

UNIT DESCRIPTION

CD CHANGER

FOR NSM-PHONOGRAPHS

ES V-CD TECHNOLOGY

to
Technical Information, ASSY

176 393	THE PERFORMER GRAND II
176 352	THE WIZARD/ OLD FASHION WIZARD
176 514	THE PERFORMER CLASSIC
176 610	CD HIDE-AWAY II
176 598	FIREBIRD II
176 705	THE PERFORMER WALL

NSM

Aktiengesellschaft
Saarlandstraße 240
55411 Bingen am Rhein

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1 PICKUP FUNCTION

The pickup serves to transport the CD's between the magazines and the player.

1.1 Transport

The lift is moved via a stepping motor controlled by the microprocessor of the control unit. The distance between 2 CD slots is 8 motor steps (1 counter step of a light barrier).

During the run the light barrier OPTSP, which is directly connected to the drivewheel, checks the motor's position every 4 steps. Stepping errors are immediately recognized and displayed with "Er 73" on display 3.

Together with the light barrier OPEND the end position of the lift is verified. Should a mistake appear here (signal too late or too early) the display shows "Er 74".

1.2 Pull Holder

With both grip levers, brought into lock position by CD motors MOGRL for left and MOGRR for right, the CD holders with their CD's are pulled out of the magazine. The light barrier OPPUM reports the correct position of the CD holder in the pickup unit.

If there is no report 2 sec. after switching on the motor, the display will show "Er 71" for the left and right magazine.

1.3 Return Holder

To return a CD holder to its magazine, either motor MOGRL for the left magazine or MOGRR for the right magazine is switched on in the opposite direction.

Light barriers OPGRL or OPGRR report the end position of the grips.

If the report does not appear within 2 sec. after switching on the motor, the display shows "Er 71" for pull holder or "Er 72" for return holder.

2 PICKUP DRIVER

2.1 Lift Control

With output port of IC1 the microprocessor of the control unit controls the switch transistors T 1–4 via drivers T 5, T 6 and T 8, T 9. These drive the unipolar coil of the stepping motor (ST4, Pin 1–6).

The coil is supplied with a constant current. The current control is done with the current sensor resistors R 44 and R 54 via transistors T 7 and T 10.

The necessary current which depends on the running phase of the stepping motor is switched via R 39, R 40 and R 49, R 50 and IC 1 by the microprocessor.

Using signal OPSTP (ST 5, Pin 2) the microprocessor controls the position of the motors.

Together with signal OPEND (ST 3, Pin 8) the end position of the lift is reported via input port of IC 3.

2.2 Grip Control

Both of the grip motors (MOGRL for the left magazine and MOGRR for the right magazine) are driven from the double motor bridge IC 4 via the output port of IC 2.

While pulling a CD from the magazine the signal OPPUM (ST 3, Pin 7) reports the end position of the CD holder in the pickup to the microprocessor of the control unit.

While returning the CD it recognizes the end position of the grips via signals OPGRL (ST 3, Pin 5) for left and OPGRR (ST 3, Pin 6) for right.

3 CD PLAYER

The disc-player "CDM 4" contains the components laser diode, play motor, radial motor, and focus unit. It reads the data from the CD. (The density is xxx bits per inch?).

4 PCB DECODER BOARD

The components servoprocessor, decoder, digital filter, DA converter and NF output driver are combined on the decoder board. The digital information read from the CD are transformed into the corresponding audio signal for the amplifiers.

5 MAGAZINES

2 equal magazines that are equipped with 50 CD holders each are in the CD changer. With CD holders it is to play 5-inch CD's.

The magazine can be fold out by pushing the corresponding release button to the center of the changer. The magazine can be taken out by pushing the corresponding button to the outside of the changer.

Equipping with or changing CD's can be done simply by taking out the respective CD holders, inserting the new CD into the holder and pushing it back till it locks in the magazine. For the transportation of a equipped magazine just pull the red transportation fixture of the lift axle through the center holes of all CDs in the magazine.

6 CD CHANGER 100, test, set, adjust

6.1 GENERAL INFORMATION

Please note the illustration of the CD changer on the last page and the informations about the command P 157 in the chapter "Programming of the phonograph" regarding the following text.

After exchanging units their functions must be checked and, if needed, certain adjustments must be made. To exchange the playing unit the CD changer can remain in the phonograph. But to remove or install the lift the changer has to be removed from the machine; tests and adjustments are only possible at a bench tester or at the machine with appropriate extensions!

Take care that the changer is set down on supports so that the board disc (12) or the main axle (14) which protrude from the cabinet floor are not pushed inside. Otherwise the board disc will jam the gear (2); a displaced axle changes the position of the upper distance sleeve so that the lift drives against it and blocks!

With help of the command P 157 (in the service and programming mode) "Test CD Changer" the grips can be moved left or right with Keys "4"/"5" or "6"/"5" and the lift can be moved up or down with key "2"/"8". With key "1" the CD player can be started and stopped.

For fine adjustments of the lift position the lift can be moved with Key "3" (+) or "9" (-) one motor step at a time (equals about 0,5 mm height difference) either up or down.

The distance between two magazine slots is 8 motor steps (or 1 step. of the light barrier).

In the displays the present status of the respective opto mask and the time in seconds during which the lift position is held are shown.

6.2 MAGAZINE

The magazines are supported by height-adjustable studs in fold-in and locked position. Changing the height setting can be necessary when the lift is exchanged; setting see Pt. 6.4 "Lift".

6.3 PLAYING UNIT

To exchange the playing unit with CD player





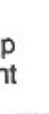


- remove both magazines
- pull lift up on gear belt
- remove 4 screws M4
- carefully (!) pick up playing unit, watch balance washers under cabinet
- open plug connections
- installation of playing unit in opposite sequence
- function test:
 - choose CD, check if CD is securely clamped in play position.
 - further tests see Pt. 6.4 "Lift".

6.4 LIFT

To exchange the lift as well as to check and adjust the optical coupling devices (light barrier) of the CD changer, completely remove the CD changer, disconnect cables, remove rear wall.

- From the rear side of the machine pull lift (04) up by the gear belt (02), interrupt connection between lift and gear belt by unscrewing the gear belt lock (03).
 - Pull out plug of connecting cable (06).
 - Remove board disc (12) after removal of washer.
 - Pull lower distance disc(s) (13) and rubber gasket of main axle (14) from cabinet floor upwards.
 - Push main axle down until lower rubber gasket can be removed.
 - Remove lift; mount exchange lift in opposite sequence.
 - Function test, basic setting; CD changer must be completely connected to operate either with extensions to phonographs or a bench tester:
 - After entering the service mode call the command P 157. On display 2 the corresponding number of the test "F8" is displayed. Now the different functions can be tested according to the scheme shown below.
- The control is done via the keys of the operating panel.

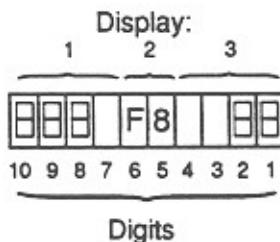
Movement of the lift:

1	 2 Lift up	 3 Lift up, single steps
 4 Grip left	 5 Return holder	 6 Grip right
7	 8 Lift down	 9 Lift down, single steps
C	0 Return holder, restore lift	H

CD positioned on the player:

1 CD player start/stop	2 >FF< fast forward then two times like 1	3 Play next track
4 Return CD grip last CD	5 CD player start/stop like 1	6 Return CD grip next CD
7	8 >FR< fast rewind	9 Play last track
C	0 Stop player return CD	H

The state of the light barriers are displayed on the displays 1 and 3.

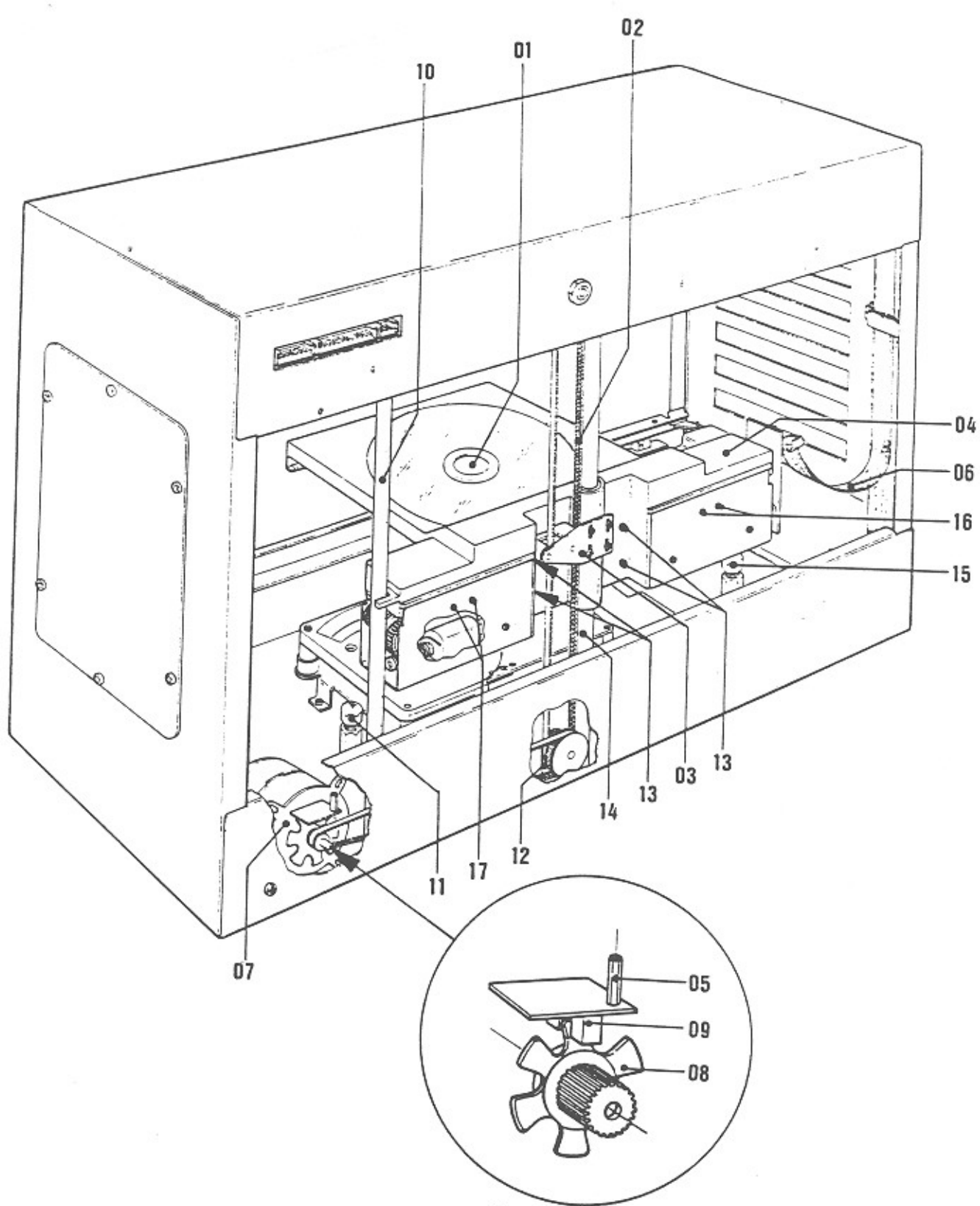


- Digit 1: Counter Wheel (OPSTP)
- Digit 2: Final Position (OPEND)
- Digit 8: Grip right (OPGRR)
- Digit 9: Middle Opto OPPUL/OPPUR
- Digit 10: Grip left (OPGRL)

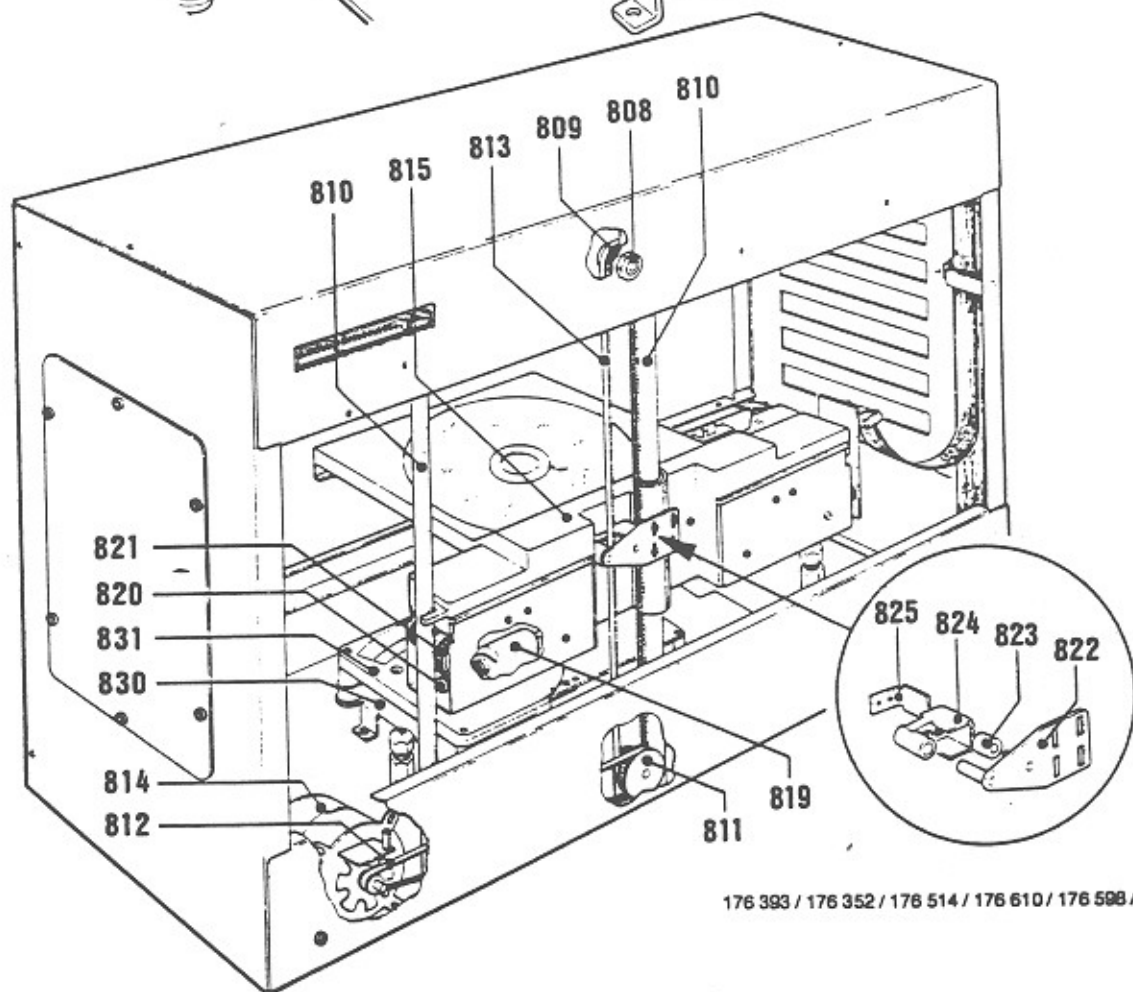
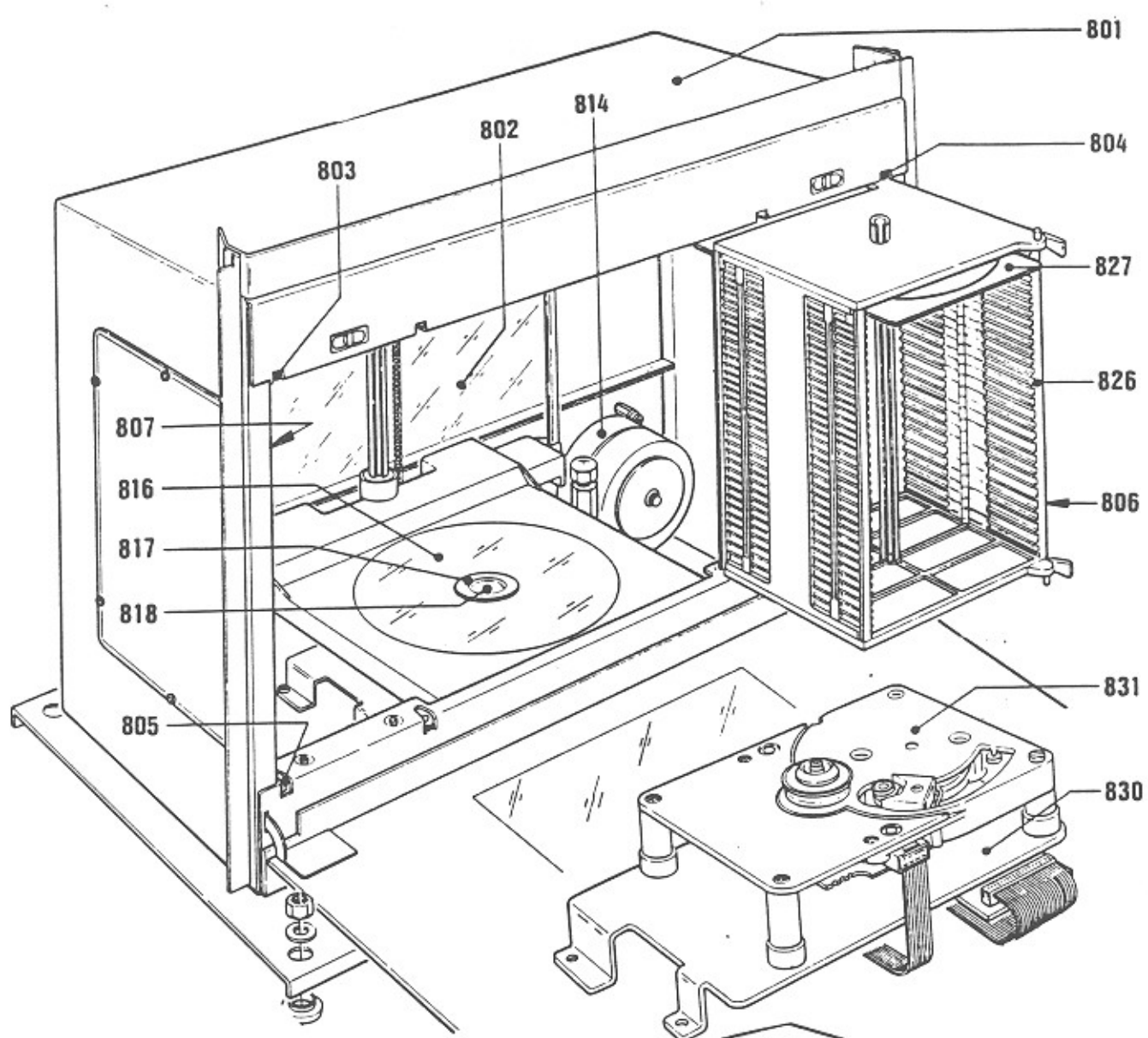
Meaning of displays: light barrier lit up = "0", darkened = "1".

On Display 2 (Digit 5+6) code F8 will be displayed during the test. The test is stopped by pressing "C".

- The basic setting occurs in parked position at magazine slot 25/75. Drive pick-up to this position with keys "2" or "8".
The lift is held after each function in this position for 2 sec.; with key "0" for 10 sec.
- Drive cassette in and out with Keys "4"/"5" or "6"/"5".
Check function for smooth movement.
The respective grip lever must fall into the cassette without hindrance!
- To adjust lift height loosen belt lock and move up or down; then tighten screws!
- Move lift down one motor step (about 0.5 mm height difference) with key "9" (-); same test for smooth movement.
- Drive to normal park position with key "0" and with key "3" (+); switch lift one motor step above normal position. Same check for smooth movement.
- Set magazine height: If magazine slots do not align with lift, then adjust lift only to one magazine at first. After that the other magazine is adjusted with support screw (11/15) to the correct height.
- The light barrier (08) on the step motor must be in parked position 25/75 in the center of the light barrier OPSTP (09) (status display of OPSTP in display = "1"). If necessary, loosen screw on hexagon bolt and set PCB with light barrier to center of mask.
- To check light barrier OPEND, lift must be driven down to bottom. Drive lift upwards manually or by pressing Key "3" 4 times one half opto step; the mask must release OPEND when OPSTP (09) opens the light mask, displayed by "0" on digit 1.
- Leave the service mode by pressing the housing switch.
- Select CD in normal play mode. In the parked position of the playing position the lift must have a gap to the lower end position.
- The distance between a cassette and the clamping dish should be at least 1 mm during a gripping procedure. So that the clamping dish can be magnetically attracted, the decorative cover must be in place.
- The CD must run without touch and grinding sounds when in a suspended position.
To test the function get cassette with CD from magazine by pressing the corresponding keys and place it on CD player in play position.
Turn on CD player with key "1". After the test is done, turn off CD player by pressing key "0" or any of the other function test keys. The clamping dish must clamp down the CD exactly in center.
- Check function of fork light masks OPGRR, OPGRL, OPPUM as per test "F8". The respective light mask must cover the light barrier in its entire breadth (when status display "1" is shown) and may not touch it physically.



CD CHANGER, COMPL.



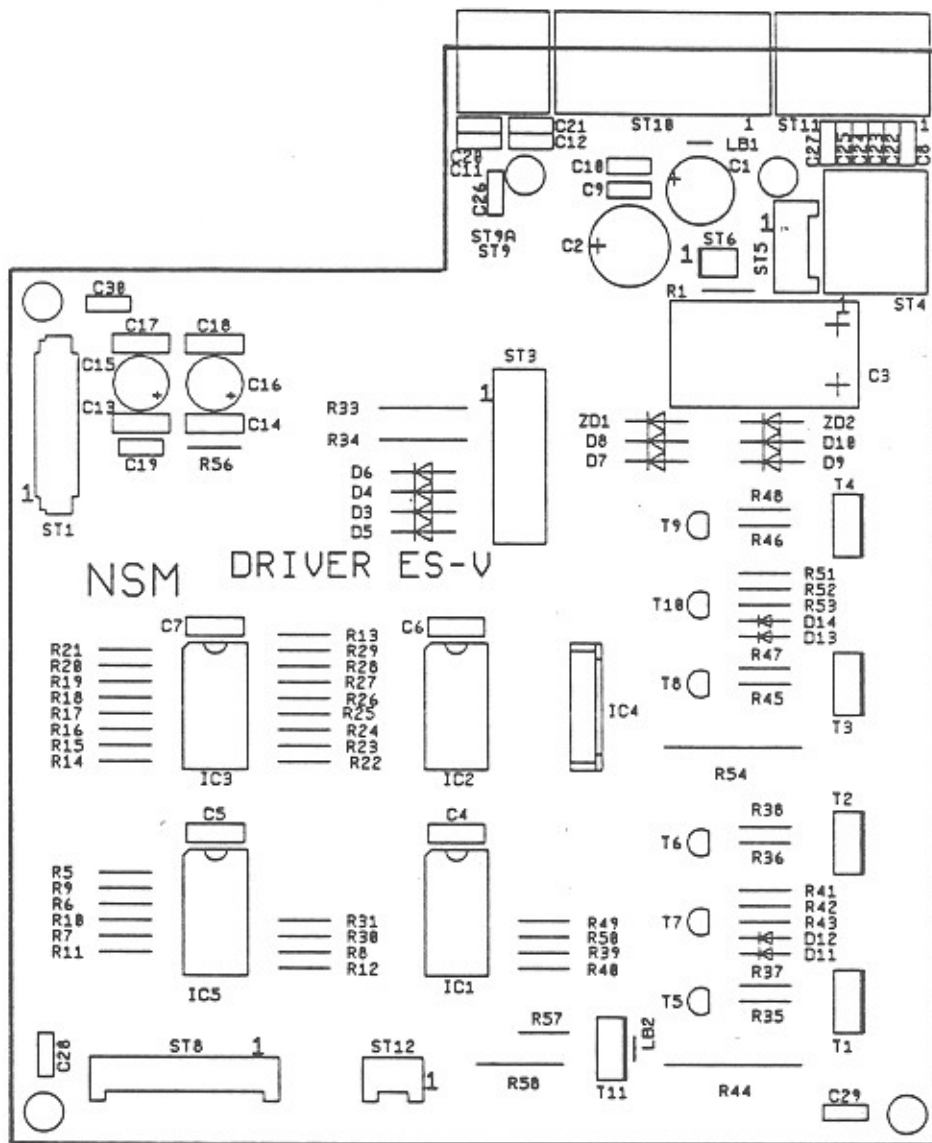
810

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SPARE PARTS LIST

POS.	PART-No.	DESCRIPTION	DATA	QTY
see Page 100/...		<u>CD-CHANGER 100 -CDM 4-</u>	STANDARD	1
800				
801	176 320	CABINET, welded without SIDE PARTS, slotted		1
	175 733	CABINET, welded with SIDE PARTS, slotted		1
802	175 730	REAR WALL		1
803	175 913	CLOSING LEDGE, UPPER, LEFT, welded		1
804	175 914	CLOSING LEDGE, UPPER, RIGHT, welded		1
805	174 294	CLOSING LEDGE, LOWER, LEFT		1
806	174 295	CLOSING LEDGE, LOWER, RIGHT		1
807	206 655	CONNECTION AXLE		2
808	173 538	SCREW SLEEVE, ASSY		2
	173 526	BOARD WASHER		2
809	173 522	STEP WHEEL, MOUNTED		1
	173 521	WASHER 48		1
810	176 134	AXLE		2
811	173 530	BELT WHEEL, MOUNTED		1
812	206 644	BELT	Typ MXL 195	1
813	206 643	BELT	Typ MXL 298	1
814	176 299	STEPPER MOTOR, ASSY		1
815	175 735	LIFT, ASSY		1
	175 783	LIFT, welded		1
816	176 375	PROTECTIVE SCREEN, ASSY		1
817	175 777	CD-GUIDE		1
818	175 789	COVER		1
819	176 938	MOTOR, ASSY		2
820	175 762	GEAR, MOUNTED		2
821	206 902	BELT	Typ 30 S 2 M 426	2
822	176 298	HOLDING PLATE, riveted		1
823	206 975	DAMPING		1
824	176 293	LEVER		1
825	176 317	BRACKET		1
	173 491	MAGAZINE, LEFT, MOUNTED	(without Cassette)	1
826	173 499	MAGAZINE, RIGHT, MOUNTED	(without Cassette)	1
827	176 395	CASSETTE CD 120	only 10 piece	-
830	175 887	CHASSIS		1
831	176 725	SERVICE KIT -PLAYER CDM-4		1
	205 846	CLAMP		8
	210 486	CARDBOARD for MAGAZINE		1
	212 542	TRANSPORT DEVICES for CASSETTE and LIFT		2
	176 010	CB-CARRIAGE, ASSY	see Page 813	1
	176 249	CB-STEPPER, ASSY	see Page 813	1
	177 231	CB-DECODER BOARD, MOUNTED	OSDA CDM4 - NSM	1
	176 384	CB-DRIVER		1
	175 964	TRAILING CABLE		1
	206 943	CABLE HARNESS 1 CDM 4		1
	206 942	CABLE HARNESS 2 CDM 4		1



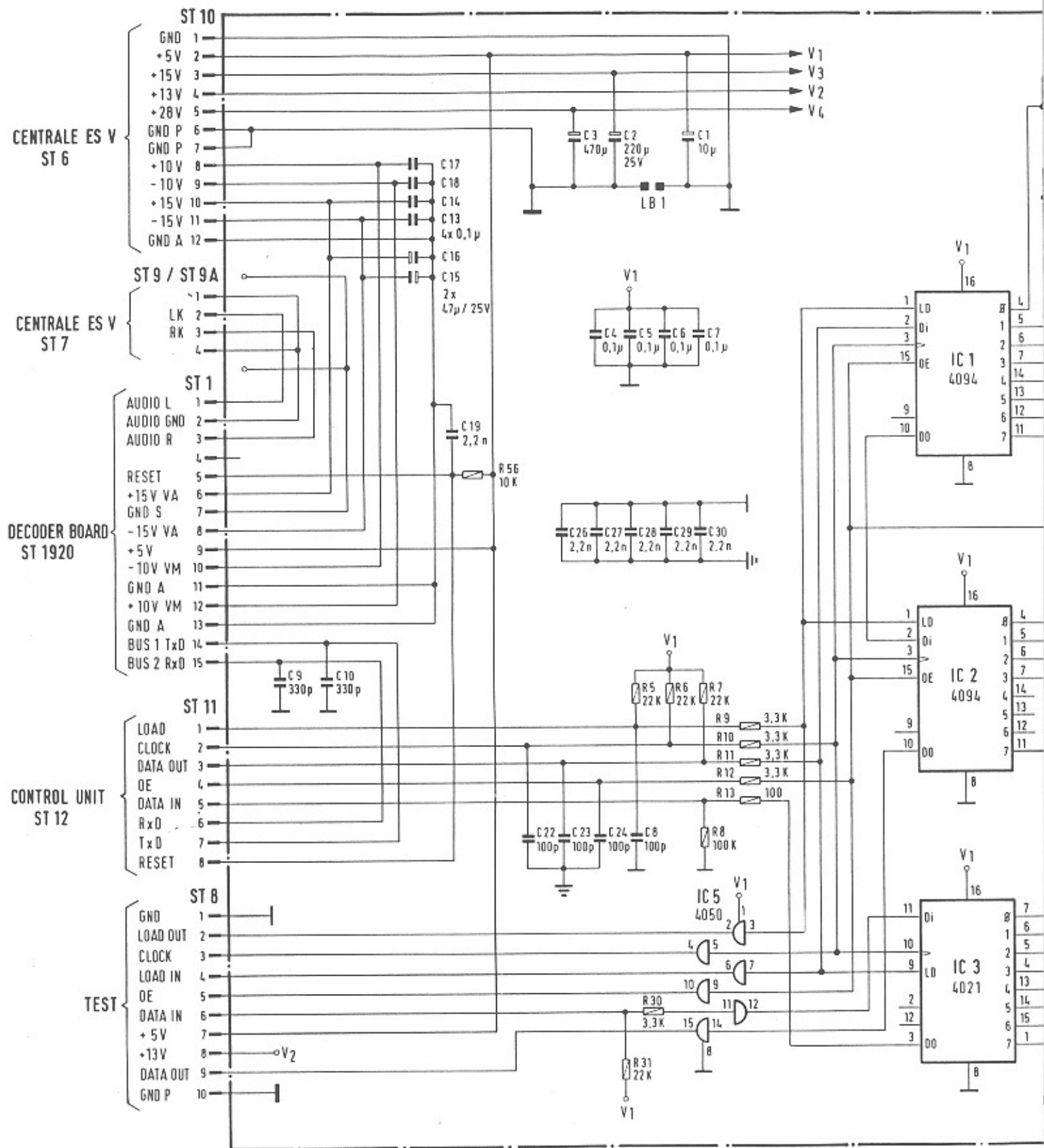
SPARE PARTS LIST

POS.	PART-No.	DESCRIPTION	DATA	QTY
	176 384	<u>CB-DRIVER ES V. ASSY</u>		1
	175 976	COOLING PLATE		1
ST 3	225 912	PIN PLUG AMP	14 prongs	1
ST 1	225 959	FLAT CABLE PLUG	15 prongs	1
ST 12	225 650	PIN PANEL	2 prongs	1
ST 5	225 651	PIN PANEL	4 prongs	1
ST 9	225 661	PIN PANEL	4 prongs	90° 1
ST 4	225 662	PIN PANEL	6 prongs	90° 1
ST 11	225 663	PIN PANEL	8 prongs	90° 1
ST 10	225 665	PIN PANEL	12 prongs	90° 1
IC 3	221 763	IC-CMOS	HEF 4021 B	1
IC 1, 2	221 771	IC-CMOS	HEF 4094 B	2
IC 4	231 303	IC-LINEAR	L 298	1
D 15-17	221 115	SI-DIODE	1 N 4004	4
D 11-14	221 114	SI-DIODE	1 N 4148	4
D 3-10	221 822	SI-DIODE	BA 157	8
ZD 1, 2	231 326	ZENER-DIODE	ZY 24	2
T 5-10	221 757	SI-TRANSISTOR	BC 547 B	6
T 1-4, 11	231 150	SI-TRANSISTOR	TIP 130	5
C 8	220 342	CER.-CAPACITOR	100 pF	1
C 9-12	220 274	CER.-CAPACITOR	330 pF	4
C 20, 21	220 263	CER.-CAPACITOR	1 nF	2
C 4-7, 13,				>
14, 17, 18	220 481	CER.-CAPACITOR	0,1 µF	8
C 19, 26-30	220 231	CER.-CAPACITOR	2,2 nF	6
C 1	220 162	LYTIC	10 µF	63 V 1
C 15, 16	220 493	LYTIC	47 µF	25 V 2
C 2	220 391	LYTIC	220 µF	25 V 1
R 13	221 600	RESISTOR	100 Ohm	1/4 W 1
R 1	221 632	RESISTOR	160 Ohm	1/4 W 1
R 37, 38,				>
47, 48	221 624	RESISTOR	220 Ohm	1/4 W 4
R 42, 43,				>
52, 53	221 029	RESISTOR	1 KOhm	1/4 W 4
R 9-12, 30	221 033	RESISTOR	3,3 KOhm	1/4 W 5
R 41, 51	221 607	RESISTOR	6,8 KOhm	1/4 W 2
R 35, 36,				>
39, 45, 46,				>
49, 56	221 035	RESISTOR	10 KOhm	1/4 W 7
R 14-21	221 603	RESISTOR	12 KOhm	1/4 W 8
R 22-29	221 036	RESISTOR	15 KOhm	1/4 W 8
R 5-7,				>
31, 55	221 604	RESISTOR	22 KOhm	1/4 W 5
R 40, 50	221 618	RESISTOR	24 KOhm	1/4 W 2
R 8	221 048	RESISTOR	100 KOhm	1/4 W 1
R 56	221 685	-RESISTOR	3,9 Ohm	1/2 W 1
R 33	221 152	RESISTOR	330 Ohm	1/2 W 1
R 44, 54	221 692	WIRE WOUND RESISTOR	1 Ohm	1 W 2

SPARE PARTS LIST

POS.	PART-No.	DESCRIPTION	DATA	QTY
	176 249	<u>CB-STEPPER. ASSY</u>		1
	231 322	OPTO-COUPLER	LTH-301	1
	225 611	SOCKET	4 prongs	sw 1
	176 557	<u>CABLE HARNESS - LIFT</u>		1
	176 004	CB-LIFT ADAPTR, ASSY		1
	176 433	OPTO, LEFT MOUNTING		1
	231 322	OPTO-COUPLER	LTH 301	2
	220 334	MKT-CAPACITOR	0,1 μ F / 63 V	1
	176 434	OPTO, RIGHT MOUNTING		1
	231 322	OPTO-COUPLER	LTH 301	2
	220 334	MKT-CAPACITOR	0,1 μ F / 63 V	1
	176 556	CB-ENDCONTROL		1
	231 322	OPTO-COUPLER	LTH 301	1
	176 385	CABLE HARNESS: DRIVER - DECODER		1

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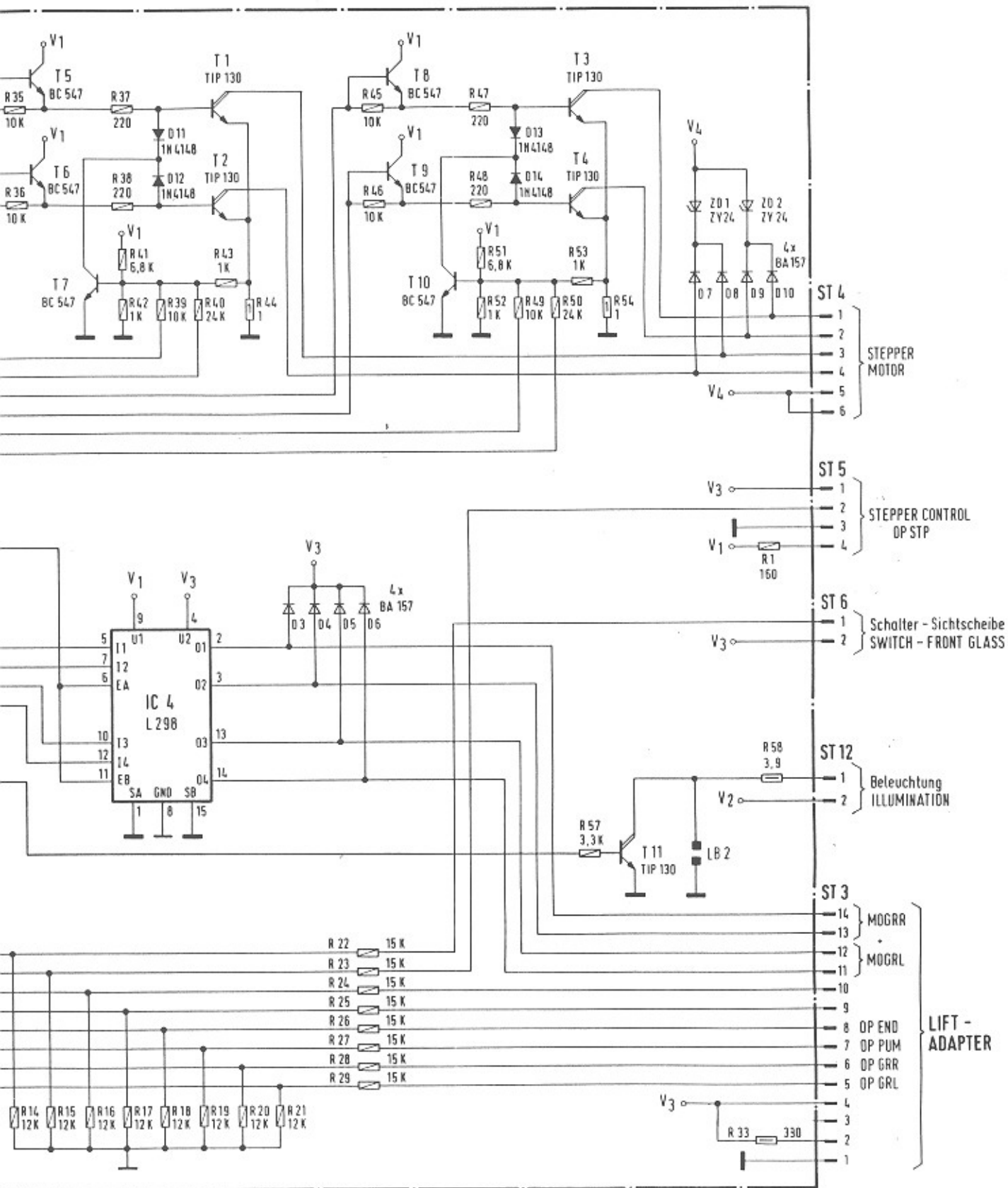
Draufsicht
TOP VIEW



von unten
BOTTOM VIEW



- 1/4 W
- 1/2 W
- 1 W
- ZENER DIODE



- OP END OPTO END POSITION
- OP GRL OPTO GREIFER LINKS
OPTO GRASP LEFT
- OP GRR OPTO GREIFER RECHTS
OPTO GRASP RIGHT
- OP PUM OPTO PICK UP MITTE
OPTO PICK UP CENTER
- OP STP OPTO STEPPER CONTROL
- MO GRL MOTOR GREIFER LINKS
MOTOR GRASP LEFT
- MO GRR MOTOR GREIFER RECHTS
MOTOR GRASP RIGHT

ÄNDERUNGEN IM SINNE DES TECHN. FORTSCHRITTES VORBEHALTEN,
JEDOCH KEINE NACHRÜSTPFLICHT!
SUBJECT TO TECHNICAL MODIFICATION WITHOUT OBLIGATION
TO MODIFY EQUIPMENT ALREADY DELIVERED!

NSM MUSIKAUTOMATEN **ES V-CD** TECHNOLOGY
PHONOGRAPHS

Schaltbild
WIRING DIAGRAM

DRIVER

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Dat	19.03.92	Gez	Braun	Bearb	Jim	Gepr	Reinhold
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