridge	see separate data sheet

Mounting dimensions and mounting board cut out: see installation instructions

Fig. 2 TA-Anschlußschema / Audio Connection Diagram / Schema de branchement / Esquema de conexion del fono captor



3. Unsolder connecting leads to rotary switch (5) and the generator. Open twists of holding angle (150) with flat pliers. Lift off motor electronic (152). Remove machine screw (151) and holding angle (150).
4. Loosen threaded pins (15) and remove platter cone (14). Remove the three screws (148). Lift off motor mechanics (149).
5. Put platter cone (14) on new motor mechanics and fix it. Fix new motor mechanics with the three screws (148). Fix holding angle (150) with screws (151). Insert motor electronics (152) and twist holding pieces.
   Solder on resp. plug connecting leads (Fig. 4).
   Push cover on power part and fix it with screws (112).
6. 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.

Setting nominal speeds

With knob (7) bring the fine speed control (129/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 Dual 621 can be changed to a nominal speed of 78 rpm.
To change the speed bring the fine speed control (129/R 19) in center position using knob (7). Using control R 9 on the motor electronics board (172) 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 whith the "pitch" control (7).
Strobe markings are provided on the outer edge of the platter for 50 and 60 Hz line frequencies.
To replace glow lamp (157) remove machine screws (160) and remove strobe cover (156).
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 ± 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 (129/R 19) located in the voltage divider is adjusted by turning the pitch control knob (7). By this the differential amplifier is altered and the motor speed accordingly.

Fig. 6

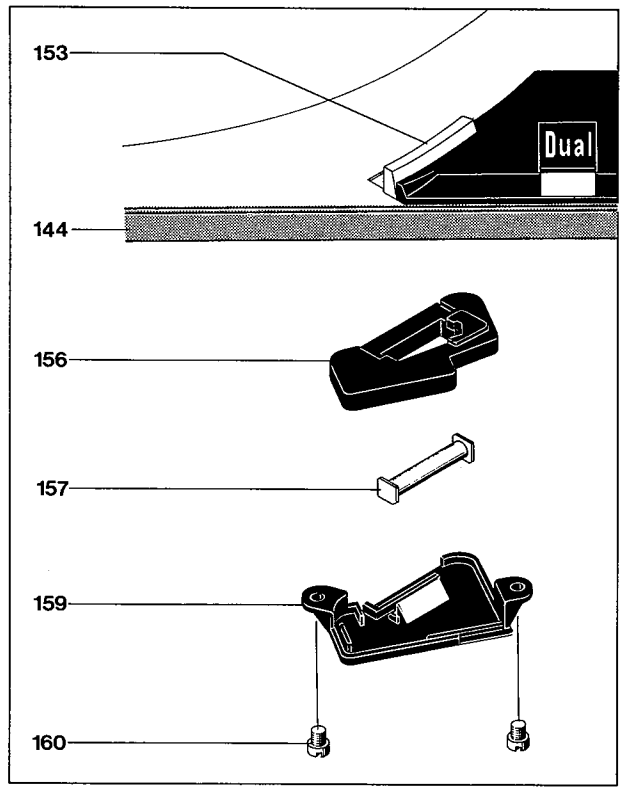
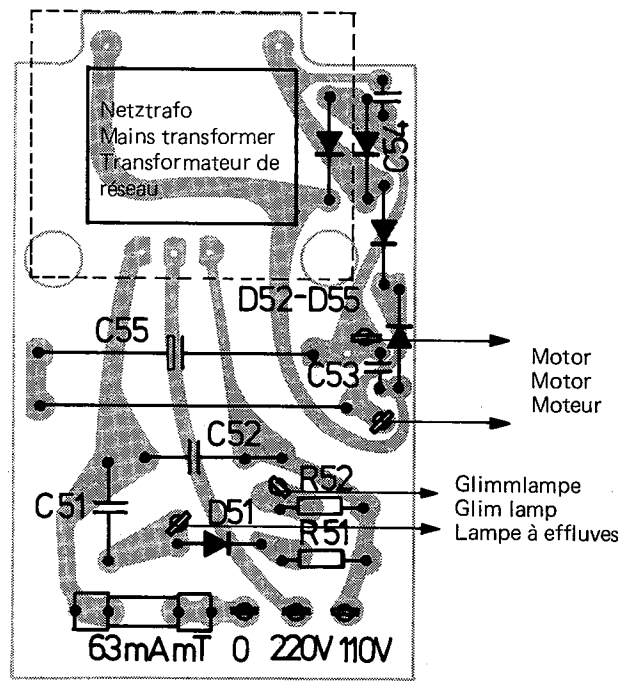


Fig. 7



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 (33) and that of the vertical tonearm bearing with threaded pin (56).

Anti-skating Device

To compensate for skating force use the knurled ring (66). The asymmetric cam plate (213) displaces the skating lever (211) from the tonearm pivoting point. The anti-skating force is transmitted to the segment (208) and to the tonearm (48) by tension spring (209).
Optimum adjustment is carried out at the factorys for styli having a tip radius of 15 µm (conical), 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.

Recheck as follows:

Balance tonearm (48) correctly. Set knurled ring (66) to 0. The tonearm should remain at any desired point within its turning range. The hole of the skating lever (211) should be in alignment with the center line of the tonearm. Adjustment is made by the eccentric pulley (E) which is accessible through the hole in the installation plate (23) between the knurled ring (68) and the tonearm.
Then set knurled ring (66) to "0.5". The tonearm should now smoothly rotate from the platter center to its rest (71).

Cue Control

By moving the lever (190) forward (▼) lift cam (192) rotates. The slide bar (141) transmits the lifting movement to the lift pin (206), that raises the tonearm. As a result, the cue control permits raise up the tonearm at any desired point.
The lever (190) is released by moving the cue control lever rear wards (▼). As a result of the action of compression spring (205) the lift pin (206) is brought back to its normal position and the tonearm loweres slowly. Lowering of the tonearm is damped by silicone oil in the lift tube.

Adjustment Point

The lift can be varied by turning the sleeve (45). The distance between the record and the needle should be 5 - 7 mm.

Replacement of Cue Control Plate

Replace cue control plate (207) as follows:

1. Clamp unit in the repair jig. and lock tonearm. Turn unit in head position.

2. Remove safety washer (184). Lift off main lever (183) and bearing support (182).

3. Remove safety washer (144). Lift off positioning bar (141) and rotary bearing (143) and turn towards motor (149).

4. Remove both machine screws (204), remove lift plate compl. (207).

For installation proceed in the reverse order.

Fig. 10

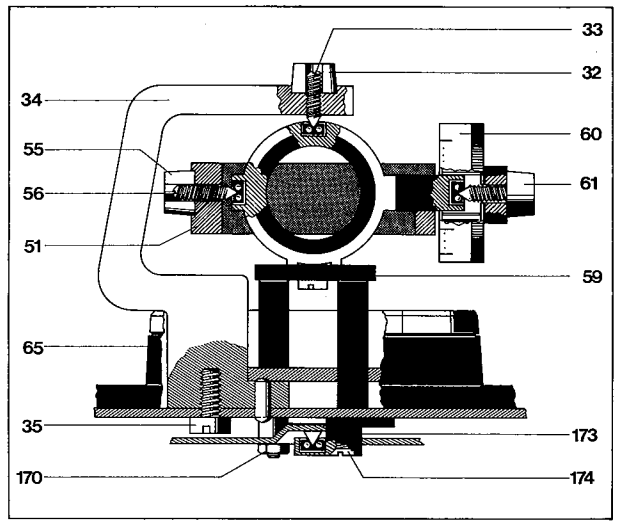


Fig. 11

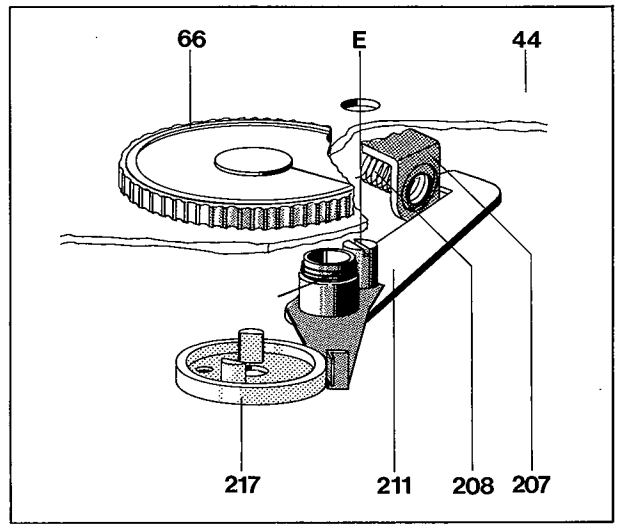
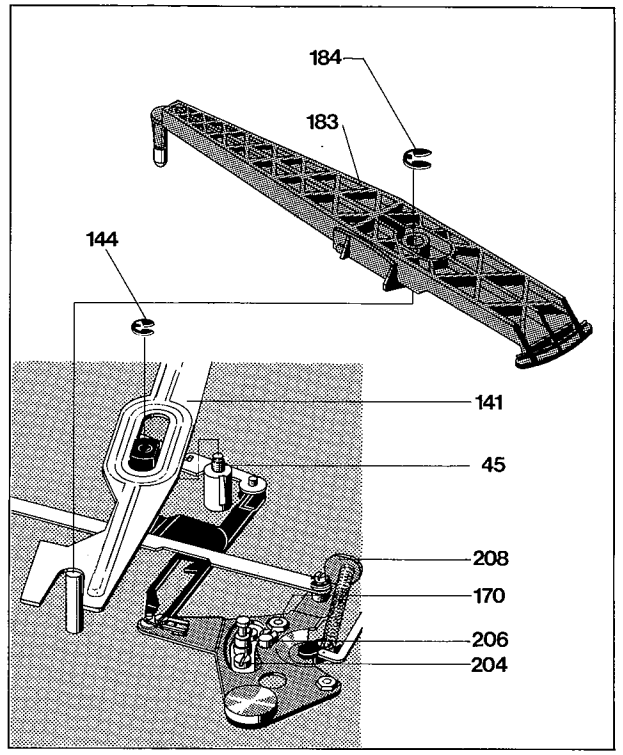


Fig. 12



Stopping

When control lever is set to "stop position the start slide (38) which is pulled towards the cam by means of tension (34), becomes free. As a result, the shut-off lever is moved into the range of dogs cam. The lever remains in its stop position.

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.

Fig. 15

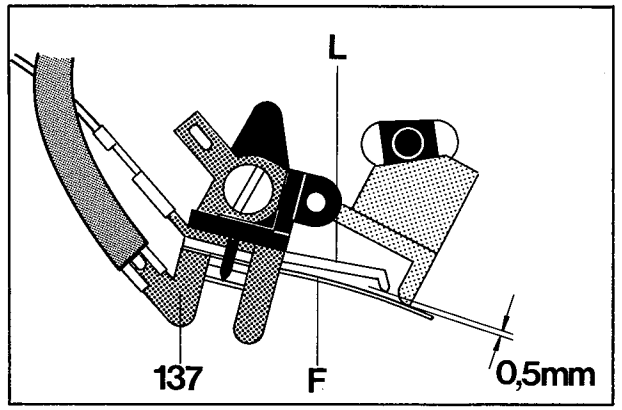
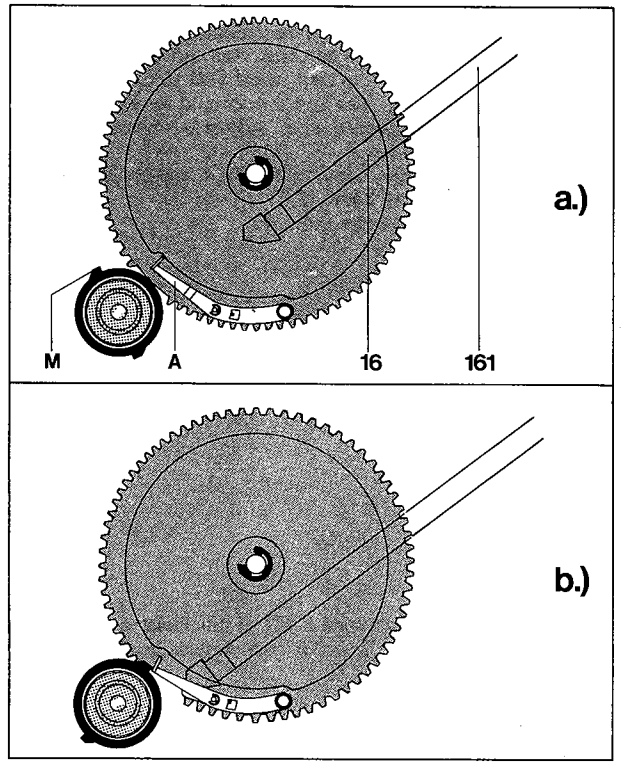


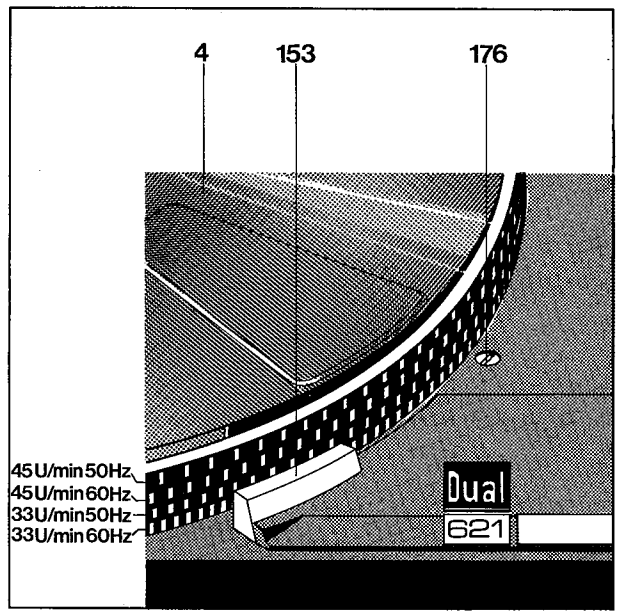
Fig. 16



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 (183) after every start (longer end of the guide lever towards cam wheel centre).
The shut-off bar (161) is guided along in proportion to the movement of the segment (208).
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).
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 (183) 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 (42) of the switch arm (41) can run into the cut-out provided at the cam wheel and achate the power switch (116).

Fig. 17



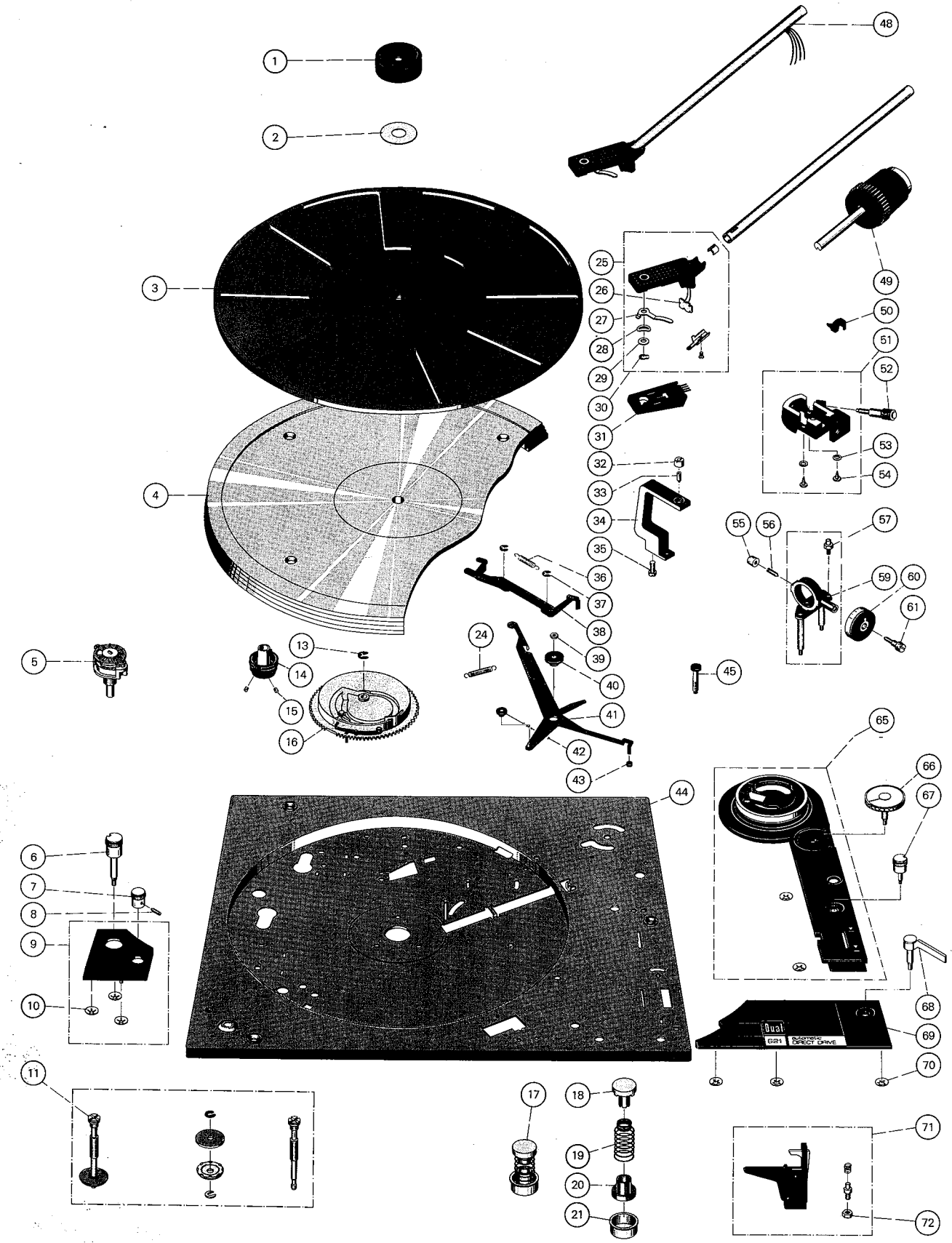
Adjustment Points

Tonearm set-down point

The set-down point can be varied with the eccentric bolt (176). If the stylus sets down onto the record too far inside or outside turn eccentric bolt (176) in left or right direction.

Defect	Cause	Remedy
Speed lies at limit of the range of adjustment of the pitch control	Nominal speed is maladjusted.	Readjust nominal speed, described on page 7.
Stylus slides out of playing groove	a) Tonearm is not balanced	a) Balance tonearm
	b) Tonearm tracking force is too low	b) Adjust force to the value stated by the cartridge manufacturer
	c) Anti-skating setting incorrect	c) Correct anti-skating setting
	d) Stylus tip worn or chipped	d) Renew stylus
	e) Excessive bearing friction in tonearm bearing	e) Check tonearm bearings and readjust if necessary
	f) Steel ball (162) of shut-off bar (161) missing	f) Renew steel ball
Tonearm moves with tracking force and anti-skating scale in 0-position outwards or inwards	a) Antiskating device maladjusted	a) Readjust anti-skating device as described on page 9.
	b) Tight tonearm leads cause a torque	b) Slacken leads
Tonearm does not set down on record or lowers too quickly when operating the cue control lever (190)	Excessive or insuffidient damping as a result of contamination of the silicone oil in the lift tube	Remove cue control plate (207). Remove shaft pin (200) and washer (201). Remove adjustment bush sleeve (212). Remove washer (203). Remove lift pin (206) and compression spring (205). 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 (205) in guide tube	See obove, if necessary change the lift pin (206)
Platter does not turn after switching unit on and moving tonearm in side	Power supply to motor interruppted. Power fuse (110) defect	Replace the fuse (110)
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 (176)
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	a) Line up mounting board cut-out according to installation instructions
	b) Connecting leads too tight.	b) Slacken or lengthen leads.

Fig. 22 Exploded View 1



Replacement parts

Pos.	Part.No.	Qty.	Description	
118	200 444	1	Spring washer	
119	233 012	1	Switch plate comp.	
120	219 200	1	Snab spring	
121	239 732	1	Tension spring	
122	230 148	1	Switch angle	
123	241 883	1	Capacitor	10 nF/250 V
124	242 102	1	Cover	
125	210 498	1	Machine screw	M 3 x 28
126	231 079	1	Cable holder	
128	237 782	1	Nut for potentiometer	
129	238 073	1	Speed control-potentiometer	
130	242 195	1	Contact piece	
131	210 587	1	Washer	3.2/7/1
132	210 362	1	Hex nut	BM 3
133	242 187	1	Contact assembly	
134	210 469	1	Machine screw	AM 3 x 3
135	242 741	1	Switch lever	
136	242 790	1	Contact arm	
137	242 612	1	Muting switch compl.	
138	239 806	1	Base shet	
139	210 486	1	Machine screw	AM 3 x 8
140	242 791	1	Screning shut	
141	242 769	1	Positioning slide	
142	244 834	1	Compression spring	
143	237 498	1	Rotary bearing	
144	210 145	2	Lock washer	2.3
148	210 511	3	Machine screw	AM 4 x 4
149	244 476	1	Motor mechanic	
150	242 233	1	Upholder	
151	210 511	1	Machine screw	AM 4 x 4
152	244 477	1	Motor electronic compl.	
153	242 160	1	Stroboscope trim plate	
154	210 469	1	Machine screw	AM 3 x 3
155	242 158	1	Reflector	
156	237 677	1	Unit bottom	
157	225 321	1	Glim lamp	
158	242 201	1	Reflector	
159	237 679	1	Stroboscope cover	
160	210 472	2	Machine screw	AM 3 x 4
161	242 763	1	Shut-off lever	
162	209 357	1	Ball	
163	232 104	1	Ball bearing	
164	210 472	1	Machine screw	AM 3 x 4
165	243 706	1	Ball spring	
166	242 771	1	Rotary plate	
167	210 146	8	Lock washer	3.2
168	223 777	1	Control stud	
170	210 362	2	Hex nut	
171	201 187	1	Washer	
172	210 145	3	Lock washer	
173	242 615	1	Bearing	
174	203 475	1	Sunk screw	M 3 x 8
175	242 792	1	Tension spring	
176	242 751	1	Excenter pin	
177	242 748	1	Plate	
178	210 472	1	Machine screw	AM 3 x 4
179	239 444	1	Tension spring	
180	242 775	1	Changeover lever	
181	210 146	8	Lock washer	3.2
182	242 789	1	Bearing	
183	246 042	1	Main lever compl.	
184	210 147	4	Lock washer	4
185	237 382	1	Switch angle	
186	237 383	1	Spring	
187	210 549	1	Washer	2.1/5/0.5
188	210 353	1	Hex nut	BM 2
189	242 774	1	Switch slide	
190	237 541	1	Lever compl.	
191	237 543	1	Rubber sleeve	
192	242 742	1	Curve	
193	210 353	1	Hex nut	BM 2
200	216 844	1	Control stud	
201	210 143	2	Lock washer	1.5
202	218 318	1	Sleeve	
203	210 143	2	Lock washer	1.5

Pos.	Part.No.	Qty.	Description			
204	210 472	2	Machine screw			AM 3 x 4
205	234 798	1	Compression spring			
206	242 753	1	Lift pin			
207	246 043	1	Lift plate			
208	246 044	1	Segment			
209	218 591	1	Tension spring			
210	201 184	1	Adjustment disc			
211	238 192	1	Scating lever compl.			
212	210 146	8	Lock washer			3.2
213	225 176	1	Pivoting cam			
214	210 362	1	Hex nut			
215	242 764	1	Pawl			
216	239 915	1	Square plate			
217	210 472	1	Machine screw			AM 3 x 4
218	218 154	1	Tension spring			
219	242 747	1	Switch lever			
220	210 600	1	Washer			3.2/8/1
221	210 361	2	Hex nut			
230	209 424	1	5 pole plug			
231	207 303	1	Audio cable compl.			
232	207 301	1	Audio cable compl. with cynch plugs			
233	209 436	3	Flat connector sleeve			
234	209 425	1	Cynch plug white			
235	209 426	1	Cynch plug black			
236	214 602	2	AMP plug			
237	232 996	1	Power cable Europa compl.			
238	232 995	1	Power cable America compl.			
***	214 120	1	TA mounting parts			
***	244 347	1	Mounting instruction			
***	242 682	1	Operating instruction			
***	242 718	1	Shipping carton CS			
***	244 312	1	Shipping carton			
			Motorelectronic			
C 1	220 766	4	Elyt	47	µF/	25 V
C 2	224 597	1	Elyt	220	µF/	6 V
C 3	216 410	3	Elyt	470	µF/	35 V
C 4	216 410	3	Elyt	470	nF/	35 V/10 %
C 5	227 963	1	Ceramic	10	nF/	30 V/20 %
C 6	227 390	2	Ceramic	1	nF/	63 V/20 %
C 7	227 390	2	Ceramic	1	nF/	63 V/20 %
C 8	202 499	1	Foli	0.22	µF/100 V/	5 %
C 9	222 760	1	Ceramic	20	nF/	50 V
C 10	216 410	3	Elyt	470	nF/	35 V/10 %
C 11	235 573	1	Elyt	10	µF/	16 V
C 12	242 314	1	Elyt	0.68	µF/	35 V
C 13	220 766	4	Elyt	47	µF/	25 V
C 14	226 459	1	Foil	0.1	µF/100 V/	5 %
D 1	227 360	1				ZPD 7.5
D 2	223 906	1				1 N 4148
R 1	224 603	3		1 MΩ	/0.25	W/5 %
R 2	211 202	4		10 kΩ	/0.25	W/5 %
R 3	224 735	1		68 kΩ	/0.25	W/5 %
R 4	239 387	1		22 kΩ	/0.25	W/5 %
R 5	224 603	3		1 MΩ	/0.25	W/5 %
R 6	241 342	1		82 kΩ	/0.25	W/5 %
R 7	242 307	1		47 kΩ		
R 8	243 616	1	Potentiometer	10 kΩ		
R 9	243 617	1	Potentiometer	22 kΩ	/lin.	
R 10	245 531	1		24 kΩ		
R 11	227 384	1		110 kΩ	/0.25	W/5 %
R 12	228 265	1		270 kΩ	/0.25	W/5 %
R 13	239 395	1		15 kΩ	/0.25	W/5 %
R 14	224 590	1		220 kΩ	/0.25	W/5 %
R 15	211 202	4		10 kΩ	/0.25	W/5 %
R 16	217 868	1		560 Ω	/0.3	W/5 %
R 17	239 367	1		47 kΩ	/0.25	W/5 %
R 18	242 311	1		2 Ω	/25	W/5 %
T 1	229 511	3				BC 172 B
T 2	229 511	3				BC 172 B
T 3	244 715	3				BC 238 C
T 4	242 306	1				BD 415
IC 1	242 303	1				NS 4069
IC 2	242 304	1				NS 555

***Not illustrated

Modification reserved!