

SERVICE MANUAL

VIDEO CASSETTE RECORDER

BASIC TAPE MECHANISM : D-33 (6721R-0122A)

This Service Manual is the "Revision Publishing" and replaces "Simple Manual" (S/M Code No.09-999-335-6T1).

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SPECIFICATIONS

Video recording system	Rotary 2 head helical scanning system	RF output	VHF channel 3 or 4 (switchable), 66 dBμ
Video head	Double azimuth 4 head	Video input	1.0 Vp-p, 75 ohm, unbalanced
Tuner system	Frequency synthesized tuner	Video output	1.0 Vp-p, 75 ohm, unbalanced
TV system	M	Horizontal resolution	230 lines
Video signal system	NTSC color signal, 525 lines, 60 fields	Video S/N	43 dB (at SP)
Usable cassttes	VHS video cassette	Audio track	1 track (Mono)
Recording Playback time		Audio input	-6 dBs, 47 kohm
	SP: 3 hours with T-180 tape	Audio output	-6 dBs, less than 4.7 kohm
	LP: 6 hours with T-180 tape (playback only)	Audio frequency response	100 Hz - 10 kHz (at SP)
	EP: 9 hours with T-180 tape	Audio S/N	More than 43 dB (at SP)
Tape speed		Operating temperature	5°C to 35°C
	SP: 33.35 mm/sec.	Power requirements	120 V AC, 60 Hz
	LP: 16.67 mm/sec.	Power consumption	14 W (Standby: 3 W)
	EP: 11.12 mm/sec	Dimensions	360 (W) x 278 (D) x 95 (H) mm (14 1/4 x 11 x 3 3/4 in.)
Fast forward/Rewind time	Less than 180 seconds with T-120 tape	Weight	3.3 kg (7.26 lbs.)
Channel coverage	VHF: 2 to 13 UHF: 14 to 69 CATV: 4A, 2 to 13, A to W, W + 1 to W + 58, A-5 to A-1, W + 59 to W +84		

• Design and specifications are subject to change without notice.

ACCESSORIES LIST

DESCRIPTIONで判断できない物は "REFERENCE NAME LIST" を参照してください。
If can't understand for Description please kindly refer to "REFERENCE NAME LIST".

REF. NO	PART NO.	KANRI NO.	DESCRIPTION
1	S8-35R-M00-34E		INSTRUCTION ASSY
2	S7-11R-1N0-32A		REMOTE CONTROLLER A
3	S8-615-06F-000		RF MONO SEARS CABLE SET ASSY

DISASSEMBLY INSTRUCTIONS

1. Top Case Removal

- 1) Remove 4 screws holding the top case.

2. Panel Front Removal (see Fig. 1)

- 1) Release 7 tabs, and then remove the panel front.

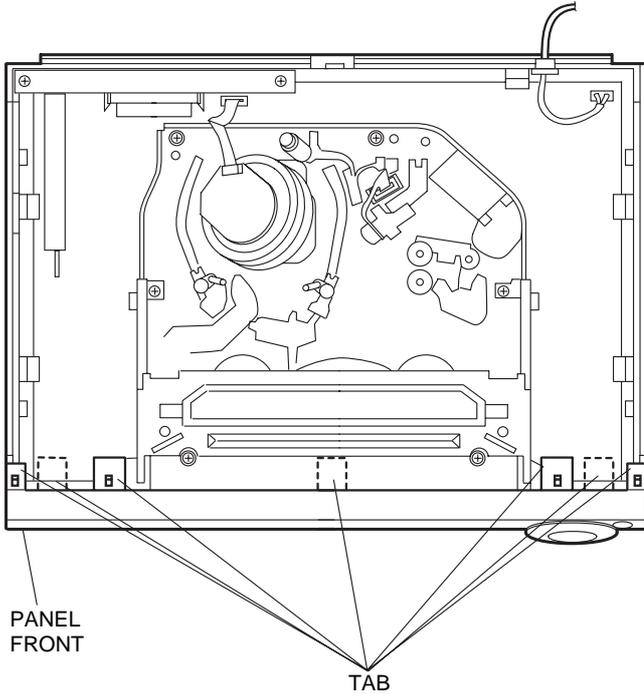


Fig. 1

4. Mechanism Removal (see Fig. 3)

- 1) Disconnect the drum FF cable from the connector (PMD01) on the Main C.B.
- 2) Disconnect the ACE head FF cable from the connector (P3D02) on the Main C.B.
- 3) Remove 6 screws (A).

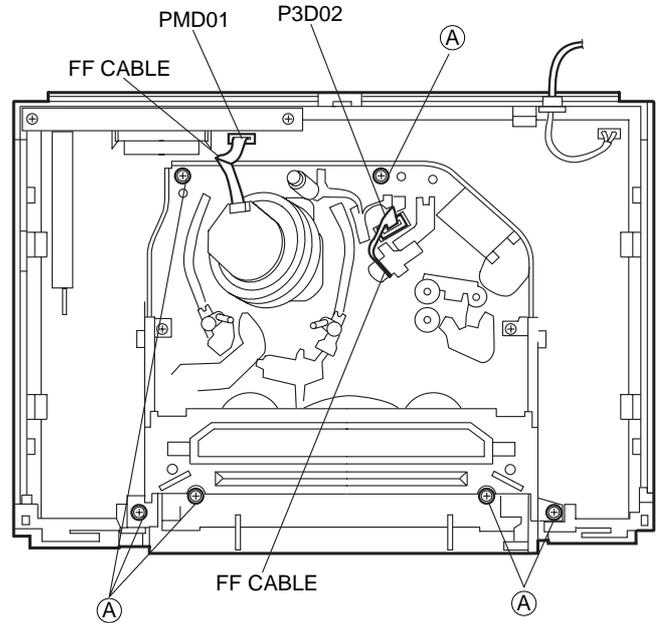


Fig. 3

3. Front-1 C.B. and Front-2 C.B. Removal (see Fig. 2)

- 1) Release 2 tabs, and then remove front-1 C.B. from the connector (PKM02) in the direction of arrow (1).
- 2) Release the tab, and then remove front-2 C.B. from the connector (PKM01) in the direction of arrow (2).

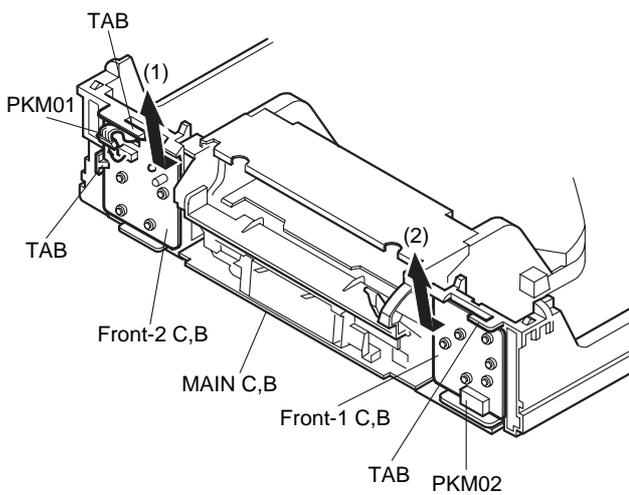


Fig. 2

5. Main C.B. Removal (see Fig. 4)

- 1) Remove 2 SCREWS B holding the panel assy, distributor.
- 2) Release 5 tabs, and then simultaneously lift the panel assembly, distributor and Main C.B. to remove them.

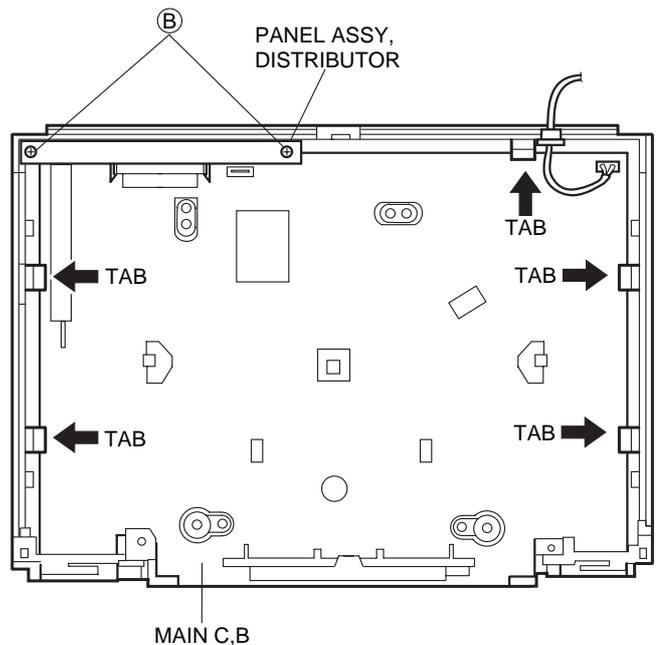
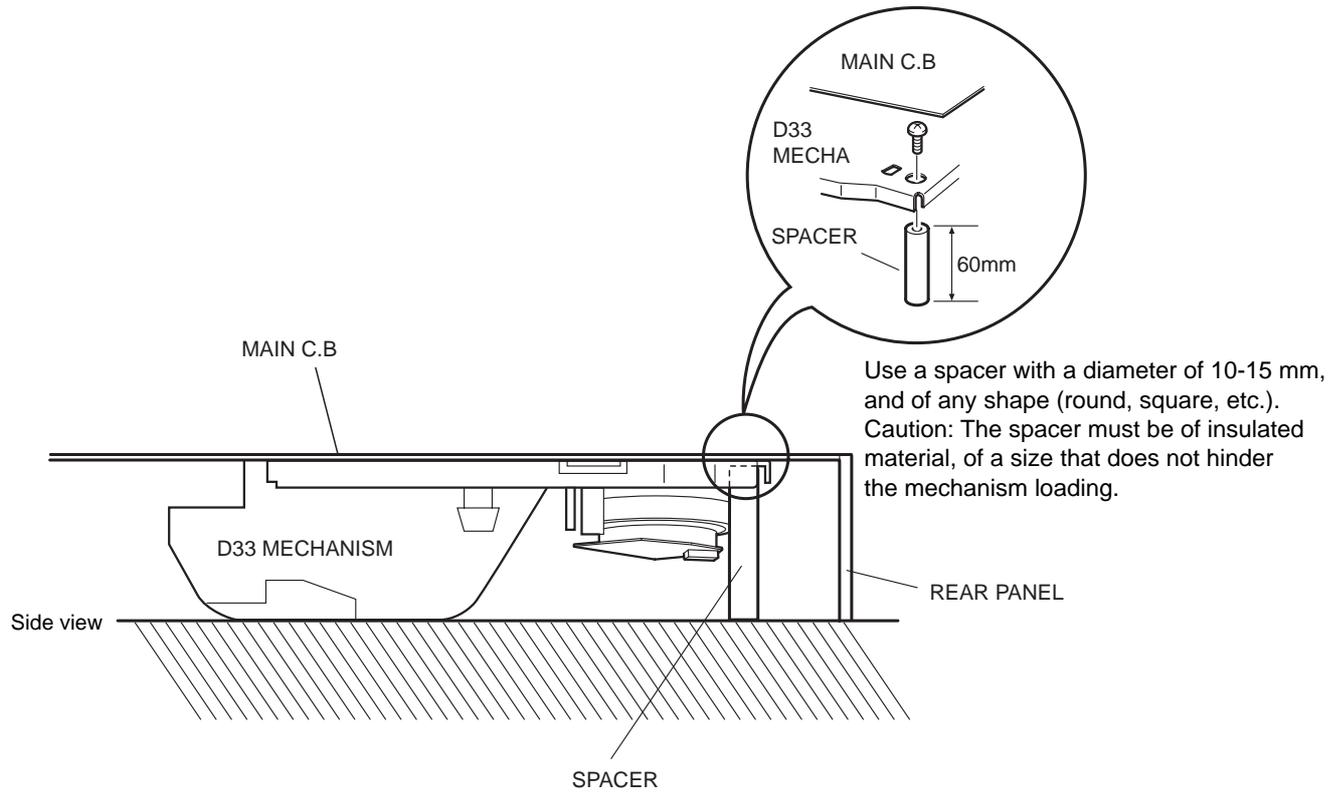


Fig. 4

SERVICE POSITION

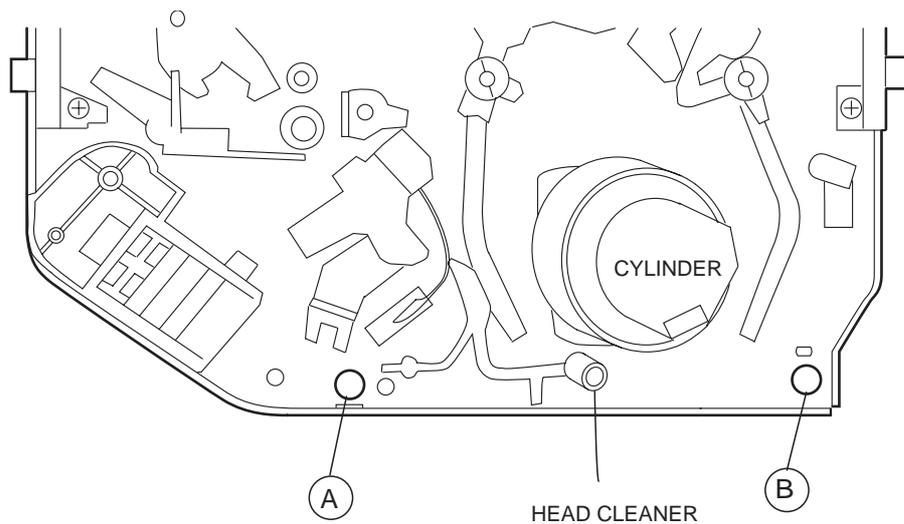
To set the mechanism to the service position in active status:

Insert a spacer as shown below: The service position can be set in the stable status without any defective contact.



Location

Install spacers at locations (A) and (B).



D33 Mechanism Top View

VCR TEST TAPE INTERCHANGEABILITY TABLE

There are two types of the new alignment tape CH-1B (for NTSC) and CH-2 (for PAL). On each tape four signals (1)-(4) are recorded for the times and in the order shown below.

(1) : 8min. → (2) : 2min. → (3) : 5min. → (4) : 5min.

The TTV-MP1 (for M-PAL), TTV-MS1 (for MESECAM) and TTV-S1 (for SECAM) alignment tapes have the same contents as the previous tapes.

Method	Now in use TYPE		New TYPE		Application
	Model	Contents *1	Model	Contents *1	
NTSC	TTV-N1	NTSC, Color bar, 1 kHz, SP	CH-1B(2)	NTSC, Stairsteps, 1 kHz, SP	PB-Y Level/General electrical ADJ. Head ACE Height/Tilt ADJ.
	TTV-NS1	NTSC, Color bar, 1 kHz, SP	No Changed.		For S-VHS (SQPB) check
	TTV-N1E	NTSC, Color bar, 1 kHz, EP	CH-1B(4) *2	NTSC, Color bar, 1 kHz, EP	Switching position ADJ.
	TTV-NS6E	NTSC, Color bar, No sound, EP	No Changed.		For S-VHS (SQPB) check
	TTV-N2	NTSC, Stairsteps, 7 kHz, SP	CH-1B(1)	NTSC, Stairsteps, 7 kHz, SP	Head ACE Azimuth ADJ.
	TTV-N12 (SCV-1998)	NTSC, Color bar, 1 kHz, SP	CH-1B(4)	NTSC, Color bar, 1 kHz, EP	FM Envelope ADJ. X-Value ADJ.
	TTV-N6 (TTV-N06T)	NTSC, Mono scope, 7 kHz, SP	No Changed.		For total picture quality check (resolution, etc)
	TTV-N7A	NTSC, Stairsteps, 1 kHz, SP, HiFi 400 Hz	CH-1B(3)	NTSC, Color bar, No sound SP, HiFi 400 Hz	HiFi Audio PB Level ADJ.
PAL	TTV-P1	PAL, Color bar, 1 kHz, SP	CH-2 (2) * 3	PAL, Stairsteps, 1 kHz, SP	Switching position ADJ. PB-Y Level/General electrical ADJ. Head ACE Height/Tilt ADJ.
	TTV-P1L	PAL, Color bar, 1 kHz, LP	CH-2 (4)	PAL, Color bar, 1 kHz, LP	Switching position. (LP Model) FM Envelope ADJ. (LP Model) X-Value ADJ. (LP Model)
	TTV-P2	PAL, Stairsteps, 6 kHz, SP	CH-2 (1)	PAL, Stairsteps, 6 kHz, SP	HEAD ACE Azimuth ADJ. FM Envelope ADJ. (SP Model) X-Value ADJ. (SP Model)
	TTV-P6 (TTV-N06T)	PAL, Monoscope, 6 kHz, SP	No Changed.		For total picture quality check (resolution, etc)
	TTV-P7	PAL, Stairsteps, 1 kHz, SP, HiFi 1 kHz	CH-2 (3)	PAL, Color bar, No sound SP, HiFi400 Hz	HiFi Audio PB Level ADJ.
	TTV-P16	PAL, Color bar, 400 Hz, SP, HiFi 1 kHz	No Changed.		FM Filter ADJ.

* 1. Described in the order of color format. video signal. linear audio. tape speed and Hi-Fi audio.

* 2. Use CH-1B (1)-(3) with models used exclusively in the SP mode.

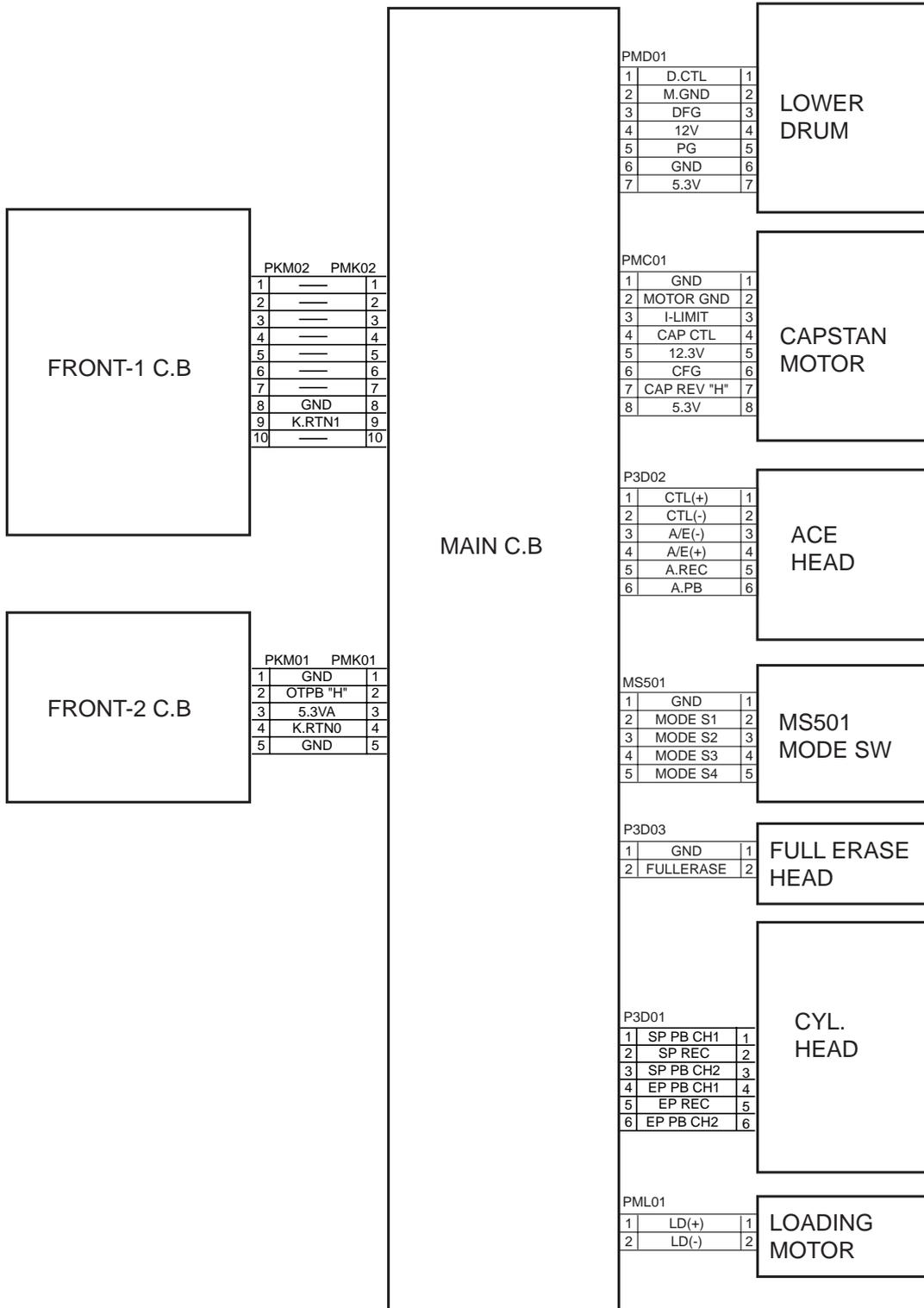
* 3. Use CH-2 (3) and (4) when it is necessary to observe the chroma signal.

ELECTRICAL MAIN PARTS LIST

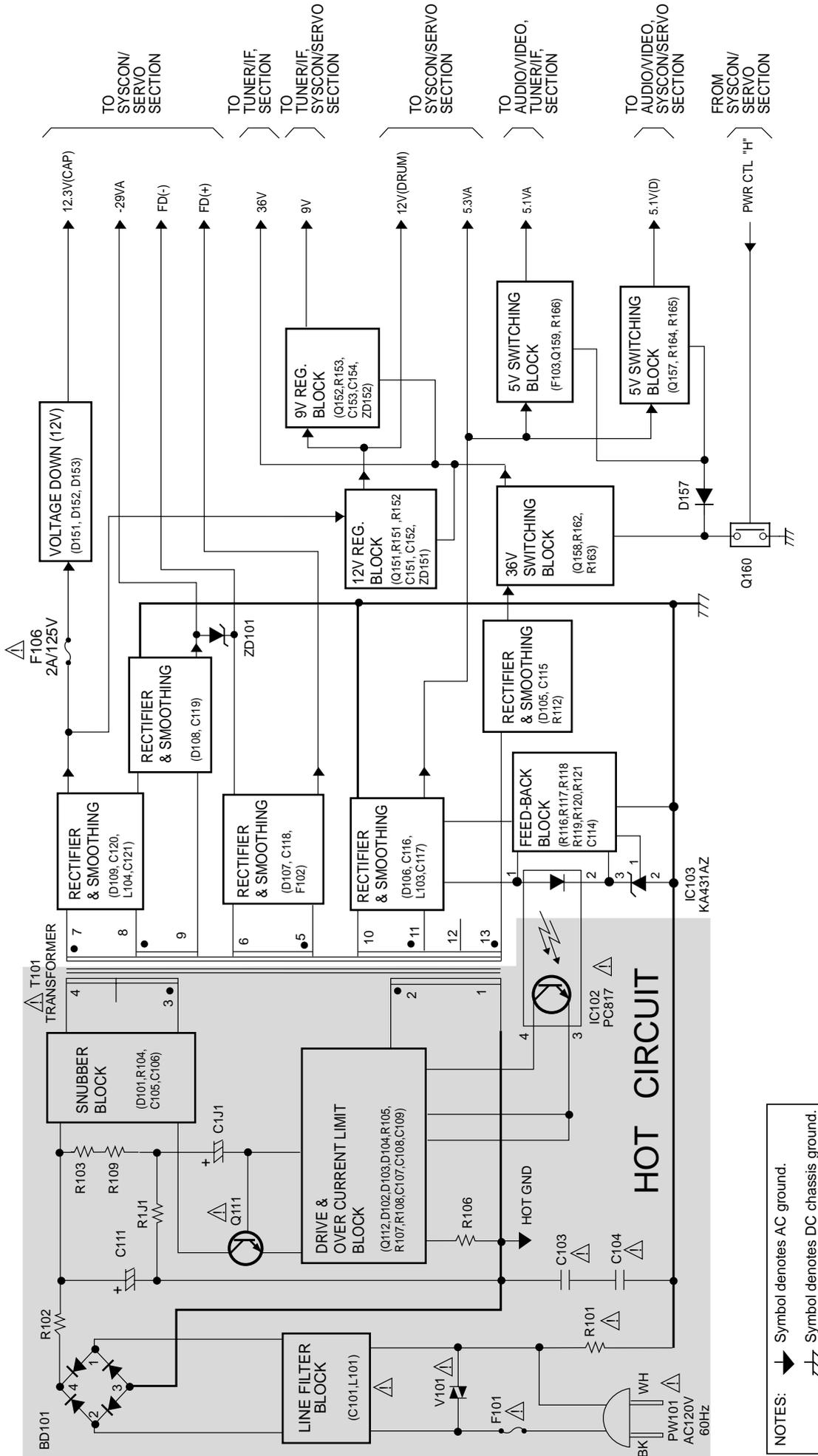
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REF. NO	PART NO.	KANRI NO.	DESCRIPTION	REF. NO	PART NO.	KANRI NO.	DESCRIPTION
IC				C328	87-015-681-080		CAP,E 10-16V
△	S6-570-62A-000	IC,PC817		C330	87-010-402-040		CAP,E 2.2-50V
	SI-SS4-310-00A	IC,KA431AZ		C331	87-015-695-080		CAP,E 1.0-50V
	SI-KE4-310-00A	IC,KIA431 3P		C332	87-010-544-010		CAP,E 0.1-50V
	SI-HI1-187-17A	IC,HA118717NF		C335	87-016-088-040		CAP,E 220-6.3V
	SI-HI3-977-36A	IC,HD3977RC36F		C342	87-015-684-080		CAP,E 47-16V
	SI-SS3-082-00A	IC,KA3082		C345	87-015-698-080		CAP,E 4.7M-50V
	SI-SS7-531-00A	IC,KA7531Z		C347	87-015-698-080		CAP,E 4.7M-50V
	SI-SS7-542-00A	IC,KA7542Z		C350	87-015-695-080		CAP,E 1.0-50V
	87-A20-281-010	IC,MN12510		C352	87-010-402-040		CAP,E 2.2-50V
TRANSISTOR				C358	87-010-403-040		CAP,E 3.3-50V
△	ST-R44-190-0AA	TR,KTC4419		C359	87-015-684-080		CAP,E 47-16V
	ST-R14-140-9AA	TR,KTD1414		C365	87-015-684-080		CAP,E 47-16V
	ST-R31-990-9AF	TR,KTC3199-BL		C370	87-015-681-080		CAP,E 10-16V
	ST-R32-050-9AB	TR,KTC3205-TP-Y		C378	87-015-695-080		CAP,E 1.0-50V
	ST-R10-300-9AE	TR,KRC103M		C500	87-016-040-080		CAP,0.047F-5.5V
	87-026-609-080	TR,KTA1266-GR		C502	87-015-684-080		CAP,E 47-16V
	ST-R31-980-9AC	TR,KTC3198-TP-BL		C503	87-016-088-040		CAP,E 220-6.3V
	ST-R32-030-9AA	TR,KTC3203-Y		C505	87-015-684-080		CAP,E 47-16V
	ST-R12-810-9AA	TR,KTA1281Y		C506	87-016-455-080		CAP,E 470UF-6.3V
	ST-R12-730-9AA	TR,KTA1273-TP-Y		C524	87-010-265-080		CAP,E 33-16V
	ST-R12-670-9AC	TR,KTA1267-GR		C525	87-015-684-080		CAP,E 47-16V
	S3-1KR-A10-3M0	TR,KRA103M-TP		C526	87-010-408-040		CAP,E 47UF-50V
DIODE				C530	87-015-681-080		CAP,E 10-16V
	SD-D01-000-9AC	DIODE,EU01W		C531	87-015-695-080		CAP,E 1.0-50V
	87-020-215-010	DIODE,ERC81-004L		C534	87-015-698-080		CAP,E 4.7M-50V
	87-017-011-080	DIODE,IN4003A		C535	87-015-698-080		CAP,E 4.7M-50V
	87-020-465-080	DIODE,1SS133		C540	87-015-684-080		CAP,E 47-16V
	87-070-173-010	DIODE,S1WBA60		C541	87-015-698-080		CAP,E 4.7M-50V
	SD-D01-000-9CB	DIODE,EG01AW		C546	87-015-684-080		CAP,E 47-16V
	SD-D22-060-9AA	DIODE,ERA22-06		C547	87-015-684-080		CAP,E 47-16V
	SD-D31-040-9AA	DIODE,31DQ04		C561	87-015-684-080		CAP,E 47-16V
	87-017-352-010	DIODE,RU3YXLF-C1 100V2		C588	87-015-698-080		CAP,E 4.7M-50V
	SD-R10-551-0AA	DIODE,RZ1055LF-C1		C5F6	87-015-698-080		CAP,E 4.7M-50V
MAIN C.B				C5F7	87-015-684-080		CAP,E 47-16V
△C101	S6-240-88F-000	CAP,PCX2 275V 0.1UF,M		C5F8	87-015-684-080		CAP,E 47-16V
△C103	S6-240-86B-000	CAP,103-400V		C701	87-015-698-080		CAP,E 4.7M-50V
△C104	S6-240-86B-000	CAP,103-400V		C702	87-016-455-080		CAP,E 470UF-6.3V
△C105	87-016-375-010	CAP,0.01UF-630V		C704	87-010-544-010		CAP,E 0.1-50V
△C106	87-016-533-010	CAP,220PF/1KV		C705	87-016-455-080		CAP,E 470UF-6.3V
C111	87-A11-809-010	CAP,E 100UF-250V		C708	87-010-403-040		CAP,E 3.3-50V
C115	87-010-408-040	CAP,E 47UF-50V		CS501	S6-00R-DB0-04B		SW SPPB62042 5V
C116	87-016-623-080	CAP,E 1000UF-10V		CS501	S6-00R-DB0-04C		SW,MPU10252MLB4 MIC
C117	S6-240-83E-000	CAP,1000-10V		DIG5F1	S3-02R-2N0-03B		DH SVV07MM16 MONO
C118	87-010-375-080	CAP,E 330-10V		DIG5F1	S3-02R-1N0-03B		LEVEL METER 7MT229GK
C119	87-010-408-040	CAP,E 47UF-50V		ES501	S9-31R-001-6A0		SENSOR END
C120	87-010-387-010	CAP,E 470UF-25V KME		ES502	S9-31R-001-6A0		SENSOR END
C121	87-010-387-080	CAP,E 470UF-25V		△F101	S5-850-27B-000		FUSE,1600MA 250V
C151	87-015-698-080	CAP,E 4.7M-50V		△F102	87-020-840-080		ICP-N20
C152	87-015-681-080	CAP,E 10-16V		△F103	87-020-840-080		ICP-N20
C153	87-010-060-080	CAP,E 100-16V		△F106	S5-850-35V-000		F 2000MA 125 V 3-7.5
C154	87-015-698-080	CAP,E 4.7M-50V		△FH01	S5-860-08B-000		FUSE CLUMP
L1J1	87-010-403-040	CAP,E 3.3-50V		△FH02	S5-860-08B-000		FUSE CLUMP
C302	87-010-552-040	CAP,E 22-16V		FL301	S6-330-32N-000		COIL,BIAC OSC DEO-010 KSE
C304	87-015-698-080	CAP,E 4.7M-50V		JK301	S5-720-80D-000		JACKBJP-404F
C306	87-015-698-080	CAP,E 4.7M-50V		△L101	S6-161-45E-000		FILTER KSE-145E
C307	87-015-681-080	CAP,E 10-16V		△L101	S6-161-45G-000		FL SHT LFSQ2215V4-04220
C311	87-010-552-040	CAP,E 22-16V		L103	S6-330-88G-000		COIL,CHOCK TP 5MM
C312	87-015-698-080	CAP,E 4.7M-50V		L104	S6-330-88G-000		COIL,CHOCK TP 5MM
C315	87-015-684-080	CAP,E 47-16V		L301	87-005-208-080		COIL,100
C317	87-015-684-080	CAP,E 47-16V		L302	87-005-208-080		COIL,100
C320	87-015-681-080	CAP,E 10-16V		L303	87-A50-002-080		COIL,270U 2.3-3.4-5
C324	87-015-681-080	CAP,E 10-16V		L304	87-005-696-080		COIL,100UH
C327	87-010-403-040	CAP,E 3.3-50V		L305	87-005-688-080		COIL,22UH
				L306	87-005-685-080		COIL,12UH
				L309	87-005-208-080		COIL,100
				L310	87-005-208-080		COIL,100
				L311	87-003-152-080		INDUCTOR,100M 2.3-3.4-5
				L3P1	87-003-129-080		INDUCTOR,6800
				L3P2	87-005-696-080		COIL,100UH

WIRE HARNESS DIAGRAM

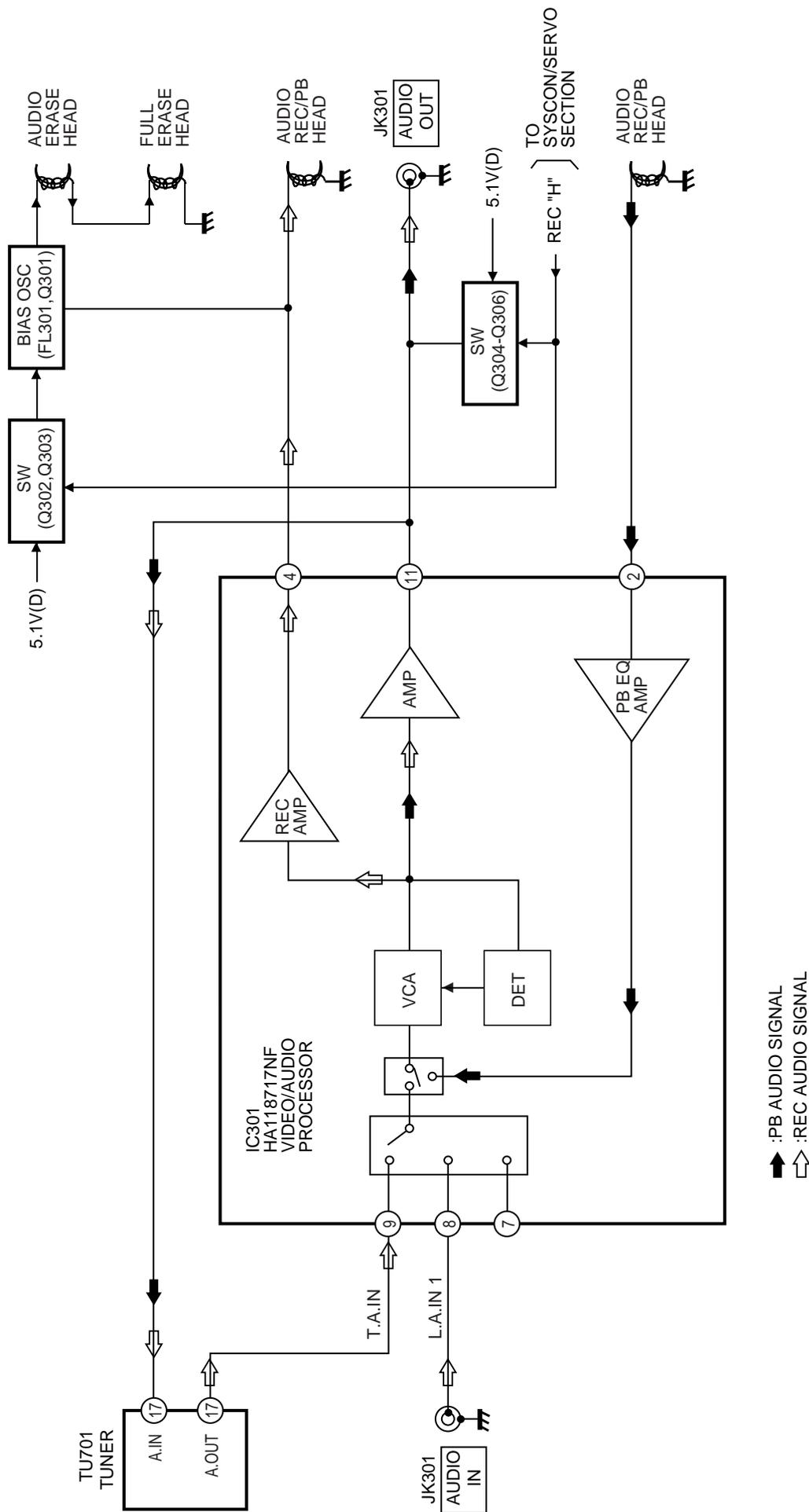


BLOCK DIAGRAM-1 (POWER SECTION)

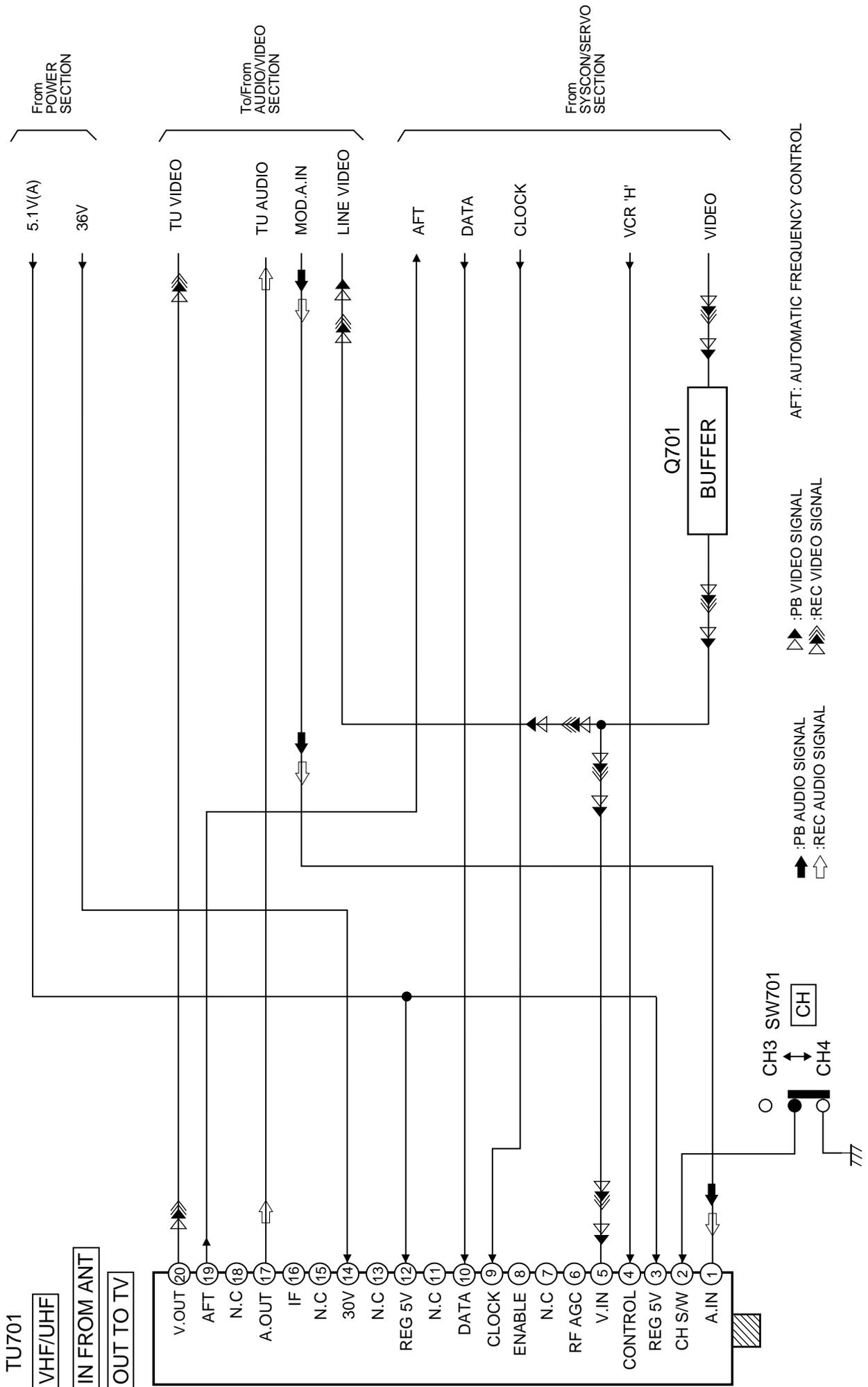


NOTES:
 ➤ Symbol denotes AC ground.
 ⚡ Symbol denotes DC chassis ground.

BLOCK DIAGRAM-2 (AUDIO SECTION)

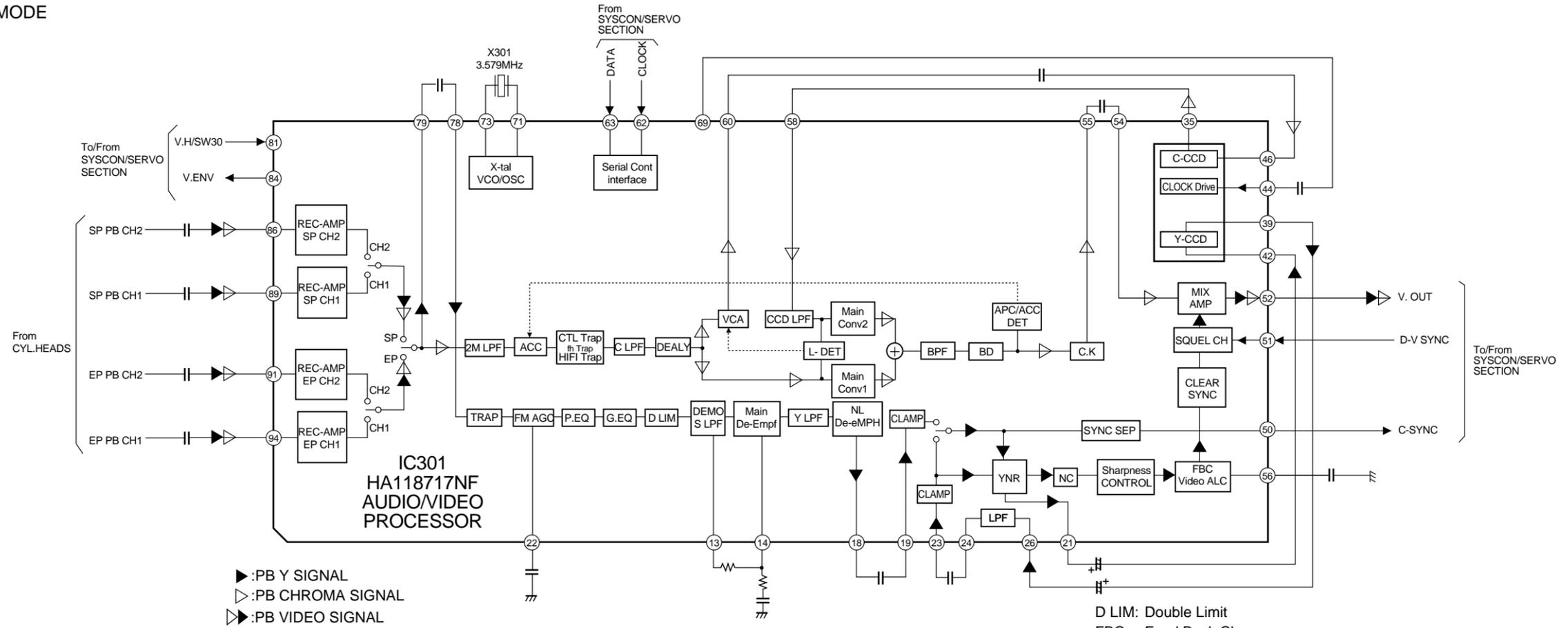


BLOCK DIAGRAM-3 (TUNER SECTION)

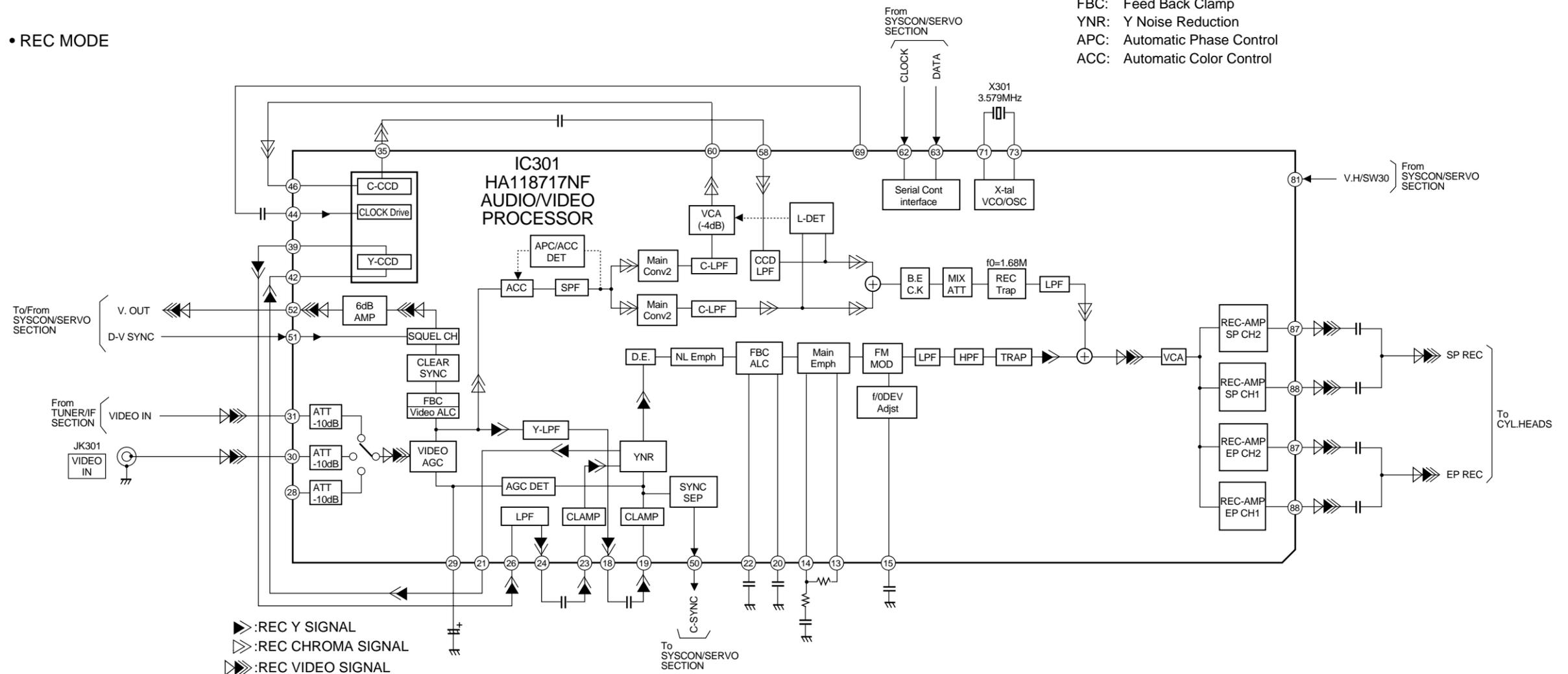


BLOCK DIAGRAM-4 (VIDEO SECTION)

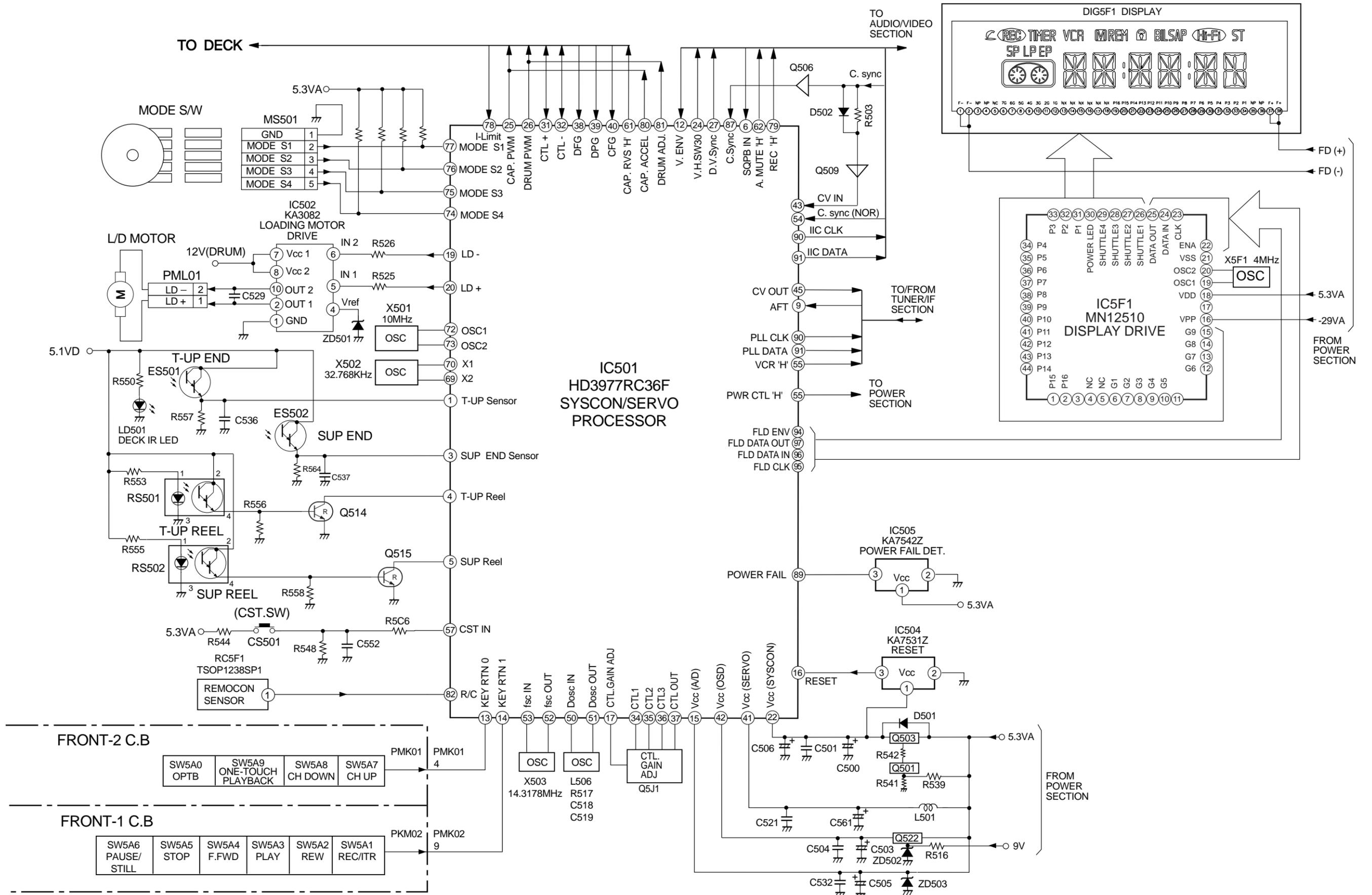
• PB MODE

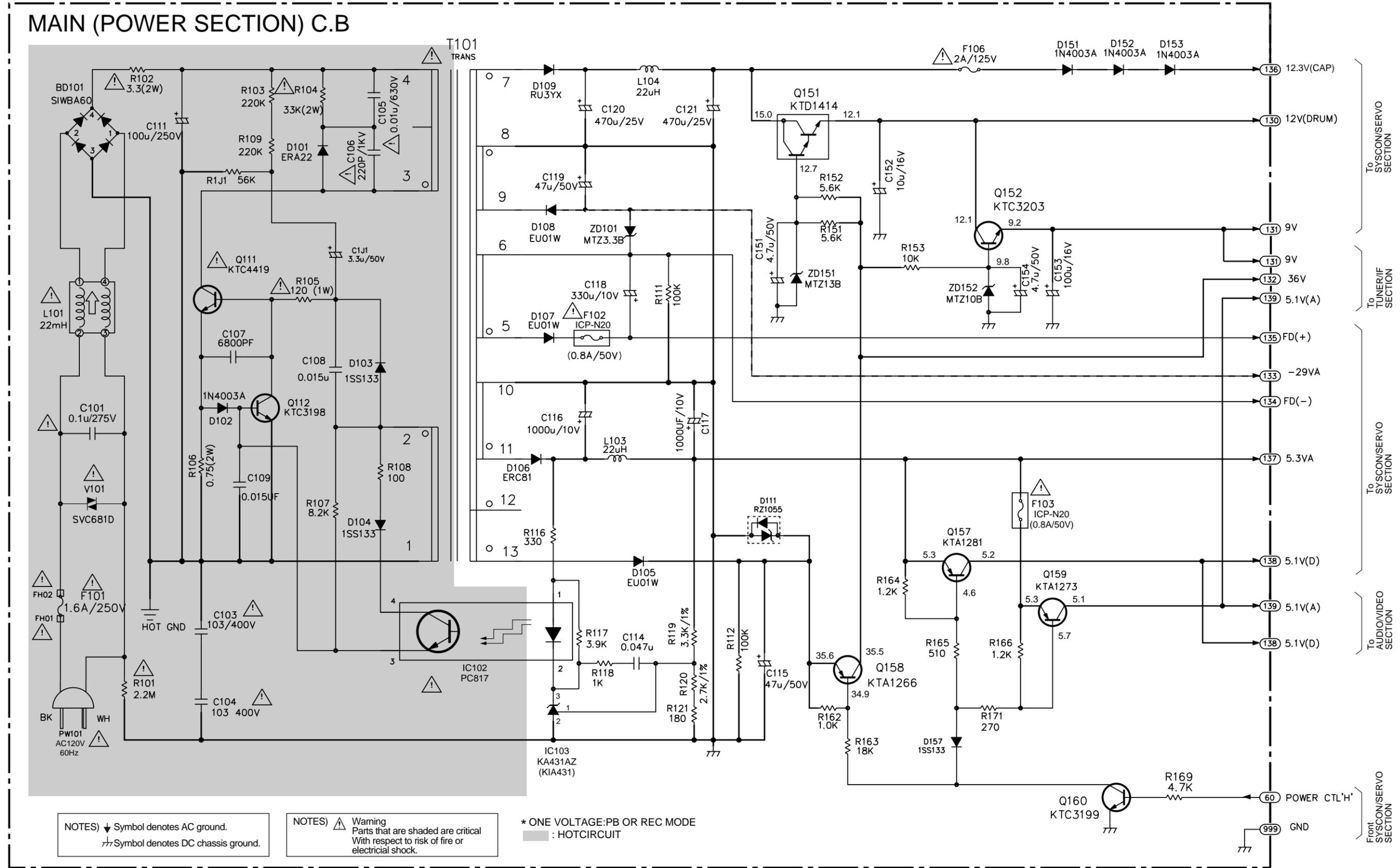


• REC MODE

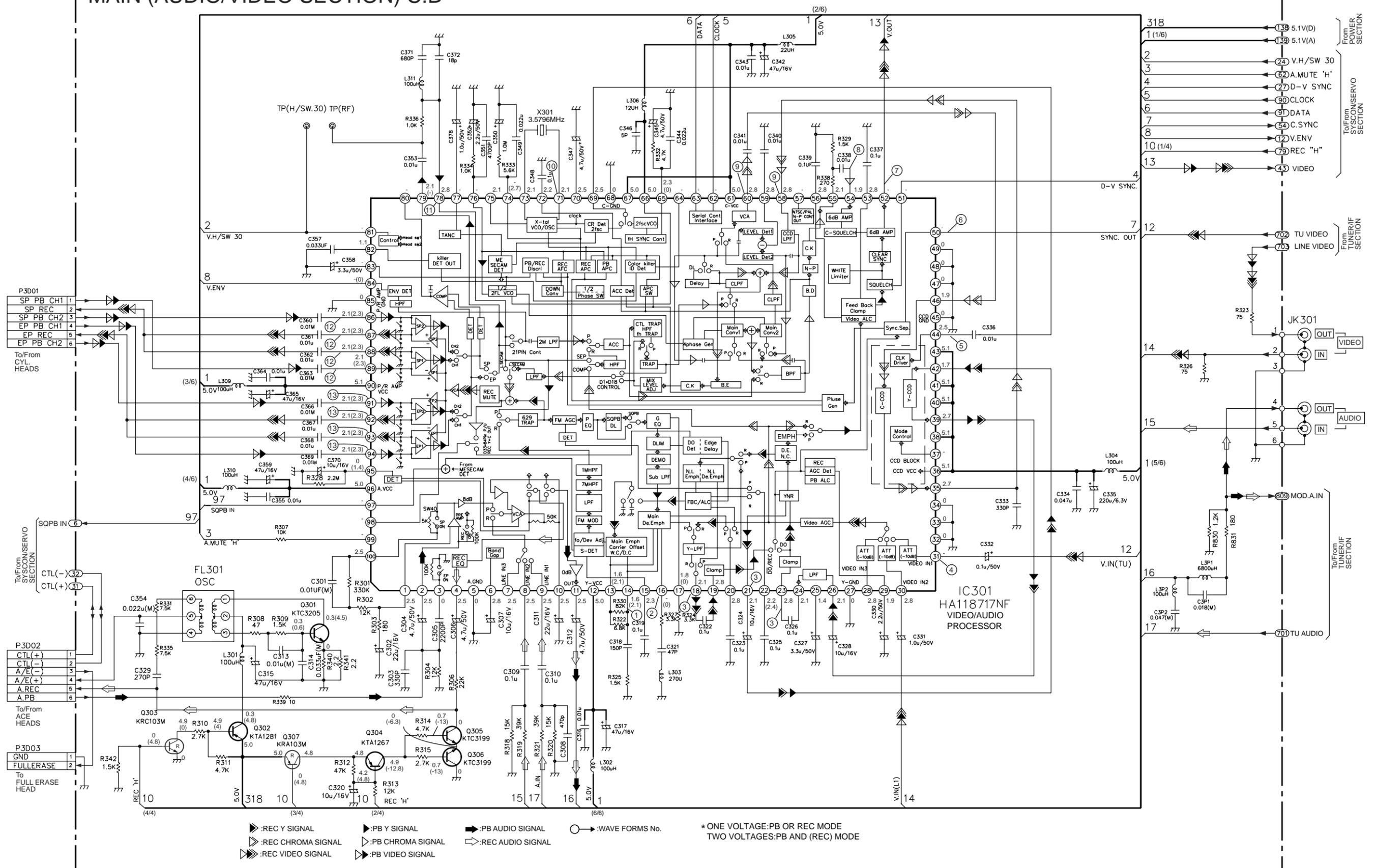


BLOCK DIAGRAM-5 (SYSTEM CONTROL SECTION)

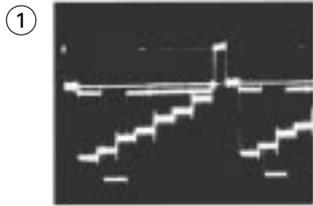




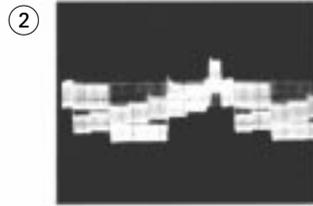
MAIN (AUDIO/VIDEO SECTION) C.B



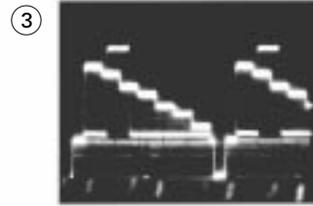
WAVEFORM-1 (VIDEO SECTION)



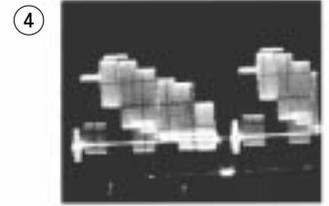
IC301 Pin 14
100mV/10µsec DIV
VV/EE
(Main De-Emphasis out)



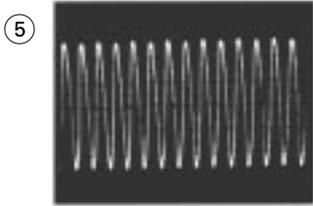
IC301 Pin 16
100mV/10µsec DIV
PB
(Main De-Emphasis Peaking)



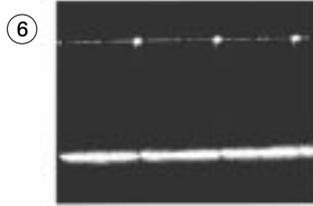
IC301 Pin 18, 21, 23
100mV/10µsec DIV
VV/EE
Clamp Drive In Pin 18
Y-out (to 1H CCD) Pin 21
Y-out (from 1H CCD) Pin 23



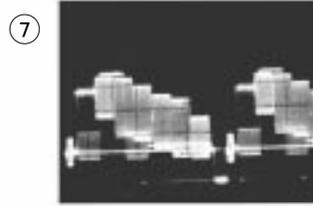
IC301 Pin 31
200mV/10µsec DIV
EE
(VIDEO IN)



IC301 Pin 44
100mV/0.2msec DIV
REC/PB
(2fsc)



IC301 Pin 50
1.0mV/20µsec DIV
VV/EE
(C-SYNC OUT)



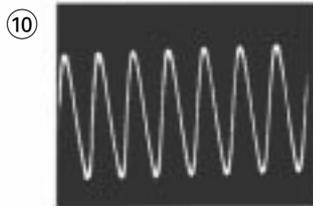
IC301 Pin 52
500mV/10µsec DIV
VV/EE
(VIDEO OUT)



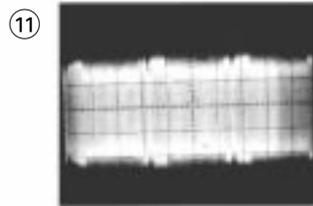
IC301 Pin 54
220mV/20µsec DIV
PB
(C.OUT)



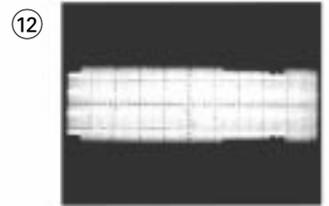
IC301 Pin 58, 60
200mV/20µsec DIV
VV/EE
(from 1H CCD Pin 58 to 1H CCD Pin 60)



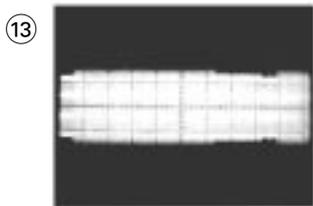
IC301 Pin 71
100mV/0.2msec DIV
PB/REC
(3.58MHz X-TAL IN)



IC301 Pin 78
100mV/5msec DIV
PB
(PB RF out)

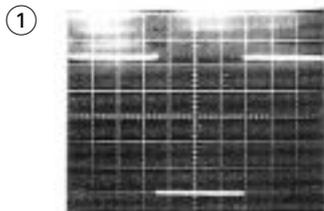


IC301 Pin 86, 87, 88, 89
500mV/2msec DIV
SP REC
(REC RF)

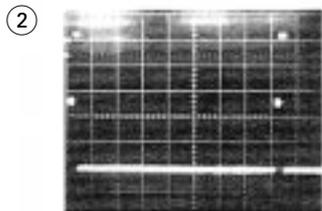


IC301 Pin 91, 92, 93, 94
500mV/2msec DIV
EP REC
(REC RF)

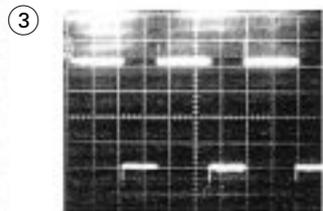
WAVEFORM-2 (SERVO/OSD SECTION)



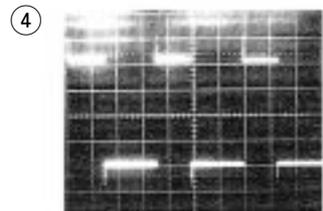
IC501 Pin ②④
1V/5msec DIV
REC/PB
(V.H/SW)



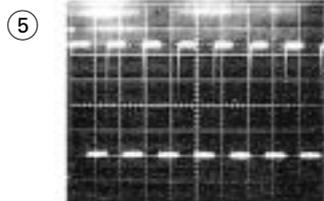
IC501 Pin ②⑦
1V/2msec DIV
QUE/REV
(D.V-SYNC)



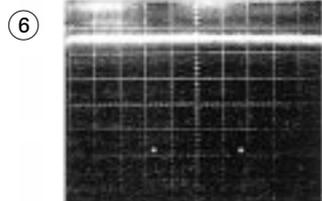
IC501 Pin ③①
1V/10msec DIV
REC
(CTL+)



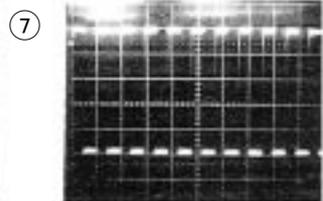
IC501 Pin ③②
1V/10msec DIV
REC
(CTL-)



IC501 Pin ③⑧
1V/1msec DIV
REC/PB
(DFG)



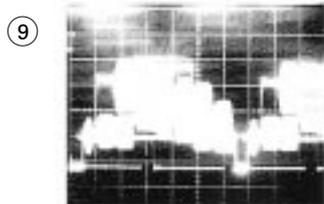
IC501 Pin ③⑨
1V/10µsec DIV
REC/PB
(DPG)



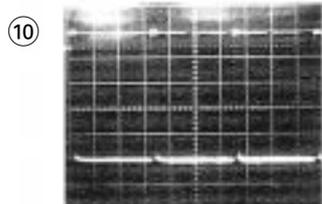
IC501 Pin ④⑩
1V/1msec DIV
REC/PB
(CFG)



IC501 Pin ④③
100mV/10µsec DIV
EE/PB
(V-IN)

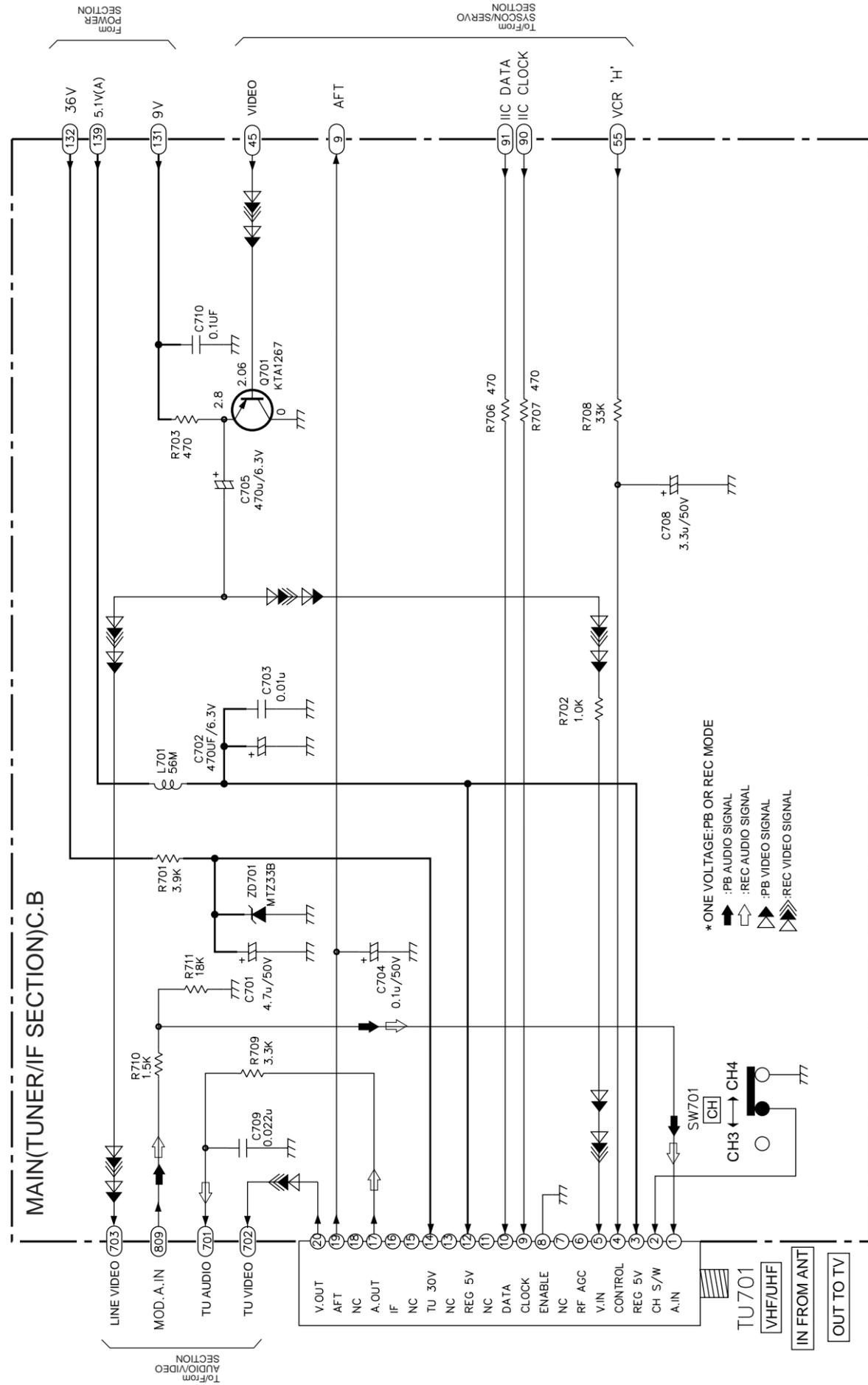


IC501 Pin ④⑤
500mV/10µsec DIV
EE/PB
(V-OUT)



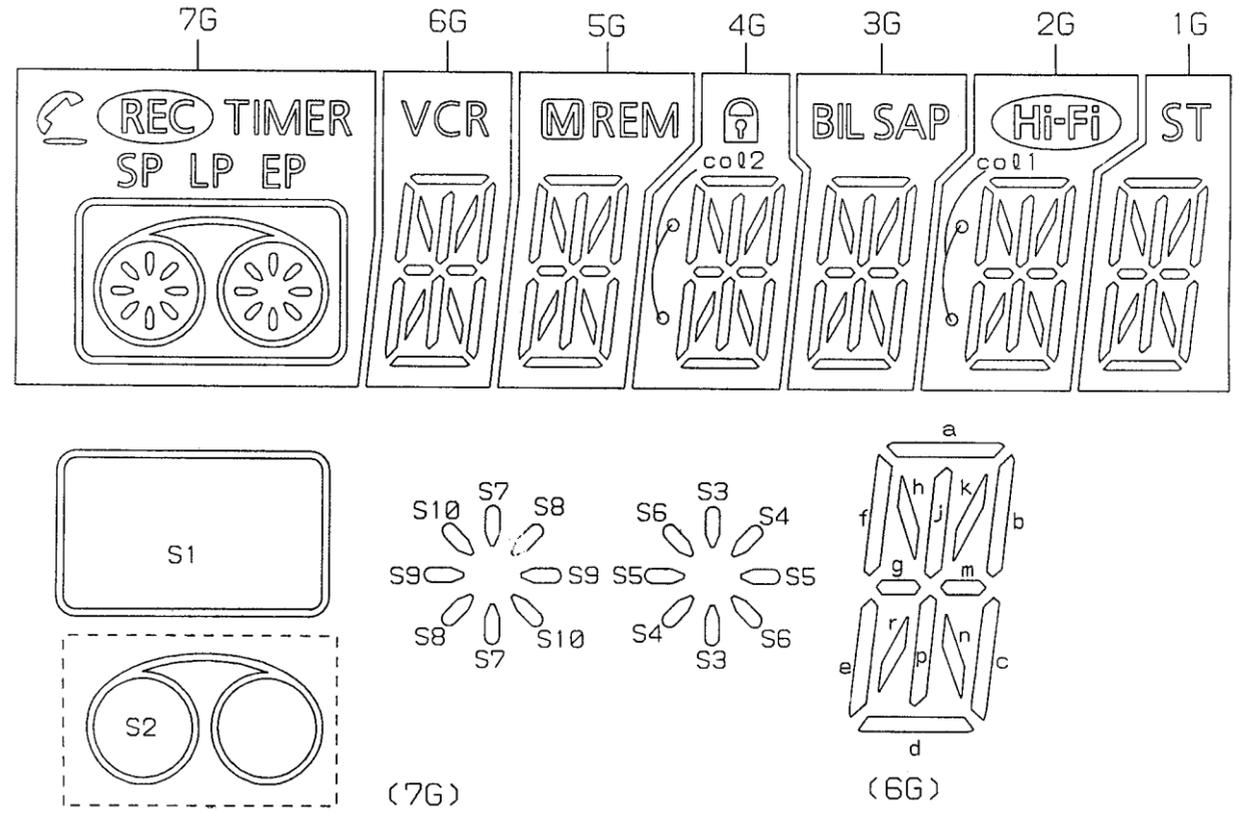
IC501 Pin ⑤④
1V/20µsec DIV
EE/PB
(C-SYNC)

SCHEMATIC DIAGRAM-4 (TUNER SECTION)



FL DISPLAY

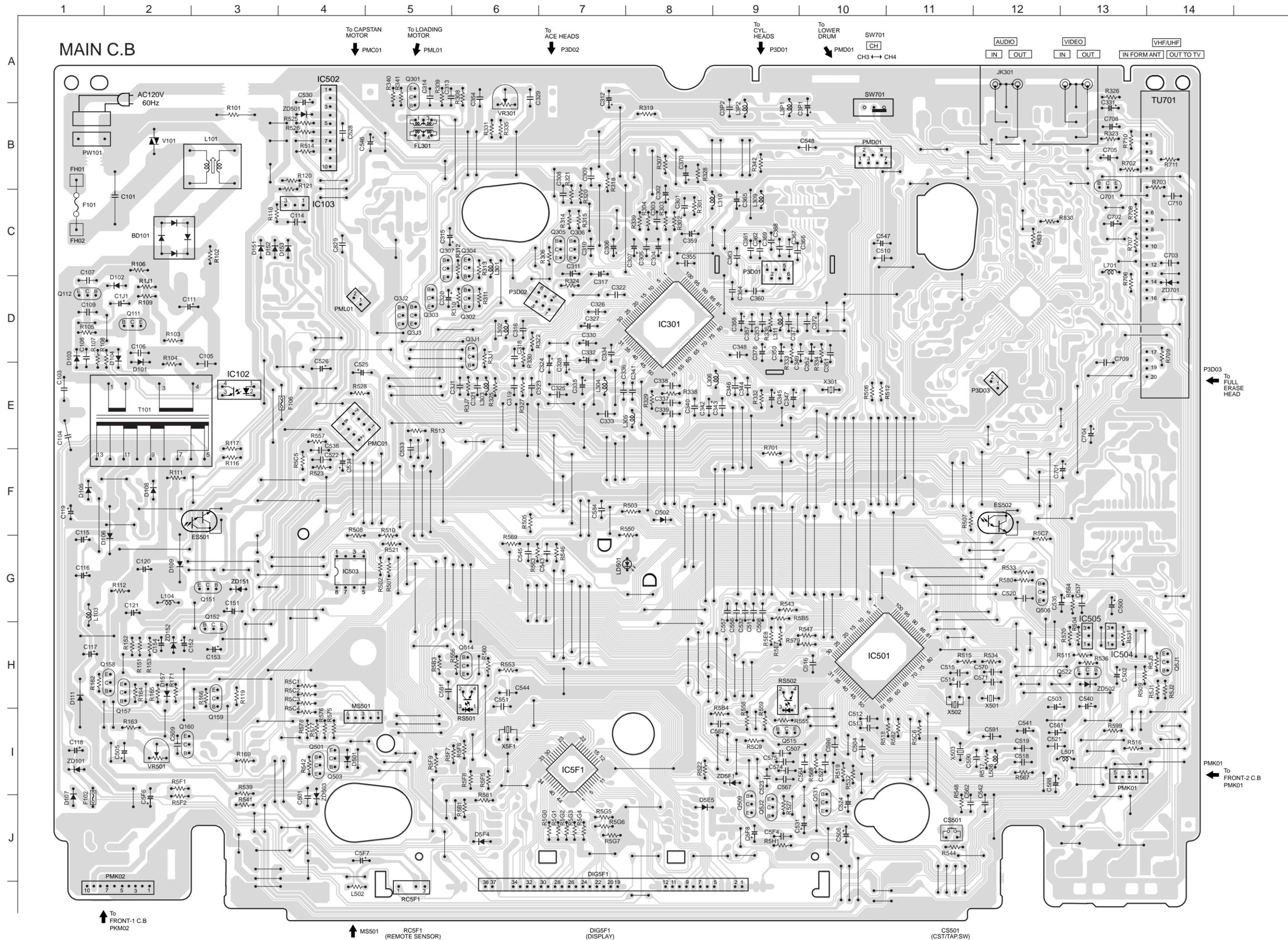
• GRID ASSIGNMENT



• ANODE CONNECTION

	7G	6G	5G	4G	3G	2G	1G
P1	TIMER	VCR	M	col2	SAP	HI-FI	ST
P2	REC	-	REM	col2	BIL	col1	-
P3	a	a	a	a	a	a	a
P4	EP	h	h	h	h	h	h
P5	LP	j	j	j	j	j	j
P6	SP	k	k	k	k	k	k
P7	S1	b	b	b	b	b	b
P8	S2	f	f	f	f	f	f
P9	S3	m	m	m	m	m	m
P10	S4	g	g	g	g	g	g
P11	S5	c	c	c	c	c	c
P12	S6	e	e	e	e	e	e
P13	S7	r	r	r	r	r	r
P14	S8	p	p	p	p	p	p
P15	S9	n	n	n	n	n	n
P16	S10	d	d	d	d	d	d

WIRING-1 (MAIN C.B SECTION)



MAIN C.B

AC120V
60Hz

To CAPSTAN
MOTOR
↓
PMC01

To LOADING
MOTOR
↓
PML01

To ACE HEADS
↓
P3D02

To
HEADS
↓
P3D01

To
LOWER
DRUM
↓
PMD01

SW701
CH
CH3 ← CH4

AUDIO
IN OUT

VIDEO
IN OUT

VHF/UHF
IN FORMANT OUT TO TV

P3D03
TO
FULL
ERASE
HEAD

PMK01
TO
FRONT-2 C.B
PMK01

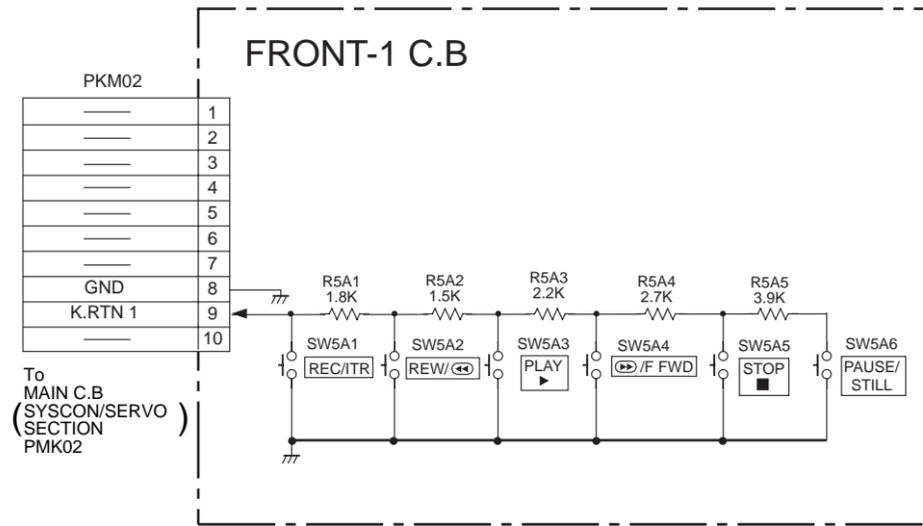
↑
To
FRONT-1 C.B
PKM02

↑
MS501
RC5F1
(REMOTE SENSOR)

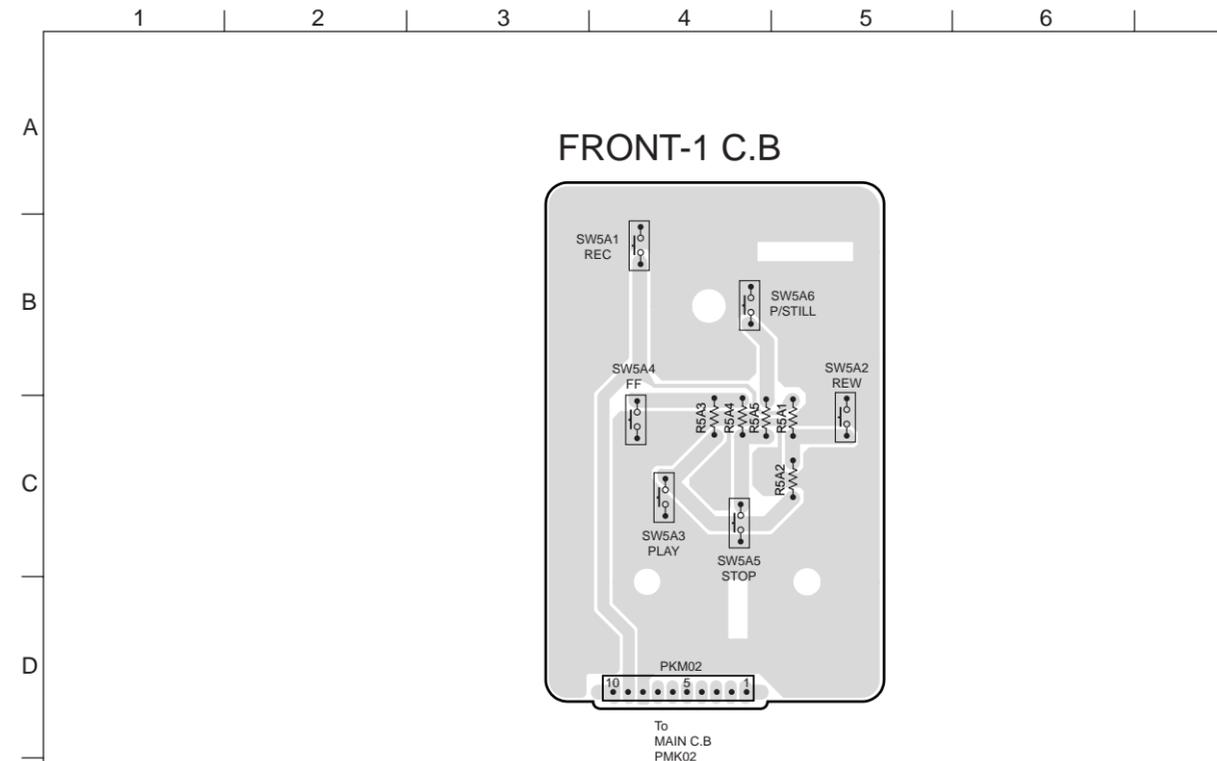
DIG5F1
(DISPLAY)

CS501
(CST/TAP.SW)

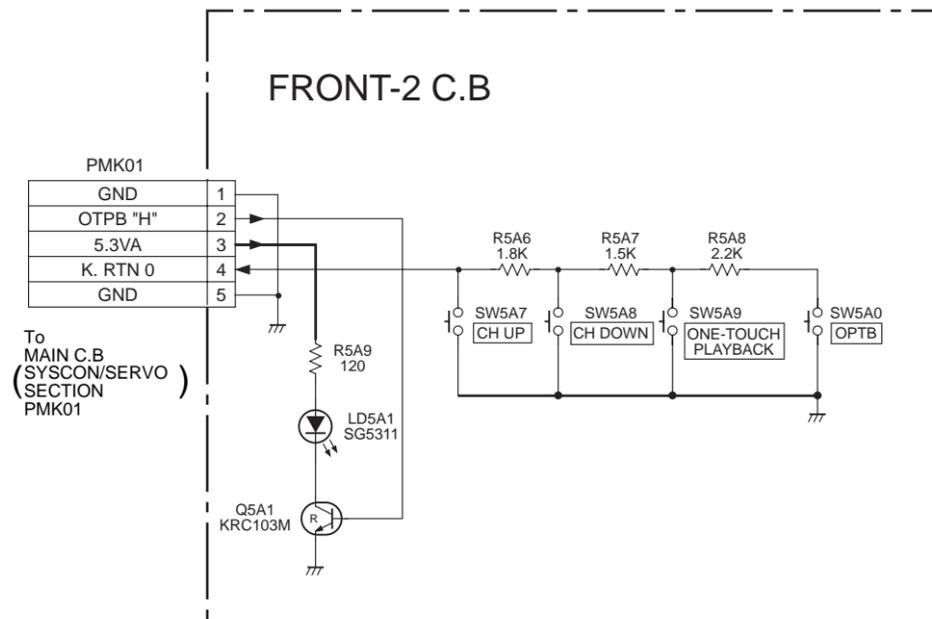
SCHEMATIC DIAGRAM-5 (FRONT-1 SECTION)



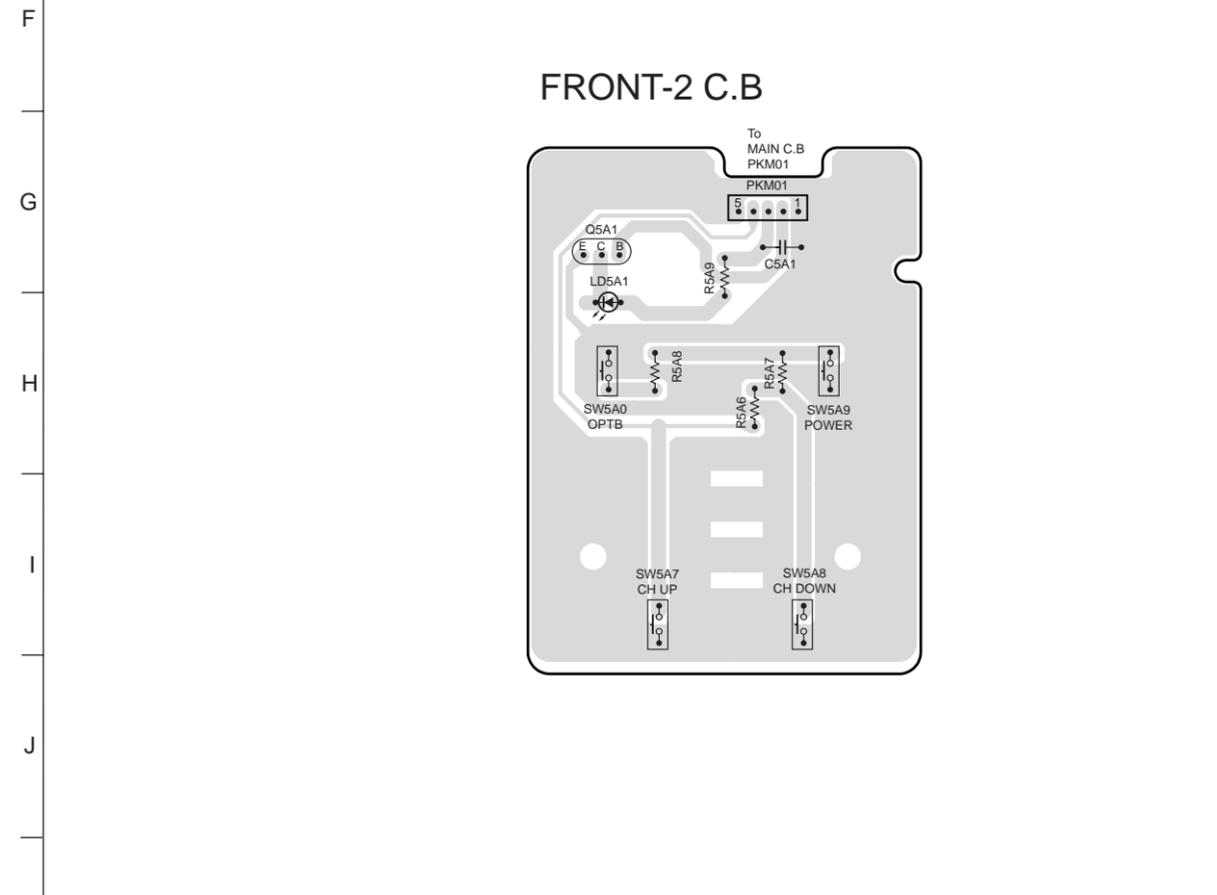
WIRING-2 (FRONT-1 C.B SECTION)



SCHEMATIC DIAGRAM-6 (FRONT-2 SECTION)



WIRING-3 (FRONT-2 C.B SECTION)



IC DESCRIPTION

IC, HD3977RC36F

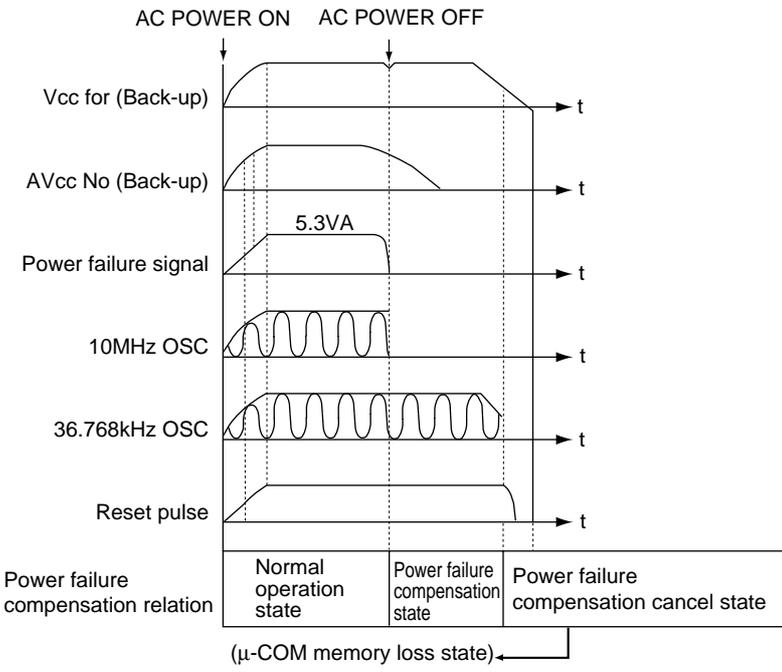
Pin No.	Pin Name	I/O	Description								
1	TAKE UP SENSOR	I	End sensor to detect the tape's terminal (Lead taps section). If "H" is detected signal in the REW, REV modes, the mechanism stops and ejects the cassette automatically.								
2	VSS (A/D)	-	GND								
3	END SENSOR	I	End sensor to detect tape's terminal (Lead tape section). If "H" signal is detected in the FF mode, then REW mode will occur automatically.								
4	TAKE UP REEL	I	<ol style="list-style-type: none"> When the tape is transporting. Reel pulses are input. If the tape is transporting and take-up reel pulses are not input during regular time, the unit stops at STOP point automatically. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Each operating mode</th> <th>Sec</th> </tr> </thead> <tbody> <tr> <td>PLAY, REC</td> <td>SP=3 EP/LP=6</td> </tr> <tr> <td>FF, (REW)</td> <td>2</td> </tr> <tr> <td>CUE, (REV)</td> <td>1</td> </tr> </tbody> </table> <ol style="list-style-type: none"> Distinguishes the tape type, counts the tape remaining and reduces the tape speed at the end of FF/REW modes. 	Each operating mode	Sec	PLAY, REC	SP=3 EP/LP=6	FF, (REW)	2	CUE, (REV)	1
Each operating mode	Sec										
PLAY, REC	SP=3 EP/LP=6										
FF, (REW)	2										
CUE, (REV)	1										
5	SUPPLY REEL	I	<ol style="list-style-type: none"> When the tape is transporting, Reel pulses are input. Distinguishes the tape type, counts the tape remaining and reduces the tape speed at the end of FF/REW modes. If supply reel pulses are not detected, FF/REW mode is not operating normally. And the unit stops at stop point automatically. (Refer to table of pin 17.) 								
6	SQ PB IN	I	Input "H" signal from AVCP in super tape PB mode. (option)								
7	LEVEL METER "L"	I	Audio "L" signal input for driving level meter on FDP.								
8	LEVEL METER "R"	I	Audio "R" signal input for driving level meter on FDP.								
9	AFT	I	Port to detect AFT (+)'s state during tuning. When more than 4V, is detected by AFT (+) detector. Detects AFT (-)'s state during tuning. When less than 0.96V, is detected by AFT (-) detector.								
10	PG ADJ	I	A DC bias level set by VR501 determines the pulse width of PG M.M for H. S/W 30 switching interval.								
11	A.ENV	I	Input signal to detect Hi-Fi signal. Main signal to perform auto tracking mode. V.ENV signal is the sub signal.								
12	V.ENV	I	<ol style="list-style-type: none"> Reference input signal to perform auto tracking mode. Video envelope (F/F) signal is input through LPF. Perform auto tracking mode by sampling video envelope signal which is input during a period of head switching and changing servo tracking data to obtain maximum value. <p>Note : When the DC level of the envelope is at its maximum, it is considered tracking properly.</p>								
13	KEY RTN 0	I	KEY RTN 0								

Pin No.	Pin Name	I/O	Description																																				
14	KEY RTN 1	I	<table border="1"> <thead> <tr> <th>No.</th> <th>KEY NAME</th> <th>A/D RANGE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>SP/EP</td> <td>0.0V ~ 0.45V</td> </tr> <tr> <td>2</td> <td>CH UP</td> <td>0.46V ~ 0.96V</td> </tr> <tr> <td>3</td> <td>CH DOWN</td> <td>0.97V ~ 1.47V</td> </tr> <tr> <td>4</td> <td>STOP/EJECT</td> <td>1.48V ~ 1.97V</td> </tr> <tr> <td>5</td> <td>REC/ITR</td> <td>1.99V ~ 2.48V</td> </tr> </tbody> </table> <p>KEY RTN1</p> <table border="1"> <thead> <tr> <th>No.</th> <th>KEY NAME</th> <th>A/D RANGE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>PAUSE</td> <td>0.0V ~ 0.45V</td> </tr> <tr> <td>2</td> <td>FF</td> <td>0.46V ~ 0.96V</td> </tr> <tr> <td>3</td> <td>REW</td> <td>0.97V ~ 1.47V</td> </tr> <tr> <td>4</td> <td>PLAY</td> <td>1.48V ~ 1.97V</td> </tr> <tr> <td>5</td> <td>POWER</td> <td>1.99V ~ 2.48V</td> </tr> </tbody> </table> <ol style="list-style-type: none"> Input detector port of A/D input key. Samples 256 steps with AVcc in the center and confirms which key is pressed by the input voltage. Key voltage table. Excluding above item's key after receiving, detecting and amplifying the remoon data from the remoon receiver (RC5F1), decodes input signals from μ-COM (pin 82), performs its key operation. 	No.	KEY NAME	A/D RANGE	1	SP/EP	0.0V ~ 0.45V	2	CH UP	0.46V ~ 0.96V	3	CH DOWN	0.97V ~ 1.47V	4	STOP/EJECT	1.48V ~ 1.97V	5	REC/ITR	1.99V ~ 2.48V	No.	KEY NAME	A/D RANGE	1	PAUSE	0.0V ~ 0.45V	2	FF	0.46V ~ 0.96V	3	REW	0.97V ~ 1.47V	4	PLAY	1.48V ~ 1.97V	5	POWER	1.99V ~ 2.48V
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5	POWER	1.99V ~ 2.48V																																					
15	VCC(A/D)	-	A/D Vcc.																																				
16	RESET	I	<ol style="list-style-type: none"> Initially 5.3 VA is applied to Vcc pin 22 of μ-COM. This pulses is applied to clear the RAM inside the μ-COM and to reset programs to 0000H in ROM. Reset timing pulse. <p style="text-align: center;">RESET Period</p>																																				
17	CTL GAIN ADJ	O	Output "H" port to CTL gain control in FF/REW mode.																																				
18	JUST CLOCK IN	I	Input signal for automatic clock setting																																				
19	LD (-)	O	<ol style="list-style-type: none"> Output signal to IC502 for control of the loading motor's direction of rotation. Control table of loading motor's driving direction. <table border="1"> <thead> <tr> <th>Pin 19</th> <th>Pin20</th> <th>Rotation of Loading Motor</th> </tr> </thead> <tbody> <tr> <td>H</td> <td>H</td> <td>Brake Mode.</td> </tr> <tr> <td>H</td> <td>L</td> <td>Reverse Direction.</td> </tr> <tr> <td>L</td> <td>H</td> <td>Forward Direction.</td> </tr> </tbody> </table>	Pin 19	Pin20	Rotation of Loading Motor	H	H	Brake Mode.	H	L	Reverse Direction.	L	H	Forward Direction.																								
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L	H	Forward Direction.																																					
20	LD (+)																																						
21	HSR "H" (24V)	O	Switches capstan Vcc to 24 V for high speed rewind.																																				
22	Vcc(SYS)	-	SYSCON Vcc.																																				

Pin No.	Pin Name	I/O	Description
23	A.H.S/W 30	O	Output for the audio head switching 30Hz to the Hi-Fi circuits is made by inputting DPG, DFG signal through pin 38, 39 for switching Hi-Fi head. Refer to pin 24.
24	V.H.S/W 30	O	Pulses output for switching video head A and B. - Produces PG M.M pulses internally by using inputted DPG, DFG pulses to pin 38, 39. - Produces video head switching 30 Hz pulses by synchronizing at edge point of first PG. M.M.(PG monostable multivibrator) - Produces audio head switching 30 Hz pulses by synchronizing at edge point of second PG.M.M.
25	CAPSTAN PWM	O	- Output pulses (PWM waveform) for controlling capstan motor speed and phase; control feedback voltage which is inputted to the capstan motor driver IC. - Output pulses (PWM waveform) for controlling capstan motor stop and drive during slow mode.
26	DRUM PWM	O	Output pulses (PWM waveform) for controlling drum motor speed and phase; control feedback voltage which is inputted to the drum motor driver IC.
27	D.V. SYNC.	O	Provides an output sync signal to prevent the picture from rolling upward or downward, when the video track is not being scanned in the search mode.
28	COLOR ROTARY	O	A pulse to control phase of color at Y/C circuit.
29	HEAD AMP S/W	O	A pulse for switching the HEAD SP and EP on the DRUM.
30	COMP IN	I	A reference signal for switching video head (SPA, SPB, EPA, EPB) on the drum in search the mode.
31	CTL (+)	I/O	CTL pulse is outputted at recording, CTL pulse is inputted at playback. Functions which control capstan motor phase at playback, check tape speed, Viss and Real time counter are performed by using CTL pulse (input/output).
32	CTL (-)		
33	Vss (SERVO)	-	Servo circuit GND in the μ -COM.
34	CTL 1	I/O	Port for gain (Amp) control of CTL pulse during recording and playback.
35	CTL 2		
36	CTL 3		
37	CTL OUT		
38	D.FG	I	D.FG pulse input according to rotation of drum motor. Produces Audio/Video Head S/W 30Hz by using these pulses. And it is used as a comparison signal for speed control of the drum motor.
39	D.PG	I	One D.PG pulse is generated for each rotation the drum motor and inputted to μ -COM. When producing Head S/W pulses, D.PG pulse is used as reference point, and it is used as comparision signal when controlling drum motor phase.
40	C.FG	I	C.FG pulses are generated by the rotating capstan motor and are inputted to μ -COM. When checking tape speed and controlling. The capstan motor phase, These CFG pulses are used as comparison signal.
41	Vcc (SERVO)	I	Vcc for servo circuit in the μ -COM.
42	Vcc (OSD)	I	Vcc for OSD circuit in the μ -COM.
43	CV IN	I	When the OSD display function is activated both video and text are present, when in the EE or PB modes.

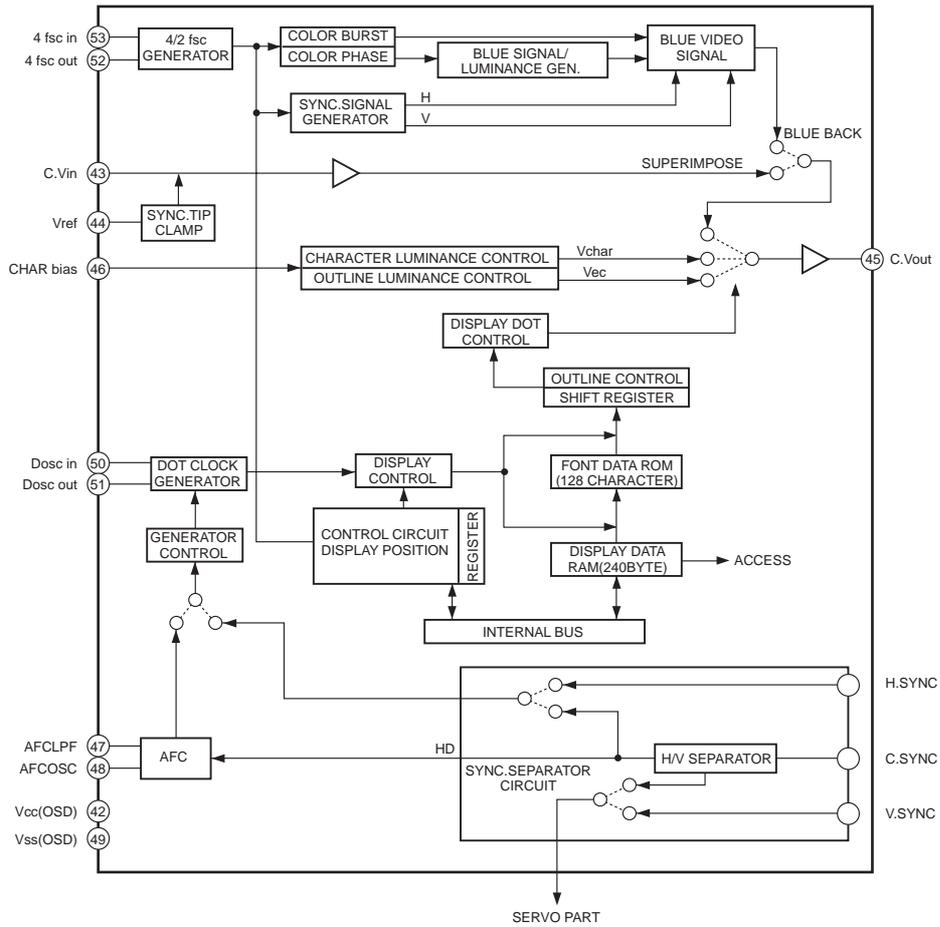
Pin No.	Pin Name	I/O	Description
44	Vref (OSD)	–	GND.
45	CV OUT	O	The video signal is output to the RF modulator and line output jack.
46	CHAR BIAS	–	GND.
47	AFC LPF	I	Horizontal sync is used to lock the OSD. (Reduce Jitter)
48	AFC OSC		
49	Vss (OSD)	–	GND.
50	DOSC IN	I	OSD DOT CLOCK oscillator. (OSD character oscillator)
51	DOSC OUT	O	Determining the horizontal position (left or right) of OSD.
52	4fsc OUT	O	Oscillator for OSD Sync. signal.
53	4fsc IN	I	Generating a blue background.
54	COMPOSITE SYNC.	I	- Receives composite signal from Y/C circuit. - Separates V-sync and H-sync in the OSD internal block. - The sync signal determines the character position of OSD.
55	VCR “H”	O	1. Turns on modulator thus allowing audio/video signal to output on CH3 or CH4. 2. Selects TV mode automatically upon turn on. 3. Output “H” turns power on to the VCR. 4. If tape is loaded in the VCR, PB mode is automatically selected.
56	SERVO PB “H”	O	Output “H” port to control, CFG gain control port in PB mode.
57	CST SW “H”	I	1. Port to detect CST(cassette tape) switch input state. 2. With CST S/W input state, determines whether CST tape is inserted or not.
58	C-SYNC “H”	I	C-sync input port for servo control.
59	OSD “H”	O	High “H” applied, turns on the OSD or POWER.
60	POWER CONTROL “H”	O	1. A signal to switch voltages (5.3V, 12V) on/off which is controlled by the power key. 2. Outputs “H” in power On mode. Outputs “L” in power Off mode.
61	CAPSTAN REVERSE “H”	O	A signal to control capstan motor’s direction of rotation. “L” output = Reverse direction. “H” output = Forward direction.
62	AUDIO MUTE “H”	O	1. Outputs “H” to mute audio signal in search mode and without sync signal. 2. Outputs “H” to eliminate pop noise generated in each mode during early switching point (Approx. 500ms) (EE/VV, TUNER/LINE, POWER ON/OFF, CH. UP/DOWN etc.)
63	Z-SEARCH “H” (18V)	O	Switches capstan motor voltage to 18 V.
64	OTPB “H”	O	Output “H” port to light the OTPB LED.
65	EXT REC “H”	O	Output chip enable signal for ACSS IC (IC5A1)
66	JUST PWR ON	O	Output “H” port in auto clock setting mode.
67	OPT RTNC (CTL MON)	I	Option check port
68	TEST “H”	I	GND.
69	X-TAL 2	O	1. 32.768 kHz oscillator is used as standard clock for clock display. 2. When Vcc supplied, oscillation occurs.
70	X-TAL 1	I	
71	Vss (SYS)	–	μ-COM main ground.

Pin No.	Pin Name	I/O	Description																																																																		
72	OSC 1	I	1. 10MHz oscillator is used to generate the standard clock used to operate the u-COM. 2. When Vcc is applied, Oscillation occurs. (But, when "L" is applied to pin 89 in power failure, Oscillation stops.)																																																																		
73	OSC 2	O																																																																			
74	MODE SW4	I	<p>1. Port to detect the mechanism's position.</p> <p>2. Deck and Mode SW Positions.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>No.</th> <th>MODE SW4</th> <th>MODE SW3</th> <th>MODE SW2</th> <th>MODE SW1</th> <th>DECK POSITION NAME</th> </tr> </thead> <tbody> <tr><td>1</td><td>L</td><td>H</td><td>L</td><td>H</td><td>RETURN</td></tr> <tr><td>2</td><td>L</td><td>L</td><td>L</td><td>H</td><td>EJECT</td></tr> <tr><td>3</td><td>L</td><td>L</td><td>H</td><td>L</td><td>ULC</td></tr> <tr><td>4</td><td>L</td><td>H</td><td>H</td><td>L</td><td>LOADING START</td></tr> <tr><td>5</td><td>H</td><td>H</td><td>L</td><td>L</td><td>LOADING END</td></tr> <tr><td>6</td><td>H</td><td>L</td><td>L</td><td>L</td><td>TUNE</td></tr> <tr><td>7</td><td>H</td><td>L</td><td>H</td><td>H</td><td>REV</td></tr> <tr><td>8</td><td>H</td><td>L</td><td>H</td><td>H</td><td>PLAY</td></tr> <tr><td>9</td><td>H</td><td>L</td><td>L</td><td>H</td><td>STOP</td></tr> <tr><td>10</td><td>H</td><td>H</td><td>L</td><td>H</td><td>FF, REW</td></tr> </tbody> </table> <div style="text-align: right; margin-right: 20px;"> </div>	No.	MODE SW4	MODE SW3	MODE SW2	MODE SW1	DECK POSITION NAME	1	L	H	L	H	RETURN	2	L	L	L	H	EJECT	3	L	L	H	L	ULC	4	L	H	H	L	LOADING START	5	H	H	L	L	LOADING END	6	H	L	L	L	TUNE	7	H	L	H	H	REV	8	H	L	H	H	PLAY	9	H	L	L	H	STOP	10	H	H	L	H	FF, REW
No.	MODE SW4		MODE SW3	MODE SW2	MODE SW1	DECK POSITION NAME																																																															
1	L		H	L	H	RETURN																																																															
2	L		L	L	H	EJECT																																																															
3	L		L	H	L	ULC																																																															
4	L		H	H	L	LOADING START																																																															
5	H		H	L	L	LOADING END																																																															
6	H		L	L	L	TUNE																																																															
7	H		L	H	H	REV																																																															
8	H		L	H	H	PLAY																																																															
9	H	L	L	H	STOP																																																																
10	H	H	L	H	FF, REW																																																																
75	MODE SW3																																																																				
76	MODE SW2		<p>* Description of Deck Positions</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr><td>RETURN</td><td>Cassette insertion standby mode</td></tr> <tr><td>EJECT</td><td>For cassette insertion and ejection</td></tr> <tr><td>ULC</td><td>Mode in which base assemblies P2 and P3 are completely unloaded status (unloading complete)</td></tr> <tr><td>LOADING START</td><td>Mode in which base assemblies P2 and P3 can load tape after cassette loading is completed.</td></tr> <tr><td>LOADING END</td><td>Mode in which base assemblies P2 and P3 have completely loaded tape. Also used for "power off mode".</td></tr> <tr><td>NONE</td><td>None</td></tr> <tr><td>REV</td><td>"REV" or "-SLOW" mode</td></tr> <tr><td>PLAY</td><td>"Playback/Still/Slow/Stop" mode.</td></tr> <tr><td>BRAKE</td><td>Mode that drives the brake (take-up, supply) to stop tape during "fast forward" or "rewind".</td></tr> <tr><td>FF, REW</td><td>FF, REW / "Fast forward" or "Rewind" mode</td></tr> </tbody> </table>	RETURN	Cassette insertion standby mode	EJECT	For cassette insertion and ejection	ULC	Mode in which base assemblies P2 and P3 are completely unloaded status (unloading complete)	LOADING START	Mode in which base assemblies P2 and P3 can load tape after cassette loading is completed.	LOADING END	Mode in which base assemblies P2 and P3 have completely loaded tape. Also used for "power off mode".	NONE	None	REV	"REV" or "-SLOW" mode	PLAY	"Playback/Still/Slow/Stop" mode.	BRAKE	Mode that drives the brake (take-up, supply) to stop tape during "fast forward" or "rewind".	FF, REW	FF, REW / "Fast forward" or "Rewind" mode																																														
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77	MODE SW1																																																																				
78	I-LIMIT	I	1. Input signal for stopping capstan motor. 2. When this port inputs "L", the capstan motor stops.																																																																		
79	REC START "H"	O	1. When REC mode is operating normally, outputs "H". 2. Switched to REC mode by operating audio, Y/C pre-amp. 3. Outputs "H" and record audio, video signals on the tape.																																																																		
80	CAP ACCEL "H"	O	Pulse output to control capstan motor in slow mode.																																																																		
81	DRUM ADJ	O	Pulse output to control drum motor in slow mode.																																																																		

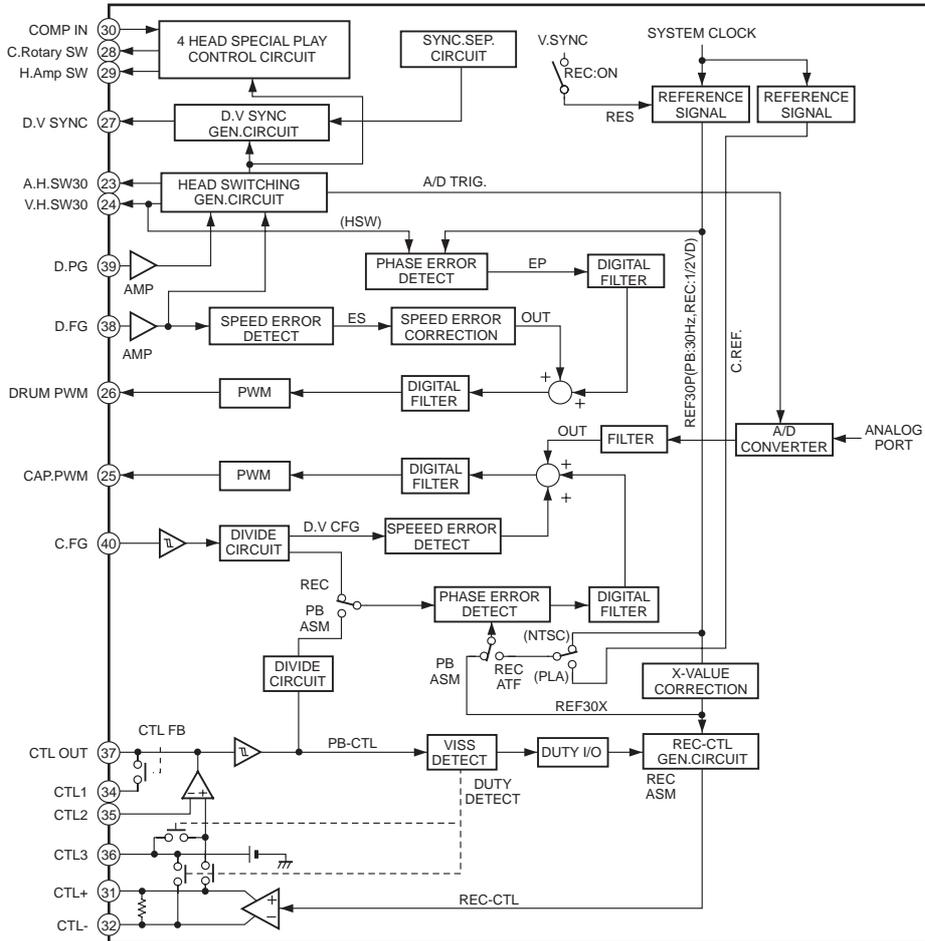
Pin No.	Pin Name	I/O	Description				
82	R/C	I	<ol style="list-style-type: none"> 1. This pin receives remote data through RC5F1, which amplifies and detects the R/C signal. 2. After input signal is decoded in μ-COM (IC501), and performs related key operation. 				
83	G4	O	For LED clock model.				
84	G3						
85	G2						
86	G1						
87	COMPOSITE SYNC. (INV)	I	<ol style="list-style-type: none"> 1. Input C-Sync (composite sync) to confirm whether video signal is present or not. 2. Confirms by counting 1H (63.5μsec) horizontal sync for a fixed time period. 				
88	—	—	Not connected.				
89	POWER FAIL	I	<ol style="list-style-type: none"> 1. When a power failure is detected, this pin goes “L” and the following sequence of events occurs. 2. Power failure detector timing sequence.  <p>AC POWER ON AC POWER OFF</p> <p>Vcc for (Back-up) → t</p> <p>AVcc No (Back-up) → t</p> <p>Power failure signal (5.3VA) → t</p> <p>10MHz OSC → t</p> <p>36.768kHz OSC → t</p> <p>Reset pulse → t</p> <table border="1"> <tr> <td>Power failure compensation relation</td> <td>Normal operation state</td> <td>Power failure compensation state</td> <td>Power failure compensation cancel state</td> </tr> </table> <p>(μ-COM memory loss state) ←</p>	Power failure compensation relation	Normal operation state	Power failure compensation state	Power failure compensation cancel state
Power failure compensation relation	Normal operation state	Power failure compensation state	Power failure compensation cancel state				
90	IIC CLOCK	O	A reference CLOCK for Hi-Fi, TU/IF, MTS, SPEAKER				
91	IIC DATA	O	A reference DATA for Hi-Fi, TU/IF, MTS, SPEAKER				
92, 93	S9, S8	O	For LED clock model.				
94	S7/FLD ENABLE	O	Outputs chip enable signal for FLD Drive IC (IC5F1).				
95	S6/FLD CLOCK	O	Outputs clock signal to operate FLD Drive IC (IC5F1).				
96	S5/FLD DATA IN	I	Serial interface signals for FLD Drive IC control.				
97	S4/FLD DATA OUT	O					
98 ~ 100	S3 ~ S1	O	For LED clock model.				

IC BLOCK DIAGRAM

IC, HD3977RC36F <OSD Section>



<SERVO Section>



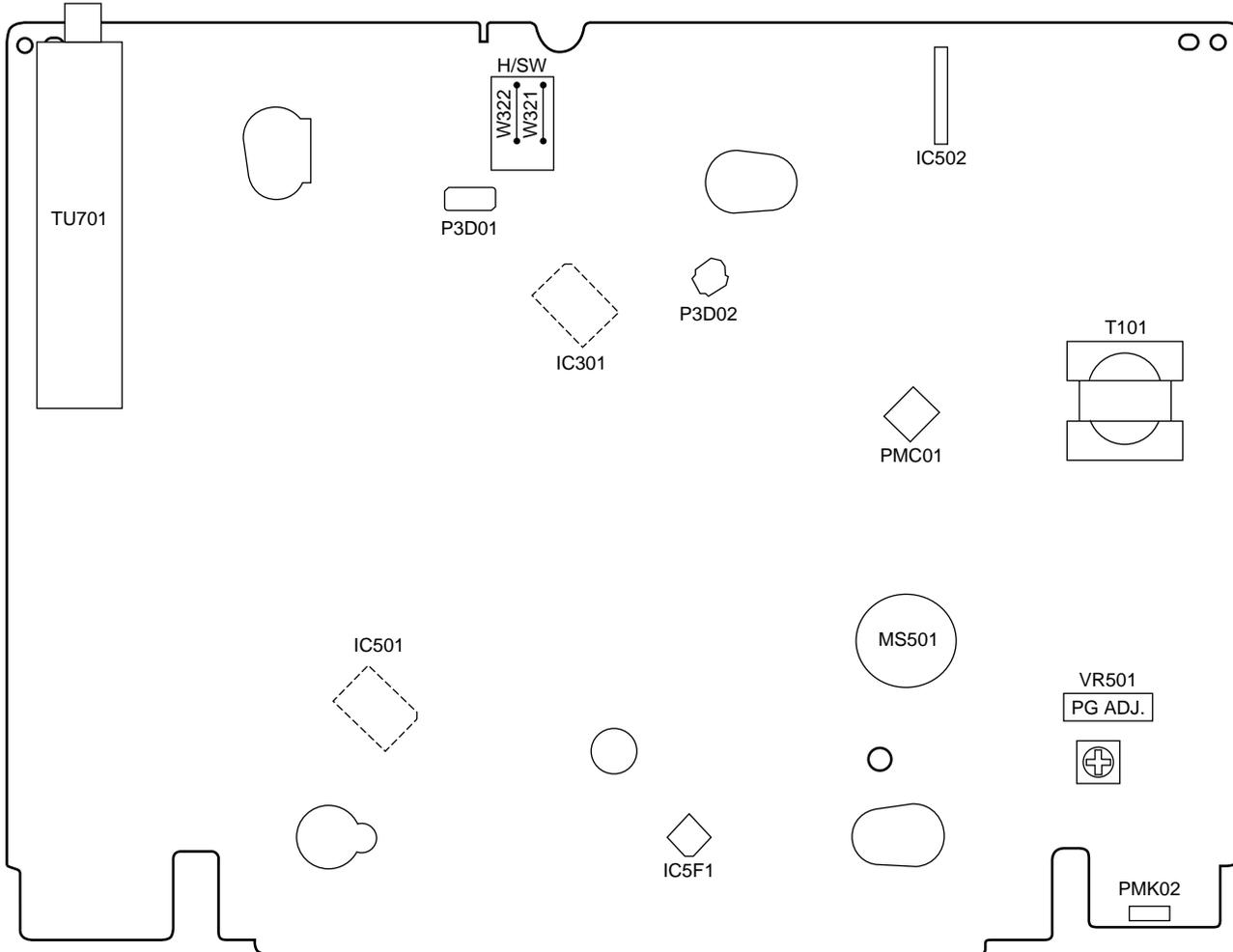
ADJUSTMENT

Test Equipment

- Oscilloscope
- AC Millivolt Meter
- Test Tape
TTV-P1

Adjustment Location

MAIN C.B (TOP VIEW)



1. Servo Adjustment

1) PG Adjustment

MODE	MEASUREMENT POINT	ADJUSTMENT POINT	SPECIFICATION
PLAY (TTV-P1)	VIDEO OUT H/SW (W321, W322)	VR501	$6.5 \pm 0.5H$

• Adjustment Procedure

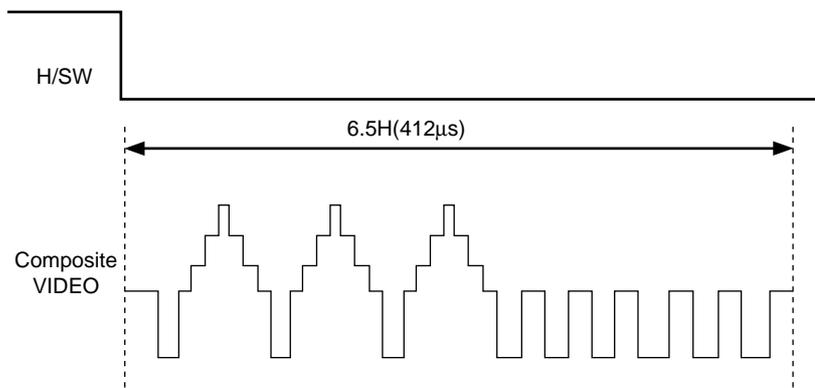
1. Insert the PAL SP Test Tape (TTV-P1) and play.

Note - Adjust the distance of X, pressing the Tracking(+) or Tracking(-) when the "ATR" is blink after the PAL SP Test Tape is inserted.

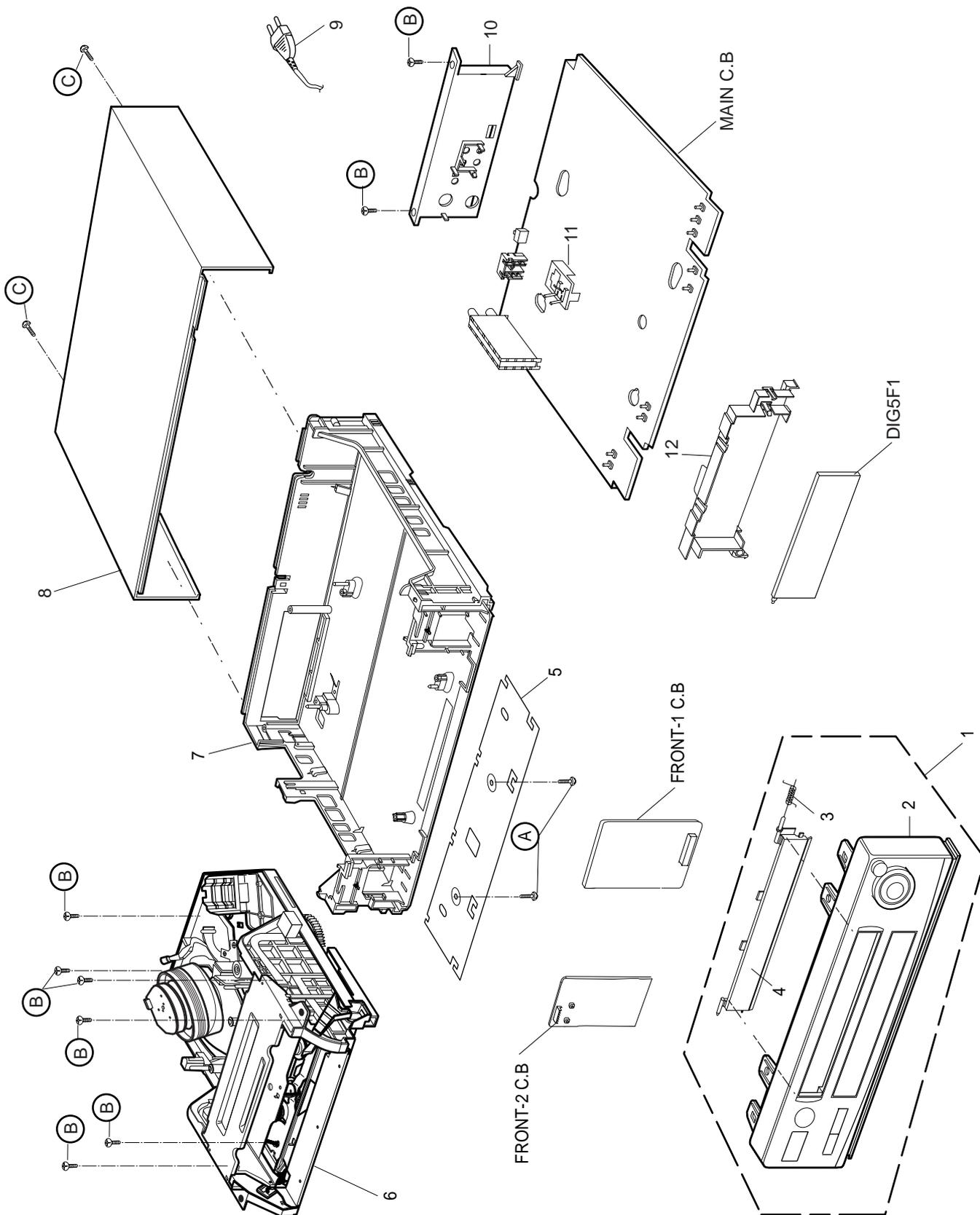
2. Connect the CH1 of the oscilloscope to the H/SW (W321, 322) and CH2 to the Video Out for the VCR.

3. Trigger the mixed Video Signal of CH2 to the CH1 H.SW (W321, W322), and then check the distance (time difference), which is from the selected A(B) Head point of the H.SW(W321, W322) signal to the starting point of the vertical synchronized signal, to $6.5H \pm 0.5H$ ($412\mu s$, $1H=63.5\mu s$).

• WAVEFORM



MECHANICAL EXPLODED VIEW 1/1



MECHANICAL MAIN PARTS LIST 1/1

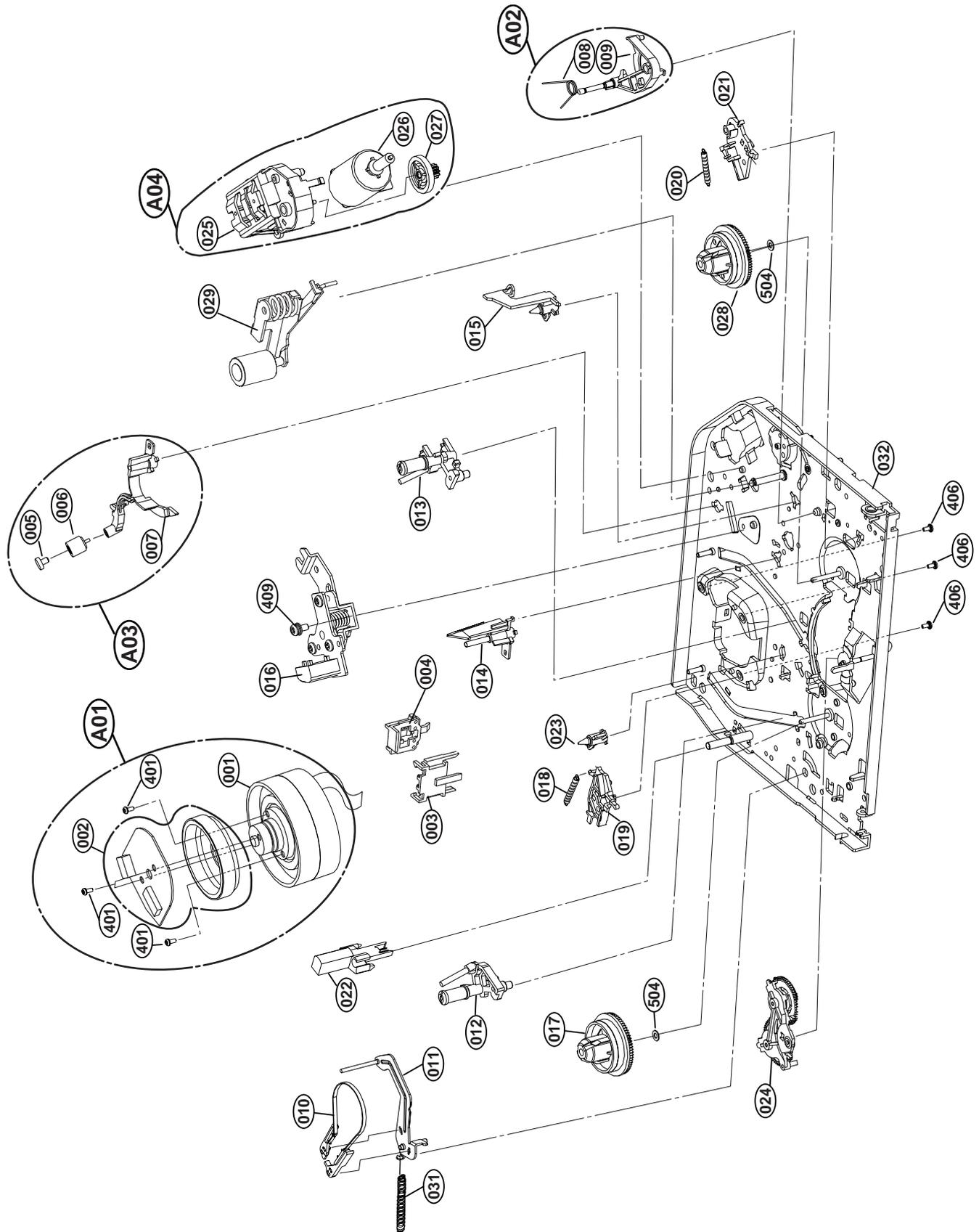
DESCRIPTIONで判断できない物は "REFERENCE NAME LIST" を参照してください。
 If can't understand for Description please kindly refer to "REFERENCE NAME LIST".

REF. NO	PART NO.	KANRI NO.	DESCRIPTION
1	S7-21R-F09-4H0		PANEL ASSY FRONT
2	S7-20R-F07-2G0		PANRL,FRONT
3	S4-426-81A-000		SPR,DOOR
4	S5-80R-003-3J0		DOOR,CST
5	—		COVER BOTTOM
6	—		DECK ASSY D33
7	—		FRAME MAIN
8	S1-10R-012-8E0		CASE TOP BACK
9	S4-10R-GHC-01A		CORD POWER
10	S7-21R-D01-8F0		PANEL RCA ASSY DISTRIBU
11	S1-11R-008-9B0		CASE ASSY
12	S9-30R-013-3A0		HOLDER DIGITRON
A	S3-530-51A-000		SCREW,SPECIAL
B	87-741-097-410		SCREW,3-12
C	S3-531-36A-000		SCREW,SPECIAL(FBK)

COLOR NAME TABLE

Basic color symbol	Color	Basic color symbol	Color	Basic color symbol	Color
B	Black	C	Cream	D	Orange
G	Green	H	Gray	L	Blue
LT	Transparent Blue	N	Gold	P	Pink
R	Red	S	Silver	ST	Titan Silver
T	Brown	V	Violet	W	White
WT	Transparent White	Y	Yellow	YT	Transparent Yellow
LM	Metallic Blue	LL	Light Blue	GT	Transparent Green
LD	Dark Blue	DT	Transparent Orange		

MECHANISM EXPLODED VIEW 1/3

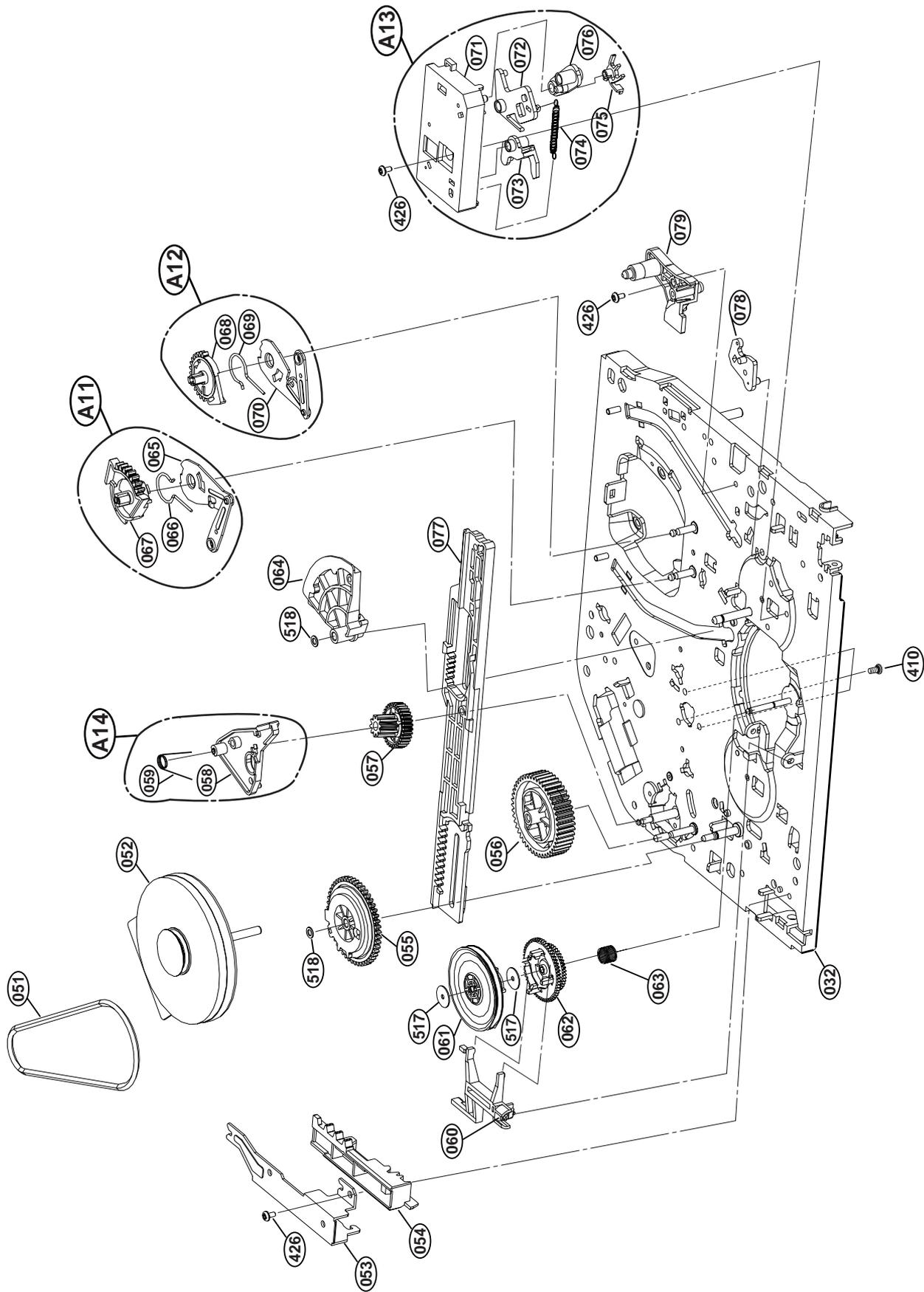


MECHANISM MAIN PARTS LIST 1/3

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 If can't understand for Description please kindly refer to "REFERENCE NAME LIST".

REF. NO	PART NO.	KANRI NO.	DESCRIPTION	REF. NO	PART NO.	KANRI NO.	DESCRIPTION
001	—		SUB DRUM ASSY D33-4CH	022	S5-238-33B-000		HEAD FE D33
002	S6-80R-B00-04A		MOTOR(MECH)	022	S5-238-33C-000		FE HEAD
002	S6-80R-B00-05A		MOTOR(MECH) DRUM GVD-033A	023	S9-80R-001-0A0		SUPPORTER CST
003	S9-30R-010-7A0		HOLDER FPC	024	S2-61R-000-9A0		ARM ASSY IDLER-J
004	S0-06R-002-0A0		CAP,FPC	025	S8-10R-005-3A0		BRACKET L/D MOTOR
005	—		CAP,FPC	026	S6-81R-000-7A0		MOTOR ASSY L/D
006	—		ROLLER CLEANEA	027	S4-70R-002-5A0		GEAR WHEEL
007	—		CLEANER ARM ASSY	028	S4-08R-000-2A0		REEL T
008	S9-70R-004-3A0		SPRING T/UP	029	S2-61R-001-1A0		ARM ASSY PINCH
009	—		T/UP ARM	029	S2-61R-001-1B0		PINCH ARM ASSY
010	S7-70R-000-4A0		BAND ASSY TENSION(MECH)	031	S9-70R-005-2A0		SPRING TENSION
011	S2-61R-000-4A0		ARM ASSY TENSION	032	S1-41R-000-2A0		CHASSIS ASSY
012	S0-41R-000-3A0		BASE ASSY P2	401	87-261-071-410		PAN HEAD SCREW 2.6-4
012	S0-41R-000-3B0		BASE ASSY P2	406	87-261-094-410		PAN HEAD SCREW 3-6
013	S0-41R-000-4A0		BASE ASSY P3	409	87-741-095-410		SCREW,PAN HEAD 3.0-8.0
013	S0-41R-000-4B0		BASE ASSY P3	504	S3-540-01B-000		WASHER,P.S 3.1-6-0.5
014	S0-41R-000-7A0		BASE ASSY P4	A01	S7-23R-010-2C0		DRUM ASSY D33-4CH
015	S8-70R-000-1A0		OPENER LID	A01	S7-23R-B10-2C0		DRUM(CIRC) ASSY
016	S0-41R-000-5A0		BASE ASSY A/C HEAD	A01	S7-23R-D10-2C0		DRUM(CIRC) ASSY
016	S0-41R-000-5E0		A/C HEAD BASE ASSY	A02	—		ARM ASSY
017	S4-08R-000-1A0		REEL S	A02	S2-61R-001-2B0		T/UP ARM ASSY
018	S9-70R-005-4A0		SPRING SB	A03	S2-61R-000-3A0		ARM ASSY CLEANER
019	S4-21R-000-3A0		BRAKE ASSY S	A04	—		BRACKET ASSY L/D MOTOR
020	S9-70R-005-3A0		SPRING TB				
021	S4-21R-000-4A0		BRAKE ASSY T				

MECHANISM EXPLODED VIEW 2/3

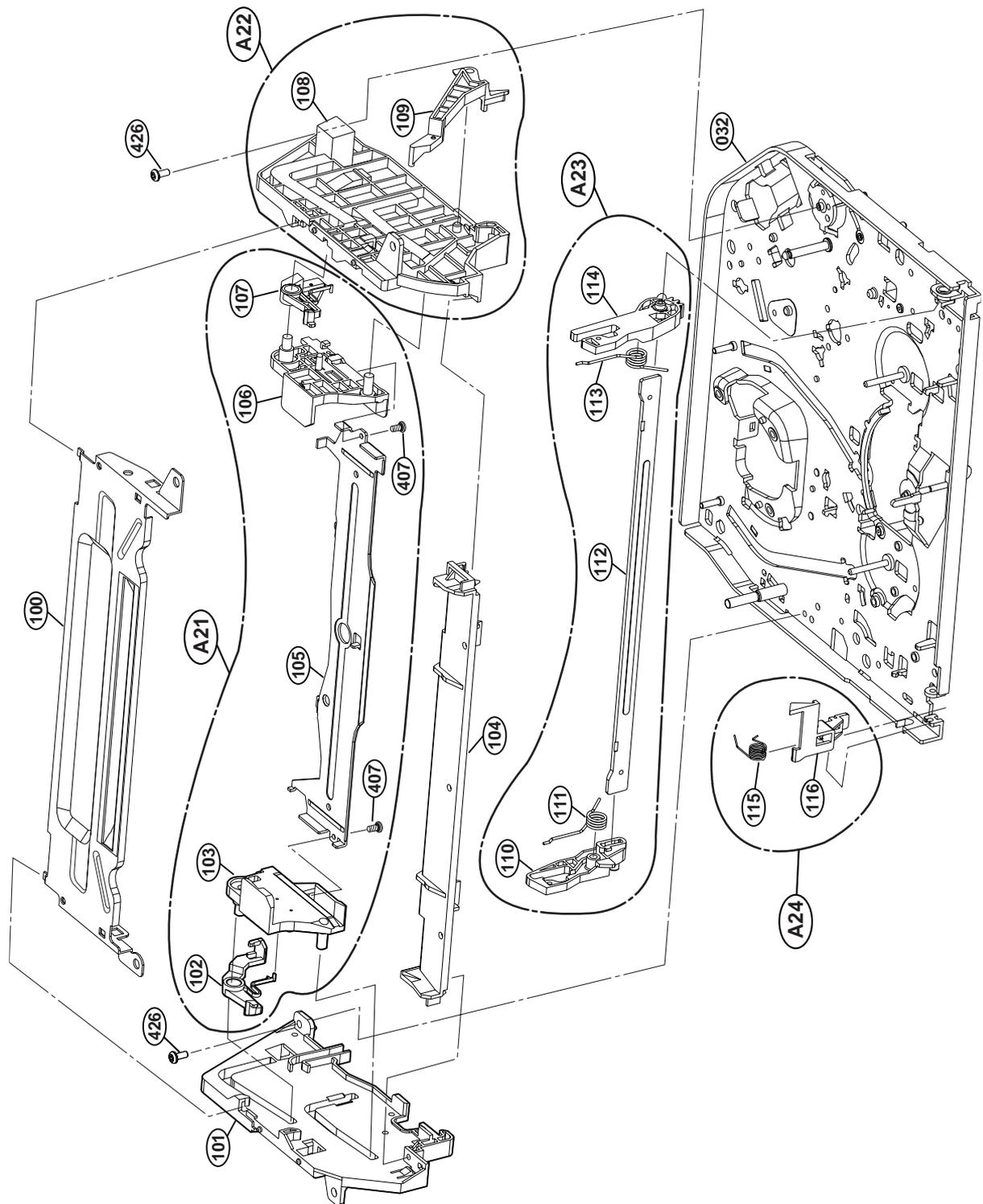


MECHANISM MAIN PARTS LIST 2/3

DESCRIPTIONで判断できない物は "REFERENCE NAME LIST" を参照してください。
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REF. NO	PART NO.	KANRI NO.	DESCRIPTION
032	S1-41R-000-2A0		CHASSIS ASSY
051	S4-00R-000-5A0		BELT CAPSTAN
052	S6-80R-000-2A0		MOTOR (MECH)
052	S6-80R-A00-03A		MOTOR (MECH)
053	S9-74R-001-8A0		GUIDE RACK F/L
054	S4-70R-003-7A0		GEAR RACK F/L
055	S4-70R-003-3A0		GEAR DRIVE
056	S4-70R-003-2A0		GEAR CAM
057	S4-70R-003-6B0		GEAR CONNECT
058	—		BRAKE CAPSTAN
059	S9-70R-005-9A0		SPRING CAPSTAN
060	S5-10R-002-5A0		LEVER F/R
061	S2-65R-000-2A0		CLUTCH ASSY
062	S4-70R-004-4A0		GEAR ASSY UP/D
063	S9-70R-005-1A0		SPRING UP/D
064	S4-70R-003-4A0		GEAR SECTOR
065	—		LEVER P3
066	—		SPRING L/D
067	—		GEAR P3
068	—		GEAR P2
069	—		SPRING L/D
070	—		LEVER P2
071	—		BRACKET JOG
072	—		LEVER JOG
073	—		LEVER, SLOW
074	S9-70R-004-9A0		SPRING JOG
075	—		GEAR JOG
076	—		ARM JOG
077	S3-00R-015-7A0		PLATE SLIDER
078	S5-10R-002-2A0		LEVER TENSION
079	S0-40R-001-8A0		BASE TENSION
410	SA-PF0-262-218		SCREW, PAN HEAD 2.6-6.8
426	87-261-094-410		PAN HEAD SCREW 3-6
517	SW-ZZR-000-4B0		WASHER STOPPER
518	SW-ZZR-000-4A0		WASHER STOPPER
A11	S4-70R-002-8A0		GEAR ASSY P3
A12	S4-70R-002-6A0		GEAR ASSY P2
A13	S8-11R-001-2A0		BRACKET ASSY JOG
A13	S8-11R-001-2B0		JOG BRACKET ASSY
A14	—		BRACKET ASSY CAPSTAN
A14	S4-21R-000-5C0		CAPSTAN BRAKE ASSY

MECHANISM EXPLODED VIEW 3/3



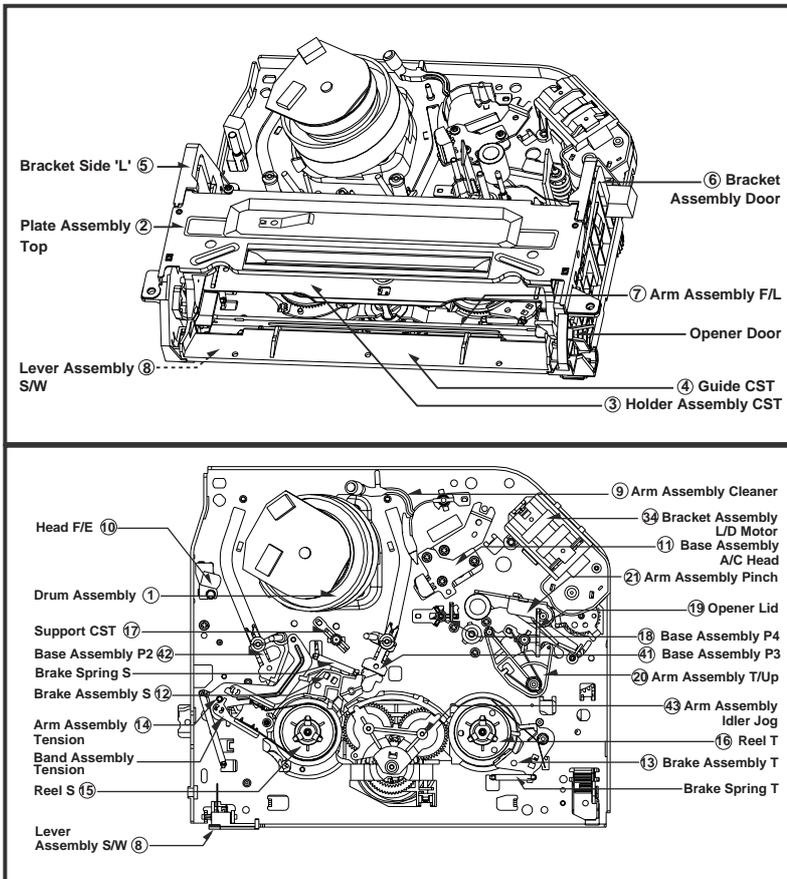
MECHANISM MAIN PARTS LIST 3/3

DESCRIPTIONで判断できない物は "REFERENCE NAME LIST" を参照してください。
 If can't understand for Description please kindly refer to "REFERENCE NAME LIST".

REF. NO	PART NO.	KANRI NO.	DESCRIPTION
032	S1-41R-000-2A0		CHASSIS ASSY
100	S3-01R-002-9A0		PLATE ASSY TOP
101	S8-10R-005-6A0		BRACKET SIDE(L)
102	—		LEVER STOPPER(L)
103	—		HOLDER SIDE(L)
104	S9-74R-001-9A0		GUIDE CST
105	—		HOLDER CST
106	—		HOLDER SIDE(R)
107	—		LEVER STOPPER(R)
108	—		BRACKET SIDE(R)
109	—		OPENER DOOR
110	—		ARM F/L(L)
111	—		SPRING F/L(L)
112	—		BODY F/L
113	—		SPRING F/L(R)
114	—		ARM F/L(R)
115	S9-70R-005-0A0		SPRING SWITCH
116	S5-10R-002-0A0		LEVER SWITCH
407	87-841-034-210		SCREW PAN HEAD 2.0-5.0
426	87-261-094-410		PAN HEAD SCREW 3-6
A21	S9-31R-001-5A0		HOLDER ASSY CST
A22	S8-11R-001-4A0		BRACKET ASSY
A23	S2-61R-001-0A0		ARM ASSY F/L
A24	—		LEVER ASSY SWITCH

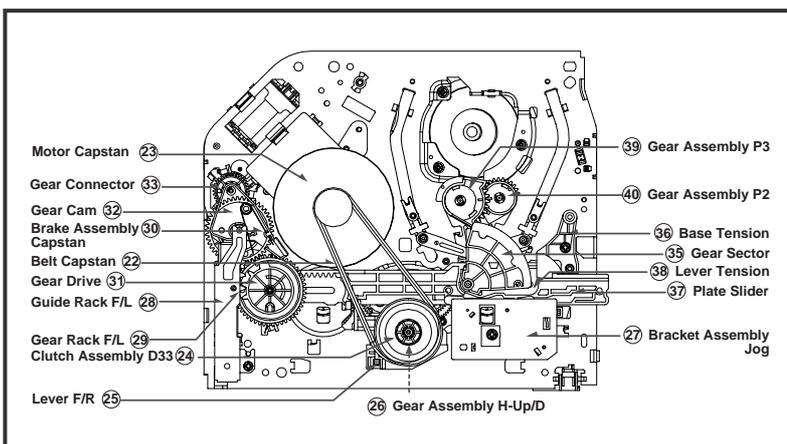
DECK MECHANISM PARTS LOCATIONS

• Top View



Starting No.	Pracedure		Fixing Type	Figure
	Part			
1	Drum Assembly	3 Screws , Cap FPC	A-1	
	Plate Assembly Top	Two Hooks	A-2	
2	Holder Assembly CST	Chassis Hole	A-2	
	Guide CST	2 Hooks	A-2	
2,3,4	Bracket Side (L)	1 Screw	A-2	
2,3,4	Bracket Assembly Door	1 Screw	A-2	
2,3,4,5,6	Arm Assembly F/L	Chassis Hole	A-2	
2,3,4,5	Lever Assembly S/W	Chassis Hole	A-2	
9	Arm Assembly Cleaner	Chassis Embossing	A-3	
	Head F/E	2 Hooks	A-3	
11	Base Assembly A/C Head	1 Screw	A-3	
	Brake Assembly S	Chassis Hole	A-4	
2,3	Brake Assembly T	Chassis Hole	A-4	
2,3,12,	Arm Assembly Tension	Chassis Hole	A-4	
2,3,12,14	Reel S	Chassis Shaft	A-4	
2,3,13	Reel T	Chassis Shaft	A-4	
17	Support CST	Chassis Embossing	A-5	
	Base Assembly P4	Chassis Embossing	A-5	
19	Opener Lid	Chassis Embossing	A-5	
	Arm Assembly T/Up	Chassis Embossing	A-5	
19	Arm Assembly Pinch	Chassis Shaft	A-5	

• Bottom View

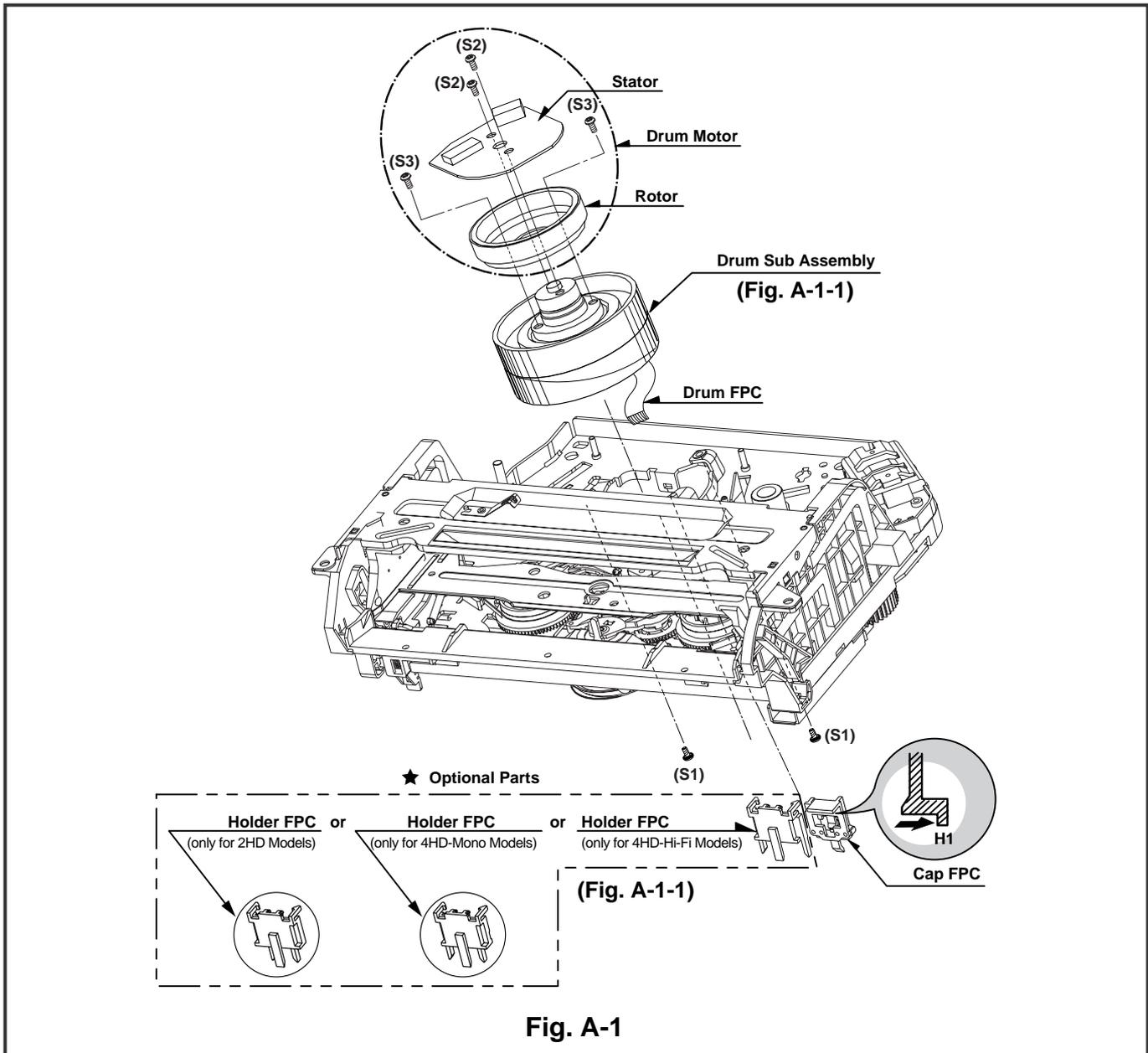


NOTE : When reassembly perform the procedure in the reverse order.

- 1) When reassembling, confirm Mechanism and Mode Switch Alignment Position (Pefer to Page 69)
- 2) When disassembling, the Parts for Starting No. Should be removed first.

Starting No.	Pracedure		Fixing Type	Figure
	Part			
22	Belt Capstan	3 Screws	A-6	
	Motor Capstan	1 Washer	A-6	
22,24	Clutch Assembly D33	1 Hook	A-6	
	Lever F/R	2 Washers	A-6	
22,24	Gear Assembly H-Up/D	1 Screw	A-7	
	Bracket Assembly Jog	1Screw	A-7	
28	Guide Rack F/L	Chassis Shaft	A-7	
	Gear Rack F/L	Chassis Shaft	A-7	
28, 29	Brake Assembly Capstan	1 Washer	A-8	
28, 29	Gear Drive	Chassis Shaft	A-8	
28, 29, 30	Gear Cam	Chassis Shaft	A-8	
28, 29, 30, 31	Gear Connector	Chassis Shaft	A-8	
34	Bracket Assembly L/D Motor	3 Hooks	A-8	
	Gear Sector	3 Washers	A-9	
36	Base Tension	1 Screw	A-9	
	Plate Slider	Chassis Shaft	A-9	
22, 24, 25, 27	Lever Tension	Chassis Hole	A-9	
28, 29, 31, 35				
36	Gear Assembly P3	2 Hooks	A-10	
22, 24, 25, 27				
35, 39	Gear Assembly P2	2 Hooks	A-10	
35, 39, 40	Base Assembly P3	Chassis Hole	A-10	
35, 39, 40, 41	Base Assembly P2	Chassis Hole	A-10	
1, 2	Arm Assembly Idler Jog	1 Hook	A-10	

DECK MECHANISM DISASSEMBLY



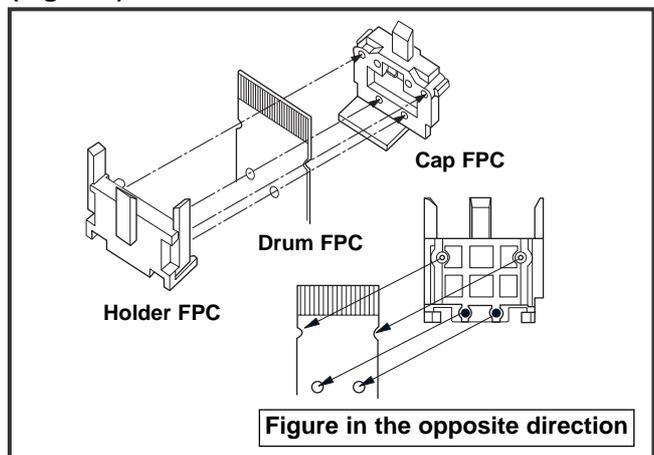
1. Drum Assembly (Fig. A-1-1)

- 1) Unhook the (H1) on the back side of the Chassis and separate the Cap FPC.
- 2) Remove three Screws (S1) and lift up the Drum Assembly.
- 3) Remove two Screws (S2) and Separate the Stator of Drum Motor.
- 4) Remove two Screws (S3) and Separate the Rotor of Drum Motor from the Drum Sub Assembly.

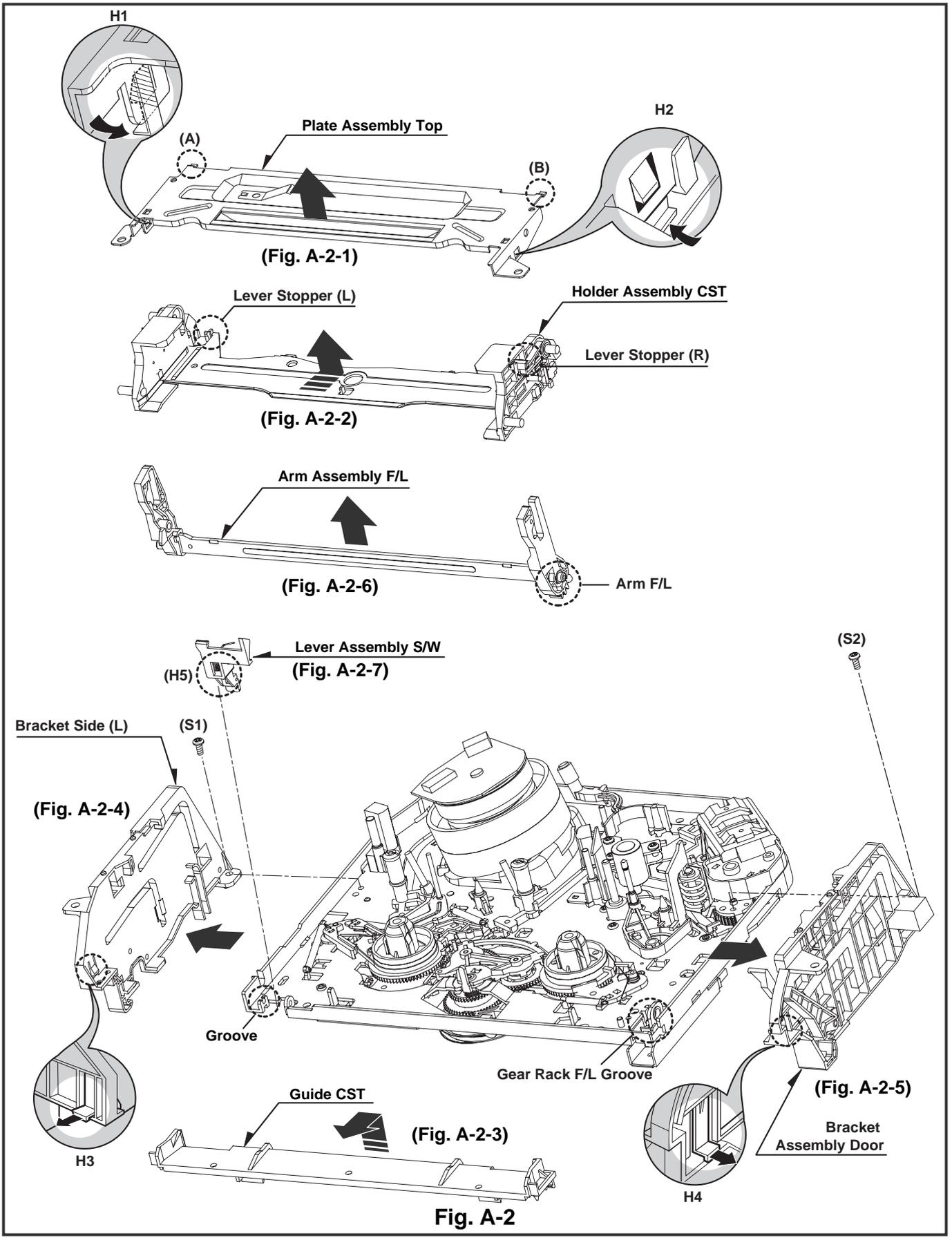
NOTE

- (1) When reassembling Cap FPC, two Holes of Drum FPC are inserted to the two Bosses of Holder FPC correctly. (Refer to Fig. B-1)

(Fig. B-1)



DECK MECHANISM DISASSEMBLY



DECK MECHANISM DISASSEMBLY

2. Plate Assembly Top (Fig. A-2-1)

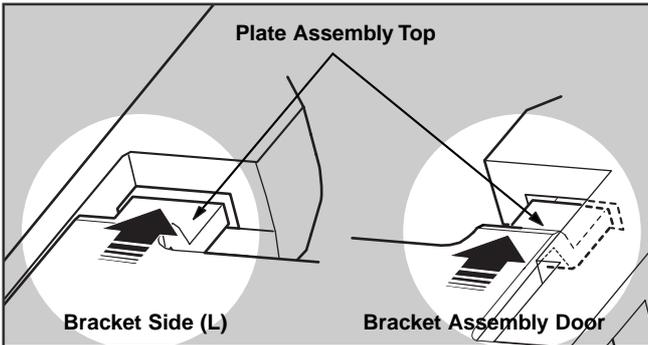
- 1) Unhook the (H1) and separate the Left Side.
- 2) Unhook the (H2) and lift up the Plate Assembly Top.

NOTE

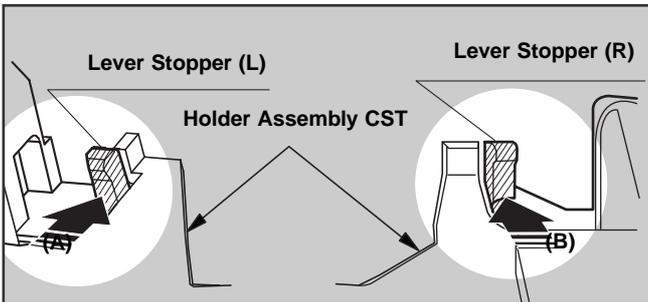
- (1) When reassembling, confirm (A),(B) Part of the Plate Assembly Top is inserted to the (L),(R) Grooves of the Bracket Side(L) and Bracket Assembly Door.

3. Holder Assembly CST (Fig.A-2-2)

- 1) Push the Lever Stopper(L),(R) in the direction of the arrows (A), (B), and move the Holder Assembly CST.

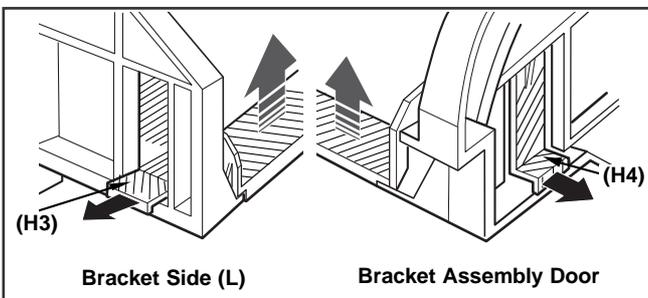


- 2) Push the Bracket Assembly Door to the right and lift up the Holder Assembly CST along the Guide Groove of the Bracket Assembly Door.



4. Guide CST (Fig.A-2-3)

- 1) Push two Hooks(H3),(H4) in the direction of the arrow and separate the left side.
- 2) Unhook (H5),(H6) as above No.1) and disassemble the Guide CST in the direction of the arrow.



5. Bracket Side(L) (Fig. A-2-4)/ Bracket Assembly Door (Fig.A-2-5)

- 1) Remove the Screw (S1) and disassemble the Bracket Side(L) in the front.

- 2) Remove the Screw (S2) and disassemble the Bracket Assembly Door in the front.

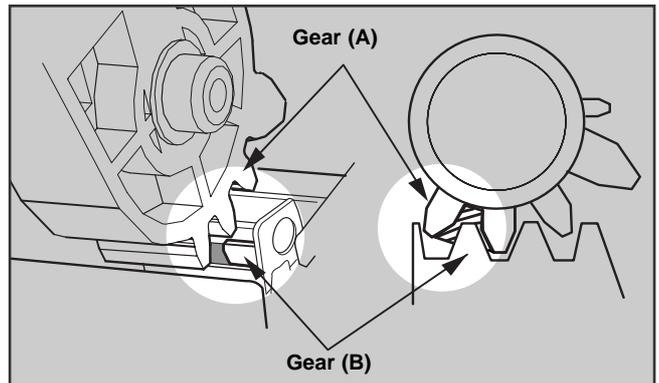
6. Arm Assembly F/L (Fig. A-2-6)

- 1) Push the Arm Assembly F/L to the left and lift up it.

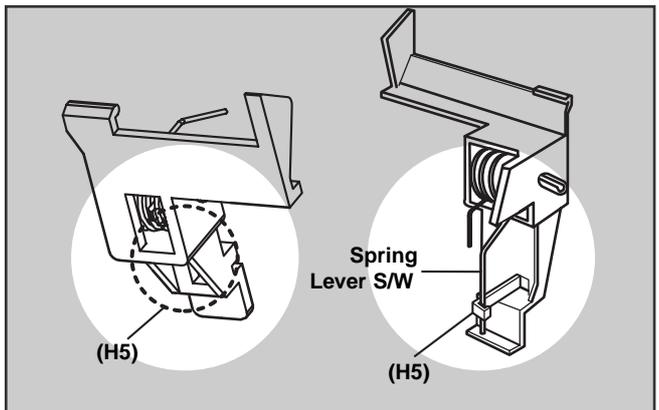
NOTE

- (1) When reassembling, confirm that the Gear(A) of the Arm F/L and the Gear(B) of the Gear Rack F/L are assembled as below.

7. Lever Assembly S/W (Fig. A-2-7)

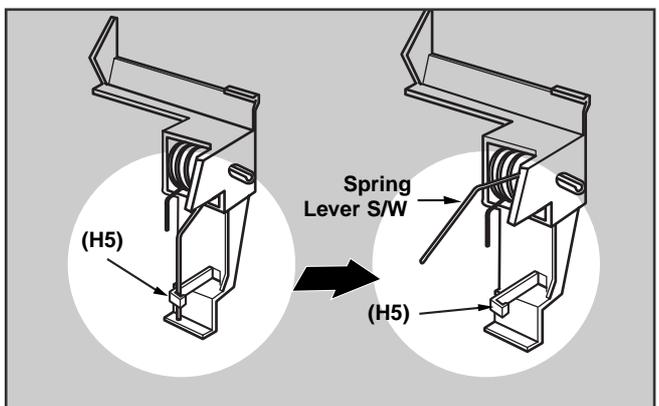


- 1) Hook the Spring Lever S/W on (H5).
- 2) Lift up the left side of the Lever S/W from the Groove(A) of the Chassis.



NOTE

- (1) Place the Spring Lever S/W of the above (No.1) as original position.



DECK MECHANISM DISASSEMBLY

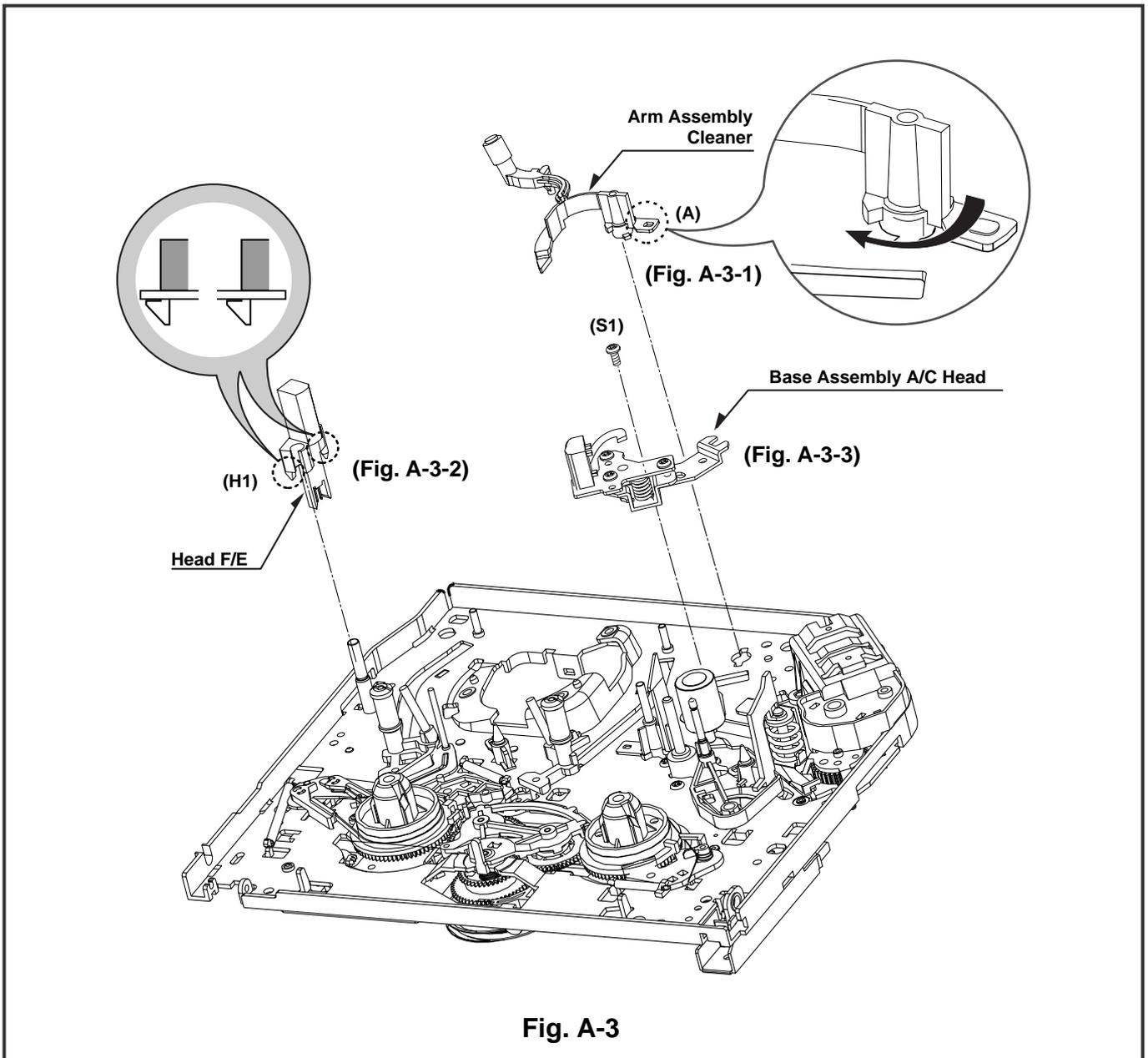


Fig. A-3

8. Arm Assembly Cleaner(Fig. A-3-1)

- 1) Break away the (A) part shown above Fig. A-3-1 from the Embossing of the Chassis in the clockwise direction and lift up the Arm Assembly Cleaner.

9. Head F/E (Fig. A-3-2)

- 1) Unhook the two Hooks (H1) on the back side of the Chassis and lift up the Head F/E.

10. Base Assembly A/C Head (Fig. A-3-3)

- 1) Remove the Screw (S1) and lift up the Base Assembly A/C Head.

DECK MECHANISM DISASSEMBLY

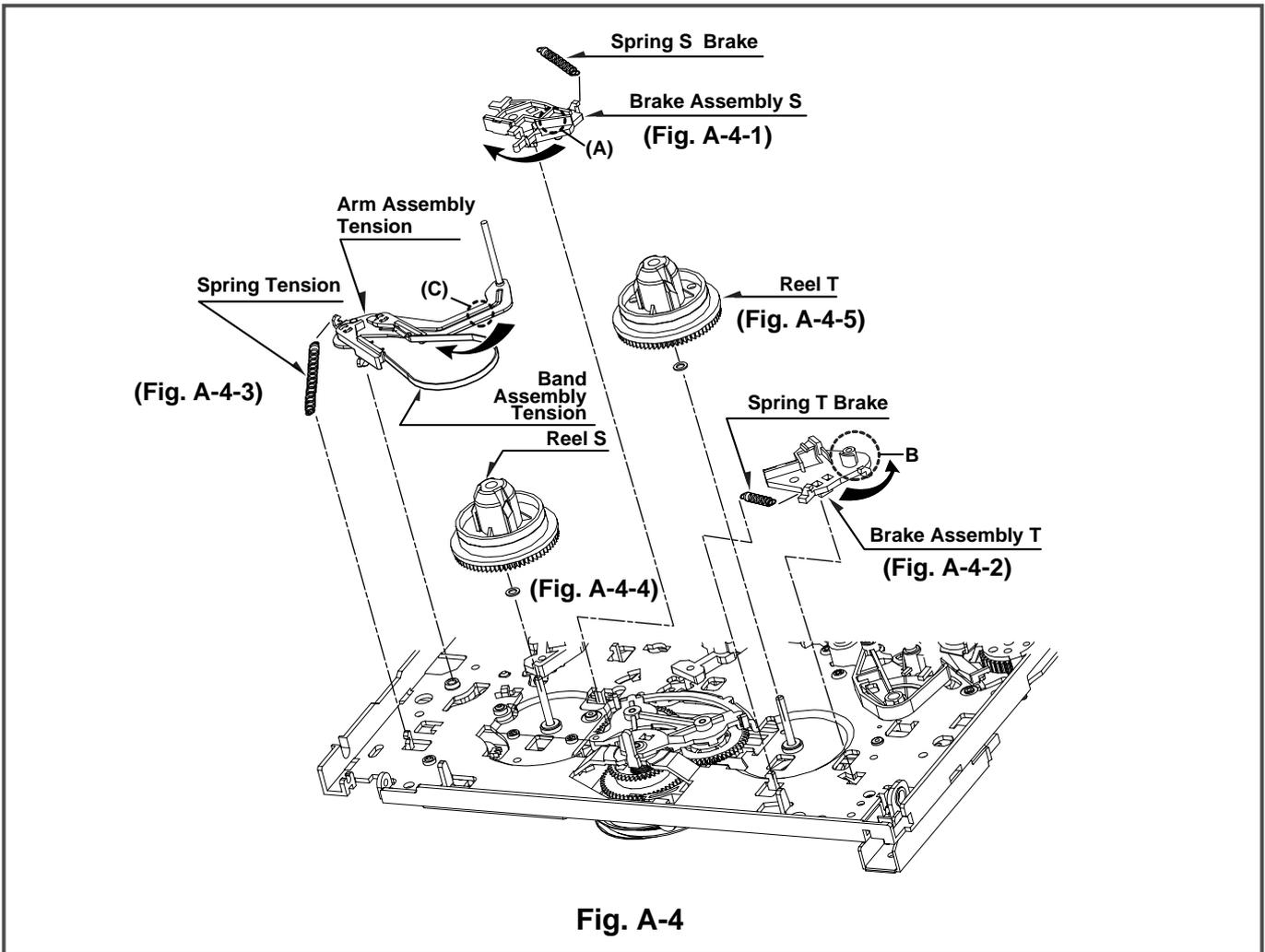


Fig. A-4

11. Brake Assembly S (Fig. A-4-1)

- 1) Remove the Spring S Brake.
- 2) Hold the (A) part shown above Fig. A-4-1 and turn to the clockwise direction, and then lift up the Brake Assembly S.

NOTE

- (1) When reassembling, be careful not to change the Spring with below No.12.(Refer to Fig. B-2).

12. Brake Assembly T (Fig. A-4-2)

- 1) Remove the Spring T Brake.
- 2) Hold the (B) part shown above Fig. A-4-2 and turn to the counterclockwise direction, and then lift up the Brake Assembly T.

NOTE

- (1) When reassembling, be careful not to change the Spring with above No.11.(Refer to Fig. B-2).

(Difference for Springs)

(Fig. B-2)

	Spring T Brake Color (Black)
	Spring S Brake
	Spring Tension

13. Arm Assembly Tension (Fig. A-4-3)

- 1) Remove the Spring Tension.
- 2) Hold the (C) part shown above Fig. A-4-3 and turn to the clockwise direction, and then lift up the Arm Assembly Tension.

NOTE

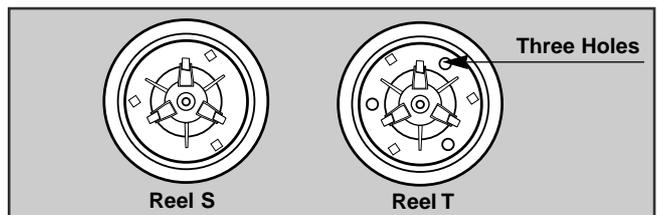
- (1) When reassembling, be careful not to change the Spring with above No.11,12.(Refer to Fig. B-2).

14. Reel S (Fig. A-4-4) & Reel T (Fig. A-4-5)

- 1) Lift up the Reel S and Reel T.

NOTE

- (1) When reassembling, be careful not to change the Reel S and Reel T each other.



- (2) Confirm two Slide Washers under the Reel S and Reel T.

DECK MECHANISM DISASSEMBLY

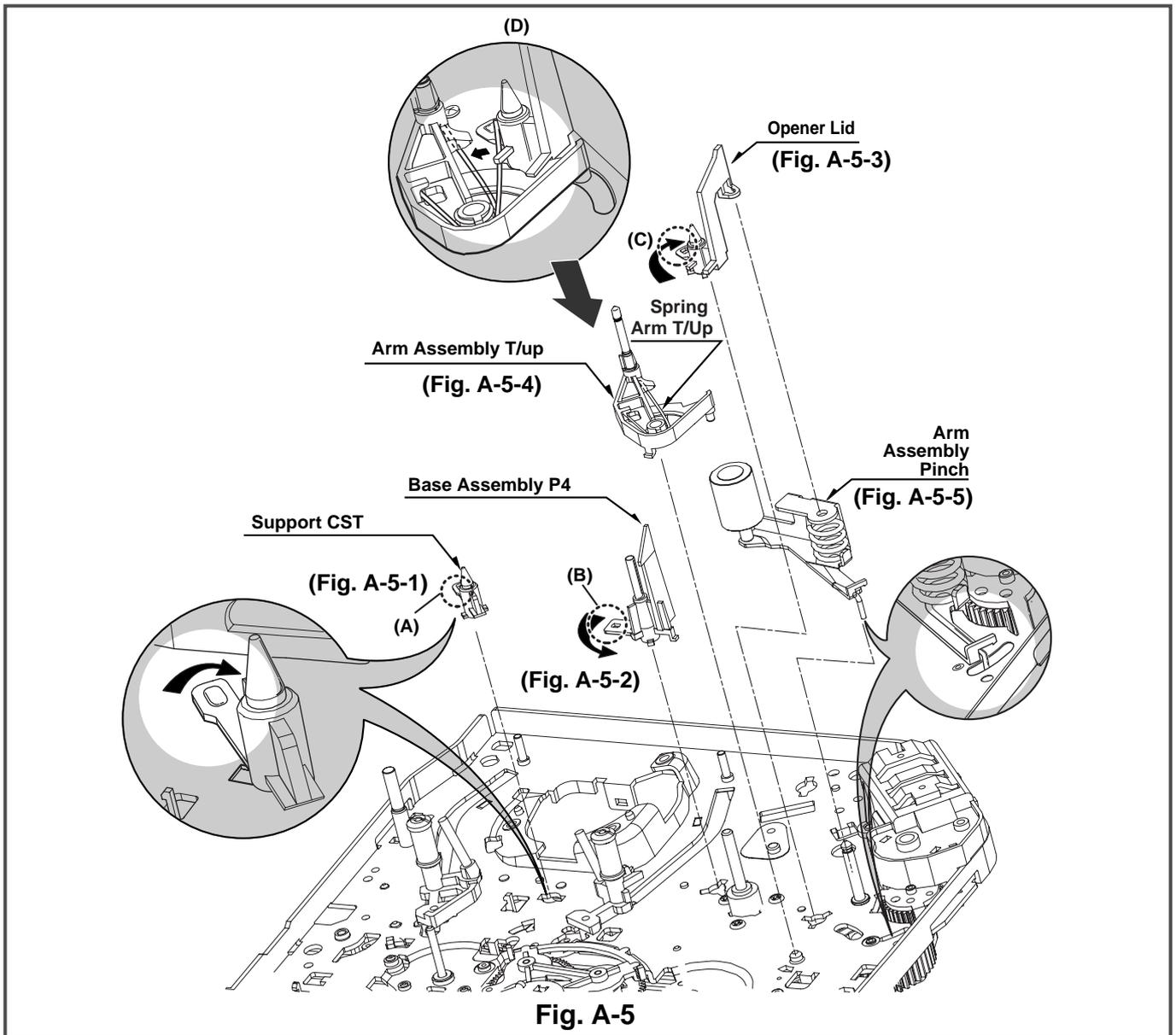


Fig. A-5

15. Support CST (Fig. A-5-1)

- 1) Break away the (A) part shown above Fig. A-5-1 from the Embossing of the Chassis in the clockwise direction, and lift up the Support CST.

16. Base Assembly P4 (Fig. A-5-2)

- 1) Break away the (B) part shown above Fig. A-5-2 from the Embossing of the Chassis in the counterclockwise direction and lift up the Base Assembly P4.

17. Opener Lid (Fig. A-5-3)

- 1) Hook the Spring Arm T/up on the Split digged under the Arm Assembly T/up.(Refer to Fig.A-5-4(D)).
- 2) Break away the (C) Part of the Opener Lid from the Embossing of the Chassis in the Clockwise direction and lift up the Opener Lid.

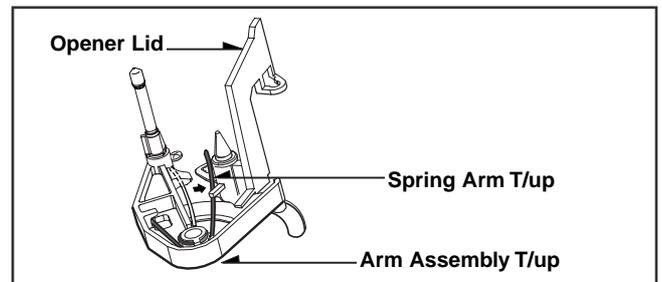
18. Arm Assembly T/up (Fig. A-5-4)

- 1) Confirm that the Spring Arm T/up is placed as above (No.17.1).

- 2) Lift up the Arm Assembly T/up.

NOTE

- (1) When reassembling, unhook the Spring Arm T/up Shown above (No.17.1) to the original position.



19. Arm Assembly Pinch (Fig. A-5-5)

- 1) Lift up the Arm Assembly Pinch.

DECK MECHANISM DISASSEMBLY

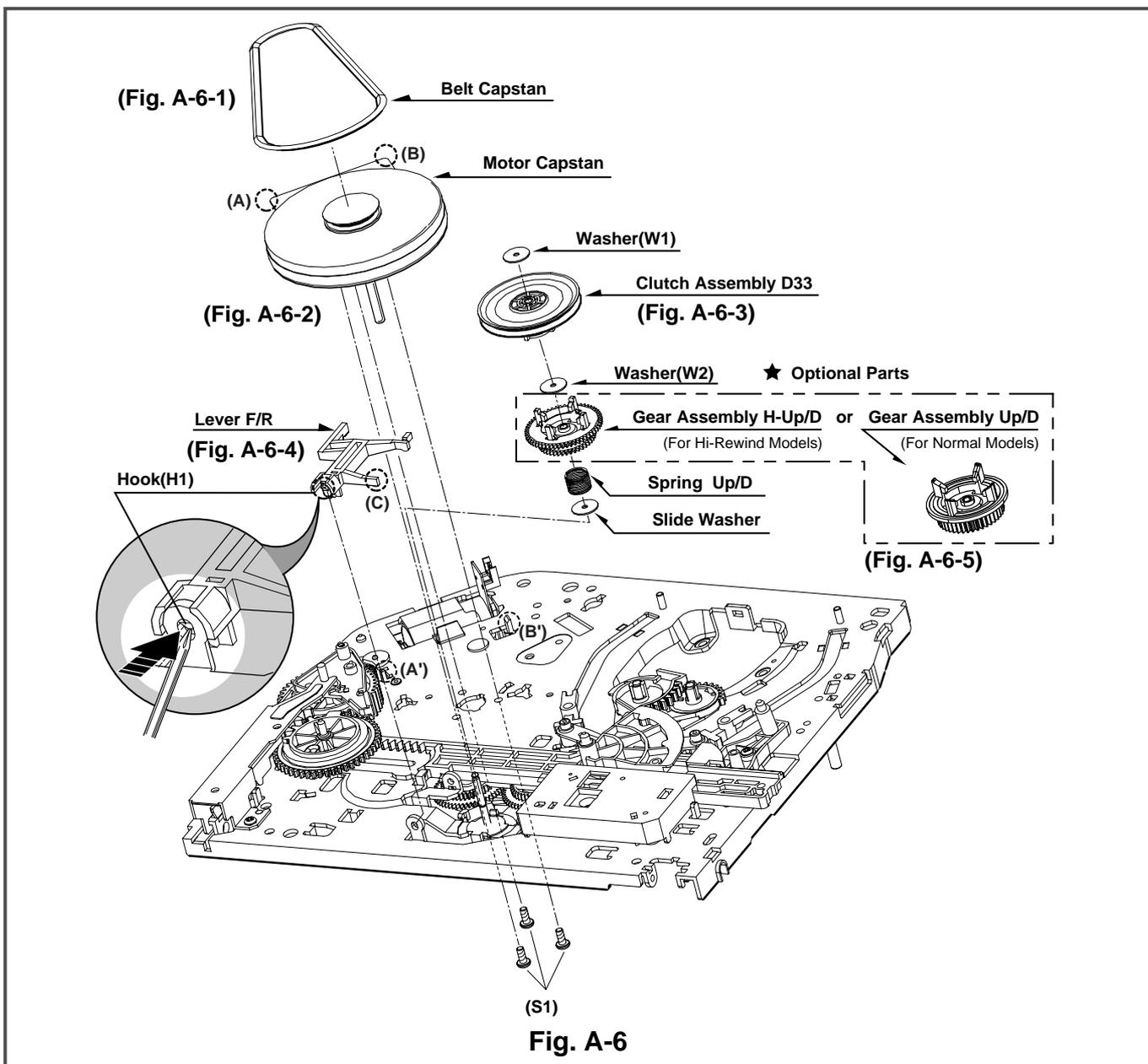


Fig. A-6

20. Belt Capstan (Fig. A-6-1)/ Motor Capstan (Fig. A-6-2)

- 1) Remove the Belt Capstan.
- 2) Remove three Screws(S1) on the back side of the Chassis and lift up the Motor Capstan.

NOTE

- (1) When reassembling, Confirm the (A), (B) parts of Motor Capstan is located to the (A'), (B') of the Chassis.

21. Clutch Assembly D33 (Fig. A-6-3)

- 1) Remove the Washer(W1) and lift up the Clutch Assembly D33.

22. Lever F/R (Fig. A-6-4)

- 1) Unhook the (H1) shown above Fig. A-6-4 and lift up the Lever F/R.

NOTE

- (1) When reassembling, move the (C) part of the Lever F/R up and down, then confirm if it is returned to original position.

23. Gear Assembly H-Up/D or Gear Assembly Up/D (Fig. A-6-5)

- 1) Remove the Washer(W2) and lift up the Gear Assembly H-up/D.
- 2) Remove the Spring Up/D.
- 3) Remove the Slide Washer.

NOTE

- (1) Gear Assembly H-Up/D is for Hi-Rewind Models.
- (2) Gear Assembly Up/D is for Normal Models except Hi-Rewind Models.

DECK MECHANISM DISASSEMBLY

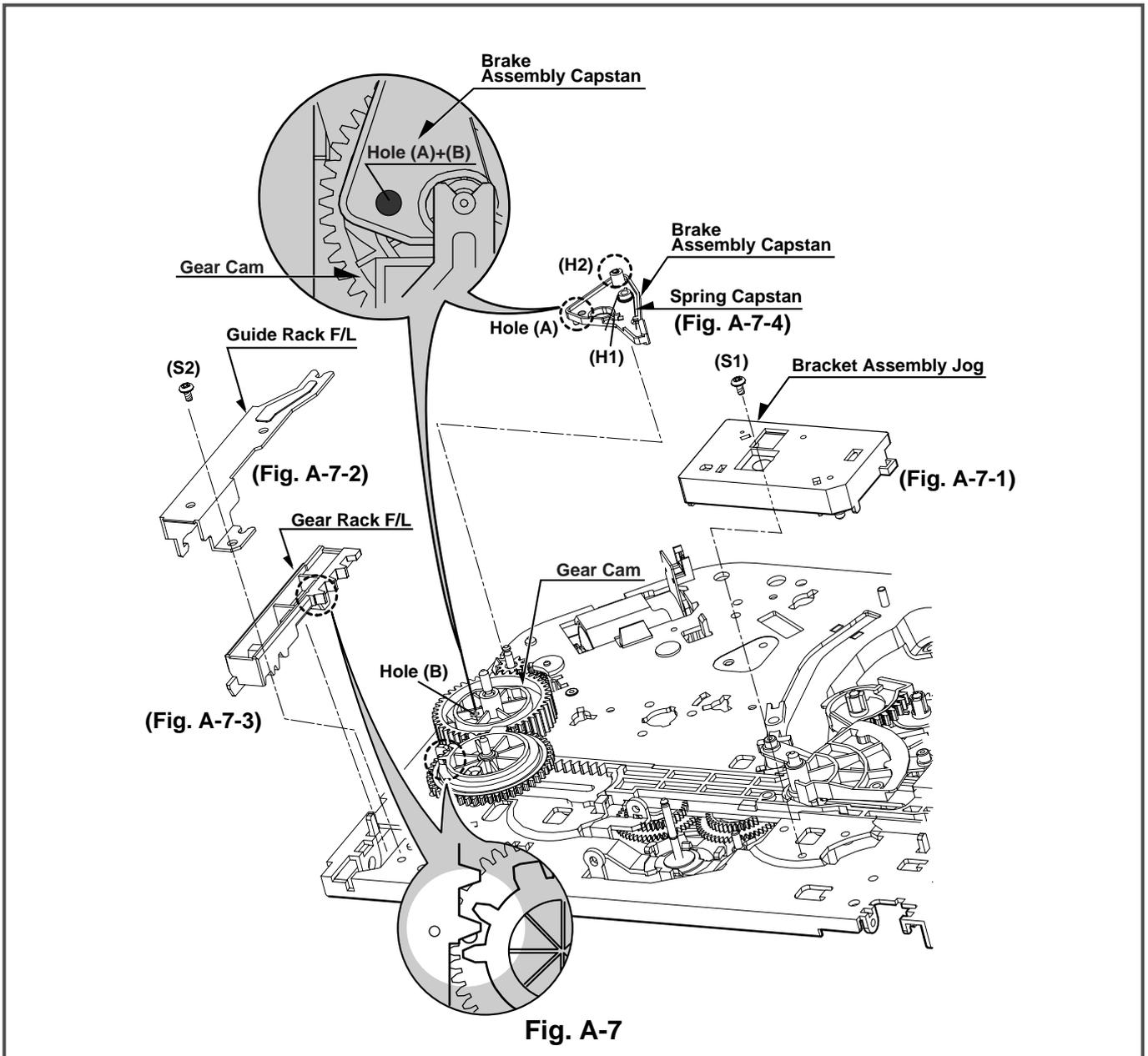


Fig. A-7

24. Bracket Assembly Jog (Fig. A-7-1)

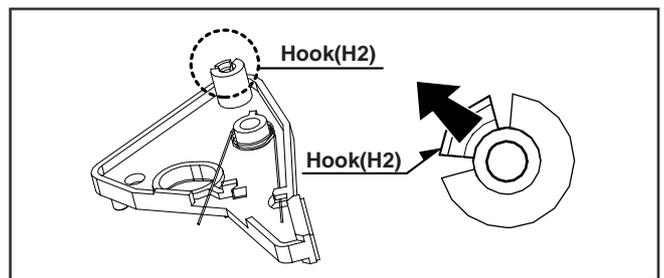
- 1) Remove the Screw(S1) and lift up the Bracket Assembly Jog.

25. Guide Rack F/L (Fig. A-7-2)/ Gear Rack F/L (Fig. A-7-3)

- 1) Remove the Screw(S2) and lift up the Guide Rack F/L.
- 2) Lift up the Gear Rack F/L.

26. Brake Assembly Capstan (Fig. A-7-4)

- 1) Hook the Spring Capstan on the Hook(H1).
- 2) Unhook the Hook(H2) and lift up the Brake Assembly Capstan.(Refer to Fig. to the right)



NOTE

- (1) When reassembling, confirm that the Hole(A) of the Brake Assembly Capstan is aligned to the Hole(B) of the Gear Cam.
(Refer to above Fig. A-7-4).

DECK MECHANISM DISASSEMBLY

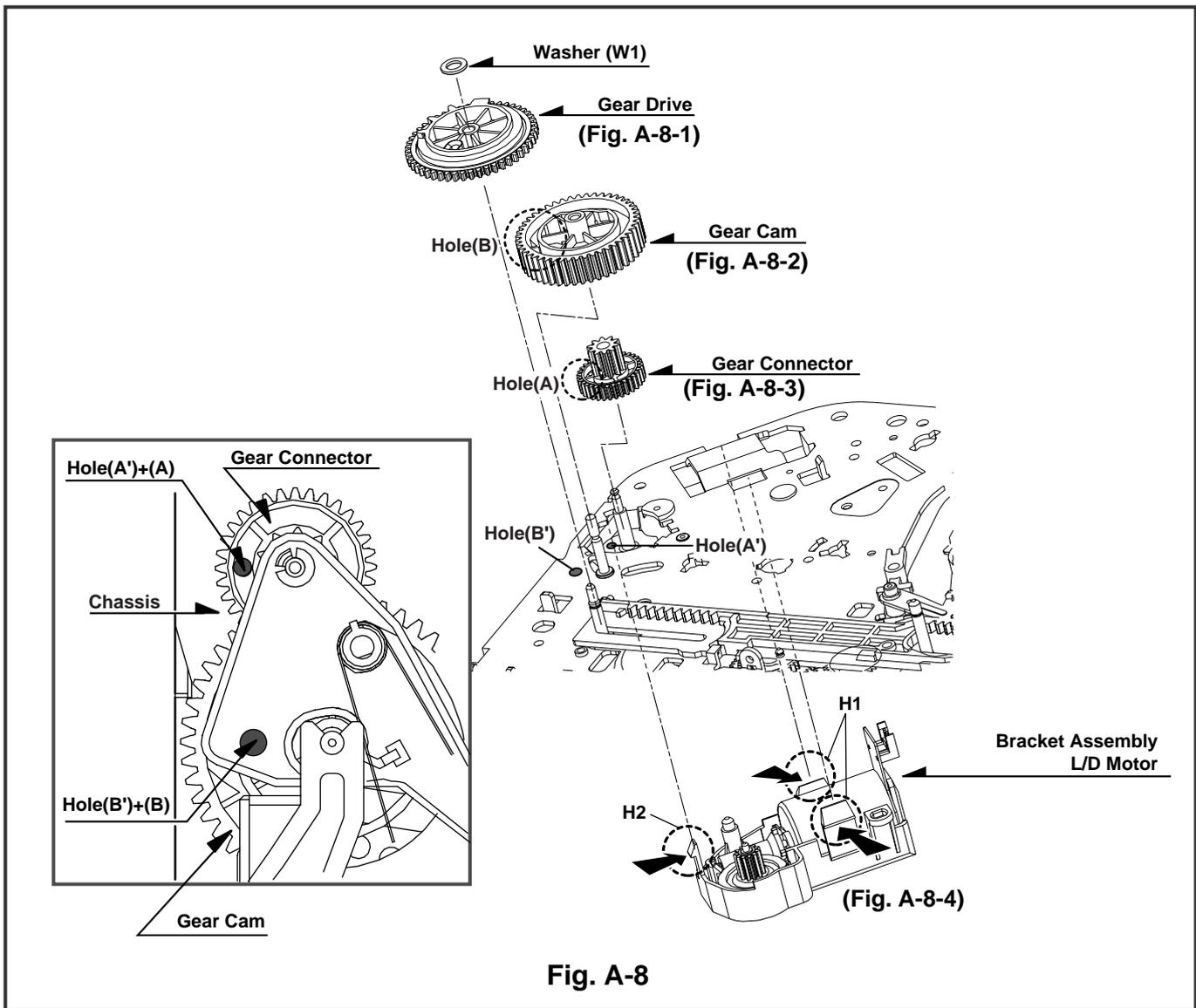


Fig. A-8

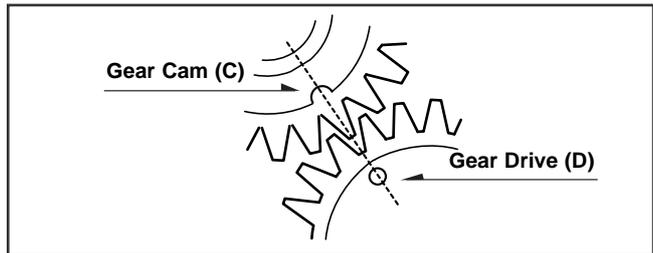
27. Gear Drive (Fig. A-8-1)/ Gear Cam (Fig. A-8-2)/ Gear Connector (Fig. A-8-3)

- 1) Remove the Washer(W1) and lift up the Gear Drive.
- 2) Lift up the Gear Cam.
- 3) Lift up the Gear Connector.

NOTE

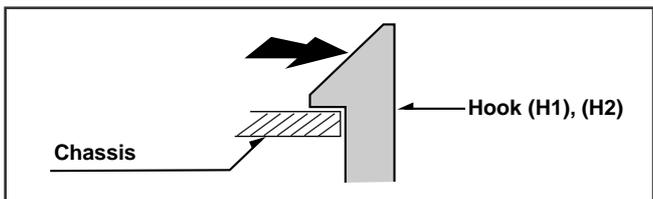
- (1) When reassembling, confirm that the Hole (A) of the Gear Connector is aligned to the Hole (A') of the Chassis (Fig. A-8-3).
- (2) When reassembling, confirm that the Hole (B) of the Gear Cam is aligned to the Hole (B') of the Chassis (Fig. A-8-2).
- (3) When reassembling, confirm that the (C) part of the Gear Cam is aligned to the (D) part of the Gear Drive as shown Fig. B-3

(Fig. B-3)



28. Bracket Assembly L/D Motor (Fig. A-8-4)

- 1) Unhook the three Hooks(H1),(H2) and push down the Bracket Assembly L/D Motor.



DECK MECHANISM DISASSEMBLY

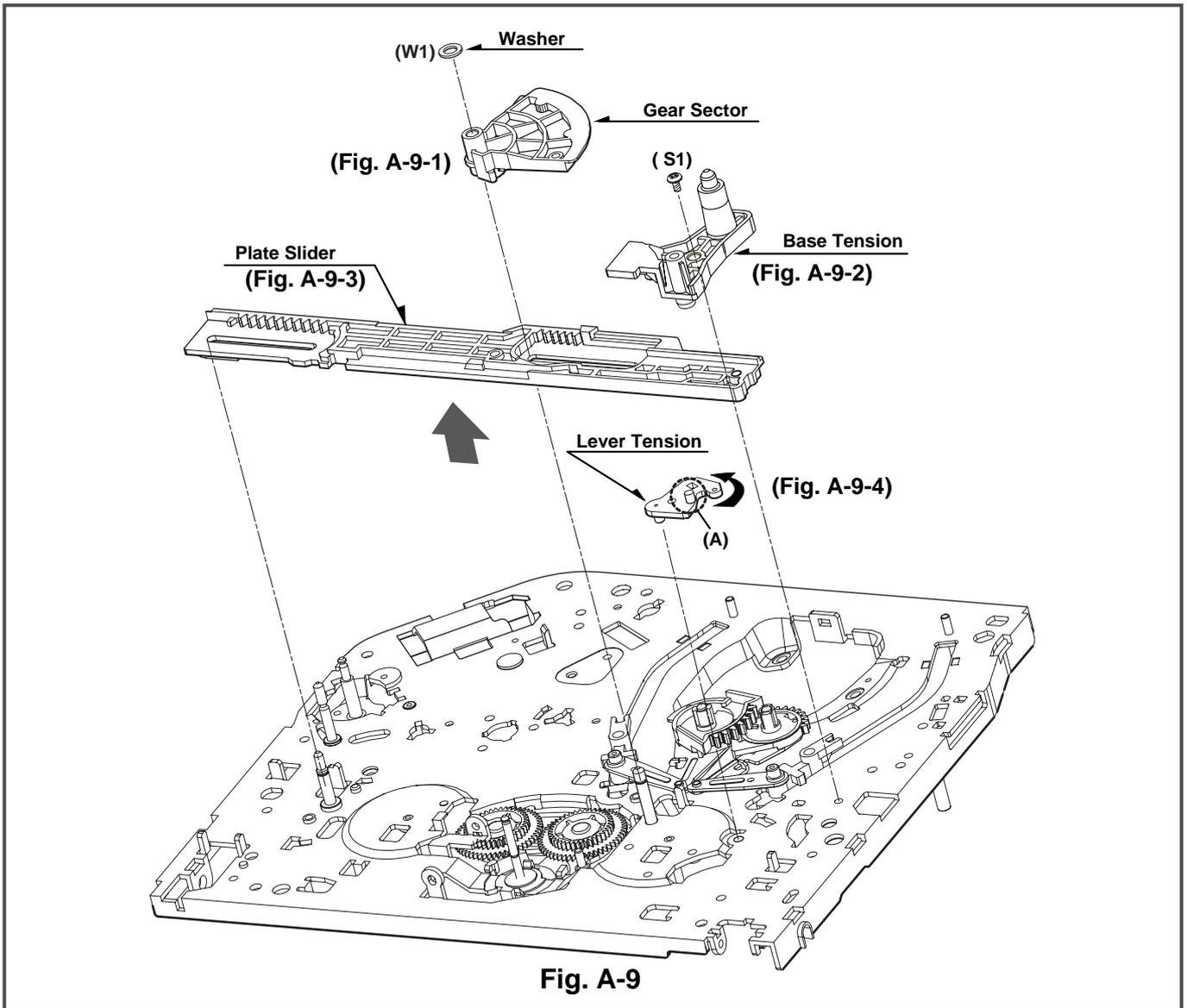


Fig. A-9

29. Gear Sector (Fig. A-9-1)

- 1) Remove the Washer(W1) and lift up the Gear Sector.

30. Base Tension (Fig. A-9-2)/

Plate Slider (Fig. A-9-3)/

Lever Tension (Fig. A-9-4)

- 1) Remove the Screw(S1) and lift up the Base Tension.
- 2) Lift up the Plate Slider.
- 3) Hold the (A) Part of the Lever Tension and turn to the counterclockwise direction, and then lift up the Lever Tension.

NOTE

- (1) When reassembling, turn the Lever Tension to the clockwise direction in maximum.

DECK MECHANISM DISASSEMBLY

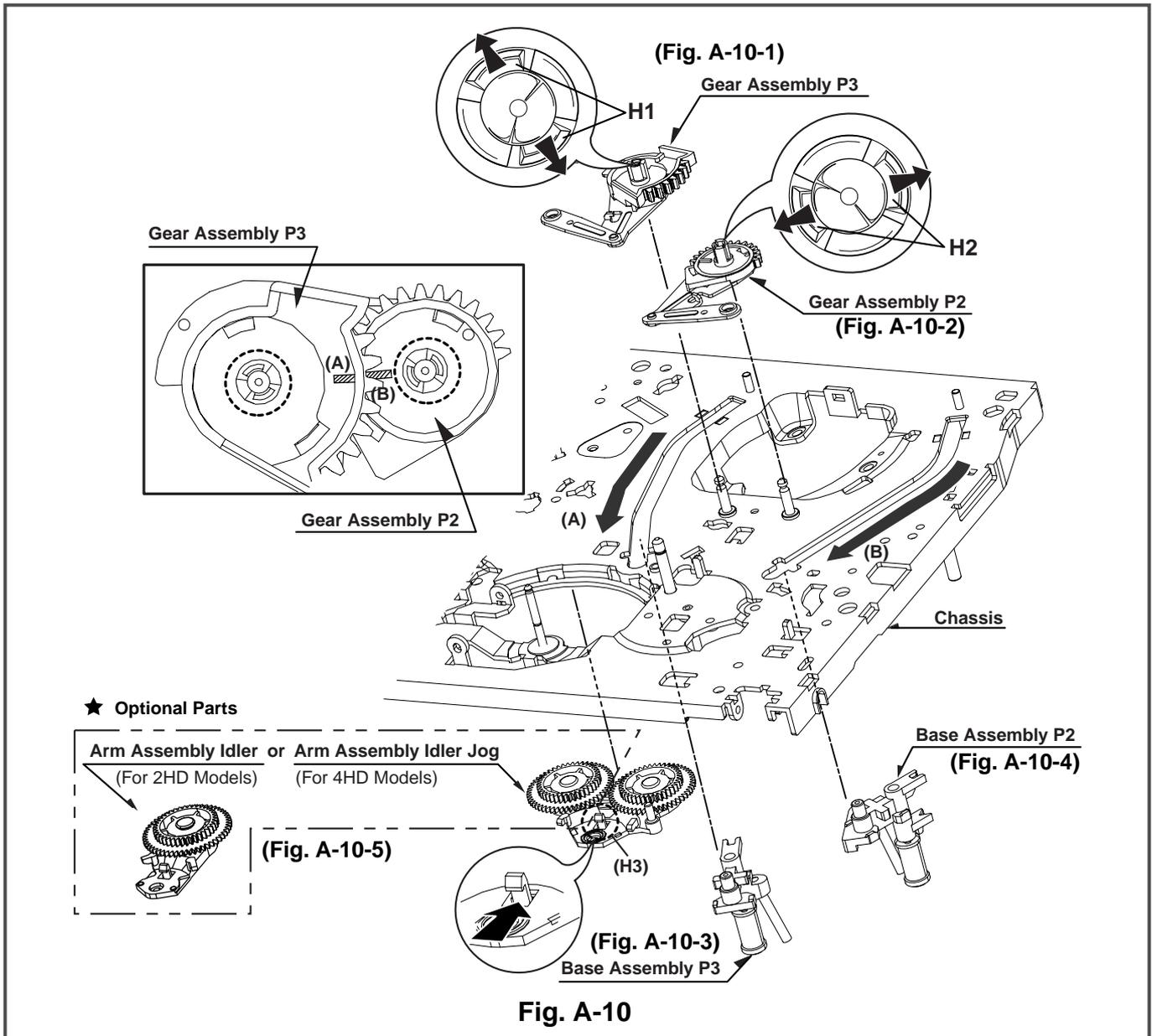


Fig. A-10

31. Gear Assembly P3 (Fig. A-10-1)/ Gear Assembly P2 (Fig. A-10-2)

- 1) Unhook the two Hooks(H1) and lift up the Gear Assembly P3.
- 2) Unhook the two Hooks(H2) and lift up the Gear Assembly P2.

32. Base Assembly P3 (Fig. A-10-3)/ Base Assembly P2 (Fig. A-10-4)

- 1) Move the Base Assembly P3 in the direction of the arrow of the Chassis Hole(A) and push down the Base Assembly P3.
- 2) Move the Base Assembly P2 in the direction of the arrow of the Chassis Hole(B) and push down the Base Assembly P2.

33. Arm Assembly Idler Jog or Arm Assembly Idler (Fig. A-10-5)

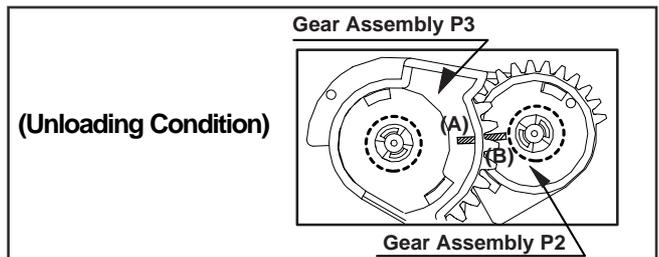
- 1) Unhook the Hook(H3) and push down the Arm Assembly Idler Jog.

NOTE

- 1) Arm Assembly Idler Jog is for 4HD Models.
- 2) Arm Assembly Idler is for 2HD Models.

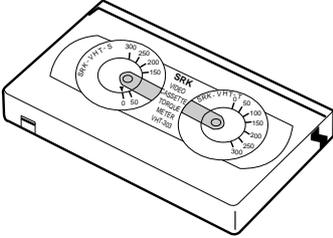
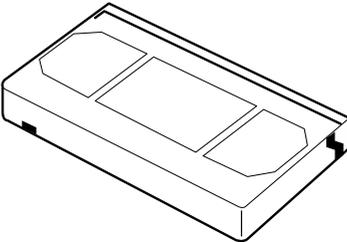
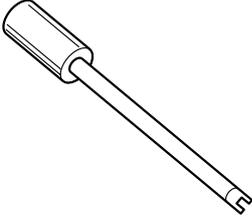
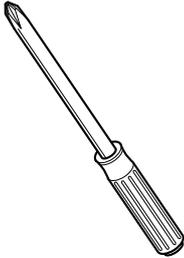
NOTE

- 1) When reassembling, confirm that the (A) Part of the Gear Assembly P3 is aligned to the (B) Part of the Gear Assembly P2 as shown below.



DECK MECHANISM ADJUSTMENT

• Tools and Fixtures for Service

<p>1. Cassette Torque meter SRK-VHT-303(Not SVC part)</p> 	<p>2. Alignment tape (See figure below)</p> 	<p>3. Torque gauge 600g.Cm ATG</p> 
<p>4. Torque gauge adaptor</p> 	<p>5. Post height adjusting driver Parts No: SV-TGO-030-000 (SMALL) SV-TGO-020-000 (LARGE)</p> 	<p>6. + Type driver (ø 5)</p> 

ALIGNMENT TAPES FOR ADJUSTMENT

Derivation No.		A	B	C	D
Mechanism		PAL	PAL	NTSC	NTSC
	Adjustment Items	SP/LP 2/4 Head	SP 2 Head	SP/LP/EP 2/4 Head	SP 2 Head
FM Envelope		TTV-P2L	TTV-P2	TTV-N1 (TTN-N12)	TTV-N2
A/C Head	Slantness	A commercially available tape			
	Height	TTV-P1 (TTV-P1L)	TTV-P1	TTV-N1 (TTV-N12) (TTV-N1E)	TTV-N1 (TTV-N12)
	Azimuth	TTV-P2	TTV-P2	TTV-N2	TTV-N2
X-value		TTV-P2 (TTV-P2L)	TTV-P2	TTV-N2 TTV-N2E TTV-N12	TTV-N2
RG Post Inclination		A commercially available tape			
Tape Back Tension		SRK-VHT-303			

The numbers in () parenthesis can be used as the substitute.

DECK MECHANISM ADJUSTMENT

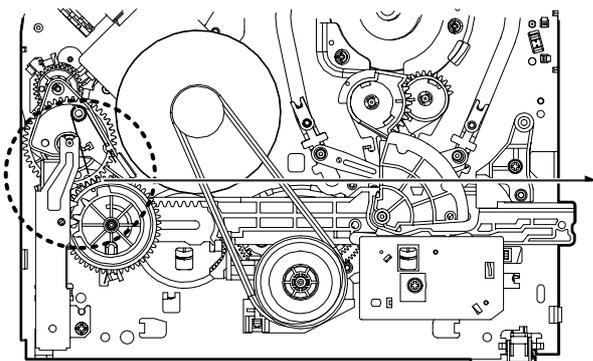
1. Mechanism Alignment Position Check

Purpose: To determine if the Mechanism is in the correct position, when a Tape is ejected.

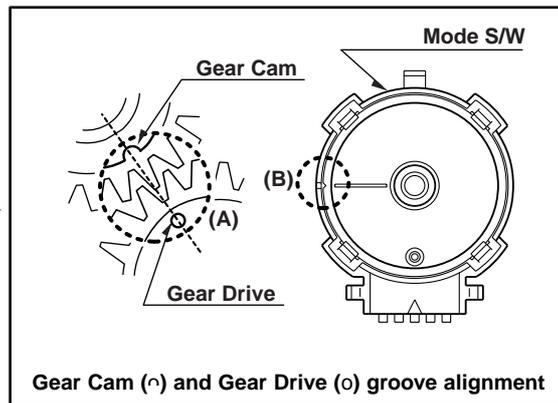
Test Equipment/ Fixture	Test Conditions (Mechanism Condition)	Check Point
• Blank tape	• Eject Mode (with Cassette ejected)	• Mechanism and Mode Switch Position

- 1) Turn the Power S/W on and eject the Cassette by pressing the Eject Button.
- 2) Remove the Top Cover and Plate Assembly Top, visually check if the Gear Cam Hole is aligned with the Chassis Hole as below Fig. C-2.
- 3) IF not, rotate the Shaft of the Loading Motor to either Clockwise or Counterclockwise until the Alignment is as below Fig. C-2.
- 4) Remove the Screw which fixes the Deck Mechanism and Main Frame and confirm if the Gear Cam is aligned with the Gear Drive as below Fig. C-1(A).
- 5) Confirm if the Mode S/W on the Main P.C.Board is aligned as below Fig. C-1(B).
- 6) Remount the Deck Mechanism on the Main P.C.Board and check each operation.

CHECK DIAGRAM

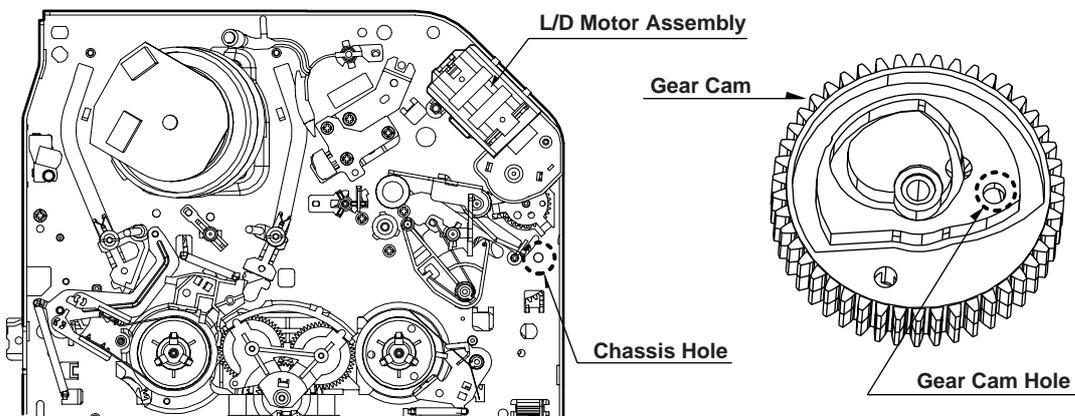


BOTTOM VIEW



Gear Cam (A) and Gear Drive (B) groove alignment

Fig. C-1



TOP VIEW

Fig. C-2

DECK MECHANISM ADJUSTMENT

2. Preparation for Adjustment (To set the Deck Mechanism to the Loading state without inserting a Cassette Tape).

- 1) Unplug the Power Cord from the AC Outlet.
- 2) Disassemble the Top Cover and Plate Assembly Top.
- 3) Plug the Power Cord into the AC Outlet.
- 4) Turn the Power S/W on and push the Lever Stopper (L),(R) of the Holder Assembly CST to the back for Loading the

Cassette without Tape.

Cover the Holes of the End Sensors at the both sides of the Bracket Side(L) and Bracket Assembly Door to prevent a light leak.

Then The Deck Mechanism drives to the Stop Mode.

In this case, The Deck Mechanism can accept inputs of each mode, however the Rewind and Review Operation can not be performed for more than a few seconds because the Take-up Reel Table is in the Stop State and can not be detected the Reel Pulses.

3. Checking Torque

Purpose: To insure smooth Transport of the Tape during each Mode of Operation.
If the Tape Transport is abnormal, then check the Torque as indicated by the chart below.

Test Equipment/ Fixture	Test Conditions (Mechanism Condition)	Checking Method		
<ul style="list-style-type: none"> • Torque Gauge(600g/cm ATG) • Torque Gauge Adaptor • Cassette Torque Meter SRK-VHT-303 	<ul style="list-style-type: none"> • Play (FF) or Review (REW) Mode 	<ul style="list-style-type: none"> • Perform each Deck Mechanism Mode without inserting a Cassette Tape(Refer to above No.2 Preparation for Adjustment). • Read the Measurement of the Take-up or Supply Reels on the Cassette Torque Meter(Fig. C-3-2). • Attach the Torque Gauge Adaptor to the Torque Gauge and then read the Value of it(Fig. C-3-1). 		
Item	Mode	Test Equipment	Measurement Reel	Measurement Values
Fast Forward Torque	Fast Forward	Cassette Torque Gauge	Take-Up Reel	More than 400g/cm
Rewind Torque	Rewind	Cassette Torque Gauge	Supply Reel	More than 400g/cm
Play Take-Up Torque	Play	Cassette Torque Meter	Take-Up Reel	75~115g/cm
Review Torque	Review	Cassette Torque Meter	Supply Reel	130~200g/m

NOTE:

The Values are measured by using a Torque Gauge and Torque Gauge Adaptor with the Torque Gauge affixed.

• Cassette Torque Meter (SRK-VHT-303)

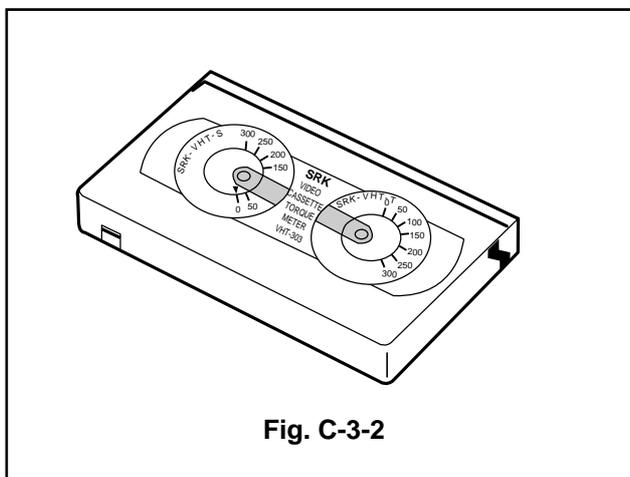


Fig. C-3-2

NOTE:

The Torque reading to measure occurs when the Tape abruptly changes direction from Fast Forward of Rewind Mode, when quick bracking is applied to both Reels.

• Torque Gauge (600g.cm ATG)

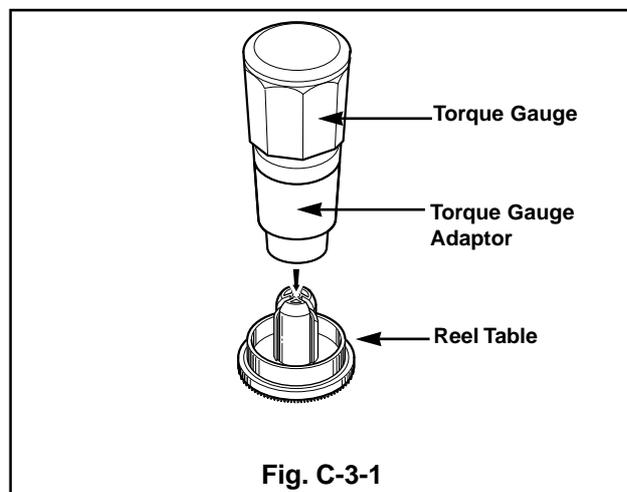


Fig. C-3-1

DECK MECHANISM ADJUSTMENT

4. Guide Roller Height Adjustment

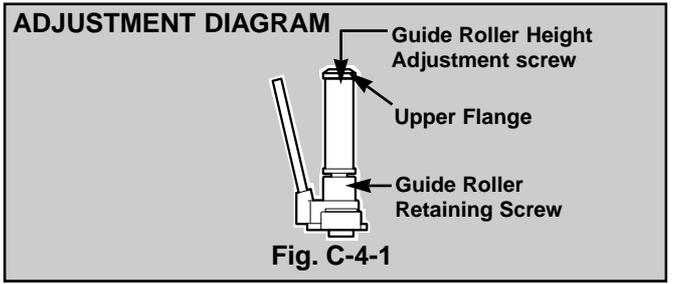
Purpose: To regulate the Height of the Tape so that the Bottom of the Tape runs along the Tape Guide Line on the Lower Drum.

4-1. Preliminary Adjustment

Test Equipment/ Fixture	Test Conditions (Mechanism Condition)	Adjustment Point
<ul style="list-style-type: none"> • Post Height Adjusting Driver 	<ul style="list-style-type: none"> • Play or Review Mode 	<ul style="list-style-type: none"> • Guide Roller Height Adjustment screws on the Supply and Take-Up Guide Rollers.

Adjustment Procedure

- 1) Confirm if the Tape runs along the Tape Guide Line of the Lower Drum.
- 2) If the Tape runs the Bottom of the Guide Line, turn the Guide Roller Height Adjustment Screw to Clockwise direction.
- 3) If it runs the Top, turn to Counterclockwise direction.
- 4) Adjust the Height of the Guide Roller to be guided to the Guide Line of the Lower Drum from the Starting and Ending Point of the Drum.



4-2. Precise Adjustment

Test Equipment/Fixture	Test Equipment Connection Points	Test Conditions VCR(VCP) State	Adjustment Point
<ul style="list-style-type: none"> • Oscilloscope • Alignment Tape • Post Height Adjusting Driver 	<ul style="list-style-type: none"> • CH-1:PB RF Envelope • CH-2:NTSC: SW 30Hz PAL: SW 25Hz • Head Switching Output Point • RF Envelope Output Point 	<ul style="list-style-type: none"> • Play an Alignment Tape 	<ul style="list-style-type: none"> • Guide Roller Height Adjustment Screws

Adjustment Procedure

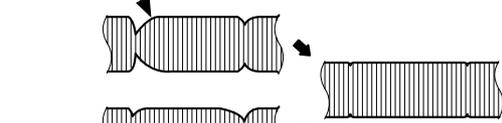
- 1) Play an Alignment Tape after connecting the Probe of the Oscilloscope to the RF Envelope Output Test Point and Head Switching Output Test Point.
- 2) Tracking Control(in PB Mode) : Center Position(When this Adjustment is performed after the Drum Assembly has been replaced, set the Tracking Control so that the RF Output is Maximum).
- 3) Height Adjustment Screw : Flatten the RF Waveform. (Fig. C-4-2)
- 4) Turn(Move) the Tracking Control(in PB Mode) Clockwise and Counterclockwise.(Fig. C-4-3)
- 5) Check that any Drop of RF Output is uniform at the Start and End of the Waveform.

NOTE

If the adjustment is excessive or insufficient the tape will jam or fold.

Waveform Diagrams

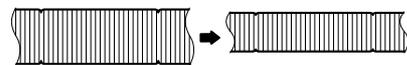
P2 POST ADJUSTMENT



P3 POST ADJUSTMENT

Turn the Roller Guide Height Adjustment Screw slightly to flatten the waveform.

Fig. C-4-2

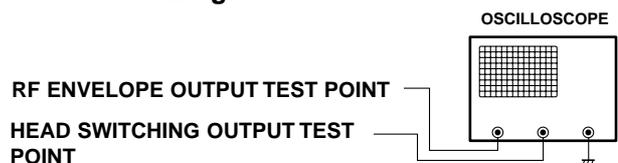


Tracking control at center

Turn(Move) the tracking control to both directions

Fig. C-4-3

Connection Diagram



DECK MECHANISM ADJUSTMENT

5. Audio/Control (A/C) Head Adjustment

Purpose: To insure that the Tape passes accurately over the Audio and Control Tracks in exact Alignment in both the Record and Playback Modes.

5-1. Preliminary Adjustment (Height and Tilt Adjustment)

Perform the Preliminary Adjustment, when there is no Audio Output Signal with the Alignment Tape.

Test Equipment/ Fixture	Test Conditions (Mechanism Condition)	Adjustment Point
<ul style="list-style-type: none"> • Blank Tape • Screw Driver(+) Type 5mm 	<ul style="list-style-type: none"> • Play the blank tape 	<ul style="list-style-type: none"> • Tilt Adjustment Screw(C) • Height Adjustment Screw(B) • Azimuth Adjustment Screw(A)

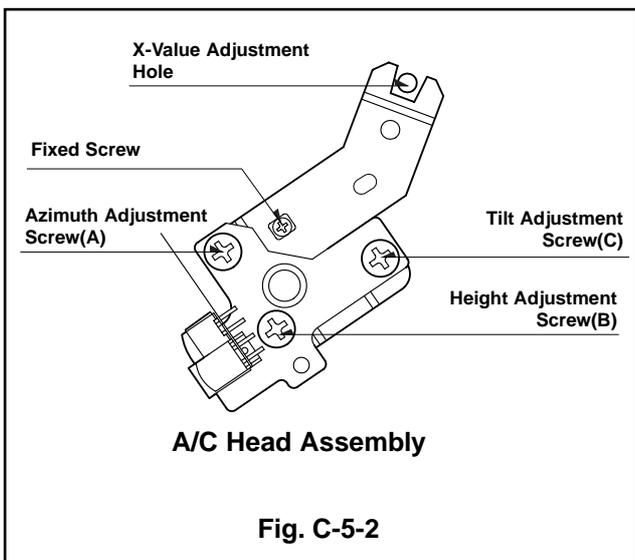
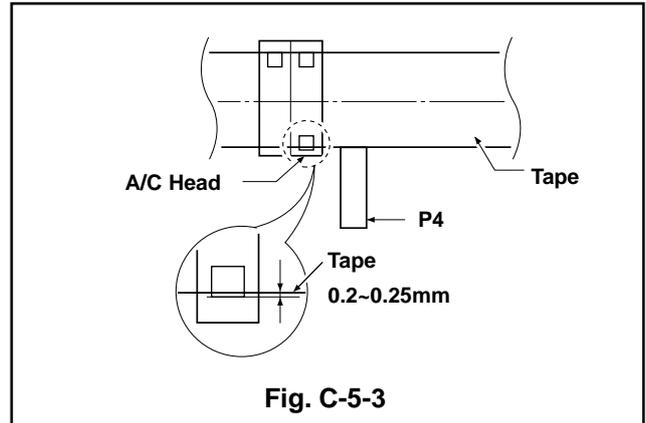
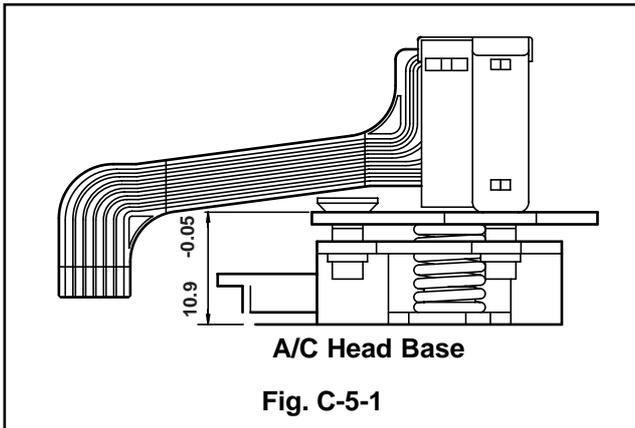
Adjustment Procedure/Diagrams

- 1) Initially adjust the Base Assembly A/C Head as shown Fig. C-5-1 by using the Height Adjustment Screw(B).
- 2) Play a Blank Tape and observe if the Tape passes accurately over the A/C Head without Tape Curling or Folding.
- 3) If Folding or Curling is occurred then adjust the Tilt Adjustment Screw(C) while the Tape is running to resemble Fig. C-5-3.

- 4) Reconfirm the Tape Path after Playback about 4~5 seconds.

NOTE

Ideal A/C head height occurs, when the tape runs between 0.2~0.25mm above the bottom edge of the A/C head core.



DECK MECHANISM ADJUSTMENT

5-2. Confirm that the Tape passes smoothly between the Take-up Guide and Pinch Roller(using a Mirror or the naked eye).

- 1) After completing Step 5-1.(Preliminary Adjustment), check that the Tape passes around the Take-up Guide and Pinch Roller without Folding or Curling at the Top or Bottom.
 - (1) If Folding or Curling is observed at the Bottom of the Take-up Guide then slowly turn the Tilt Adjustment Screw(C) in the Clockwise direction.
 - (2) If Folding or Curling is observed at the Top of it then

slowly turn the Tilt Adjustment Screw(C) in the Counterclockwise direction.

NOTE:

Check the RF Envelope after adjusting the A/C Head, if the RF Waveform differs from Fig. C-5-4, performs Precise Adjustment to flat the RF Waveform.

5-3. Precise Adjustment (Azimuth adjustment)

Test Equipment/ Fixture	Connection Point	Test Conditions (Mechanism Condition)	Adjustment Point
<ul style="list-style-type: none"> • Oscilloscope • Alignment Tape(SP) • Screw Driver(+) Type 5mm 	<ul style="list-style-type: none"> • Audio output jack 	<ul style="list-style-type: none"> • Play an Alignment Tape 1KHz, 7KHz Sections 	<ul style="list-style-type: none"> • Azimuth Adjustment Screw(A) • Height Adjustment Screw(B)
Adjustment Procedure <ol style="list-style-type: none"> 1) Connect the Probe of the Oscilloscope to Audio Output Jack. 2) Alternately adjust the Azimuth Adjustment Screw(A) and the Tilt Adjustment Screw(C) for Maximum Output of the 1KHz and 7KHz segments, while maintaining the flattest Envelope differential between the two Frequencies. 			

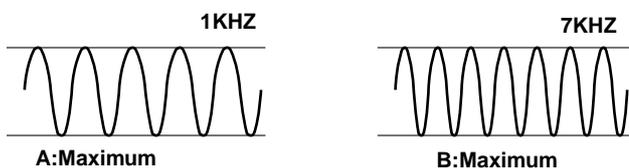


Fig. C-5-4

6. X-Value Adjustment

Purpose: To obtain compatibility with other VCR(VCP) Models.

Test Equipment/ Fixture	Connection Point	Test Conditions (Mechanism Condition)	Adjustment Point
<ul style="list-style-type: none"> • Oscilloscope • Alignment tape(SP only) • Screw Driver(+) Type 5mm 	<ul style="list-style-type: none"> • CH-1: PB RF Envelope • CH-2: NTSC: SW 30Hz PAL: SW 25Hz • Head Switching Output Test Point • RF Envelope Output Test Point 	<ul style="list-style-type: none"> • Play an Alignment Tape 	
Adjustment Procedure <ol style="list-style-type: none"> 1) Insert the alignment tape, and press the + or - manual tracking (channel) button once while "AUTO TRACKING" is flashing on the screen to release auto tracking, and then center the tracking. 2) Run the tape long enough for tracking to complete one cycle. 3) Loosen the fixing screw, and move the A/C head base assembly in the direction shown in the diagram, to find the center of the peak so that the maximum envelope is available. With this method, the 31-μm head can trace on the center of 58-μm track. 4) Tighten the A/C head base assembly fixing screw. 		Adjustment Diagram	
		Connection Diagram	

DECK MECHANISM ADJUSTMENT

7. Adjustment after Replacing Drum Assembly (Video Heads)

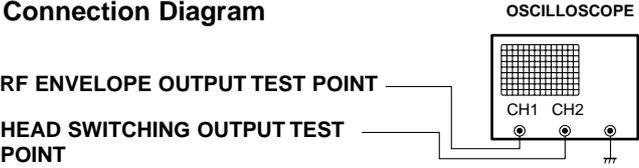
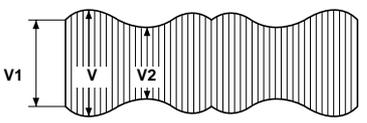
Purpose: To correct for shift in the Roller Guide and X value after replacing the Drum.			
Test Equipment/ Fixture	Connection Point	Test Conditions (Mechanism Condition)	Adjustment Points
<ul style="list-style-type: none"> Oscilloscope Alignment tapes Blank Tape Post Height Adjusting Driver Screw Driver(+) Type 5mm 	<ul style="list-style-type: none"> CH-1: PB RF Envelope CH-2: NTSC: SW 30Hz PAL: SW 25Hz Head Switching Output Test Point RF Envelope Output Test Point 	<ul style="list-style-type: none"> Play the blank tape Play an alignment tape 	<ul style="list-style-type: none"> Guide Roller Precise Adjustment Switching Point Tracking Preset X-Value
Checking/Adjustment Procedure Play a blank tape and check for tape curling or creasing around the roller guide. If there is a problem then follow the procedure 4. "Guide Roller Height" and 5. "Audio Control(A/C) Head Adjustment".		Connection Diagram  Waveform $V1/V \text{ MAX} \leq 0.7$ $V2/V \text{ MAX} \leq 0.8$ RF ENVELOPE OUTPUT 	

Fig. C-7

8. Check the Tape Travel after Reassembling Deck Assembly.

8-1. Check Audio and RF Locking Time during playback and after CUE or REV (FF/REW)

Test Equipment/ Fixture	Specification	Connection Points	Test Conditions (Mechanism Condition)
<ul style="list-style-type: none"> Oscilloscope Alignment tapes(with 6H 3kHz Color Bar Signal) Stop Watch 	<ul style="list-style-type: none"> RF Locking Time: Less than 5 sec. Audio Locking Time: Less than 10sec 	<ul style="list-style-type: none"> CH-1: PB RF Envelope CH-2: Audio Output RF Envelope Output Point Audio Output Jack 	<ul style="list-style-type: none"> Play an alignment tape (with 6H 3kHz Color Bar Signal)
Checking Procedure Play an alignment tape then change the operating mode to CUE or REV and confirm if the unit meets the above listed specifications.		NOTES: 1) CUE is fast forward mode (FF) 2) REV is the rewind mode (REW) 3) Referenced to the Play mode	

8-2. Check for tape curling or jamming

Test Equipment/ Fixture	Specification	Test Conditions (Mechanism Condition)
<ul style="list-style-type: none"> T-160 Tape T-120 Tape 	<ul style="list-style-type: none"> Be sure there is no tape jamming or curling at the beginning, middle or end of the tape. 	<ul style="list-style-type: none"> Run the CUE, REV play mode at the beginning and the end of the tape.
Checking Procedure 1) Confirm that the tape runs smoothly around the roller guides, drum and A/C head assemblies while abruptly changing operating modes from Play to CUE or REV. This is to be checked at the beginning, middle and end sections of the cassette. 2) Confirm that the tape passes over the A/C head assembly as indicated by proper audio reproduction and proper tape counter performance.		

MAINTENANCE/INSPECTION PROCEDURE

1 Check before starting repairs

The following faults can be remedied by cleaning and oiling. Check the needed lubrication and the conditions of cleanliness in the unit.

Check with the customer to find out how often the unit is used, and then determine that the unit is ready for inspection and maintenance. Check the following parts.

Phenomenon	Inspection	Replacement
Color beats	Dirt on full-erase head	o
Poor S/N, no color	Dirt on video head	o
Vertical or Horizontal jitter	Dirt on video head Dirt on tape transport system	o
Low volume, Sound distorted	Dirt on Audio/control head	o
Tape does not run. Tape is slack	Dirt on pinch roller	o
In Review and Unloading (off mode), the Tape is rolled up loosely.	Clutch Ass'y S27 Torque reduced	o
	Cleaning Drum and transport system	Fig. C-9-3

NOTE

If locations marked with **o** do not operate normally after cleaning, check for wear and replace.

See the EXPLODED VIEWS at the end of this manual as well as the above illustrations See the Greasing (Page 69) for the sections to be lubricated and greased.

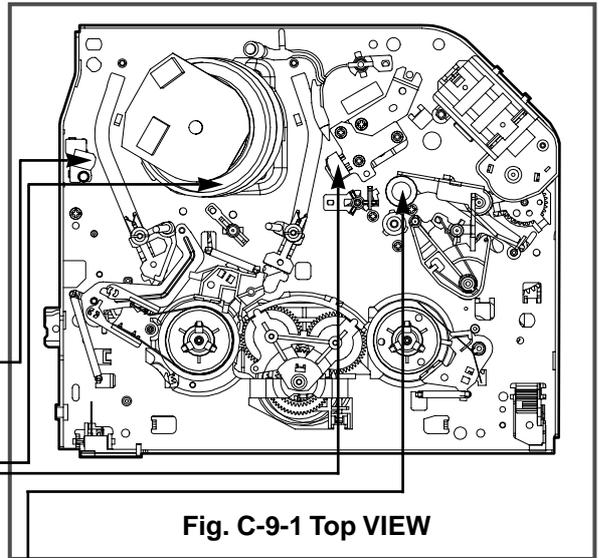


Fig. C-9-1 Top VIEW

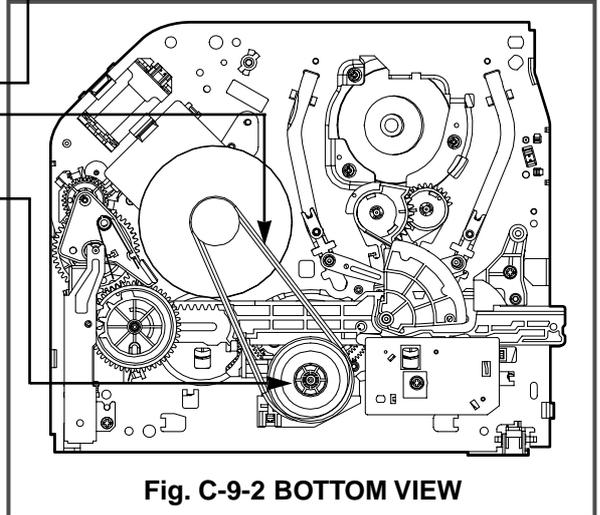


Fig. C-9-2 BOTTOM VIEW

* No. (1)~(13) Indicates the Tape Path to be traveled from Supply Reel to Take-up Reel.

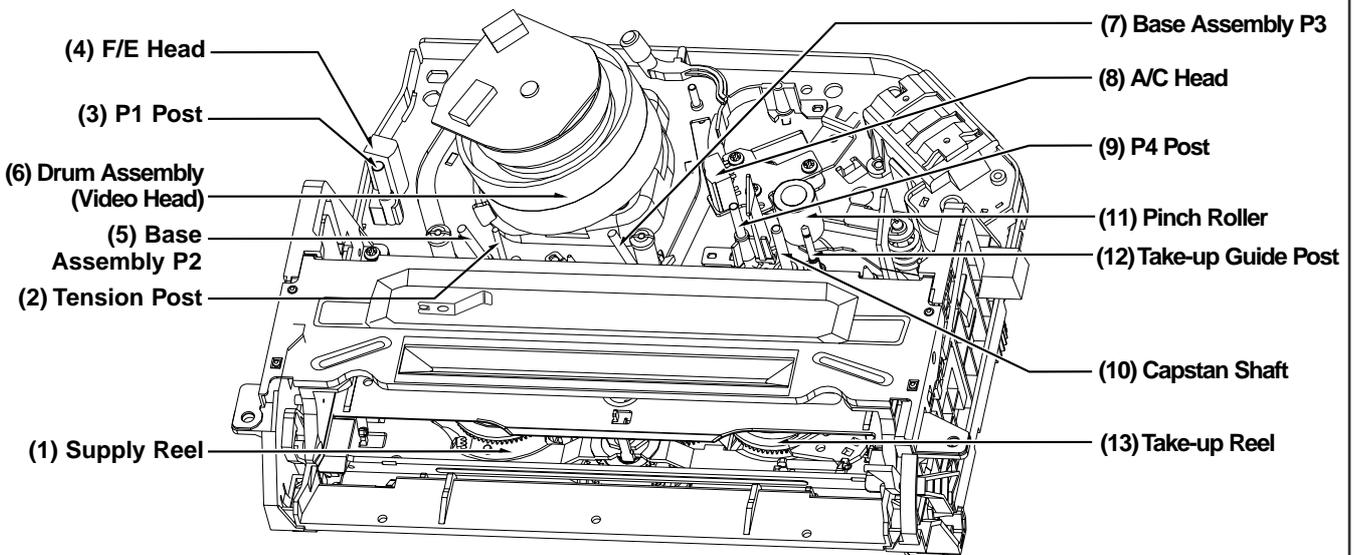


Fig. C-9-3 Tape Transport System

MAINTENANCE/INSPECTION PROCEDURE

2. Required Maintenance

The recording density of a VCR(VCP) is much higher than that of an audio tape recorder. VCR(VCP) components must be very precise, at tolerances of 1/1000mm, to ensure compatibility with other VCRs. If any of these components are worn or dirty, the symptoms will be the same as if the part is defective. To ensure a good picture, periodic inspection and maintenance, including replacement of worn out parts and lubrication, is necessary.

3. Scheduled Maintenance

Schedules for maintenance and inspection are not fixed because they vary greatly according to the way in which the customer uses the VCR(VCP), and the environment in which the VCR(VCP) is used.

But, in general home use, a good picture will be maintained if inspection and maintenance is made every 1,000 hours. The table below shows the relation between time used and inspection period.

Table 1

When inspection is necessary	About 1 year	About 18 months	About 3 years
Average hours used per day	▲	▲	▲
One hour	[Bar chart showing inspection interval]		
Two hours	[Bar chart showing inspection interval]		
Three hours	[Bar chart showing inspection interval]		

4. Supplies Required for Inspection and Maintenance

- (1) Grease : Kanto G-311G (Blue) or equivalent
- (2) Isopropyl Alcohol or equivalent
- (3) Cleaning Patches
- (4) Grease : Kanto G-381 (Yellow) : Used only for Reel S and Reel T

5) Maintenance Procedure

5-1) Cleaning

- (1) Cleaning video head

First use a cleaning tape. If the dirt on the head is too stubborn to remove by tape, use the cleaning patch. Coat the cleaning patch with Isopropyl Alcohol. Touch the cleaning patch to the head tip and gently turn the head (rotating cylinder) right and left.

(Do not move the cleaning patch vertically. Make sure that only the buckskin on the cleaning patch comes into contact with the head. Otherwise, the head may be damaged.)

Thoroughly dry the head. Then run the test tape. If Isopropyl Alcohol remains on the video head, the tape may be damaged when it comes into contact with the head surface.

- (2) Clean the tape transport system and drive system, etc, by wiping with a cleaning patch wetted with Isopropyl Alcohol.

NOTES:

- ① It is the tape transport system which comes into contact with the running tape. The drive system consists of those parts which moves the tape.
- ② Make sure that during cleaning you do not touch the tape transport system with the tip of a screw driver and no that force is that would cause deforming or damage applied to the system.

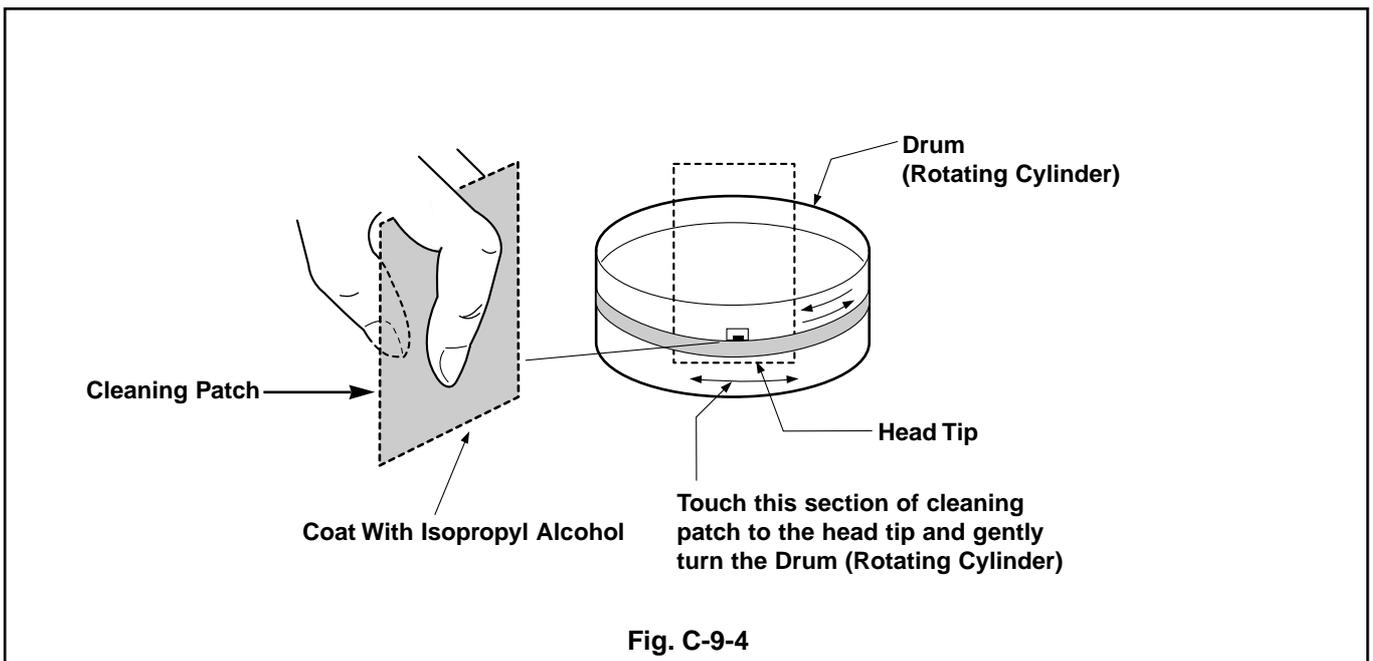


Fig. C-9-4

MAINTENANCE/INSPECTION PROCEDURE

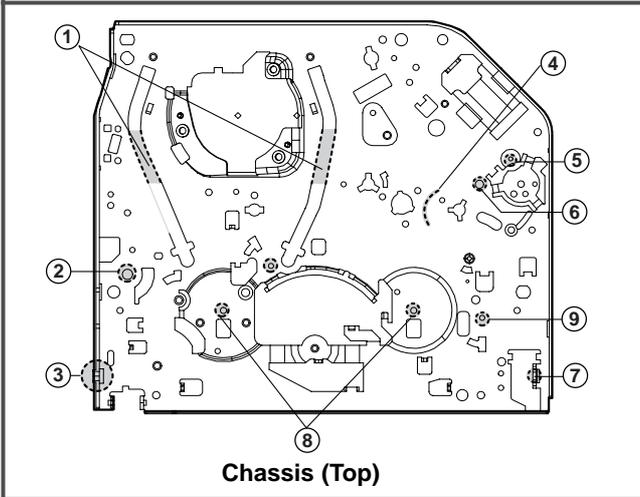
5-2) Greasing

(1) Greasing guidelines

Apply grease, with a cleaning patch. Do not use excess grease. It may come into contact with the tape transport or drive system. Wipe any excess and clean with cleaning patch wetted in Isopropyl Alcohol.

NOTE: Greasing Points

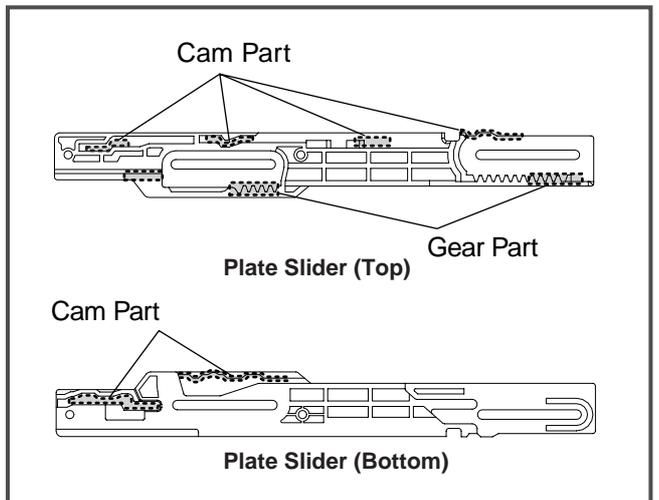
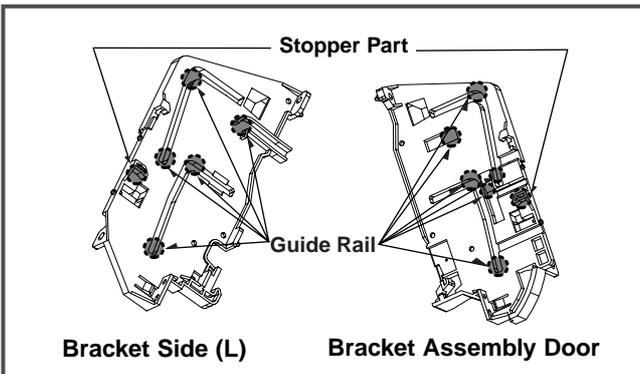
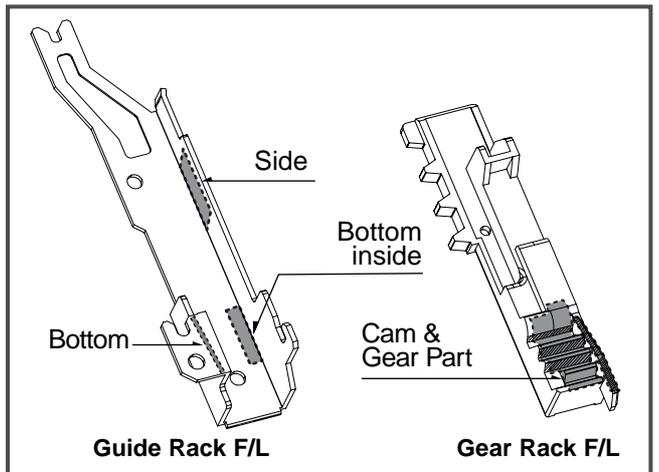
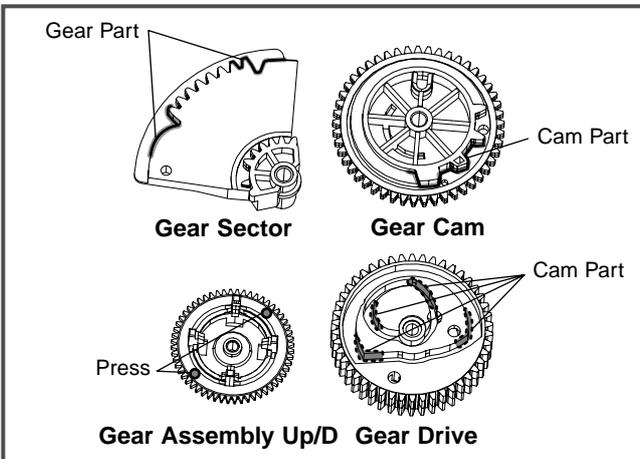
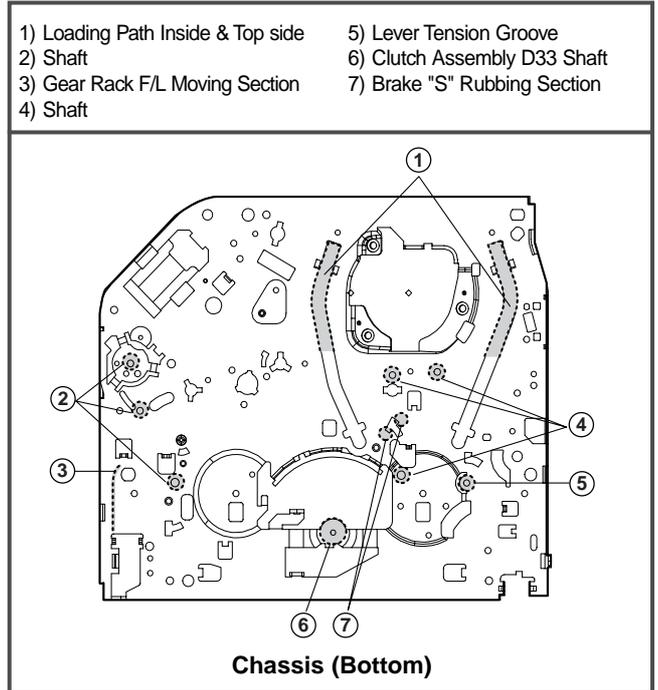
- | | |
|-----------------------------------|---|
| 1) Loading Path Inside & Top side | 6) Shaft |
| 2) Base Tension Boss inside Hole | 7) Arm Assembly F/L of Buming Inside Hole |
| 3) Arm Assembly F/L "U" Groove | 8) Reel S, T Shaft (G381:Yellow) |
| 4) Arm Take-up Rubbing Section | 9) Brake T Groove |
| 5) L/D Motor Worm Wheel Part | |



(2) Periodic greasing

Grease specified locations every 5,000 hours.

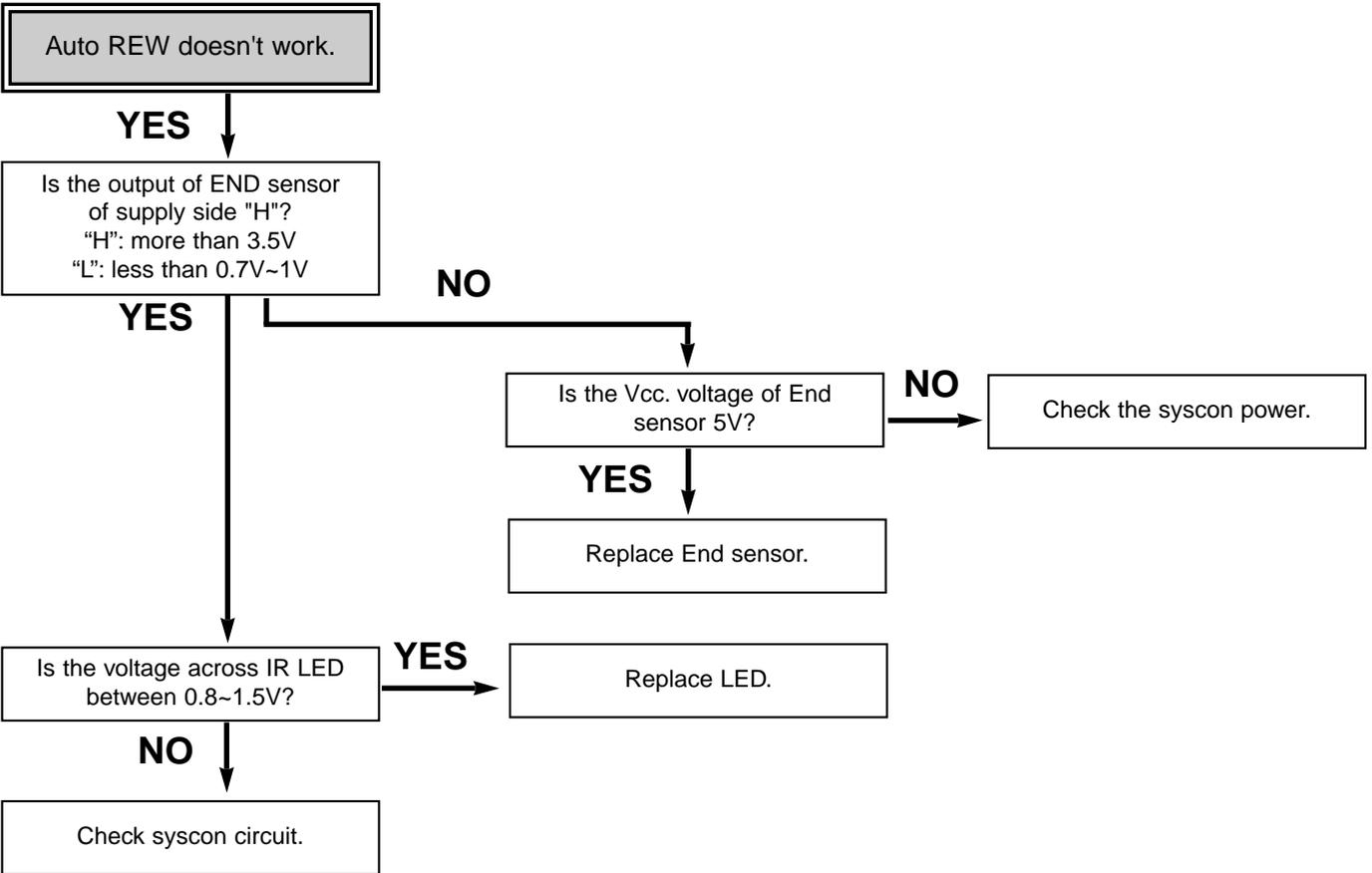
- | | |
|-----------------------------------|------------------------------|
| 1) Loading Path Inside & Top side | 5) Lever Tension Groove |
| 2) Shaft | 6) Clutch Assembly D33 Shaft |
| 3) Gear Rack F/L Moving Section | 7) Brake "S" Rubbing Section |
| 4) Shaft | |



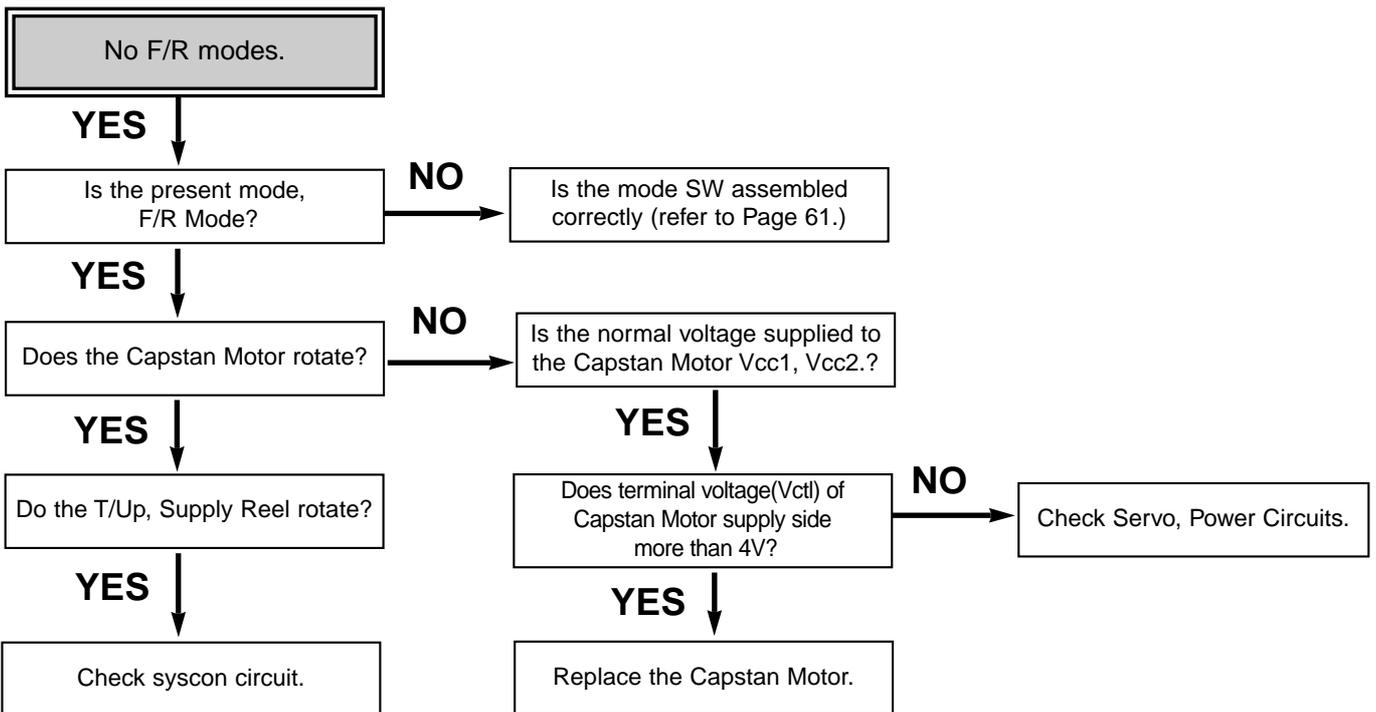
MECHANISM TROUBLESHOOTING GUIDE

1. Deck Mechanism

A.

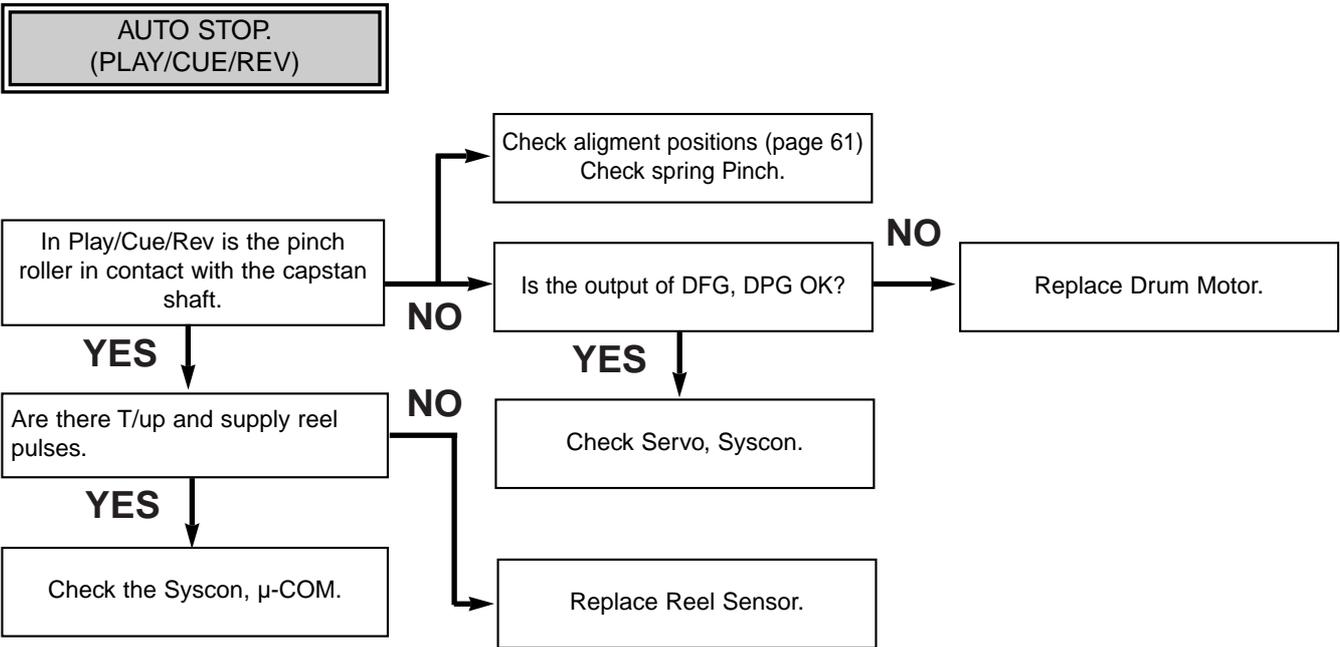


B.

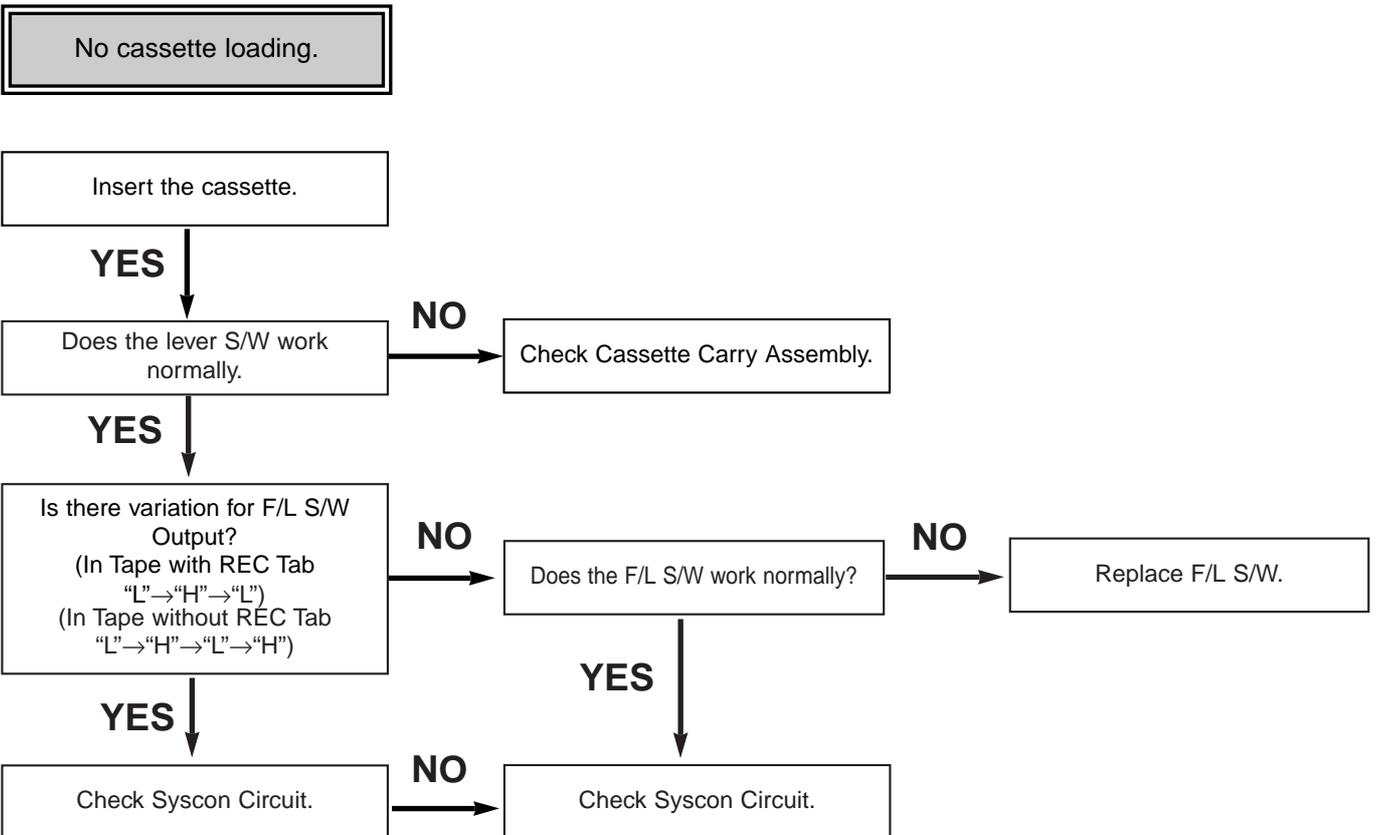


MECHANISM TROUBLESHOOTING GUIDE

C.

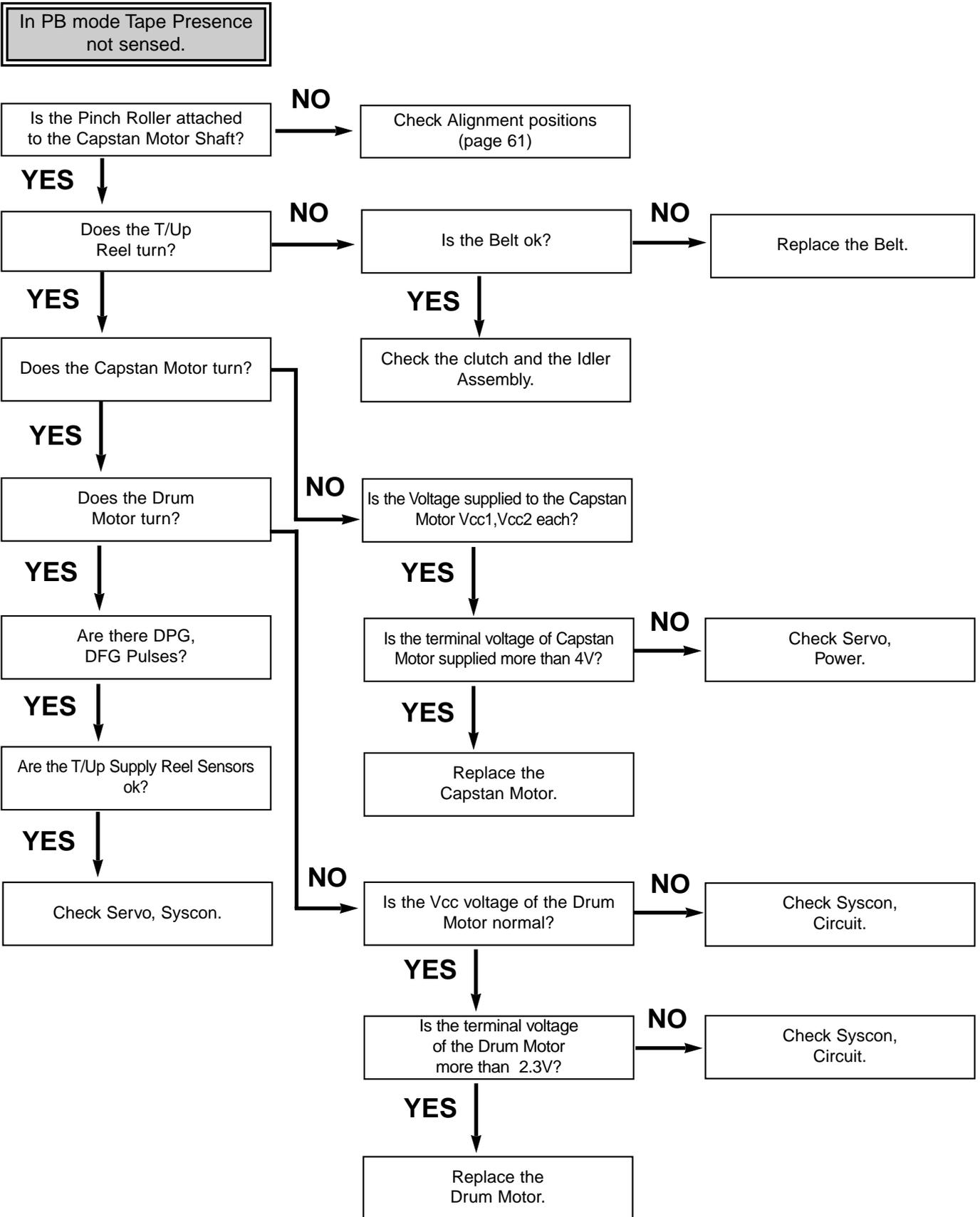


D.



MECHANISM TROUBLESHOOTING GUIDE

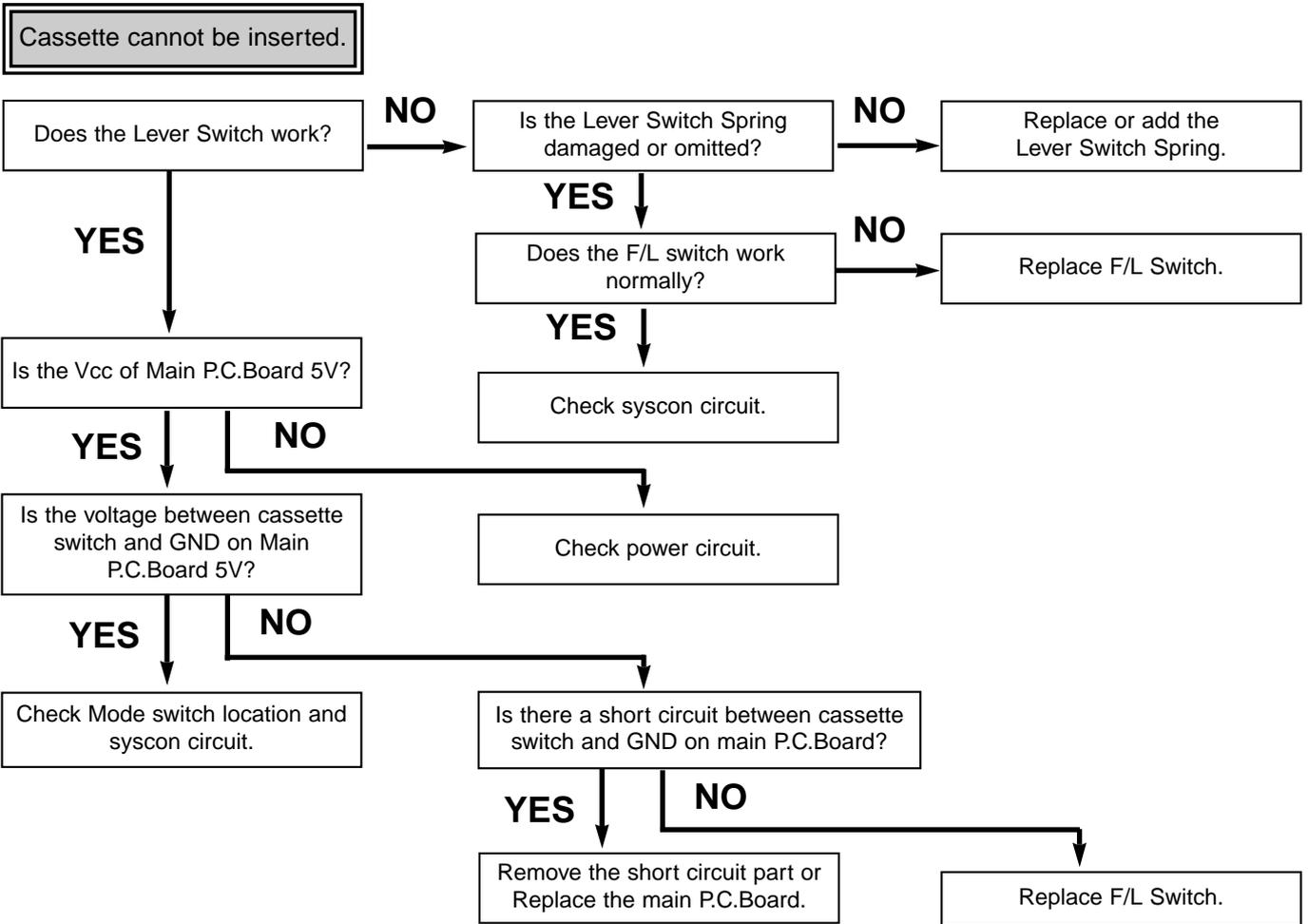
E.



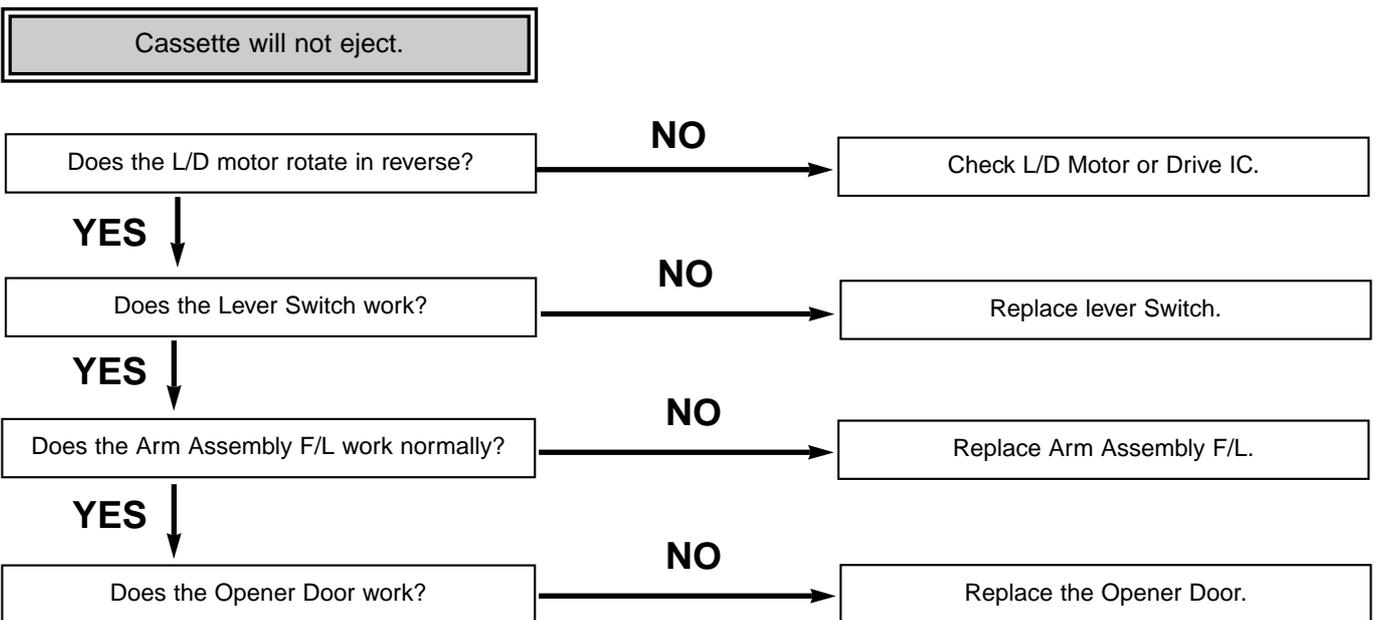
MECHANISM TROUBLESHOOTING GUIDE

2. Front Loading Mechanism

A.

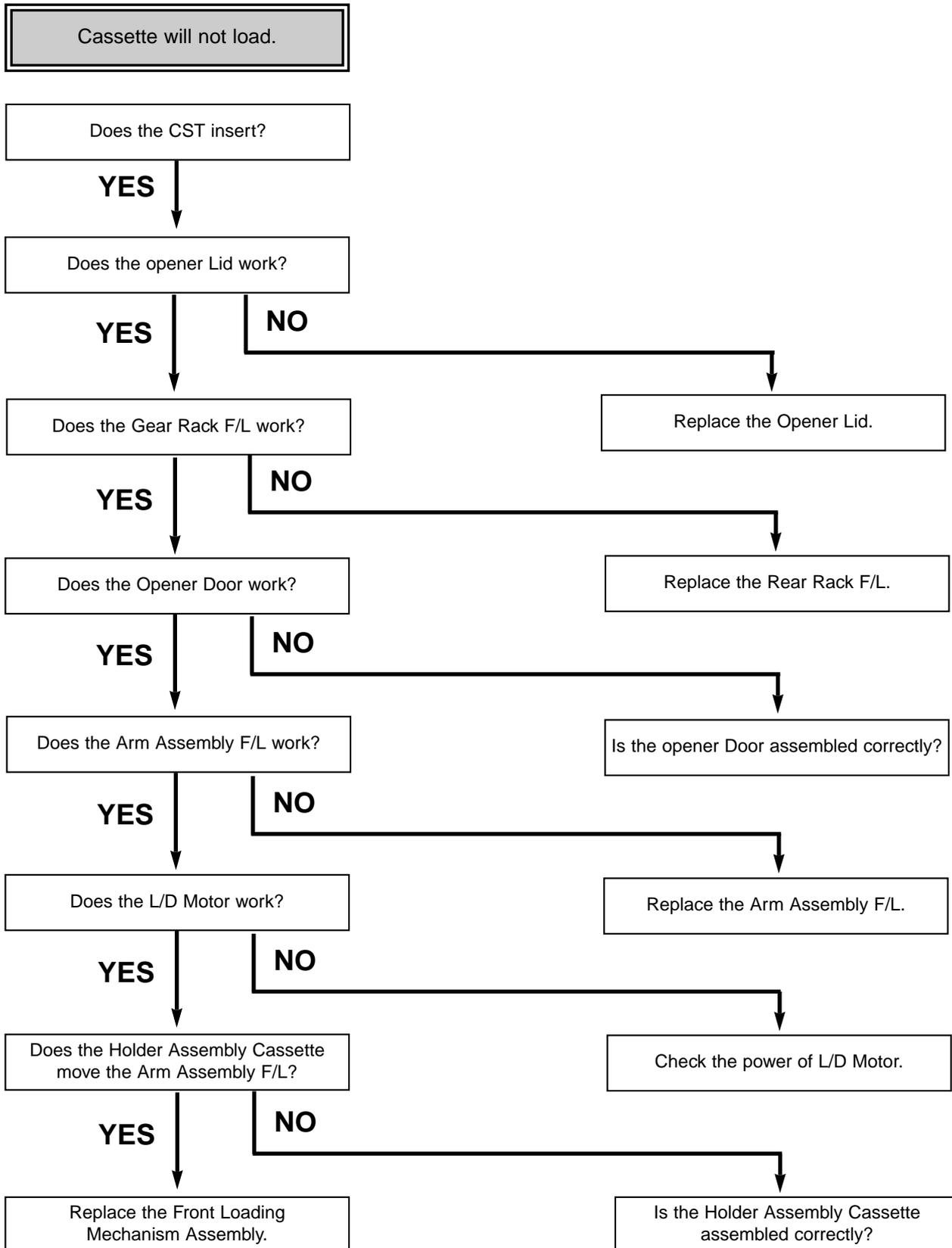


B.



MECHANISM TROUBLESHOOTING GUIDE

C.



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