

C.D.M.-1

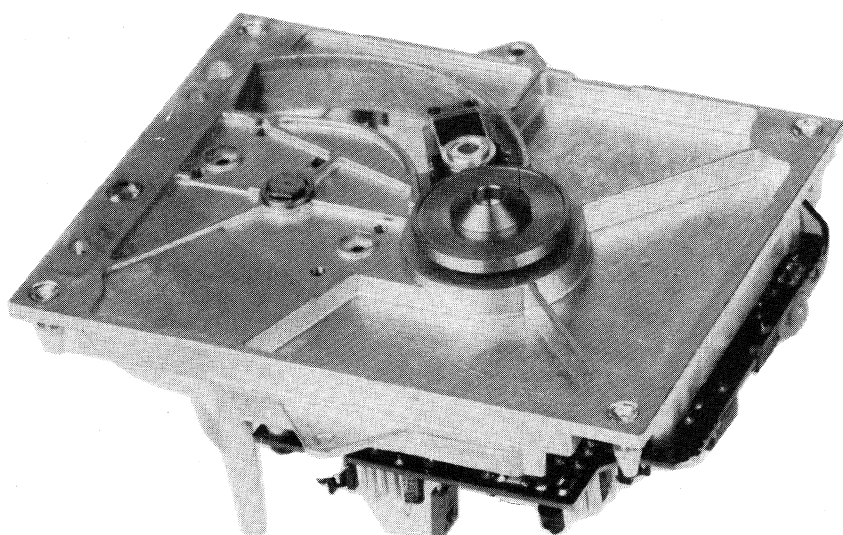
compact disc player

MECHANISM

Service
Service
Service

Service Manual

COMPACT
disc
DIGITAL AUDIO



35 367 A

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

CLASS 1
LASER PRODUCT

3122 110 03420

Documentation Technique Service Dokumentation Documentazione di Servizio Huolto-Ohje Manual de Servicio Manual de Servicio
Subject to modification



4822 725 20127

Printed in The Netherlands

CS 94 556 GB



SERVICING HINTS

In order to prevent loose metal objects from getting in the CD mechanism it will be necessary to see to a clean repair station.

The objective can be cleaned with a blow brush.

The CD-mechanism is provided with self-lubricating bearings and should thus NOT be lubricated.

Ensure that the player is not resting on the shaft of the turntable motor during repairs and measurements on the bottom.

Servicing the RAFOC unit (= Radial and Focusing unit pos. 61).

The RAFOC unit supplied by Service is the same one as in CDM-0. In the CDM-1 the bottom plate of this RAFOC unit has been replaced by frame item number 503. If the RAFOC unit is replaced, **carefully** and accurately perform the following operations:

- Take the two flex PCBs out of the connectors on the preamplifier PCB.
 - Disassemble the **defective** RAFOC unit by removing the 4 bolts M3x18 mm and shaft item number 504.
 - Remove shaft item number 504 of the new RAFOC unit.
- Pay attention to the 3 intermediate washers item number 502 and spring washer item number 505, they should assume the same positions after assembly.

Loosen the 4 bolts M3x18 mm until the bottom plate can be removed.

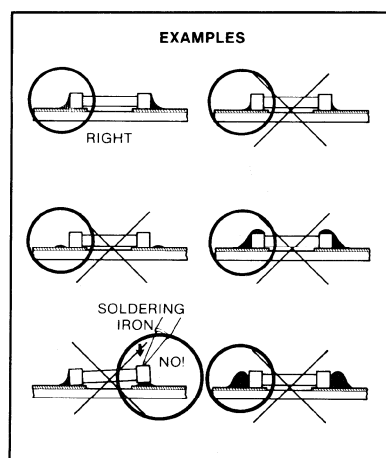
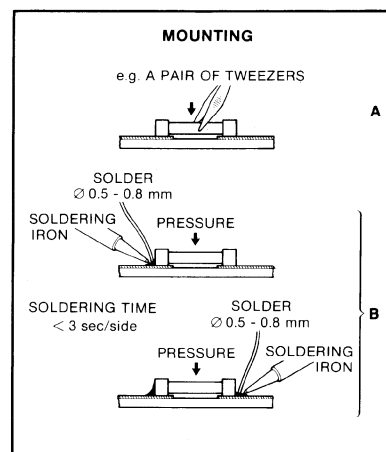
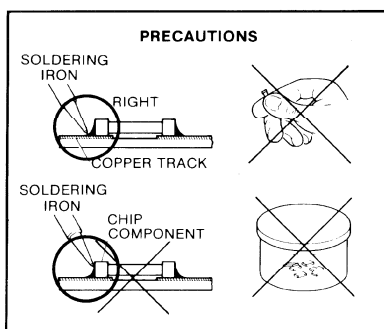
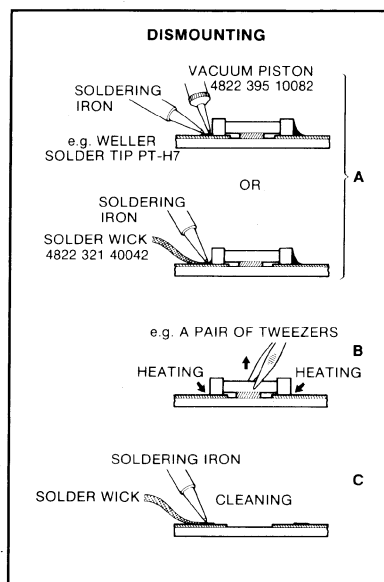
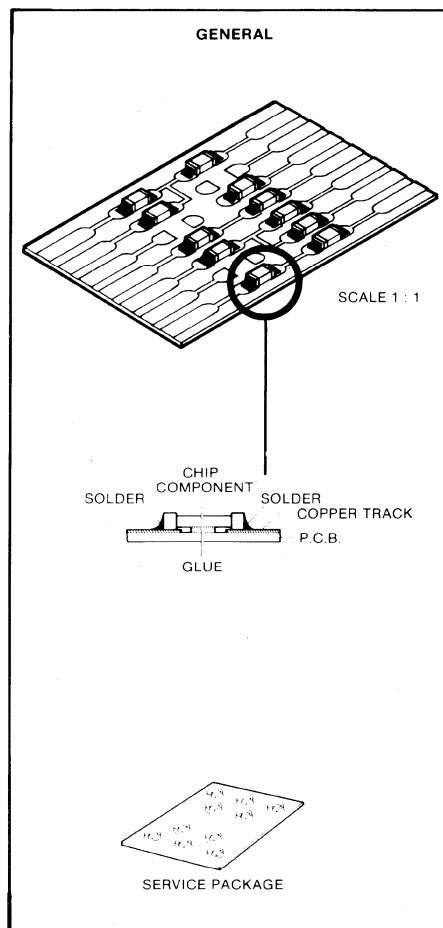
Do not remove bolts M3x18 mm (they hold the new RAFOC unit together).

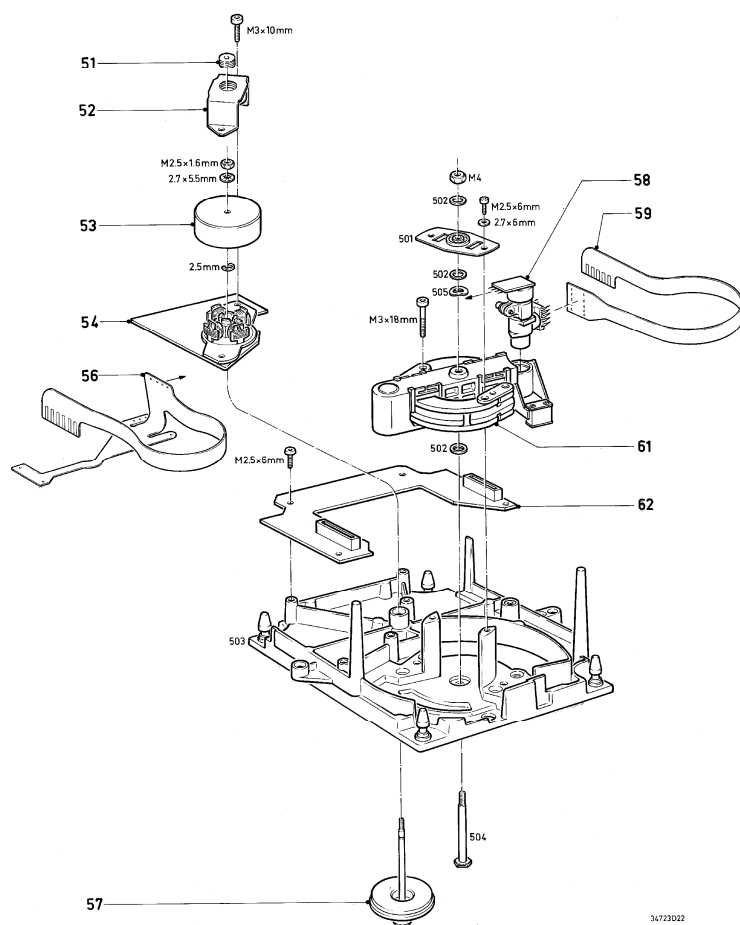
- Mount the new RAFOC unit on frame 503. Ensure that the 3 intermediate washers 502 and spring washer 505 are positioned correctly before fixing shaft item number 504.
- Check that the arm moves freely and the angle setting as well (see check and possible adjustment of angle setting).

Attention:

To prevent adjustments from changing, NO SCREWS OTHER than those mentioned above should be loosened.

THE LIGHT PIN IS MUCH MORE SENSITIVE TO STATIC CHARGE THAN A MOS IC. CARELESS TREATMENT DURING SERVICING MAY REDUCE LIFE EXPECTANCY DRASTICALLY. FOR THIS REASON CARE SHOULD BE TAKEN THAT DURING SERVICING THE POTENTIALS OF THE AIDS AND YOURSELF EQUAL THE POTENTIAL OF THE MECHANISM.





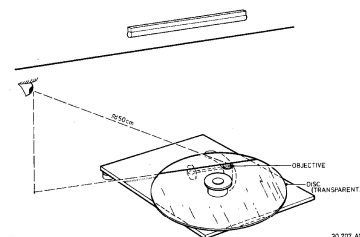
51	4822 502 11701
52	4822 520 10529
53	4822 362 20225
54	4822 214 50395
56	4822 322 40051
57	4822 528 10491
58+59	4822 691 30129
59	4822 322 40048
61	4822 691 30128
62	4822 214 50394

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MECHANICAL MEASUREMENTS AND ADJUSTMENTS

Height setting of the turntable (see service manual CD player)

Checking the angle setting

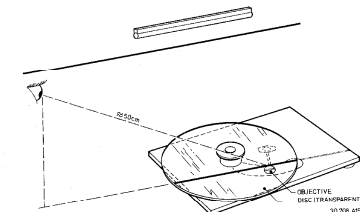


Place mirror 4822 395 90205 on the objective and glass disc 4822 395 90204 (with disc hold-down 4822 532 60906) on the turntable.

Locate the unit under a light source and under this light source a straight line should run (e.g. fluorescent tube with grid).

Set the arm to mid-position. Turn the unit until the arm is parallel to the line under the light source (see Fig.). Look in the direction and in the prolongation of this line to its reflection on glass disc and mirror.

These lines should not be more than 4 mm apart: Position the set in such a way that one line runs across the centre of the mirror. When the other line remains inside the mirror's surface, the distance is ≤ 4 mm.



Rotate the CD mechanism through 90° relative to the previous position. The arm must be kept in mid-position (see Fig.). Repeat the previous measurement.

Adjusting the angle setting

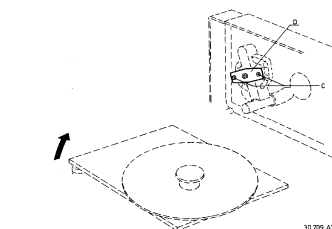
With respect to the adjustment of the angle between disc and light path, the factory has looked for a compromise between minimum angle deviation and minimum arm friction.

If the measurements show that the angle falls outside the tolerance given, the angle should NOT be adjusted for minimum deviation, but just within tolerance. The new setting should lie between the "old" setting and the optimum setting.

After adjustment, the friction of the arm should be checked. This is done by means of a spring-pressure gauge which is connected to the counterweight. The friction of the arm, measured over the total scanning deflection, is not allowed to exceed 30 mN.

When the friction appears to be too high, the angle should be reset to its old value. Then replace the arm by a new one and check the angle once more.

Adjustment of the angle is performed as follows: Place the set on the servicing supports 4822 395 30202.



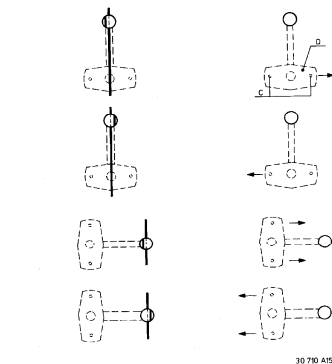
Loosen screws C (see Fig.) until bearing plate D can be shifted.

Correct the angle setting by shifting the bearing plate in the direction indicated on the Figure.

Tighten screws C ensuring that the setting does not drift. Double check the angle setting in two directions.

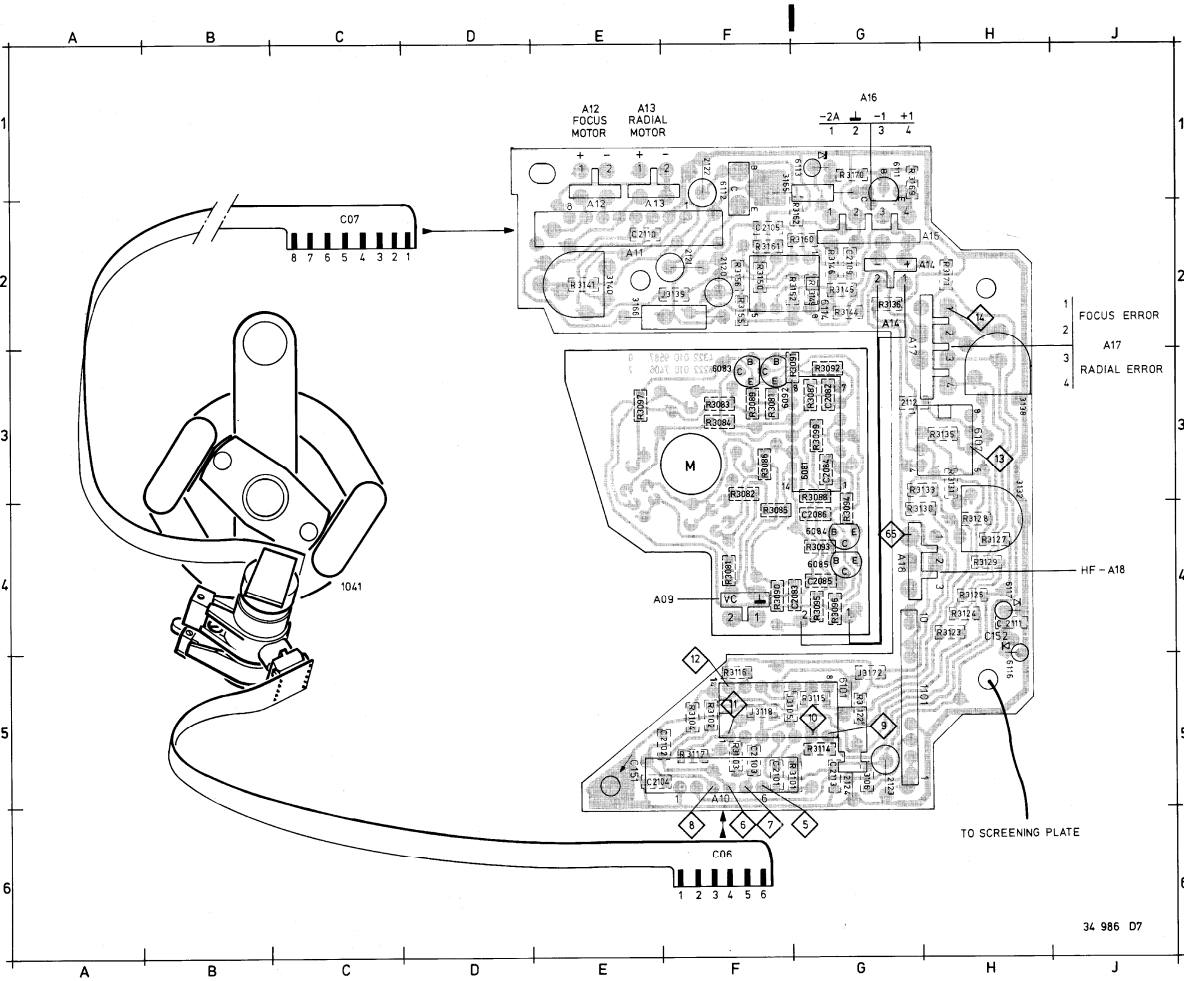
Attention

After setting the angle, the height setting of the turntable should be checked.



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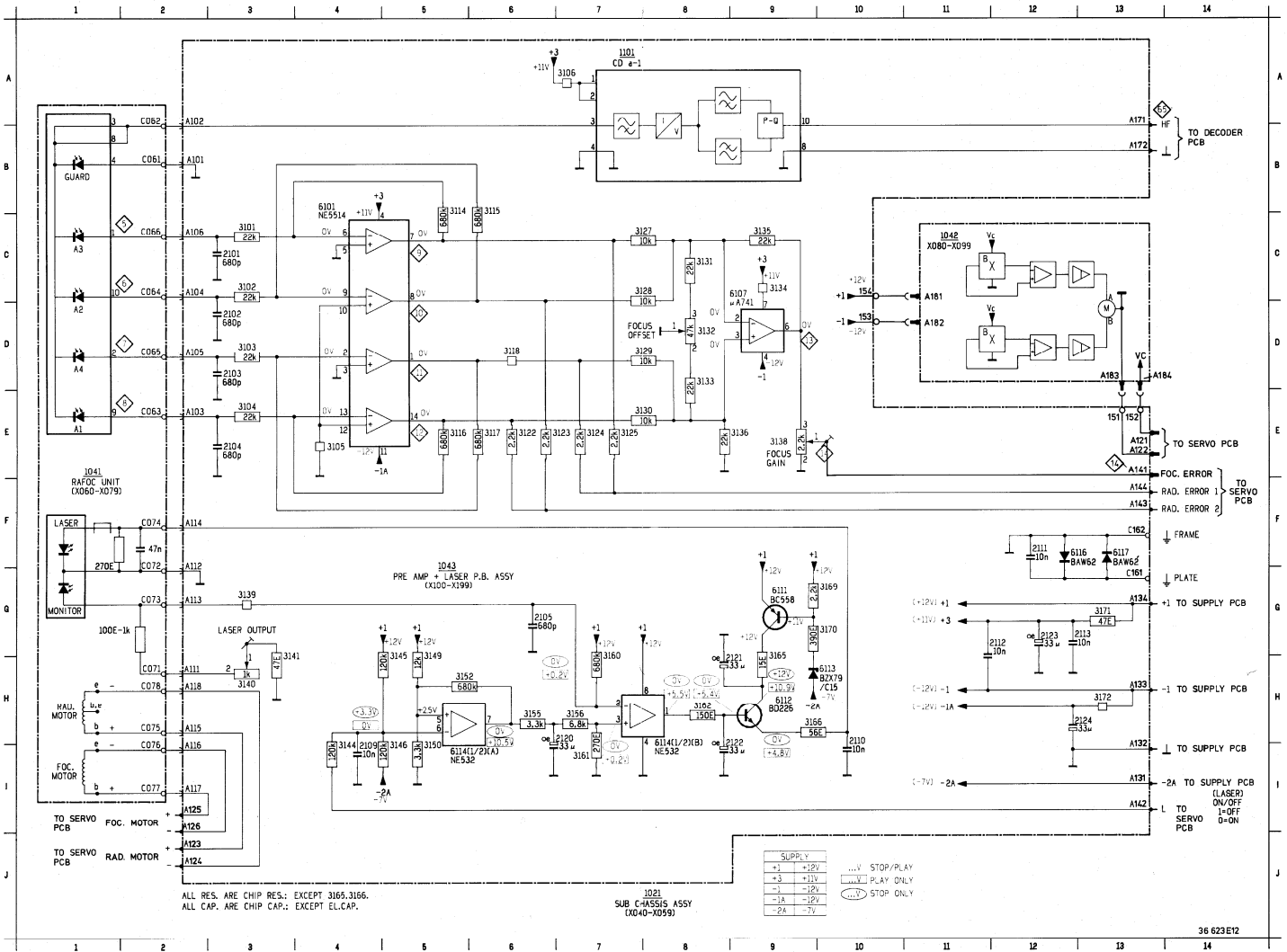


UNIT		
1101	Thick film unit HF	4822 218 10157
NE532N		4822 209 80818
NE5514N		4822 209 81451
μA714N		4822 209 80617
BC558		4822 130 40941
BD226		5322 130 44244
BZX79-C15		4822 130 34281
BAW62		4822 130 30613
3132	47k	4822 100 10583
3138	2k2	4822 100 20116
3140	1k	4822 100 20115
3165	15E MR30	5322 116 54914
3166	56E PR37	5322 116 54929
0E		4822 111 90163
47E		4822 111 90217
150E		5322 111 90098
270E		4822 111 90154
390E		5322 111 90138
2k2		4822 111 90249
3k3		4822 111 90157
6k8		5322 111 90117
10k		4822 111 90249
12k		5322 111 90097
22k		4822 111 90251
120k		4822 111 90149
680k		4822 111 90488
680 pF		4822 122 31809
10 nF		4822 122 31728

1701 G05	2133 G05	3102 P05	3133 H03	3169 G01
2082 G03	3081 F04	3103 P05	3135 H03	3170 G01
2083 F04	3082 F03	3104 P05	3136 H03	3171 H02
2084 G03	3083 F03	3105 P05	3138 H03	3172 G05
2085 G04	3084 F03	3106 G05	3139 F02	6101 G03
2086 G04	3085 F04	3114 G05	3140 E02	6085 F03
2101 P05	3086 F03	3115 G05	3141 E02	6086 G04
2102 P05	3087 G03	3116 P05	3144 G02	6085 G04
2103 P05	3088 G03	3117 P05	3145 G02	6082 F03
2104 P05	3089 P03	3118 P05	3146 G02	6101 G05
2105 F02	3090 F04	3122 G05	3149 G02	6107 H03
2109 G02	3091 F03	3123 H04	3150 F02	6111 G01
2110 H02	3092 G05	3124 H04	3152 F02	6102 F01
2111 H04	3093 G04	3125 H04	3155 F02	6113 G01
2112 G03	3094 G04	3127 H04	3156 F02	6116 H05
2113 G05	3095 G04	3128 H04	3160 G02	6117 H04
2130 F05	3096 G04	3129 H04	3161 G01	
2131 F02	3097 H03	3130 H04	3162 G02	
2132 F01	3099 G03	3131 H03	3165 G01	
2134 G05	3101 F05	3132 H04	3166 F02	

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1101 A 7 2104 E 3 2111 F12 2121 H 9 3101 C 9 3105 E 4 3116 E 5 3123 F 7 3128 C 8 3132 D 8 3136 E 9 3141 G 3 3149 G 5 3156 H 7 3165 G 9 3171 G13 6111 G 9 6114 H15
2101 C 3 2105 G 6 2112 G12 2122 H 9 3102 C 9 3106 E 7 3117 F 6 3124 F 7 3129 C 8 3133 G 8 3138 E 9 3144 I 4 3150 I 5 3159 G 7 3166 H 9 3172 H13 6112 H 9 6116 F13
2102 D 3 2109 A 4 2113 G13 2123 D12 3103 E 9 3114 E 5 3122 F 6 3125 F 7 3130 C 8 3134 G 8 3139 G 9 3145 G 5 3152 H 5 3161 I 7 3169 G10 6101 G 4 6113 H10 6117 F13
2103 D 3 2110 H10 2120 H 7 2124 H13 3104 E 9 3115 E 6 3127 C 8 3131 C 8 3135 C 9 3140 H 3 3146 I 5 3155 H 6 3162 H 8 3170 G10 6107 C 9 6114 H10

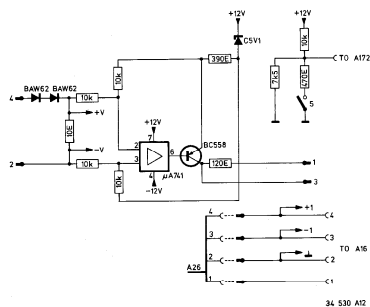


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ELECTRICAL MEASUREMENTS AND ADJUSTMENTS

Laser power supply

Since the light pin is very sensitive to static charges, care should be taken that during measurements and adjustments of the laser power supply the potentials of aids and yourself equal the potential of the CD mechanism.



Check

The laser simulator PCB nr. 3 (4822 395 30229) should be used here.

Take the flex PCB out of socket A11 and connect the switch simulator PCB with the socket.

Remove plug A16 and insert it in the socket on the simulator PCB.

Connect the plug with 4 wires to socket A16. Take out plug A17 and insert the plug with 1 wire in socket A17.

Set the switch on the simulator PCB in the OFF position and the mains switch in the ON position.

Turn trimming resistor 3140 clockwise (max. R) and measure the voltage between points +V and -V on the simulator PCB.

The voltage should be ≤ 15 mV.

Check of laser supply control:

Set the switch on the simulator PCB in the ON position and measure the voltages between points +v and -v on the simulator PCB.

Resistor 3140 clockwise (max. R):

U +v -v = 225 mV \pm 45 mV.

Resistor 3140 counterclockwise (min. R):

U +v -v = 750 mV \pm 150 mV.

Set resistor 3140 in mid-position.

This is a preliminary adjustment. After the simulator PCB has been removed the laser current must be adjusted. (see service manual CD player).

Adjusting the focus bandwidth

(see service manual CD player).

Checking the AGC and offset circuit

(see service manual CD player).

Motor-control check (Hall)

1 Remove connector A09 from the motor PCB on the CDM.

2 Connect channel A of a dual-beam oscilloscope to the emitter of transistors 6082, 6083 and channel B to the emitter of transistors 6084, 6085. Position of oscilloscope: 2 V/div — 10 ms/div.

3 Connect pin 1 of connector A09 on the motor PCB to the ground of the set.

4 Switch the set on.

5 Apply a **negative** voltage to pin 2 of connector A09. The voltage may **not** be applied until **after** the circuit has been connected to power supply voltage. Start from 0 V and slowly proceed to -5 V. Now the motor should run. When the motor runs the voltage can be brought to approx. -2.5 V. The motor should continue to run then.

6 The oscilloscope should display sinusoid signals now (see Fig. A). After approx. 2 s they should lie symmetrically round the 0-axis and be shifted 90° relative to each other. The maximum ratio of the amplitudes of these 2 signals is allowed to be 1:2.

7 The amplitude depends on the applied voltage. The V-in/V-out pp ratio should lie between 1:2 and 1:3.

8 Determine at which V-in the motor runs at 600 rpm. At 600 rpm the frequency of V-out is 30 Hz. At this speed V-in should lie between -1.5 V and 3.7 V.

Conclusion:

When all these conditions are present motor and PCB may be considered in order.

If points 5, 6 and 7 are not correct, the fault should most probably be found in the electronics.

If points 5, 6 and 7 are correct and the voltage to be applied at point 8 is e.g. -4.5 V to obtain a motor speed of 600 rpm, there will most probably be something wrong mechanically. E.g. the bearing friction is too high.

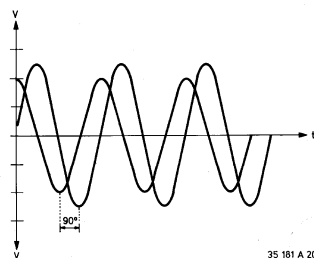
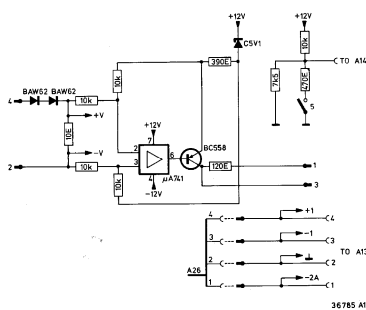


Fig. A

ELECTRICAL MEASUREMENTS AND ADJUSTMENTS

Laser power supply

Since the light pin is very sensitive to static charges, care should be taken that during measurements and adjustments of the laser power supply the potentials of aids and yourself equal the potential of the CD mechanism.



Check

The laser simulator PCB nr. 4 (4822 395 30244) should be used here.

Take the flex PCB out of socket A11 and connect the switch simulator PCB with the socket.

Remove plug A13 and insert it in the socket on the simulator PCB.

Connect the plug with 4 wires to socket A13. Take out plug A14 and insert the plug with 1 wire in socket A14.

Set the switch on the simulator PCB in the OFF position and the mains switch in the ON position.

Turn trimming resistor 3140 clockwise (max. R) and measure the voltage between points +V and -V on the simulator PCB.

The voltage should be ≤ 15 mV.

Check of laser supply control

Set the switch on the simulator PCB in the ON position and measure the voltages between points +v and -v on the simulator PCB.

Resistor 3140 clockwise (max. R):

U +v -v = 225 mV \pm 45 mV.

Resistor 3140 counterclockwise (min. R):

U +v -v = 750 mV \pm 150 mV.

Set resistor 3140 in the mid-position.

This is a preliminary adjustment. After the simulator PCB has been removed the laser current must be adjusted. (See Service Manual CD player).

Adjusting the focus bandwidth

(See Service Manual CD player).

Checking the AGC and offset circuit

(See Service Manual CD player).

Motor-control check (Hall)

1. Desolder the wire from point C152 on the preamplifier printed panel on the C.D.M.

2. Connect channel A of a dual-beam oscilloscope to the emitter of transistors 6082, 6083 and channel B to the emitter of transistors 6084, 6085. Position of oscilloscope: 2 V/div — 10 ms/div.

3. Switch the set on.

4. Apply a **negative** voltage to the wire desoldered. The voltage may **not** be applied until **after** the circuit has been connected to power supply voltage. Start from 0 V and slowly proceed to -5 V. Now the motor should run. When the motor runs the voltage can be brought to approx. -2.5 V. The motor should continue to run then.

5. The oscilloscope should display sinusoid signals now (see Fig. A). After approx. 2 s they should lie symmetrically round the 0-axis and be shifted 90° relative to each other. The maximum ratio of the amplitudes of these 2 signals is allowed to be 1:2.

6. The amplitude depends on the applied voltage. The V-in/V-out pp ratio should lie between 1:2 and 1:3.

7. Determine at which V-in the motor runs at 600 rpm. At 600 rpm the frequency of V-out is 30 Hz. At this speed V-in should lie between -1.5 V and 3.7 V.

Conclusion:

When all these conditions are present motor and PCB may be considered in order.

If points 4, 5 and 6 are not correct, the fault should most probably be found in the electronics.

If points 4, 5 and 6 are correct and the voltage to be applied at point 7 is e.g. -4.5 V to obtain a motor speed of 60 rpm, there will most probably be something wrong mechanically. E.g. the bearing friction is too high.

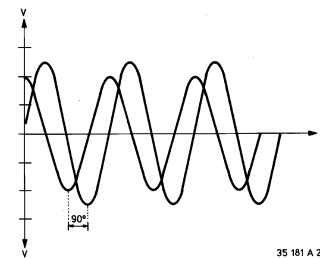
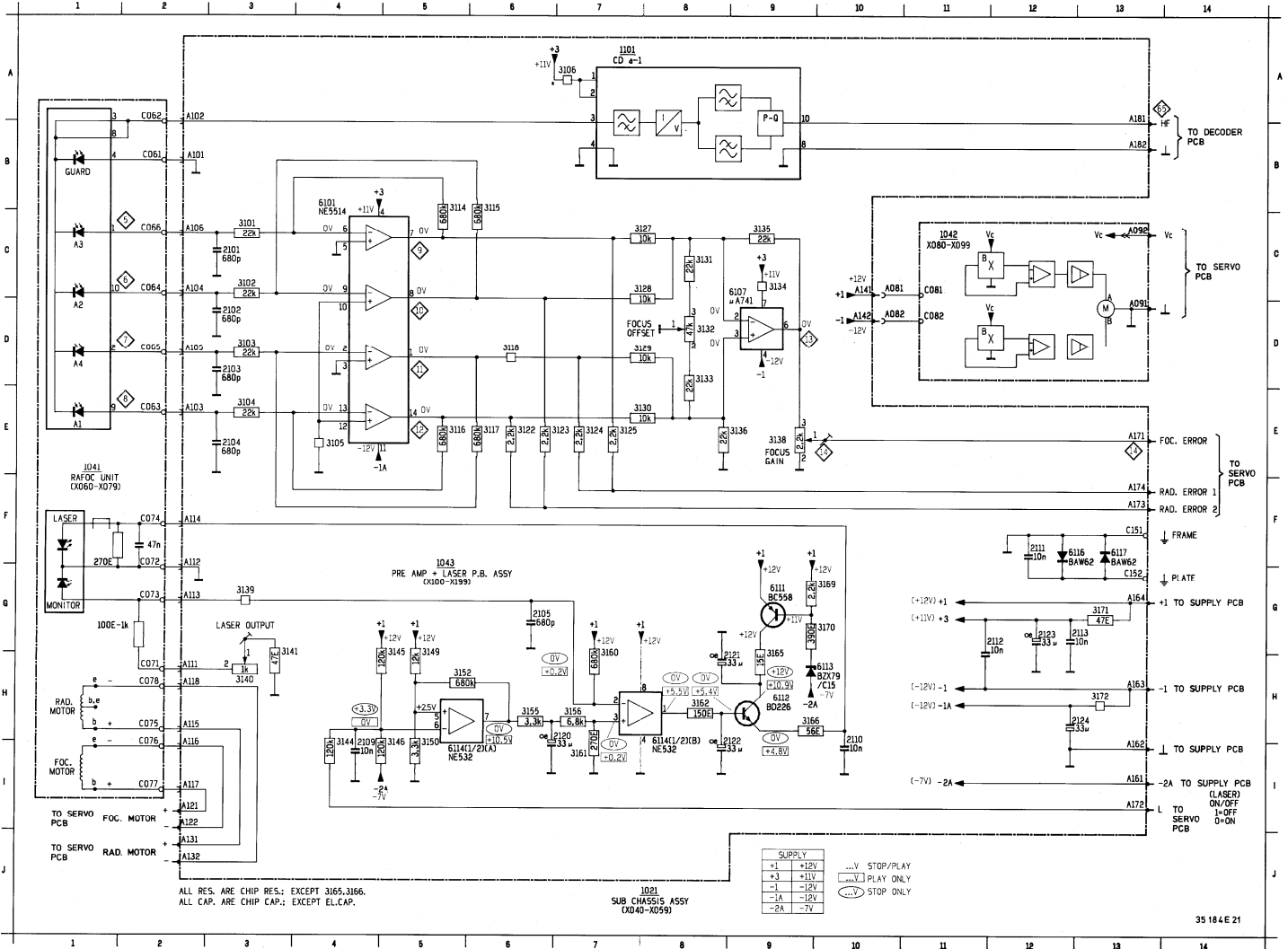
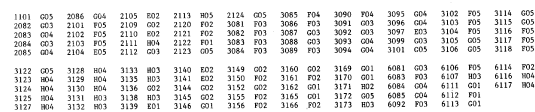


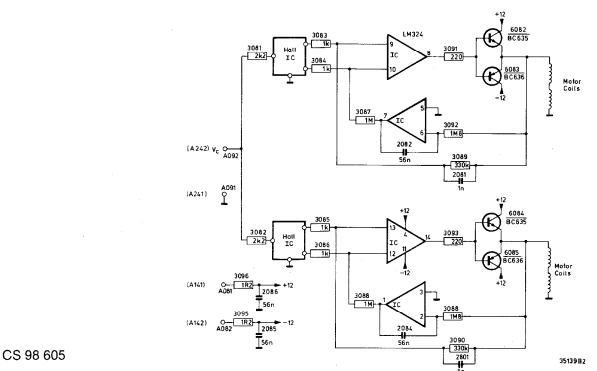
Fig. A

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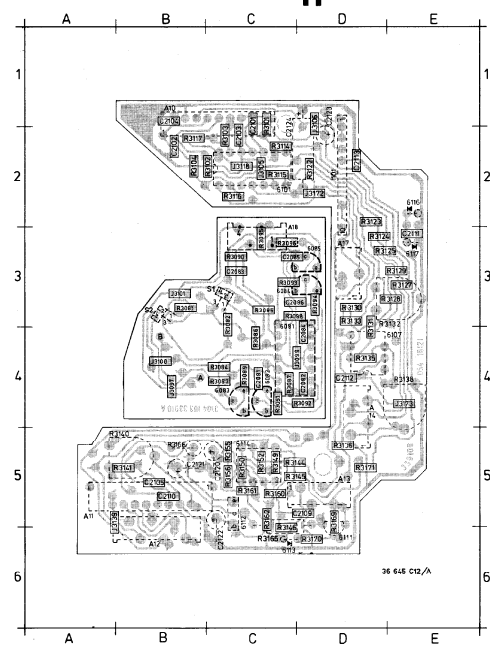
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2101	C 3	2105	G 6	2112	G12	2122	H 8	3102	C 4	3106	R 7	3117	F 6	3124	F 7	3129	D 8	3133	D 8	3138	F 9	3144	I 4	3150	I 5	3156	G 7	3166	H 9	3172	H13	6112	H 9	6116	F13
2102	D 3	2109	I 4	2113	G13	2123	G12	3103	C 4	3114	R 8	3118	F 6	3125	F 7	3130	D 8	3134	C 9	3139	O 3	3145	G 5	3152	H 5	3161	I 7	3169	O10	6101	B 4	6113	H10	6117	F13
2103	D 3	2110	H10	2120	H 7	2124	H13	3104	F 3	3115	R 8	3122	F 6	3127	C 8	3131	C 8	3135	C 9	3140	H 3	3146	I 5	3155	H 6	3162	H 8	3170	O10	6107	C 9	6114	H 8		



CS 98 604



3123	D02
3127	D02
3127	D03
3128	D03
3129	E03
3130	D03
3131	D03
3132	E03
3133	D03
3135	D04
3136	D05
3138	E04
3139	D05
3140	D05
3141	D05
3144	D05
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3146	D05
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3152	D05
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3160	D05
3161	D05
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3163	D05
3166	D05
3169	D06
3170	D06
3171	D05
3172	D02
6081	C04
6082	C04
6083	C04
6084	C03
6085	C03
6101	E02
6107	D04
6111	D06
6112	D06
6113	D06
6116	E02
6117	E03



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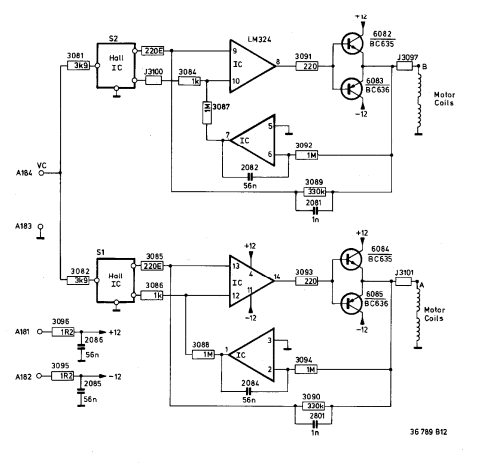
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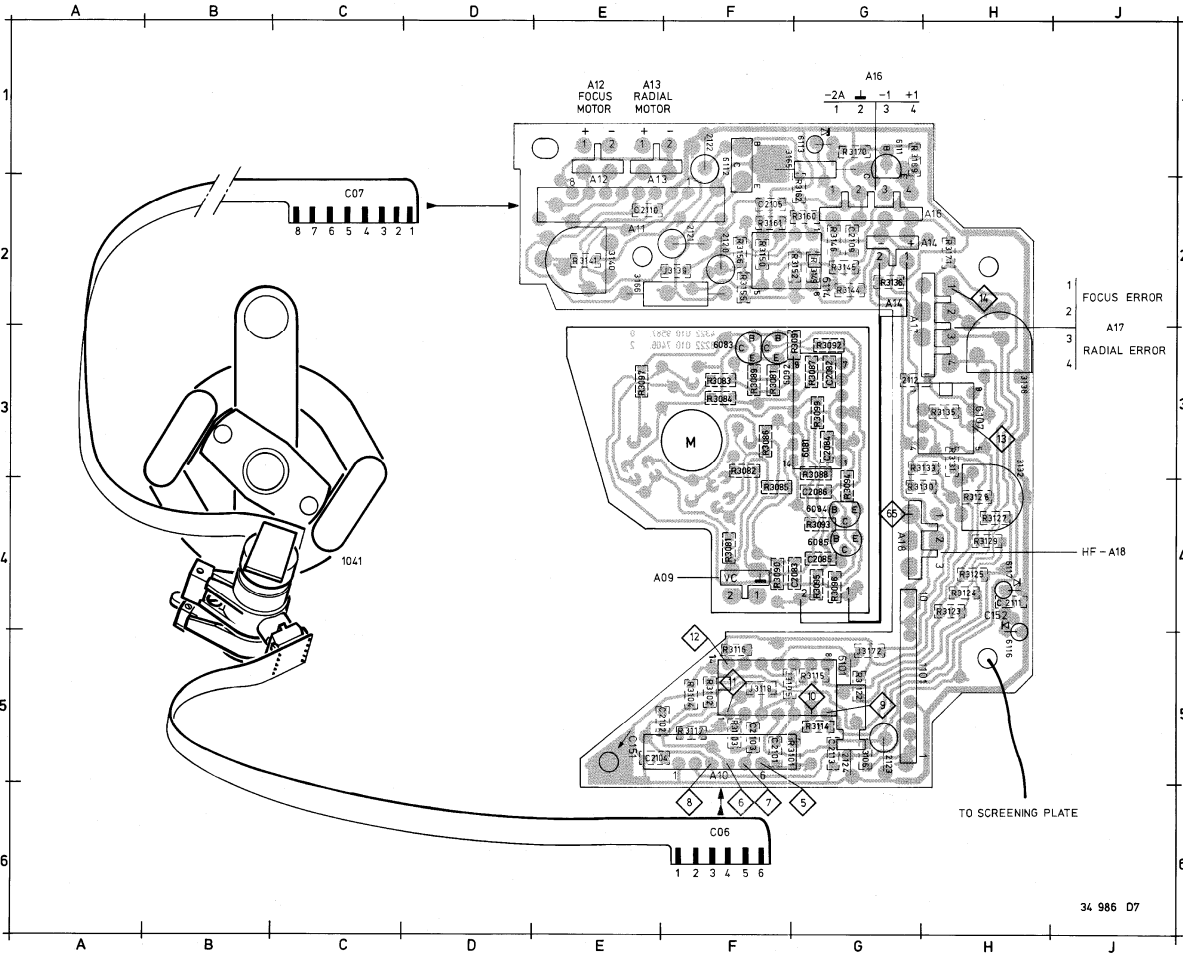
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6081
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6084

6085
6101
6102
6111
6112

6114
6116
6117





UNIT		
1101	Thick film unit HF	4822 218 10157
<div>NE532N</div> <div>NE5514N</div> <div>μA714N</div>		
		4822 209 80818
		4822 209 81451
		4822 209 80617
<div>BC558</div> <div>BD226</div>		
		4822 130 40941
		5322 130 44244
<div>BZX79-C15</div> <div>BAW62</div>		
		4822 130 34281
		4822 130 30613
<div>3132</div> <div>3138</div> <div>3140</div>		
	47k	4822 100 10583
	2k2	4822 100 20116
	1k	4822 100 20115
<div>3165</div> <div>3166</div>		
	15E MR30	5322 116 54914
	56E PR37	5322 116 54929
<div>0E</div> <div>47E</div> <div>150E</div> <div>270E</div> <div>390E</div>		
		4822 111 90163
		4822 111 90217
		5322 111 90098
		4822 111 90154
		5322 111 90138
	2k2	4822 111 90249
	3k3	4822 111 90157
	6k8	5322 111 90117
	10k	4822 111 90249
	12k	5322 111 90097
	22k	4822 111 90251
	120k	4822 111 90149
	680k	4822 111 90488
<div>680 pF</div> <div>10 nF</div>		
		4822 122 31809
		4822 122 31728

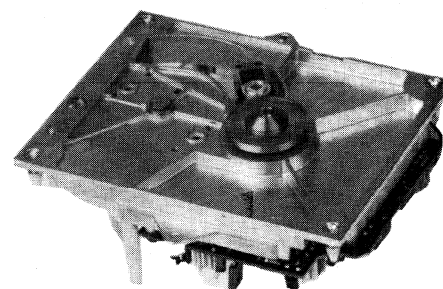
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2082 003	3081 P04	3103 P05	3135 003	3170 001
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2084 003	3083 P03	3105 P05	3138 003	3172 005
2085 004	3084 P03	3106 005	3139 P02	6081 003
3086 004	3085 P04	3114 005	3140 002	6082 P03
2101 P05	3086 P03	3115 005	3141 002	6084 004
2102 P05	3087 003	3116 P05	3144 002	6085 004
2103 P05	3088 003	3117 P05	3145 002	6086 P03
2104 005	3089 P03	3118 P05	3146 002	6101 005
2105 P02	3090 P04	3122 005	3148 002	6107 003
2109 002	3091 P03	3123 004	3150 P02	6111 001
2110 002	3092 003	3124 004	3152 002	6112 P01
2111 004	3093 004	3125 004	3153 P02	6113 001
2112 003	3094 004	3127 004	3156 P02	6116 005
2113 005	3095 004	3128 004	3160 002	6117 004
2120 P02	3096 004	3129 004	3161 P02	
2121 P02	3097 003	3130 004	3162 002	
2122 P01	3099 003	3131 003	3165 001	
2124 005	3101 P05	3132 004	3166 P02	

C.D.M.-1

Compact disc player

MECHANISM

Service
Service
Service



Service Manual

For reasons of production, several versions of the C.D. mechanism have been applied.

The C.D. mechanisms are in most cases marked with a round, yellow sticker provided with a letter impression.

The Table below indicates which exploded view and which HF pre-amplifier/laser supply PCB should be consulted.

COMPACT
disc
DIGITAL AUDIO

Sticker C.D.M.	Exploded view drawing	H.F. Pre-amp.+laser supply PCB +circuit diagram
Absent	A	I
A	See Service Manual CDM-0	See Service Manual CDM-0
B	See Service Manual CDM-0	See Service Manual CDM-0
C	A	II
D	A	I
E	See Service Manual CDM-0	See Service Manual CDM-0
F	See Service Manual CDM-0	See Service Manual CDM-0
G	A	II
H	A	II

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

CLASS 1
LASER PRODUCT

3122 110 03420

SERVICING HINTS

In order to prevent loose metal objects from getting in the CD mechanism it will be necessary to see to a clean repair station.

The objective can be cleaned with a blow brush.

The CD-mechanism is provided with self-lubricating bearings and should thus NOT be lubricated.

Ensure that the player is not resting on the shaft of the turntable motor during repairs and measurements on the bottom.

Servicing the RAFOC unit (= Radial and Focusing unit pos. 61).

The RAFOC unit supplied by Service is the same one as in CDM-0. In the CDM-1 the bottom plate of this RAFOC unit has been replaced by frame item number 503. If the RAFOC unit is replaced, **carefully** and accurately perform the following operations:

- Take the two flex PCBs out of the connectors on the preamplifier PCB.
- Disassemble the **defective** RAFOC unit by removing the 4 bolts M3x18 mm and shaft item number 504.
- Remove shaft item number 504 of the new RAFOC unit.
Pay attention to the 3 intermediate washers item number 502 and spring washer item number 505, they should assume the same positions after assembly.

Loosen the 4 bolts M3x18 mm until the bottom plate can be removed.

Do not remove bolts M3x18 mm (they hold the new RAFOC unit together).

- Mount the new RAFOC unit on frame 503.
Ensure that the 3 intermediate washers 502 and spring washer 505 are positioned correctly before fixing shaft item number 504.
- Check that the arm moves freely and the angle setting as well (see check and possible adjustment of angle setting).

- For replacing the light pin it is not necessary to remove the RAFOC unit.

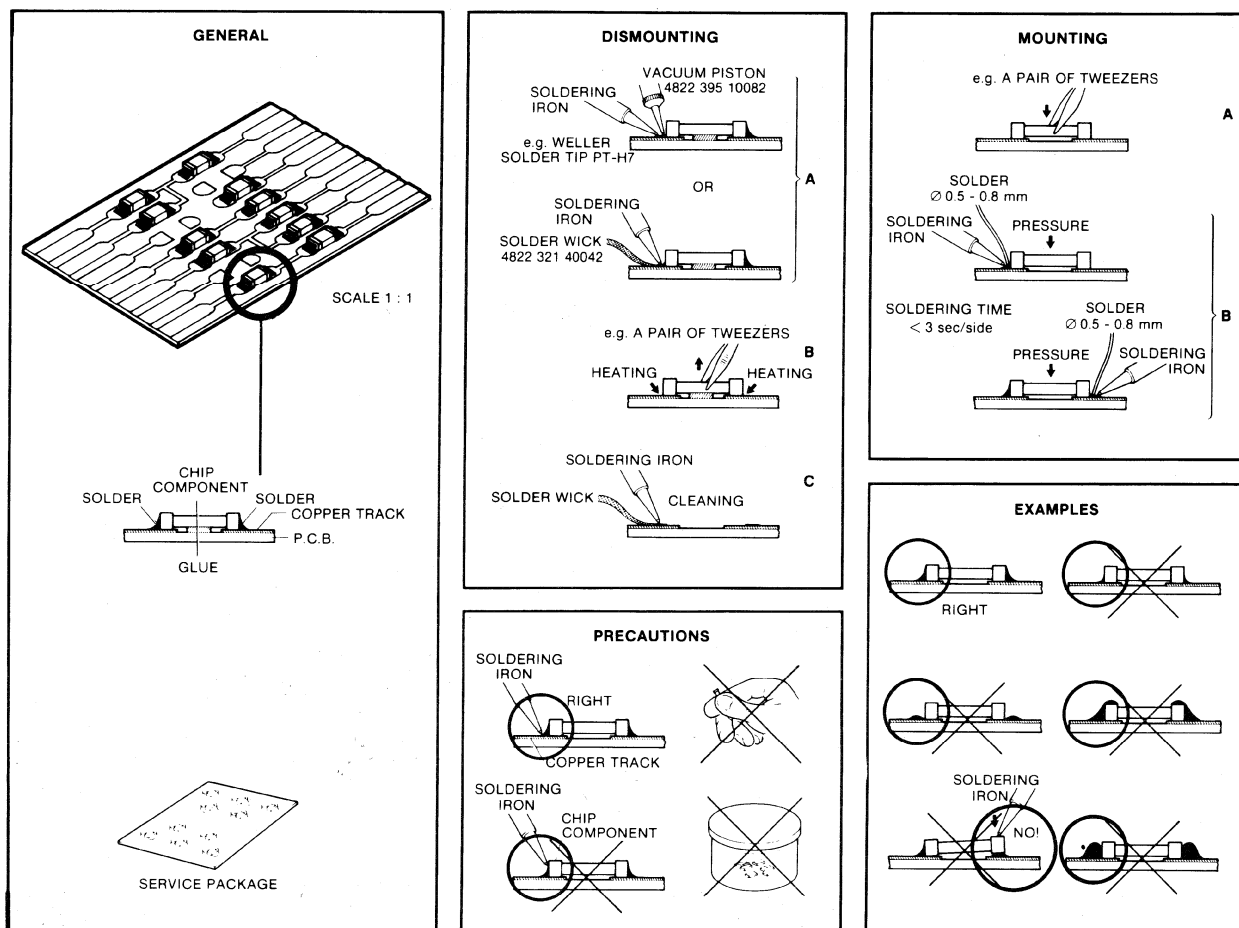
The light pin can be removed by turning it anti-clockwise by means of an open-ended spanner of 12 mm and afterwards pulling it out of the arm. During mounting, the light pin must be pushed into the arm as far as possible, and turned clockwise.

Attention:

To prevent adjustments from changing, NO SCREWS OTHER than those mentioned above should be loosened.

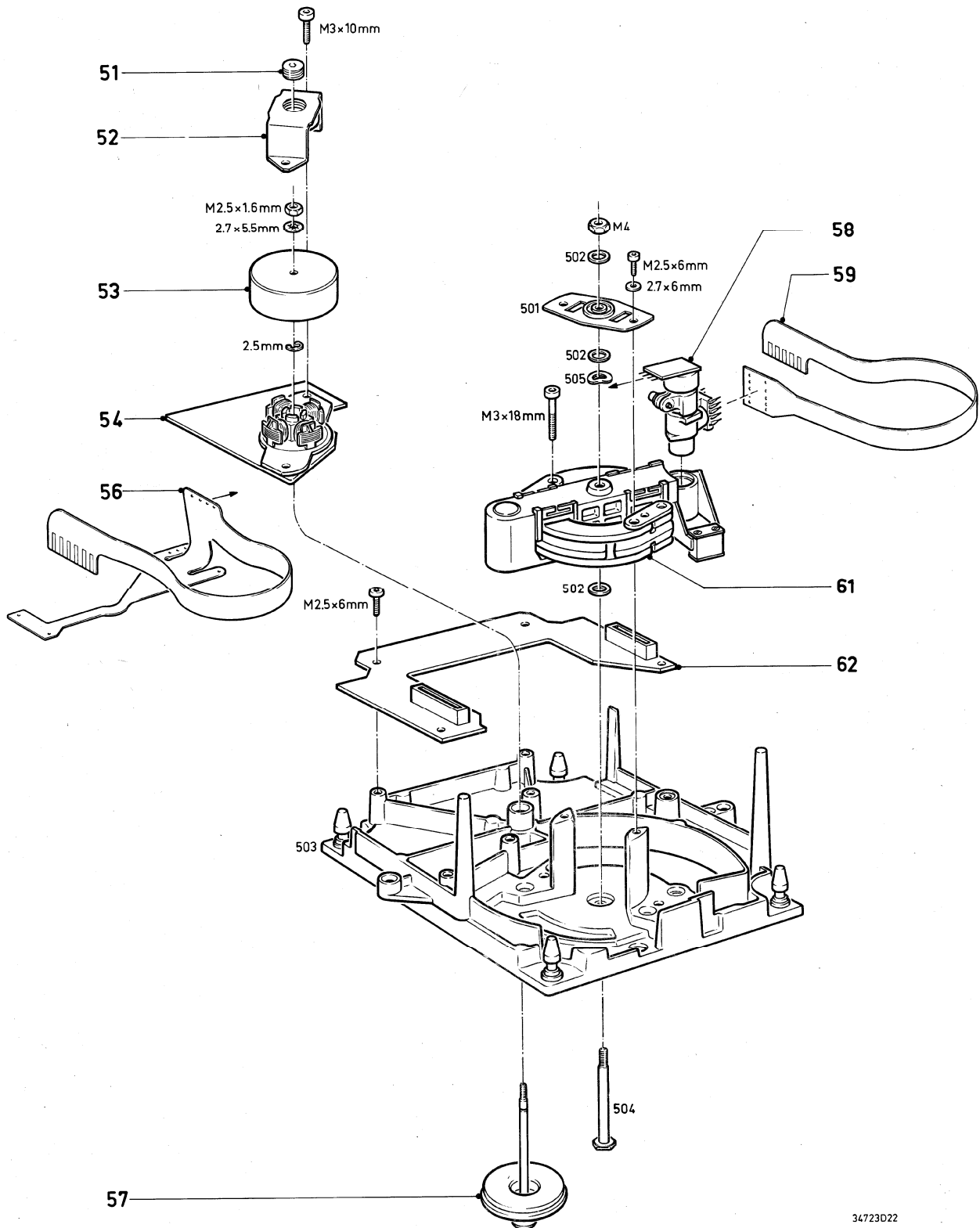
THE LIGHT PIN IS MUCH MORE SENSITIVE TO STATIC CHARGE THAN A MOS IC. CARELESS TREATMENT DURING SERVICING MAY REDUCE LIFE EXPECTANCY DRASTICALLY. FOR THIS REASON CARE SHOULD BE TAKEN THAT DURING SERVICING THE POTENTIALS OF THE AIDS AND YOURSELF EQUAL THE POTENTIAL OF THE MECHANISM.

In the player chip components have been applied. For insertion and removal of chip components see Fig.



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34723D22

51	4822 502 11701
52	4822 520 10529
53	4822 362 20225
54	4822 214 50395
56	4822 322 40051
57	4822 528 10491
58+59	4822 691 30129
59	4822 322 40048
61	4822 691 30128
62	4822 214 50394

MECHANICAL MEASUREMENTS AND ADJUSTMENTS

Height setting of the turntable

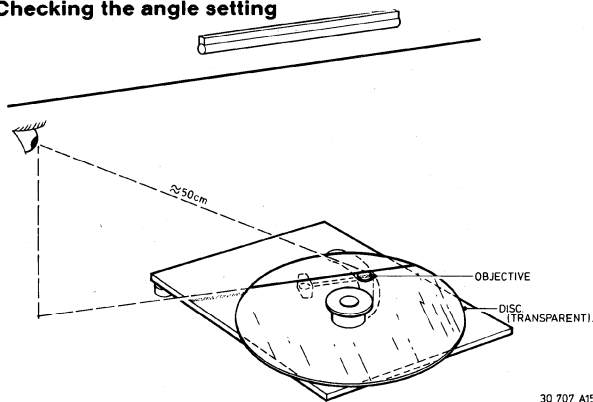
For this alignment the unit should be in the position of normal end use. The servicing supports 4822 395 30202 can be used here.

Playback track 1 of disc 4822 397 30096. (Disc without defects).

Connect a D.C. voltmeter between the **negative** of the focus motor and earth of the preamplifier print.

Adjust the height of the turntable with bearing screw 51 in such a way, that the voltage is $0\text{ V} \pm 100\text{ mV}$. Seal hereafter the screw with sealing paint.

Checking the angle setting



Place mirror 4822 395 90205 on the objective and glass disc 4822 395 90204 (with disc hold-down 4822 532 60906) on the turntable.

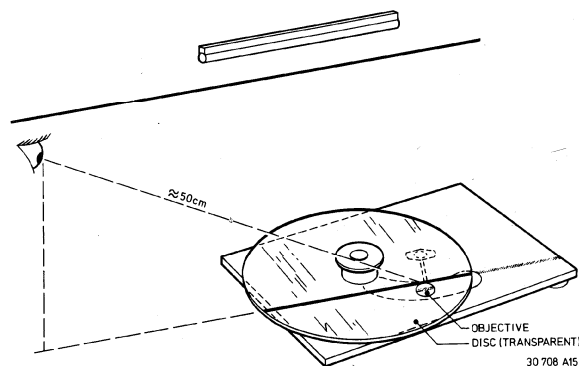
Locate the unit under a light source and under this light source a straight line should run (e.g. fluorescent tube with grid).

Set the arm to mid-position. Turn the unit until the arm is parallel to the line under the light source (see Fig.).

Look in the direction and in the prolongation of this line to its reflection on glass disc and mirror.

These lines should not be more than 4 mm apart:

Position the set in such a way that one line runs across the centre of the mirror. When the other line remains inside the mirror's surface, the distance is $\leq 4\text{ mm}$.



Rotate the CD mechanism through 90° relative to the previous position.

The arm must be kept in mid-position (see Fig.).

Repeat the previous measurement.

Adjusting the angle setting

With respect to the adjustment of the angle between disc and light path, the factory has looked for a compromise between minimum angle deviation and minimum arm friction.

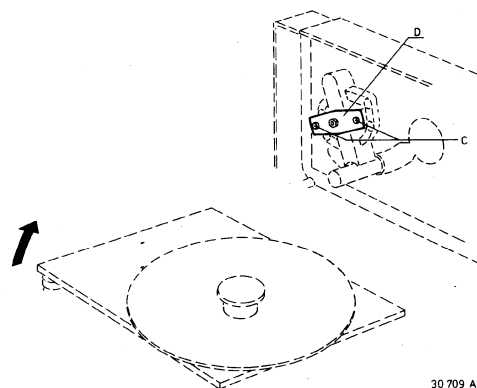
If the measurements show that the angle falls outside the tolerance given, the angle should NOT be adjusted for minimum deviation, but just within tolerance. The new setting should lie between the "old" setting and the optimum setting.

After adjustment, the friction of the arm should be checked. This is done by means of a spring-pressure gauge which is connected to the counterweight. The friction of the arm, measured over the total scanning deflection, is not allowed to exceed 30 mN.

When the friction appears to be too high, the angle should be reset to its old value. Then replace the arm by a new one and check the angle once more.

Adjustment of the angle is performed as follows:

Place the set on the servicing supports 4822 395 30202.



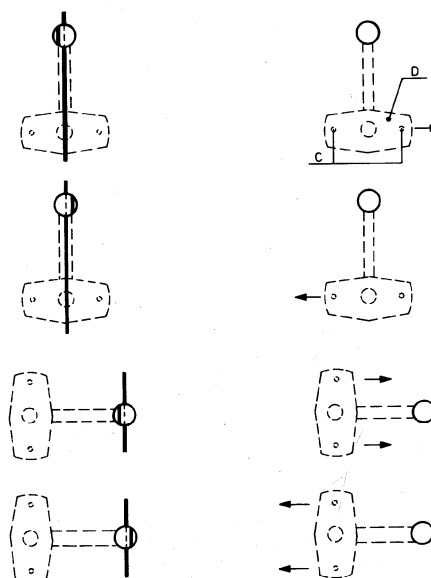
Loosen screws C (see Fig.) until bearing plate D can be shifted.

Correct the angle setting by shifting the bearing plate in the direction indicated on the Figure.

Tighten screws C ensuring that the setting does not drift. Double check the angle setting in two directions.

Attention

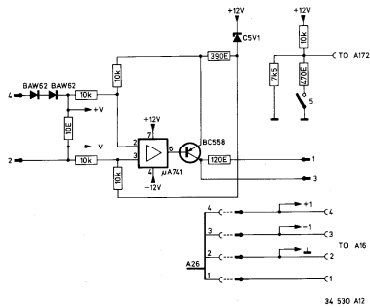
After setting the angle, the height setting of the turntable should be checked.



ELECTRICAL MEASUREMENTS AND ADJUSTMENTS

Laser power supply

Since the light pin is very sensitive to static charges, care should be taken that during measurements and adjustments of the laser power supply the potentials of aids and yourself equal the potential of the CD mechanism.



Check

The laser simulator PCB nr. 3 (4822 395 30229) should be used here.

Take the flex PCB out of socket A11 and connect the switch simulator PCB with the socket.

Remove plug A16 and insert it in the socket on the simulator PCB.

Connect the plug with 4 wires to socket A16. Take out plug A17 and insert the plug with 1 wire in socket A17.

Set the switch on the simulator PCB in the OFF position and the mains switch in the ON position.

Turn trimming resistor 3140 clockwise (max. R) and measure the voltage between points +V and -V on the simulator PCB.

The voltage should be ≤ 15 mV.

Check of laser supply control:

Set the switch on the simulator PCB in the ON position and measure the voltages between points +v and -v on the simulator PCB.

Resistor 3140 clockwise (max. R):

U +v -v = 225 mV \pm 45 mV.

Resistor 3140 counterclockwise (min. R):

U +v -v = 750 mV \pm 150 mV.

Set resistor 3140 in mid-position.

This is a preliminary adjustment. After the simulator PCB has been removed the laser current must be adjusted. (see service manual CD player).

Adjusting the focus bandwidth

(see service manual CD player).

Checking the AGC and offset circuit

(see service manual CD player).

Motor-control check (Hall)

- 1 Remove connector A09 from the motor PCB on the CDM.
- 2 Connect channel A of a dual-beam oscilloscope to the emitter of transistors 6082, 6083 and channel B to the emitter of transistors 6084, 6085. Position of oscilloscope: 2 V/div — 10 ms/div.
- 3 Connect pin 1 of connector A09 on the motor PCB to the ground of the set.
- 4 Switch the set on.
- 5 Apply a **negative** voltage to pin 2 of connector A09. The voltage may **not** be applied until **after** the circuit has been connected to power supply voltage. Start from 0 V and slowly proceed to -5 V. Now the motor should run. When the motor runs the voltage can be brought to approx -2.5 V. The motor should continue to run then.
- 6 The oscilloscope should display sinusoid signals now (see Fig. A). After approx 2 s they should lie symmetrically round the 0-axis and be shifted 90° relative to each other. The maximum ratio of the amplitudes of these 2 signals is allowed to be 1:2.
- 7 The amplitude depends on the applied voltage. The V-in/V-out pp ratio should lie between 1:2 and 1:3.
- 8 Determine at which V-in the motor runs at 600 rpm. At 600 rpm the frequency of V-out is 30 Hz. At this speed V-in should lie between -1.5 V and 3.7 V.

Conclusion:

When all these conditions are present motor and PCB may be considered in order.

If points 5, 6 and 7 are not correct, the fault should most probably be found in the electronics.

If points 5, 6 and 7 are correct and the voltage to be applied at point 8 is e.g. -4.5 V to obtain a motor speed of 600 rpm, there will most probably be something wrong mechanically. E.g. the bearing friction is too high.

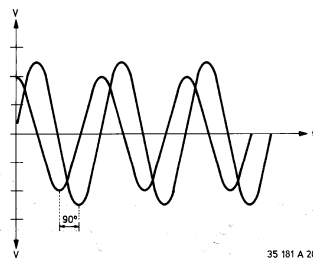
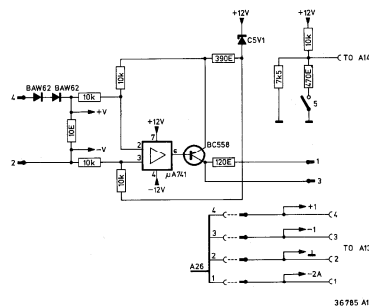


Fig. A

ELECTRICAL MEASUREMENTS AND ADJUSTMENTS

Laser power supply

Since the light pin is very sensitive to static charges, care should be taken that during measurements and adjustments of the laser power supply the potentials of aids and yourself equal the potential of the CD mechanism.



Check

The laser simulator PCB nr. 4 (4822 395 30244) should be used here.

Take the flex PCB out of socket A11 and connect the switch simulator PCB with the socket.

Remove plug A13 and insert it in the socket on the simulator PCB.

Connect the plug with 4 wires to socket A13. Take out plug A14 and insert the plug with 1 wire in socket A14.

Set the switch on the simulator PCB in the OFF position and the mains switch in the ON position.

Turn trimming resistor 3140 clockwise (max. R) and measure the voltage between points +V and -V on the simulator PCB.

The voltage should be ≤ 15 mV.

Check of laser supply control

Set the switch on the simulator PCB in the ON position and measure the voltages between points +v and -v on the simulator PCB.

Resistor 3140 clockwise (max. R):

U +v -v = 225 mV \pm 45 mV.

Resistor 3140 counterclockwise (min. R):

U +v -v = 750 mV \pm 150 mV.

Set resistor 3140 in the mid-position.

This is a preliminary adjustment. After the simulator PCB has been removed the laser current must be adjusted. (See Service Manual CD player).

Adjusting the focus bandwidth

(See Service Manual CD player).

Checking the AGC and offset circuit

(See Service Manual CD player).

Motor-control check (Hall)

1. Desolder the wire from point C152 on the preamplifier printed panel on the C.D.M.
2. Connect channel A of a dual-beam oscilloscope to the emitter of transistors 6082, 6083 and channel B to the emitter of transistors 6084, 6085. Position of oscilloscope: 2 V/div — 10 ms/div.
3. Switch the set on.
4. Apply a **negative** voltage to the wire desoldered. The voltage may **not** be applied until **after** the circuit has been connected to power supply voltage. Start from 0 V and slowly proceed to -5 V. Now the motor should run. When the motor runs the voltage can be brought to approx. -2.5 V. The motor should continue to run then.
5. The oscilloscope should display sinusoid signals now (see Fig. A). After approx. 2 s they should lie symmetrically round the 0-axis and be shifted 90° relative to each other. The maximum ratio of the amplitudes of these 2 signals is allowed to be 1:2.
6. The amplitude depends on the applied voltage. The V-in/V-out pp ratio should lie between 1:2 and 1:3.
7. Determine at which V-in the motor runs at 600 rpm. At 600 rpm the frequency of V-out is 30 Hz. At this speed V-in should lie between -1.5 V and 3.7 V.

Conclusion:

When all these conditions are present motor and PCB may be considered in order.

If points 4, 5 and 6 are not correct, the fault should most probably be found in the electronics.

If points 4, 5 and 6 are correct and the voltage to be applied at point 7 is e.g. -4.5 V to obtain a motor speed of 60 rpm, there will most probably be something wrong mechanically. E.g. the bearing friction is too high.

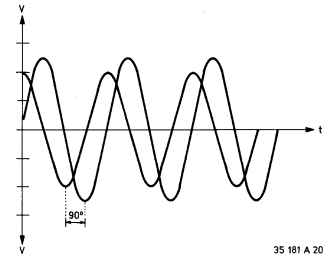
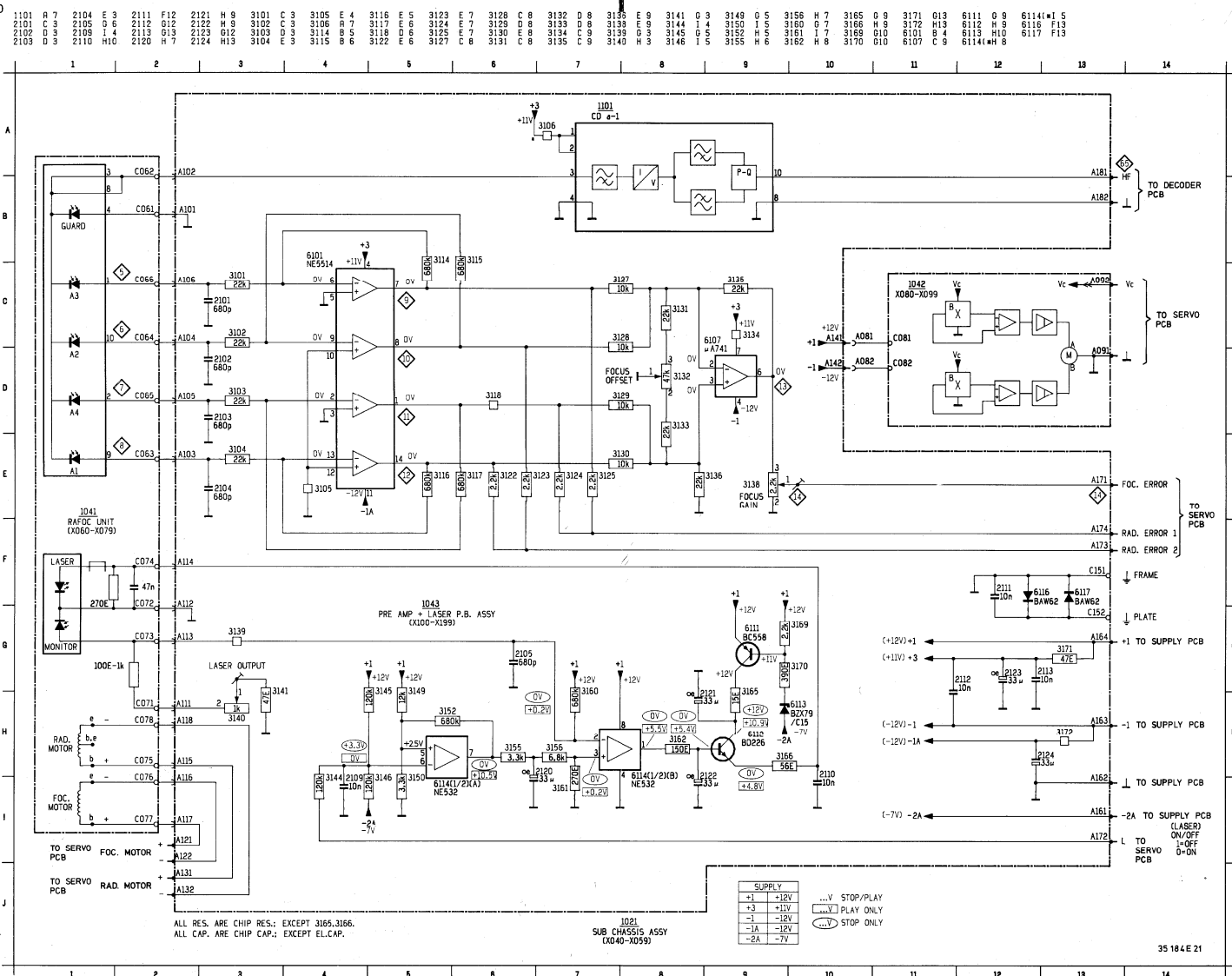
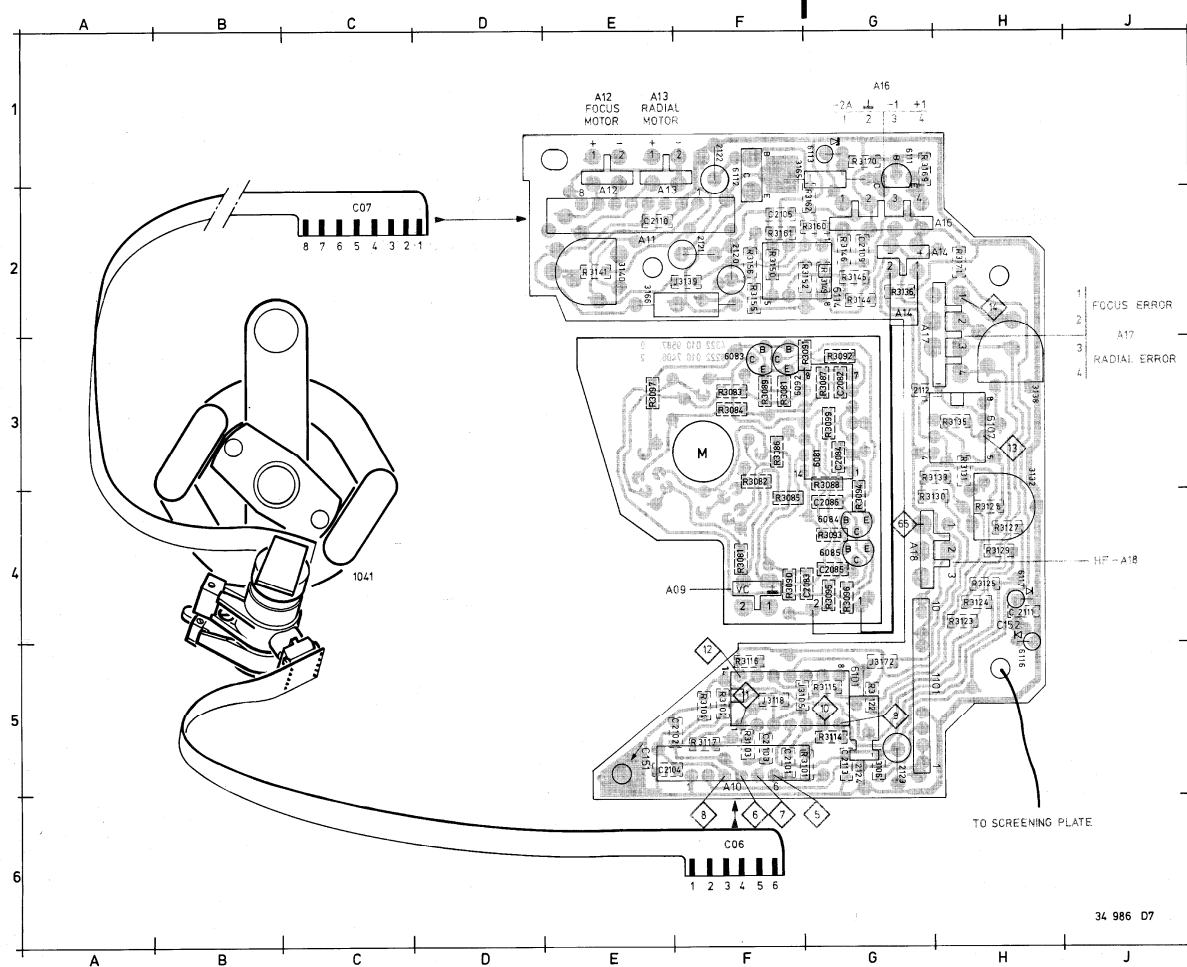


Fig. A

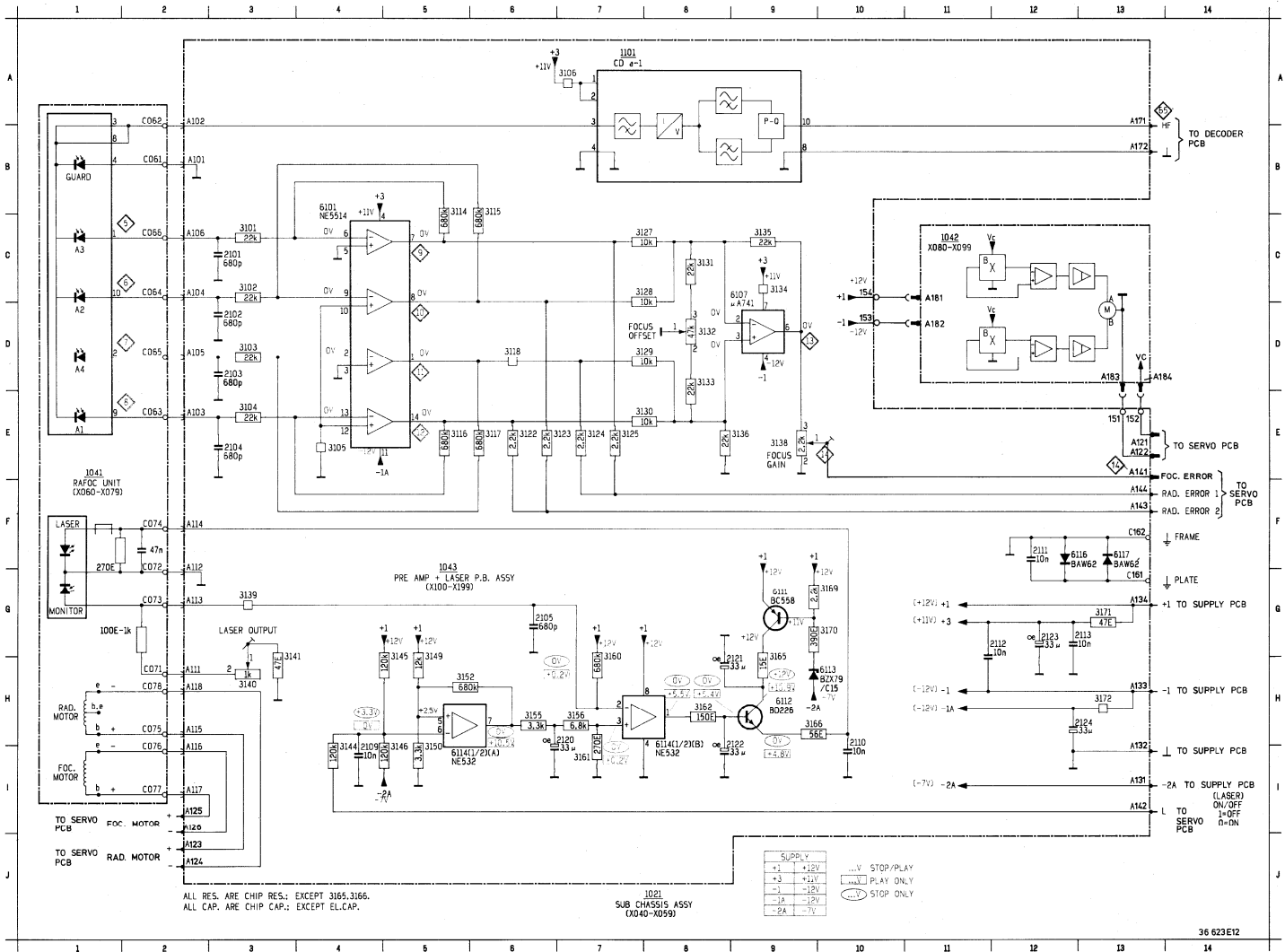




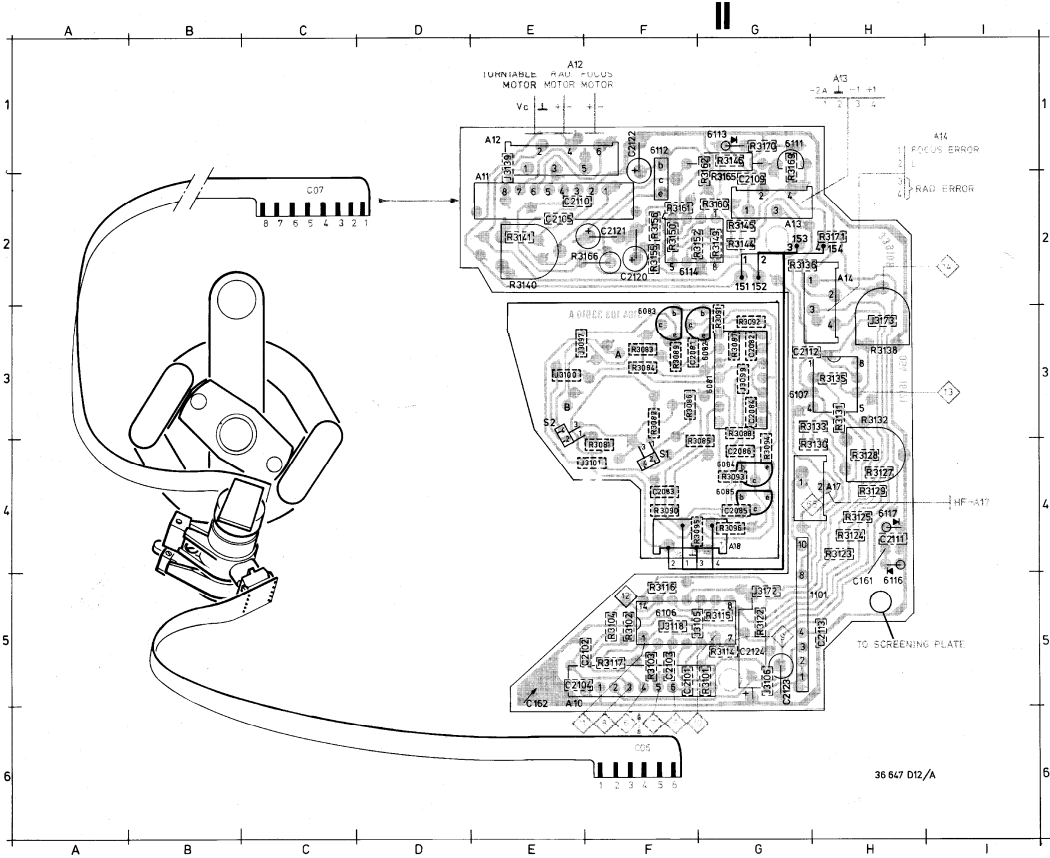
UNIT		
1101	Thick film unit HF	4822 218 10157
NE532N		
NE5514N		4822 209 80818
μA714N		4822 209 81451
		4822 209 80617
BC558		
BD226		4822 130 40941
		5322 130 44244
BZX79-C15		
BAW62		4822 130 34281
		4822 130 30613
3132	47k	4822 100 10583
3138	2k2	4822 100 20116
3140	1k	4822 100 20115
3165	15E MR30	5322 116 54914
3166	56E PR37	5322 116 54929
0E		4822 111 90163
47E		4822 111 90217
150E		5322 111 90098
270E		4822 111 90154
390E		5322 111 90138
2k2		4822 111 90249
3k3		4822 111 90157
6k8		5322 111 90117
10k		4822 111 90249
12k		5322 111 90097
22k		4822 111 90251
120k		4822 111 90149
680k		4822 111 90488
680 pF		4822 122 31809
10 nF		4822 122 31728

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1101 A 7 2104 E 3 2111 F12 2121 H 9 3101 C 3 3105 E 4 3116 E 5 3123 E 7 3126 C 8 3132 D 8 3138 E 9 3141 G 3 3149 G 5 3156 H 7 3165 G 9 3171 G13 6111 G 9 6114 H1 S
2101 C 3 2105 G 6 2112 G12 2122 H 9 3102 C 3 3106 E 7 3117 E 6 3124 E 7 3129 C 8 3133 D 8 3138 E 9 3144 G 3 3150 G 5 3160 G 7 3166 H 9 3172 H13 6112 H 9 6116 F13
2102 D 4 2108 I 4 2113 G13 2123 G12 3103 C 3 3114 E 6 3125 E 7 3130 C 8 3134 C 8 3139 C 3 3145 G 3 3152 H 5 3161 I 7 3169 G10 6101 H 4 6113 H10 6117 F13
2103 D 4 2110 H10 2120 H 7 2124 H13 3104 E 3 3115 E 6 3127 C 8 3131 C 8 3135 C 8 3140 H 3 3146 G 3 3155 H 5 3162 H 8 3170 G10 6107 C 9 6114 H1 S



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1101	G05	2086	G04	2105	B02	2113	H05	2124	G05	3085	F04	3090	F04	3093	G04	3102	F05	3114	G05
2083	G03	2101	F05	2109	G02	2120	F02	3081	F03	3086	F03	3091	G03	3096	G04	3103	F05	3115	G05
2083	G04	2102	F05	2110	G02	2121	F02	3083	F03	3087	G03	3092	G03	3097	H03	3104	F05	3116	F05
2084	G03	2102	F05	2111	H04	2122	F01	3085	F03	3088	G03	3093	G04	3099	G03	3105	G05	3117	F05
2085	G04	2104	H05	2112	G03	2123	G05	3084	F03	3089	F03	3094	G04	3101	G05	3106	G05	3118	F05
3122	G05	3128	H04	3133	H03	3140	B02	3149	G02	3160	G02	3169	G01	6081	G03	6106	H05	6114	F02
3123	H04	3129	H04	3135	H03	3141	B02	3150	F02	3161	F02	3170	G01	6083	F03	6107	H03	6116	H04
3124	H04	3130	H04	3136	G02	3144	G02	3152	G02	3162	G01	3171	H02	6084	G04	6111	G01	6117	H04
3125	H04	3131	H03	3138	H03	3145	G02	3155	F02	3165	G01	3172	G05	6085	G04	6112	F01		
3127	H04	3132	H03	3139	G01	3146	G01	3156	F02	3166	F02	3173	H03	6092	F03	6113	G01		

UNIT		
1101	Thick film unit HF	4822 218 10157
NE532N		
NE5514N		
μA714N		
BC558		
BD226		
BZX79-C15		
BAW62		
3132	47k	4822 100 10583
3138	2k2	4822 100 20116
3140	1k	4822 100 20115
3165	15E MR30	5322 116 54914
3166	56E PR37	5322 116 54929
0E		4822 111 90163
47E		4822 111 90217
150E		5322 111 90098
270E		4822 111 90154
390E		5322 111 90138
2K2		4822 111 90249
3K3		4822 111 90157
6K8		5322 111 90117
10k		4822 111 90249
12k		5322 111 90097
22k		4822 111 90251
120k		4822 111 90149
680k		4822 111 90488
680 pF		4822 122 31809
10 nF		4822 122 31728

