

15/19 Series (TM14-19RH/TM14-15RH/TM20-15RH/TM20-19RH) new FBT kit : Modification procedure

This procedure sheet will explain about (14 inch for: FBT-1415, 20 inch for: FBT-2015) of the modification point on the side of DEF BOARD associated with the method and it with modify to a main body the new FBT kit of 15/19 Series.

1. Modification with to required parts

The new FBT kit contains several parts altogether completely, before start working, or please check with following reference for the contents;

(1) FBT-1415 (the new FBT kit for TM14-15RH and also TM14-19RH)

Set composition

1-1: FBT module:

FBT BOARD (PD19N4E)+FBT BASE (M4-924082)

SHIELD COVER (M4-924081)+INSULATING SHEET (M4-924083)

1-2: FBT harness:

C4-N05016 (for the connection between FBT BOARD and DEF. BOARD)

1-3: Left frame:

LEFT FRAME (M2-924080)+INSULATING SHEET (M4-924084)

1-4: DEF BOARD:

Modification parts Resistor (RD50SST26 10ohmJ) 2ps

+ Jumper wire (UL1007AWG22 blue wire) 1m

1-5: Cable Tie: CABLE TIES (SG-100) 10 pieces.

(2) FBT-2015 (new FBT kit for TM20-15RH and TM20-19RH)

Set composition

2-1: FBT module:

FBT BOARD (PD19N4E)+FBT BASE (M 4-924082)

2-2: FBT harness:

C4-N05016 (for the connection between FBT BOARD and DEF. BOARD)

2-3: Left frame:

LEFT FRAME (M2-924085)+cable clamp (3484-1000) 2 pieces

2-4: DEF BOARD:

Modification parts Resistor (RD50SST26 10 ohm J) 2 pieces

+ Jumper wire (UL1007AWG22 blue wire) 1m

2-5: Cable Tie: CABLE TIES (SG-100) 10 pieces.

2. Assembly Point (See 7/13 - 12/13-page expand figure)

- 1) All of a cover and a rear panel are removed and DEF BOARD and POWER BOARD are removed from a main chassis.
- 2) FOCUS connector and the anode-cap from the FOCUS BLOCK are removed.

- 3) Before removing a left chassis, the wiring method of each cable is kept in your mind. If the wiring method is memorized, a left chassis will be removed from a main chassis. At this time, degauss coil and CRT ground band, which are being fixed to the left chassis with the cable tie, are also removed.
Moreover, cut from a root of GND line connected to FBT BOARD from CRT SOCKET BOARD.
- 4) FBT module (PD19N4E+M 4-924082) is attached in a left chassis.
- 5) Use the same cable clip (435) for cable harness, which was attached to the old left chassis. Remove those and place on the newer left chassis, same location.
- 6) (The connector of DF1B on board side) that is attached to CN1 of FBT BOARD the one side of FBT harness (C4-N05016) and draw to the other side of chassis through the wiring hole.
- 7) In case a left chassis is attached in a main part, it warns against inserting a cable.
- 8) It is the same method of management as the time of removing each cable, and connects. Moreover, degauss coil and CRT ground band are similarly fixed with the attached cable tie.
- 9) DEF BOARD is modified. Refer to section-3 about the modification procedure.
- 10) POWER and DEF BOARD are attached in a left chassis, and the whole of each connector is connected.
- 11) If it checks again that the whole of each connector is connected, power ON operation check will be performed. Refer to section-4 about the checkpoint.
- 12) If a check of operation is completed, it will turn off POWER and a cover will be attached.

3. Modification procedure for DEF. BOARD

Although DEF BOARD side is modified as follows in order to make new FBT drive, there is a version in the substrate of DEF BOARD to A to N.

However, for the part, which is unrelated to the portion, which modifies this time, one version in it (P-8803N) is mentioned as an example, and modification procedure is explained.

- 1) Eight pattern cuts (see 5/13-page parts side repair figure)
 - +95V line is cut two places and +95V side of D612, R629, R650, R628, R627, R626, R612, TR603, TR601 and TR608 is floated.
(The location "A" and "B" on 5/13 page)
 - The pattern between D608-A and D614-A is cut.(Place of "C" of a 5/12 page)
 - The pattern between minus side of C530 and TR 508-B is cut.
(The location "D" on 5/13-page)
 - The pattern between pin 5 of CN201 and R633 is cut.
(The location "E" on 5/13-page)
 - The pattern between pin 7 of CN 201and R635 is cut.
(The location "F" on 5/13-page)
 - The pattern between pin 6 of T502 and D518-A is cut.
(The location "G" on 5/13- page)
 - The pattern between pin 3 of T502 and D519-K is cut.
(The location "H" on 5/13-page)

- 2) Six strap wires are added (see 5/13 page).
 - The strap of between the through hole of +95V line and pin 2 of CN201 with UL1007AWG22 blue wire. (The location “a” on 5/13 page)
 - The strap of between the through hole of +95V line and R649 of +95V side with UL1007AWG22 blue wire. (The location “b” on 5/13 page)
 - The strap of between the through hole of +12V line and pin 5 of CN 201 with UL1007AWG22 blue wire. (The location “c” on 5/13 page)
 - The strap of between TP301 and pin 7 of CN201 with UL1007AWG22 blue wire. (The location “d” on a 5/13 page)
 - The strap of between through hole of +12V line and D 518-A with UL1007AWG22 blue wire. (The location “e” on 5/13 page)
 - The strap of between through hole of –12V line and D 519-K with UL1007AWG22 blue wire. (The location “f” on 5/13 page)
- 3) Deletion of parts (see 6/13-page parts side)
Remove R627 and C610 from board.
- 4) Change parts
Remove D518 and D519 and change into resistor RD50S 10 ohm (10 ohm 1/2W)

4. Adjustment procedure

When a new FBT kit sets up hi-voltage and also hi-voltage protection once, because hardly the setting value changes as for the readjustment of hi-voltage, there is not a necessity.

About what is influenced by the characteristics peculiar to CRT, such as FOCUS, a check or a re-setup is needed as follows.

1) Picture size

- Check that it is almost the same before exchanging about TM14-15RH/TM14-19RH.
- About TM20-15RH/TM20-19RH, screen size becomes large a little by change's (present setting value is 27kV) about a high-pressure setup by the rating of FBT at 25kV. For this reason, please perform a re-setup of screen size according to a service manual.
- When screen size is extremely large or is small in addition, turn off POWER and check a high-voltage setup. When high-voltage setting value is not correct, re-set up in the following ways.
- Re-setup of high voltage and protection.

1-1: In order to turn on POWER and to set up protection first, set high-pressure output voltage as 27.5kV by VR2 (HV ADJ) of FBT BOARD (PD19N4E).

At this time, it is not necessary to set the case that the protection acted with 27.5KV±0.2KV, because the protection is thought that is set up already.

When having operated by about 27.0kV except the above, it turns on POWER again, turning off POWER and using VR1 (XRAY PROT) as MIN, and the above-mentioned setup is performed.

1-2: The volume is fixed in the place which is the moment raise VR1 (XRAY PROT) in the MAX direction slowly till the place where protection operates, and protection operated.

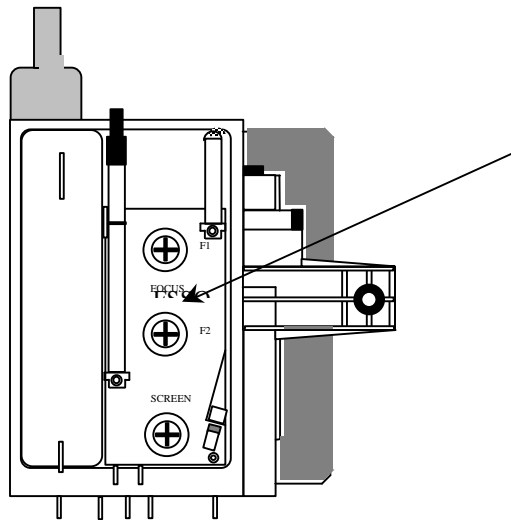
1-3: It turns off POWER, and VR2 (HV ADJ) is somewhat lowered in the MIN direction, and is turned on POWER again.

1-4: High voltage is set as 25.0kV by VR2 (HV ADJ).

1-5: The volume is fixed VR1 and also VR2 with the glue after the setting completion.

2) FOCUS setting

FOCUS is set as the best state in FOCUS volume (F2) currently attached to the fly back transformer of a new FBT kit.



FOCUS is adjusted in this volume.

FIYBACK TRANS
ST-902822

3) R.GAIN and white balance settings.

The setting of the contrast level relation becomes needed because even the ABL action changed through the means that FBT changed. The setting the necessary item is as follows.

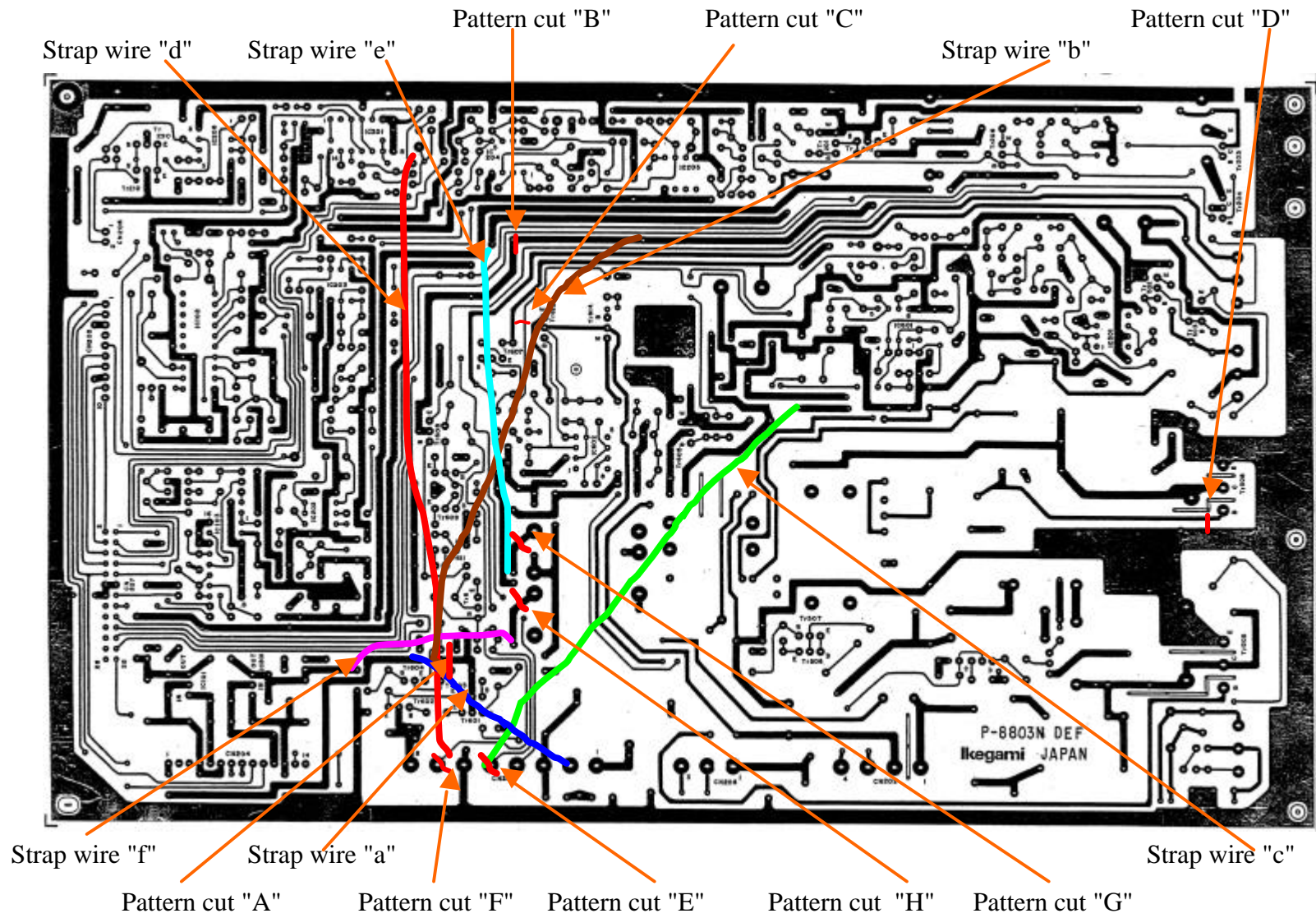
- R.GAIN

When CONTRAST VR on the FRONT PANEL is set to MAX in MANUAL operation in TP204 on VIDEO AMP BOARD (R OUT), it adjusts by VR102 (R.GAIN) on INTERFACE BOARD so that the level of the R OUT may serve as 60Vp-p.

- White balance

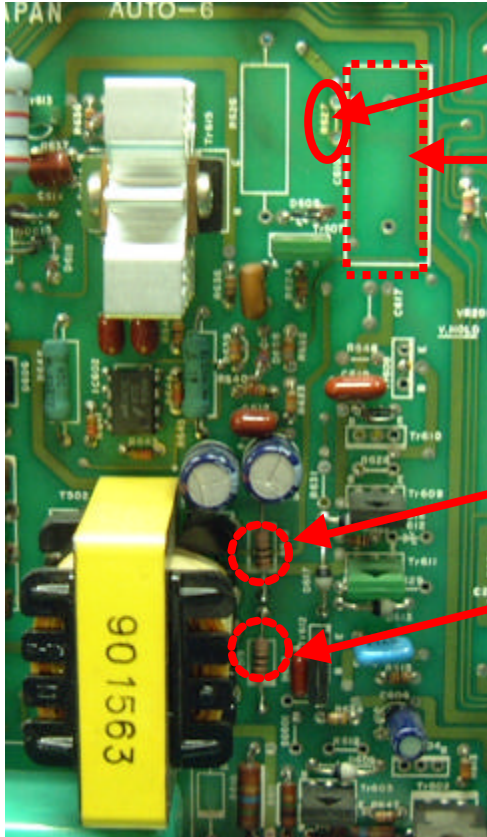
Carry out about a white balance according to a service manual

Modification figure of pattern side



DEF. Board Modification photo for new FBT Kit

1. DEF. Board for FBT-1415 and FBT-2015 (*8803)
 - 1) Deletion and change parts.

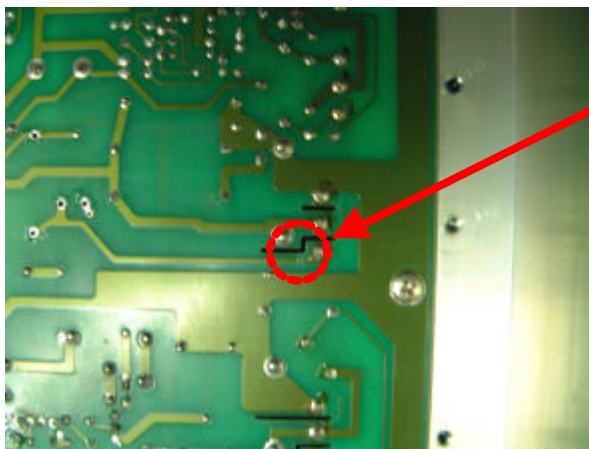


Delete R627

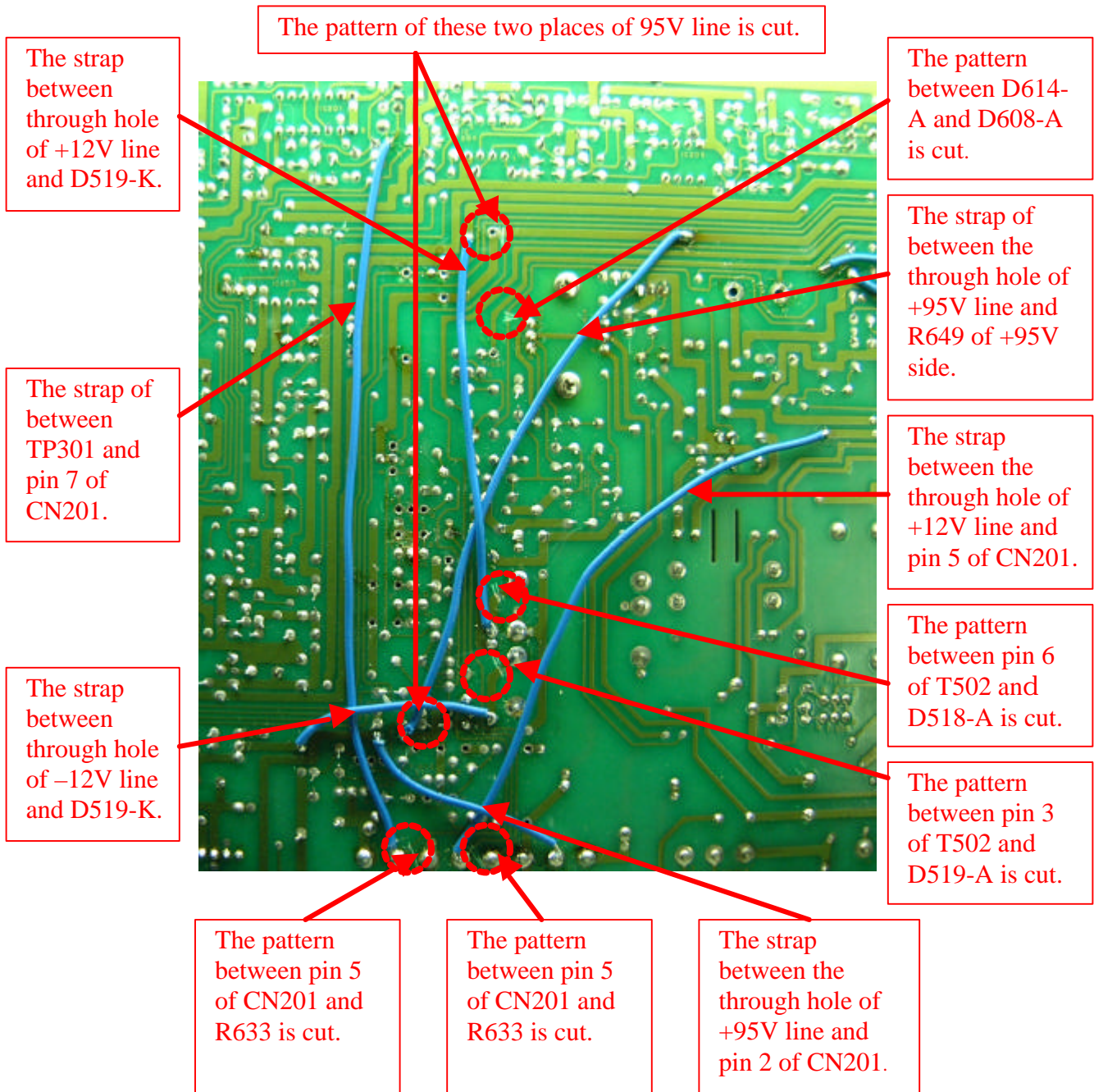
Delete C610

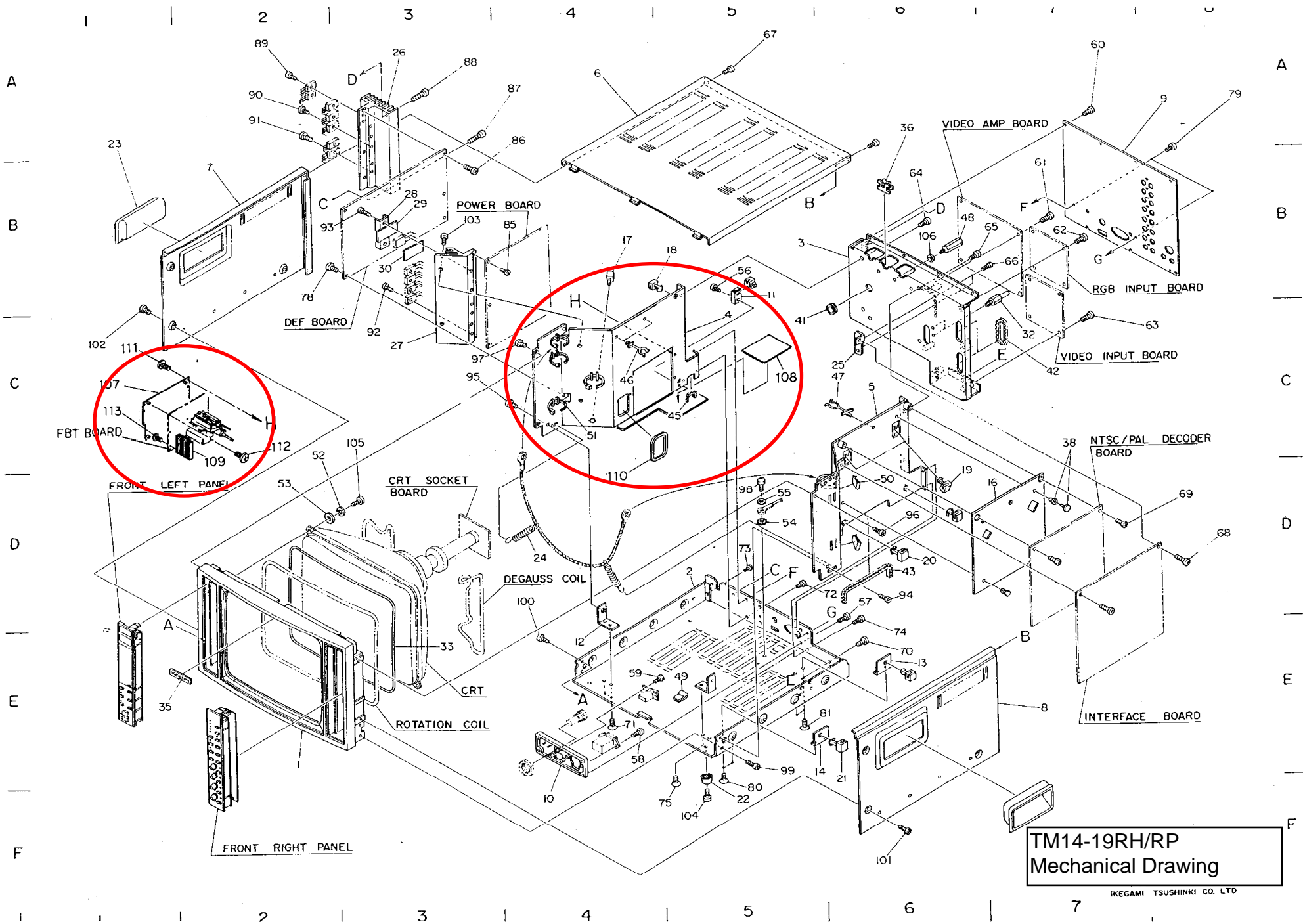
Remove D518 and change into resistor RD50S 10 ohm (10 ohm 1/2W).

Remove D519 and change into resistor RD50S 10 ohm (10 ohm 1/2W).



The pattern between minus side of C530 and TR508-B is cut.





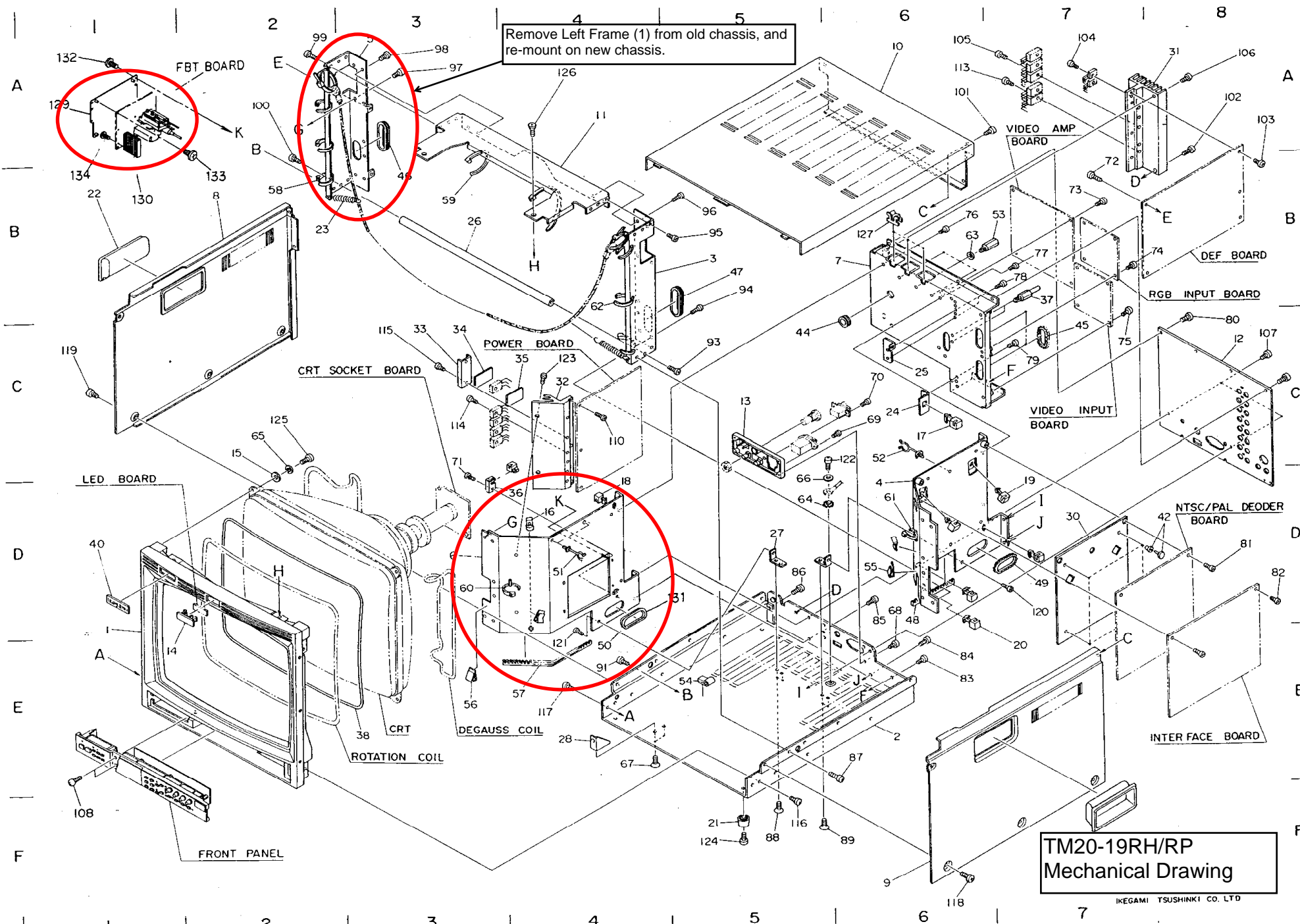
TM14-19RH/RP
Mechanical Drawing

No	INDEX	COMPONENTS	PARTS No	Q' ty	No	INDEX	COMPONENTS	PARTS No	Q' ty
41	5-C	GRMNET	G-39	1	1	2-E	ESCUTCHEON	M1-911423A	1
42	7-C	FREE BUSH	EL-12	3	2	5-D	CHASSI'S	M1-919011	1
43	6-D	FREE BUSH	EL-16	1	3	5-B	REAR CHASSI'S	M1-912826	1
44					4	5-C	LEFT FRAME	M2-924080	1
45	5-C	FREE BUSH	EL-16	1	5	6-C	RIGHT FRAME	M1-912504	1
46	4-C	CABLE CLIP	435	2	6	4-A	TOP COVER	M1-912505	1
47	6-C	CABLE CLIP	435	1	7	2-B	SIDE COVER(L)	M1-912506	1
48	6-B	TAPPING GARD SPACER	KGTS-4T	3	8	7-E	SIDE COVER(R)	M1-912506	1
49	5-E	CABLE CLAMP	3484-1000	1	9	8-A	REAR COVER	M1-919040	1
50	6-D	CABLE CLAMP	3484-1000	2	10	4-F	AC BOARD	M2-912828A	1
51	4-C	CABLE TIES	SG-100	8	11	5-B	EARTH METAL	M4-915621	1
52	2-C	WASHER	SW6	4	12	4-E	BRACKET	M4-919012	2
53	2-D	WASHER	HW16	4	13	6-E	PCB BRACKET(1)	M4-919013	1
54	5-D	WASHER	TW43	1	14	5-E	PCB BRACKET(2)	M4-919014	1
55	5-D	WASHER	SW4	1	15				
56	5-B	SCREW	NMB3-6	1	16	7-D	SHIELD PANEL	M4-914036	1
57	6-D	SCREW	BNT3-10	4	17	4-B	PCB HOLDER	M3-908268	1
58	4-E	SCREW	NT3-12	2	18	5-B	PCB HOLDER.	M3-908268	2
59	4-E	SCREW	BNT2.6-10	2	19	6-D	PCB HOLDER	M3-908268	2
60	7-A	SCREW	NMB3-6	5	20	6-D	PCB HOLDER	M3-908268	2
61	7-B	SCREW	NMB3-6	4	21	6-E	PCB HOLDER	M3-908268	2
62	7-B	SCREW	NMB3-6	3	22	5-F	MONITOR FOOT	M4-908267	4
63	8-C	SCREW	NMB3-6	3	23	1-A	HANDLE	M2-911020	2
64	6-B	SCREW	NMB3-6	2	24	4-D	EARTH SPRING	M4-279433A	2
65	7-B	SCREW	NMB3-6	2	25	6-C	BOARD MOUNT METAL	M4-912903	1
66	7-B	SCREW	NMB3-6	2	26	3-A	HEAT SINK	M3-912422	1
67	5-A	SCREW	NMB3-6	2	27	3-C	HEAT SINK	M2-912414	1
68	8-D	SCREW	NMB3-6	2	28	3-B	Tr FIXING METAL	M4-909466	1
69	8-D	SCREW	NMB3-6	2	29	3-B	INSULATED PANEL	PL-PEM(B)0.5-40-30	1
70	6-E	SCREW	NMB3-6	1	30	3-B	SILICON RUBBER SHEET	ST-901237A	1
71	4-E	SCREW	SM3-6	2	31				
72	6-D	SCREW	NMB3-6	1	32	7-C	PC SUPPORT	4825	2
73	5-D	SCREW	NMB3-6	2	33	3-E	ESCUTCHEON PACKING	KG-CR5754	1
74	6-E	SCREW	NMB3-8	1	34				
75	5-F	SCREW	SM3-6	2	35	1-E	NAME PLATE	D35	1
76					36	6-A	EDGE SADDLE	EBS-1	3
77	4-B	SCREW	NMB3-6	3	37				
78	2-B	SCREW	NMB3-6	2	38	7-C	PUSH RIVETS	P2642(B)	4
79	8-A	SCREW	NMB3-8	2	39				
80	5-F	SCREW	SM3-6	2	40				

TM14-19RH/RP
Mechanical Parts List(1/2)

No	INDEX	COMPONENTS	PARTS No	Q' ty
81	5-E	SCREW	NMB3-8	2
82				
83				
84				
85	4-B	SCREW	NMB3-8	3
86	4-A	SCREW	NMB3-8	3
87	4-A	SCREW	NMB3-8	1
88	3-A	SCREW	NMB3-8	1
89	2-A	SCREW	NMB3-8	2
90	2-A	SCREW	NMB3-8	2
91	2-A	SCREW	NMB3-10	3
92	3-C	SCREW	NMB3-10	4
93	2-B	SCREW	NMB3-14	2
94	6-D	SCREW	NMB4-8	1
95	3-C	SCREW	NMB4-8	1
96	6-D	SCREW	NMB4-8	1
97	3-C	SCREW	NMB4-8	1
98	5-D	SCREW	NMB4-6	1
99	5-E	SCREW	NMB4-8	2
100	4-D	SCREW	NMB4-8	2
101	6-F	SCREW	NMB4-8	3
102	1-C	SCREW	NMB4-8	3
103	3-B	SCREW	NMB4-10	2
104	5-F	SCREW	NMB4-14	4
105	3-C	SCREW	NM6-16	4
106	6-B	WASHER	HWL4	3
107	1-C	FBT BASE	M4-924082	1
108	5-C	INSULATING SHEET	M4-924084	1
109	2-C	HEATSINK(HV)	M4-923683	1
110	4-C	BUSHING	M3-916296(B)	4
111	1-C	SCREW	NMB3-6	4
112	2-C	SCREW	NMB3-6	4
113	1-C	SCREW	NMB2.6-6	2

TM14-19RH/RP
Mechanical Parts List(2/2)



TM20-19RH/RP
Mechanical Drawing

No	INDEX	COMPONENTS	PARTS No	Q' ty	No	INDEX	COMPONENTS	PARTS No	Q' ty
					1	1-D	ESCUTCHEON	M1-911580C	1
41					2	6-E	CHASSI'S	M1-919015	1
42	8-D	PUSH RIVETS	P2642(B)	4	3	5-B	RIGHT FRAME(1)	M2-912889	1
43					4	6-D	RIGHT FRAME(2)	M1-912890	1
44	5-C	GROMMET	G-39	1	5	3-A	LEFT FRAME(1)	M2-912891	1
45	7-C	FREE BUSH	EL-12	3					
					6	3-D	LEFT FRAME(2)	M2-924085	1
46	3-B	FREE BUSH	EL-12	1	7	6-B	REAR CHASSI'S	M1-912826	1
47	5-B	FREE BUSH	EL-12	1	8	2-B	SIDE COVER(L)	M1-911922A	1
48	6-D	FREE BUSH	EL-16	1	9	6-F	SIDE COVER(R)	M1-911922A	1
49	7-D	FREE BUSH	EL-16	1	10	6-A	TOP COVER	M2-911923A	1
50	4-E	FREE BUSH	EL-16	1					
					11	4-A	CENTER FRAME	M2-912923	1
51	4-D	CABLE CLIP	435	2	12	8-C	REAR COVER	M1-919040	1
52	6-C	CABLE CLIP	435	1	13	5-C	AC BOARD	M2-912828A	1
53	7-B	TAPPING GARD SPACER	KGTS-4T	3	14	1-E	TALLY	M4-912378	1
54	5-E	CABLE CLAMP	3484-1000	1	15	2-C	CRT WASHERS(1)	M4-281236A	4
55	6-D	CABLE CLAMP	3484-1000	2					
					16	4-D	PCB HOLDER	M3-908268	1
56	3-E	CABLE CLAMP	3484-1000	2	17	6-C	PCB HOLDER	M3-908268	1
57	4-E	FREE BUSH	EL-16	1	18	4-D	PCB HOLDER	M3-908268	2
58	2-B	CABLE TIES	SG-100	4	19	7-D	PCB HOLDER	M3-908268	2
59	3-B	CABLE TIES	SG-100	2	20	7-E	PCB HOLDER	M3-908268	3
60	3-D	CABLE TIES	SG-100	1					
					21	5-F	MONITOR FOOT	M4-908267	4
61	6-D	CABLE TIES	SG-100	1	22	1-B	HANDLE	M2-911020	2
62	4-B	CABLE TIES	SG-100	4	23	2-B	EARTH SPRING	M4-279433A	2
63	6-B	WASHER	NWL4	3	24	6-C	PCB MOUNT METAL	M4-912902	1
64	5-D	WASHER	TW4	1	25	6-C	BOARD MOUNT METAL	M4-912903	1
65	2-C	WASHER	SW6	1					
					26	3-B	STIFFEN BAR	M4-912927A	1
66	6-C	WASHER	SW4	1	27	5-D	BRACKET	M4-919016	2
67	4-E	SCREW	SM3-6	2	28	4-F	SUPPORT BRACKET	M4-919017	1
68	6-D	SCREW	BNT3-10	4	29				
69	6-C	SCREW	MT3-12	2	30	7-D	SHIELD PANEL	M4-914037	1
70	6-C	SCREW	BNT2.6-10	2					
					31	8-A	HEAT SINK	M3-912422	1
71	3-C	SCREW	NMB3-6	1	32	4-C	HEAT SINK	M2-912414	1
72	7-B	SCREW	NMB3-6	2	33	3-C	Tr FIXING METAL	M4-909466	1
73	7-B	SCREW	NMB3-6	4	34	3-C	INSULATED PANEL	PL-PEM(B)D.5-40-30	1
74	8-B	SCREW	NMB3-6	3	35	4-C	SILICON RUBBER SHEET	ST-901237A	1
75	7-C	SCREW	NMB3-6	3					
					36	4-D	EARTH METAL	M4-915621	1
76	6-B	SCREW	NMB3-6	2	37	7-B	PC SUPPORT	4825	2
77	7-B	SCREW	NMB3-6	2	38	3-E	ESCUTCHEON PACKING	KG-CR5890	1
78	7-B	SCREW	NMB3-6	2	39				
79	7-C	SCREW	NMB3-6	2	40	1-D	NAME PLATE	D45	1
80	8-C	SCREW	NMB3-6	5					

TM20-19RH/RP
Mechanical Parts
List(1/2)

No	INDEX	COMPONENTS	PARTS No	Q' ty
121	4-E	SCREW	NMB4-8	1
122	6-C	SCREW	NMB4-6	1
123	4-C	SCREW	NMB4-10	2
124	5-F	SCREW	NMB4-14	4
125	2-C	SCREW	NM6-16	4
126	4-A	SCREW	SM4-4	2
127	6-B	EDGE SADDLE	EDS-1	3
128				
129	1-A	FBT BASE	M4-924082	1
130	1-B	HEATSINK(HV)	M4-923683	1
131	5-E	BUSHING	M4-916295	1
132	1-A	SCREW	NMB3-6	4
133	2-B	SCREW	NMB3-6	4
134	1-B	SCREW	NMB2. 6-6	2

No	INDEX	COMPONENTS	PARTS No	Q' ty
81	8-D	SCREW	NMB3-6	2
82	8-D	SCREW	NMB3-6	2
83	6-E	SCREW	NMB3-6	1
84	6-E	SCREW	NMB3-6	1
85	6-D	SCREW	NMB3-6	1
86	5-D	SCREW	NMB3-6	2
87	6-E	SCREW	NMB3-6	2
88	5-F	SCREW	SM3-6	2
89	6-F	SCREW	SM3-6	2
90				
91	4-E	SCREW	NMB3-6	2
92				
93	5-C	SCREW	NMB3-6	1
94	5-B	SCREW	NMB3-6	5
95	5-B	SCREW	NMB3-6	2
96	5-B	SCREW	NMB3-6	2
97	3-A	SCREW	NMB3-6	5
98	3-A	SCREW	NMB3-6	2
99	2-A	SCREW	NMB3-6	2
100	2-A	SCREW	NMB3-6	1
101	6-A	SCREW	NMB3-6	4
102	8-A	SCREW	NMB3-8	1
103	8-A	SCREW	NMB3-8	3
104	7-A	SCREW	NMB3-8	2
105	6-A	SCREW	NMB3-8	2
106	8-A	SCREW	NMB3-8	1
107	8-C	SCREW	NMB3-8	2
108	1-F	SCREW	NMB2-6	2
109				
110	4-C	SCREW	NMB3-8	3
111				
112				
113	6-A	SCREW	NMB3-10	3
114	3-C	SCREW	NMB3-10	4
115	3-C	SCREW	NMB3-14	2
116	5-F	SCREW	NMB4-8	2
117	4-E	SCREW	NMB4-8	2
118	6-F	SCREW	NMB4-8	4
119	1-C	SCREW	NMB4-8	4
120	7-D	SCREW	NMB4-8	1

TM20-19RH/RP
Mechanical Parts List(2/2)