

JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER

HR-J282EU, HR-J283EU, HR-J285EU,
HR-J290EU, HR-J293EU, HR-J295EK, HR-J295MS,
HR-J582EU, HR-J583EU, HR-J585EU,
HR-J590EU, HR-J593EU, HR-J595EK, HR-J595MS



SHOWVIEW®



SPECIFICATIONS *(The specifications shown pertain specifically to the model HR-J290EU, J293EU, J590EU and J593EU.)*

GENERAL	
Power	: 200 V – 240 V~, 50 Hz/60 Hz
Power consumption	
Power on	: Approx. 12 W
Standby mode	: 3.0 W
Video Head system	
HR-J590/J593/J599EU	: DA4 (Double Azimuth) head helical scan system
HR-J290/J293EU	: Rotary two-head helical scan system
Tape speed	
(SP)	: 23.39 mm/sec
(LP)*	: 11.69 mm/sec
* HR-J590/J593/J599EU only	
Tape format	: Tape width 1/2" (12.7 mm high density VHS tape)
Maximum recording time	
(SP)	: 240 min. with E-240 video cassette
(LP)*	: 480 min. with E-240 video cassette
* HR-J590/J593/J599EU only	
Rewind time	: Approx. 180 sec. with E-180 cassette
Dimensions (W x H x D)	: 360 mm x 94.5 mm x 270 mm
Weight	: 4.0 kg
Operating temperature	: 5°C to 35°C
Operating humidity	: Less than 80 %
Timer	: 24 hours display type

VIDEO	
Signal system	: PAL-type colour signal and CCIR monochrome signal, 625 lines 50 fields
Recording Format	: PAL/MESECAM
RF reception	: PAL (B/G)/SECAM (B/G)
RF OUT	: PAL G
RF modulator	: UHF channels 22 – 68 (Adjustable)
Input level	: VIDEO IN (SCART type) 1.0 Vp-p, 75 ohm, unbalanced
Output level	: VIDEO OUT (SCART type) 1.0 Vp-p, 75 ohm, unbalanced
Signal-to-noise ratio	: More than 43 dBm

AUDIO	
Input level	: AUDIO IN (SCART type) –6.0 dBm, more than 10 kΩ
Output level	
HR-J590/J593/J599EU	: AUDIO OUT (SCART, RCA type) –6.0 dBm, less than 1 kΩ
HR-J290/J293EU	: AUDIO OUT (SCART type) –6.0 dBm, less than 1 kΩ
Audio track	
HR-J590/J593/J599EU	: Mono track and Hi-Fi track
HR-J290/J293EU	: Mono track
Audio frequency response	
Normal audio	: 100 Hz to 10,000 Hz (–6/+3 dBm)
Hi-Fi audio*	: 20 Hz to 20,000 Hz (–3/+3 dBm)
* HR-J590/J593/J599EU only	
Audio signal to noise ratio [HR-J590/J593/J599EU only]	
Hi-Fi audio	: More than 70 dB (JIS A filter)
Audio dynamic range [HR-J590/J593/J599EU only]	
Hi-Fi audio	: More than 85 dB (JIS A filter)

ACCESSORIES	
Provided accessories	: RF cable, Infrared remote control unit, "R3" battery x 2

Specifications shown are for SP mode unless specified otherwise.
E. & O.E. Design and specifications subject to change without notice.

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SECTION1 SUMMARY

KEY TO ABBREVIATIONS

A	AC	:Alternating Current
	ACC	:Automatic Color Control
	ACSS	:Automatic Channel Setting System
	ADJ	:Adjust
	A/E	:Audio Erase
	AFC	:Automatic Frequency Control
	AFT	:Automatic Fine Tuning
	AGC	:Automatic Gain Control
	A.H.SW	:Audio Head Switch
	ALC	:Automatic Level Control
	AM	:Amplitude Modulation
	AMP	:Amplifier
	ANT	:Antenna
	APC	:Automatic Phase Control
B	ASS'Y	:Assembly
	AUX	:Auxiliary
	B	:Base
	BGP	:Burst Gate Pulse
	BPF	:Bandpass Filter
C	BS	:Broadcasting Satellite
	BW or B/W	:Black and White
C	C	:Capacitor, Chroma, Collector
	CAN	:Cancel
	CAP	:Capstan
	CAP.BRK	:Capstan Brake
	CAP.RVS	:Capstan Reverse
	CATV	:Cable Television
	CBA	:Circuit Board Assembly
	CCD	:Charge Coupled Device
	C.CTL	:Chro Control, Capstan Control
	CFG	:Capstan Frequency Generator
	CHROMA	:Chrominance
	CNR	:Chroma Noise Redution
	COMB	:Combination
	COMP	Comb Filter
		Comparator
		Composite
	CONV	Compensation
		Converter
	C.ROT SW	:Color Rotary Switch
	CS	:Chip Selcet
	C.SYNC	:Composite Synchronization
	CTL DIV	:Control Divide
	CUR	:Current
	CYL	:Cylinder
D	D	:Drum, Digital, Diode, Drain
	D.ADJ	:Drum Adjust
	DC	:Direct Current
	D.CTL	:Drum Control
	DEMODO	:Demodulator
	DET	:Detector
	DEV	:Deviation
	DHP	:Double High Pass
	DIGITRON	:Digital Display Tube
	DL	:Delay line
	DOC	:Drop Out Compensator
	DUB	:Dubbing
	D.V SYNC	:Dummy Vertical Synchronization
E	E	:Emitter
	EE	:Electric to Eletric
	EMPH	:Emphasis
	ENA	:Enable
	ENV	:Envelope
	EP	:Extended Play
	EQ	:Equalizer
F	EXP	:Expander
	F	:Fuse
	FB	:Feed Back
	FBC	:Feed Back Clamp
	FE	:Full Erase
	FG	:Frequency Generator
	FL	:Filter
	FM	:Frequency Modulation
	F/R	:Front/Rear
	FS	:Frequency Synthesizer
	FSC	:Subcarrier Frequency
	F/V	:Frequency Voltage
G	GEN	:Generator
H	H	:High, Horizontal
I	IC	:Integrated Circuit
	IF	:Intermediate Frequency
	INS	:Insert
L	L	:Low, Left, Coil
	LD	:LED
	LD VTG CTL	:Loading Voltage Control
	LECHA	:Letter Character
	L.M	:Level Meter
	LP	:Long Play

M	LPF	:Low Pass Filter
	MAX	:Maximum
	MD	:Modulator
	MECHA.CTL	:Mechanism Control
	MIC	:Microphone
	MIN	:Minimum
	MIX	:Mixer, Mixing
	M.M.	:Monostable, Multivibrator
	MMV	:Mono Multi Vibrator
	MOD	:Modulation, Modulator
	MODEM	:Modulator-Demodulator
	MPX	:Multiplex
	NR	:Noise Reduction
N	OSC	:Oscillator
	OSD	:On Screen Display
P	PB	:Playback
	PCB	:Printed Circuit Board
	P.CTL	:Power Control
	PRE-AMP	:Preamplifier
	P.F	:Power Failure
	PG	:Pulse Generator
	PLL	:Phase Locked Loop
	PREM.DET	:Premire Detect
	P.P	:Peak-to-Peak
	PS	:Phase Shift
	PWM	:Pulse Width Modulation
	PWR CTL	:Power Control
Q	Q	:Transistor
	QH	:Quasi Horizontal
	QSR	:Quick Setting Record
	QTR	:Quick Timer Record
	QV	:Quasi Vertical
R	R	:Resistor, Right
	RE(or RC)	:Remocon, Receiver
	REC	:Recording
	REC S 'H'	:Record Start 'Hight'
	REF	:Reference
	REG	:Regulated, Regulator
	REMOCON	:Remote Control(unit)
	RF	:Radio Frequency
	R/P	:Record/Playback
	RTC	:Reel Time Counter
	S	:Serial
S	S.ACCEL	:Slow Accel
	SAOP	:Second Audio Program
	SC	:Scart, Simulcast
	S.DET	:Secam Detect
	SH	:Shift
	SHARP	:Sharpness
	SIF	:Sound Intermediate Frequency
	SLD	:Side Locking
	S/N	:Signal to Noise Ratio
	SP	:Standard Play
	ST	:Stereo
	SUB	:Subtract, Subcarrier
	SW or S/W	:Switch
	SYNC	:Synchronization
	SYSCON	:System Control
T	T	:Coil
	TP	:Test Point
	TR	:Transistor
	TRK	:Tracking
	TRANS	:Transformer
	TU	:Tuner, Take-up
U	UHF	:Ultra High Frequency
	UNREG	:Unregulated
V	V	:Volt, Vertical
	VA	:Always Voltage
	VCO	:Voltage Controlled Oscillator
	VGC	:Voltage Gain Control
	VHF	:Very High Frequency
	V.H.SW	:Video Head Switch
	VISS	:VHS Index Search
	VPS	:Video Program System
	VR	:Variable Resistor or Volume
	V-SYNC	:Vertical Synchronization
	VTG	:Voltage
W	VV	:Voltage to Voltage
	VXO	:Voltage X-tal Oscillator
	W	:Watt
X	WHT	:White
	W/O	:With out
Y	X-TAL	:Crystal
	Y/C	:Luminance/Chrominance
	YNR	:Luminance Noise Reduction
Z	ZD	:Zener Diode

Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

●Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the \triangle symbol and shaded (■) parts are critical for safety.
Replace only with specified part numbers.

Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
Caution for continued protection against fire hazard.
Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
1) Wires covered with PVC tubing
2) Double insulated wires
3) High voltage leads

5. Use specified insulating materials for hazardous live parts.
Note especially:
1) Insulation Tape 3) Spacers 5) Barrier
2) PVC tubing 4) Insulation sheets for transistors

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

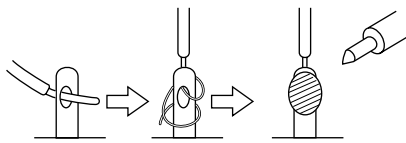


Fig.1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10-15 kg of force in any direction will not loosen it.

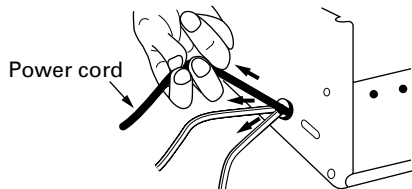


Fig.2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector

In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

1) **Connector part number** : E03830-001

2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.

3) **Replacement procedure**

(1) Remove the old connector by cutting the wires at a point close to the connector.

Important : Do not reuse a connector (discard it).

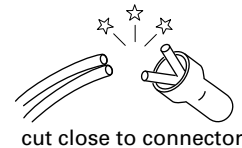


Fig.3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

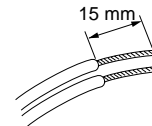


Fig.4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

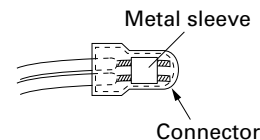


Fig.5

(4) As shown in Fig.6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

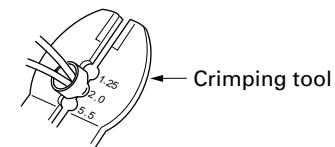


Fig.6

(5) Check the four points noted in Fig.7.

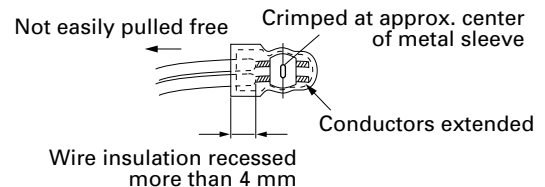


Fig.7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Insulation resistance test

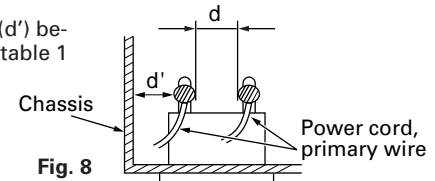
Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

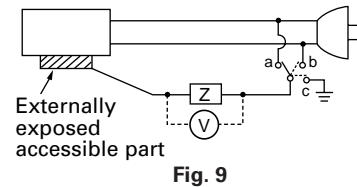


4. Leakage current test

Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method : (Power ON)

Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

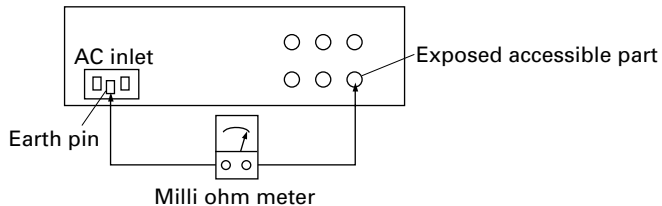


5. Grounding (Class I model only)

Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).

Measuring Method:

Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.



Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	$Z \leq 0.1 \text{ ohm}$
Europe & Australia	$Z \leq 0.5 \text{ ohm}$

Fig. 10

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	$R \geq 1 \text{ M}\Omega/500 \text{ V DC}$	AC 1 kV 1 minute	$d, d' \geq 3 \text{ mm}$
100 to 240 V			AC 1.5 kV 1 minute	$d, d' \geq 4 \text{ mm}$
110 to 130 V	USA & Canada	$1 \text{ M}\Omega \leq R \leq 12 \text{ M}\Omega/500 \text{ V DC}$	AC 1 kV 1 minute	$d, d' \geq 3.2 \text{ mm}$
110 to 130 V	Europe & Australia	$R \geq 10 \text{ M}\Omega/500 \text{ V DC}$	AC 3 kV 1 minute (Class II)	$d \geq 4 \text{ mm}$
200 to 240 V			AC 1.5 kV 1 minute (Class I)	$d' \geq 8 \text{ mm (Power cord)}$ $d' \geq 6 \text{ mm (Primary wire)}$

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	$1 \text{ k}\Omega$	$i \leq 1 \text{ mA rms}$	Exposed accessible parts
110 to 130 V	USA & Canada	$0.15 \mu\text{F}$ and $1.5 \text{ k}\Omega$	$i \leq 0.5 \text{ mA rms}$	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	$2 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Antenna earth terminals
		$50 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Other terminals

Table 2 Leakage current specifications for each region

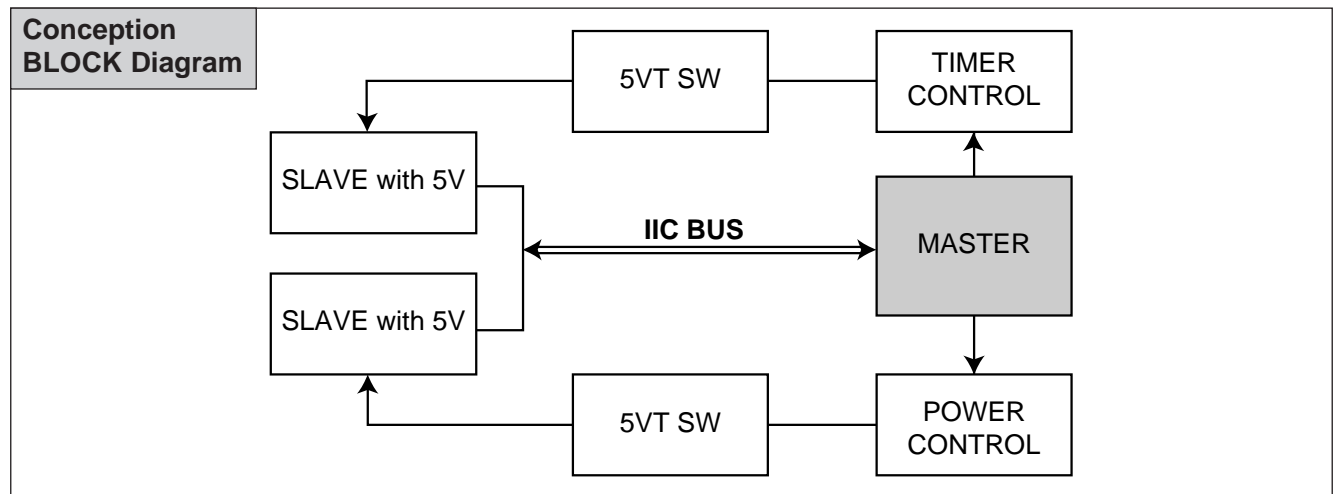
Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

PROPOSAL FOR APPLYING SHORT PROTECTION

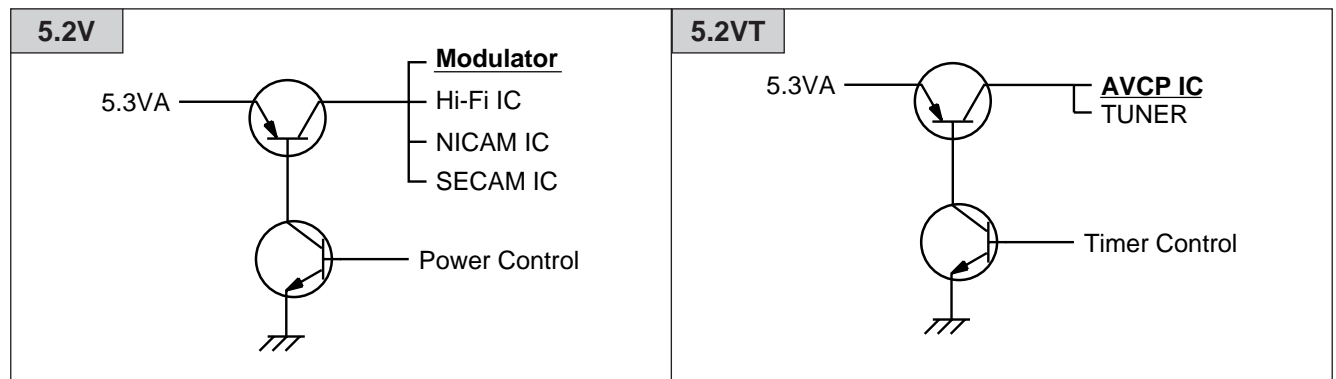
• The Contents of Examination

As all the IC that is applied to VCR is controlled by IIC, mutual communication, if Vcc of IC is short or open with detecting 'Acknowledge' data of the specific IC according to each power(5V, 5VT) μ -COM gets unable to detect 'ACK' data.

μ -COM regards this case as abnormal one and if it can't detect 'ACK' data for a certain time(3.5 sec) the signal of 'Power Control' and 'Timer Control' are switched to 'Low'. As a result POWER Switching TR is kept from generating heat and fire.



• POWER for each IC



• IC to detect 'ACK' data is selected as below because IC is different in accordance to region and option

S/	5V POWER	SECAM IC
Series	5VT POWER	AVCP IC
P/Y/I	5V POWER	Modulator
Series	5VT POWER	AVCP IC

*Short protection off mode : DJ01 Diode in

SERVICE NOTICE ON REPLACING EEPROM

In case that defective EEPROM of PAL models is replaced, to operate these sets from the initial state MP KEY must be repaired as well before delivering to the customer.

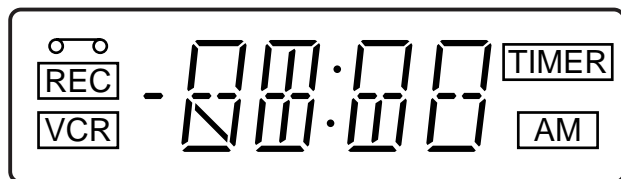
If MP KEY isn't repaired the setting of RF OUT channel or LANGUAGE might be different from that for customer's country.

- **MP KEY** : In case of PAL VCR if holding the REC button on the front panel and the CLEAR button on the remote control handset for 5 ~ 7 seconds with power being switch all and no tapes, OK is displayed at FLD for FLD models and LED becomes on for LED CLOCK models. This is the state that initializing EEPROM is finished.
(In case of PAL VCP if holding the REC button on the front panel and the MENU button on the remote control handset for 5 ~ 7 seconds with power being off and no tapes, All the LED DOTs become on. This is the state that initializing EEPROM is finished.)

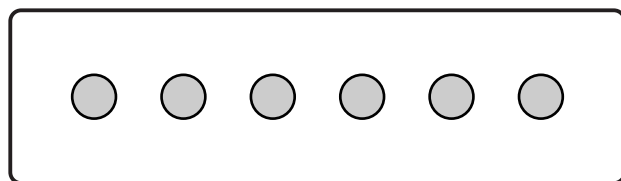
- **MP KEY's function** : MP KEY sets EEPROM's data up to the initial state.



- **FLD MODEL:**
MP KEY "OK"



- **LED CLOCK MODEL:**
MP KEY Switch all on a Light



- **LED DOT MODEL:**
MP KEY Switch all on a Light

SERVICE INFORMATION FOR EEPROM IC SETTING

EEPROM option code No. setting

MODEL	NAME	HEX	BINARY
HR-J285EU	02	00	00000000
	C0	00	00000000
	C0	00	00000000
	B1	00	00000000
	30	00	00000000
HR-J290EU	48	00	00000000
	E2	00	00000000
	C1	00	00000000
	C8	00	00000000
	B1	00	00000000
HR-J293EU	30	00	00000000
	48	00	00000000
	0C	00	00000000
	C0	00	00000000
	C0	00	00000000
HR-J585EU	B1	00	00000000
	30	00	00000000
	48	00	00000000
	EC	00	00000000
	C1	00	00000000
HR-J590EU/ J593EU	C8	00	00000000
	B1	00	00000000
	30	00	00000000
	48	00	00000000
	2C	00	00000000
HR-J595EK	C0	00	00000000
	C8	00	00000000
	B4	00	00000000
	00	00	00000000
	43	00	00000000
HR-J595MS	6C	00	00000000
	C0	00	00000000
	48	00	00000000
	B0	00	00000000
	62	00	00000000
HR-J295MS	40	00	00000000
	62	00	00000000
	C0	00	00000000
	48	00	00000000
	B0	00	00000000
HR-J295EK	62	00	00000000
	40	00	00000000
	02	00	00000000
	C0	00	00000000
	C8	00	00000000
HR-J282EU	B4	00	00000000
	00	00	00000000
	43	00	00000000
	02	00	00000000
	C0	00	00000000
	C0	00	00000000
	B7	00	00000000
	00	00	00000000
	50	00	00000000
	50	00	00000000

MODEL	NAME	HEX	BINARY
HR-J283EU	02	00	00000000
	C0	00	00000000
	C8	00	00000000
	B7	00	00000000
	00	00	00000000
HR-J582EU	50	00	00000000
	0C	00	00000000
	C0	00	00000000
	C0	00	00000000
	B7	00	00000000
HR-J583EU	00	00	00000000
	50	00	00000000
	0C	00	00000000
	C0	00	00000000
	C8	00	00000000
	B7	00	00000000
	00	00	00000000
	50	00	00000000
	50	00	00000000
	50	00	00000000

Remote control Key action

- OK : Now option data write to EEPROM
- MENU : Menu exit
- EDIT : ▲▼ (Option data change from 0~F Hexadecimal)
- MOVE : ◀▶ (Cursor move for option data setting)

EEPROM option code No. setting procedure

1. Power Cord plug-in and Power SW on, then "EEPROM option data setting" screen to the left will be displayed.
If not, press the "Child lock" key on the Remote controller to switch with "CANAL" because the VCR set has "CANAL IC" inside.
If your VCR set has "NTSC Line Record", switch the VCR set to "AV" mode after inputting the Line Video signal. If not, the Blue back screen may be shown in to screen.
2. Refer to option data in the next page and input the value to the "HEX" field using "EDIT" key only, and then press the "OK" key on the Remote controller.
3. Check the basic operation (Tuner/PB/CUE/REV/AV/REC mode...)
4. Initialize the EEPROM IC pressing the "REC" key on the Front Panel and "CLEAR" key on the Remote controller at the same time.

SPECIFICATIONS

General

Power	: 200~240V, 50Hz
Power consumption	: Approx. 12 watts(Energy Saving mode : 3 watts)
Video Head system	: Rotary 2heads, helical scanning system (2HD Model) Double azimuth 4 heads, helical scanning system (4HD MONO, 4HD Hi-Fi Model)
Tape speed	: 23.39 mm/sec (SP mode)11.69 mm/sec(LP mode)
Tape format	: Tape width 1/2" (12.7 mm high density VHS tape)
Maximum recording time	: 4 hours in SP mode/8 hours in LP mode (with E-240 tape)
Rewind time	: Approx. 150 sec. (with E-180 tape)
Dimensions (W X H X D)	: 360 x 94.5 x 270 mm
Weight	: 9.0 lbs. (4.0 kg)
Operating temperature	: 41°F-95°F (5°C-35°C)
Operating humidity	: Less than 80%
Timer	: 24 hours display type

Video

Television system	: CCIR standard (625 lines, 50 fields) PAL colour signal
Recording format	: PAL B/G (HR-J282EU/J283EU/J582EU/J583EU/J285EU/ J290EU/293EU/J585EU/J590EU/J593EU) PAL N (HR-J295EK/J595EK) PAL SECAM-L (HR-J295MS/J595MS)
Input level	: VIDEO IN (SCART, RCA type) 1.0 Vp-p, 75 ohm, unbalanced
Output level	: VIDEO OUT (SCART type) 1.0 Vp-p, 75 ohm, unbalanced
Signal to noise ratio	: More than 43 dBm

Audio

Input level	: AUDIO IN (SCART type) Scart type : -6.0dBm, more than 10kΩ
Output level	: AUDIO OUT (SCART, RCA type) Scart type : -6.0dBm, less than 1kΩ RCA type : -6.0 dBm, less than 1kΩ
Audio track	: Mono track & Hi-Fi track
Audio signal to noise ratio	: Normal : More than 70 dBm(JIS A filter)
Audio dynamic range	: Hi-Fi audio : More than 85 dBm(JIS A filter)

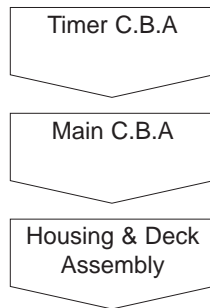
- Design and specifications are subject to change without notice.

 :Hi-Fi Model only

SECTION 2 CABINET & MAIN CHASSIS SERVICE METHOD

Electrical Part

(1) Re-assembly Flow for service like Fig. 2-1

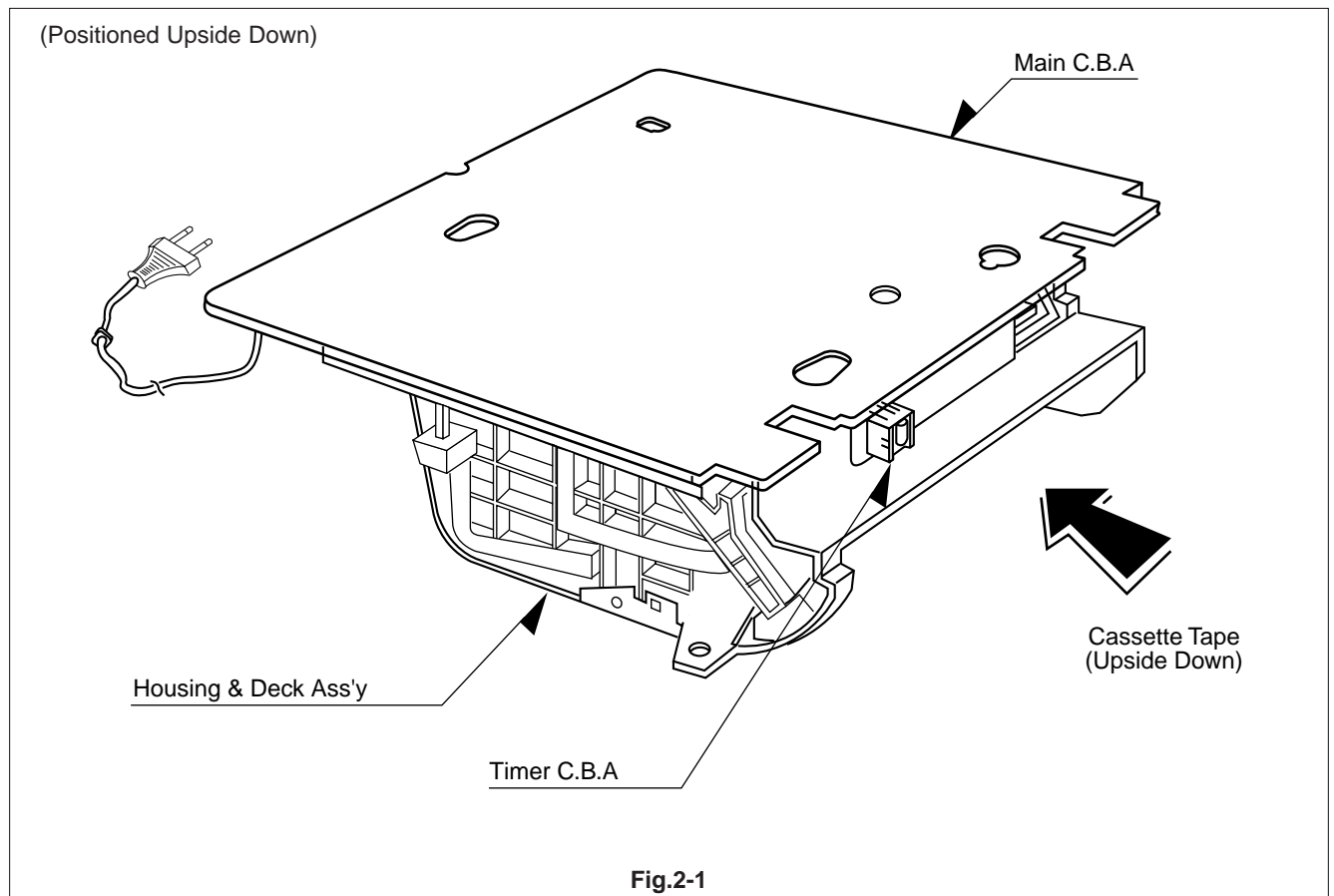


(2) To check and replace Electrical parts

- ① Re-assemble the unit according to No.1) Re-assembly Flow.
- ② Place the unit like Fig. 2-1
- ③ Check and replace Electrical parts.

NOTE :

- ① Insert Video Cassette Tape inversely like Fig. 2-1 to check and replace defective parts.
- ② In disassembling and reassembling, be careful not to damaged CST switch.



EXPLODED VIEWS

1. Cabinet and Main Frame Section

NOTE) Refer to "SECTION 5 REPLACEMENT PARTS LIST" in order to look for the part number of each part.
★ OPTIONAL PARTS

5

4

3

2

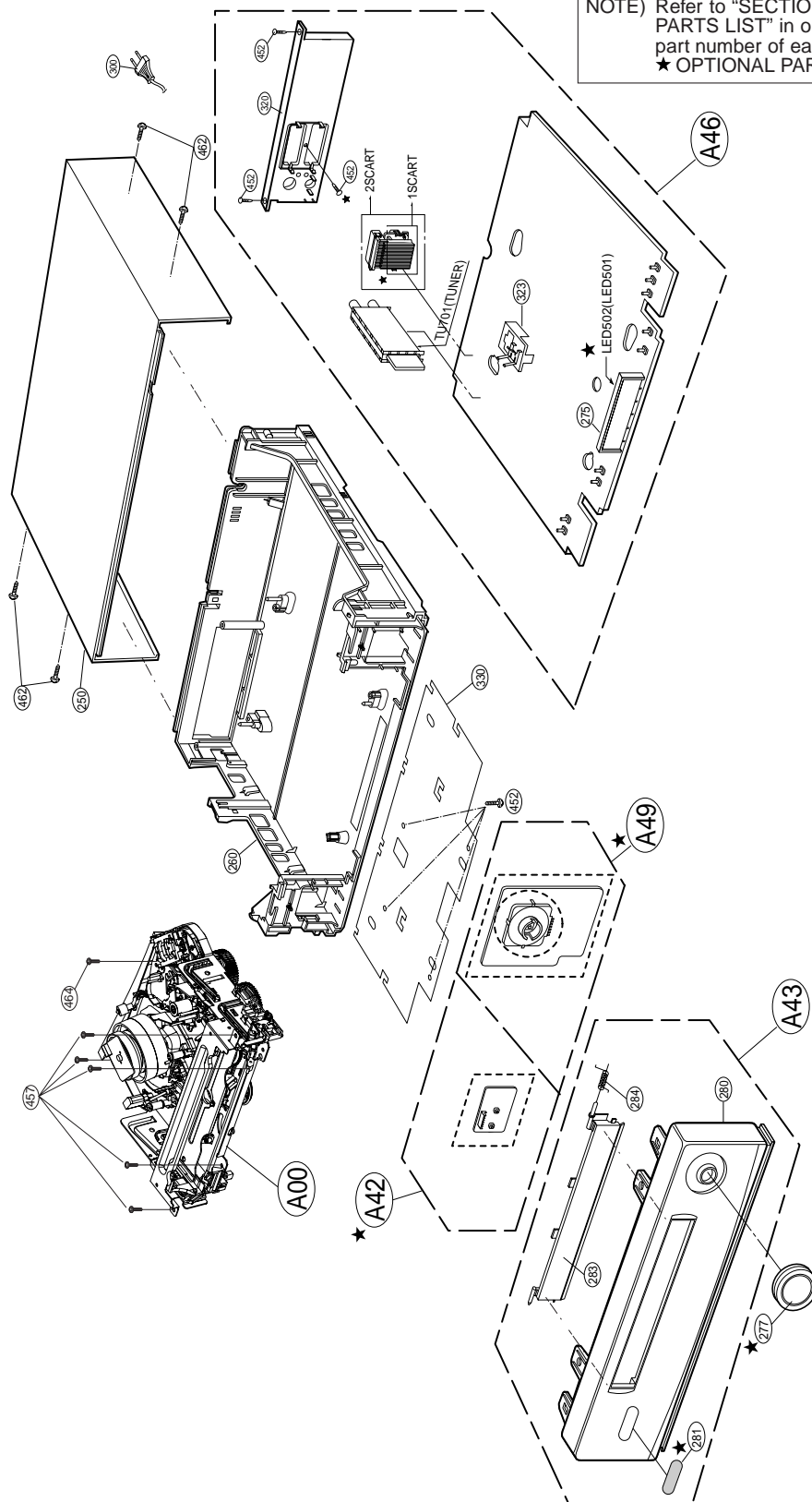
1

A

B

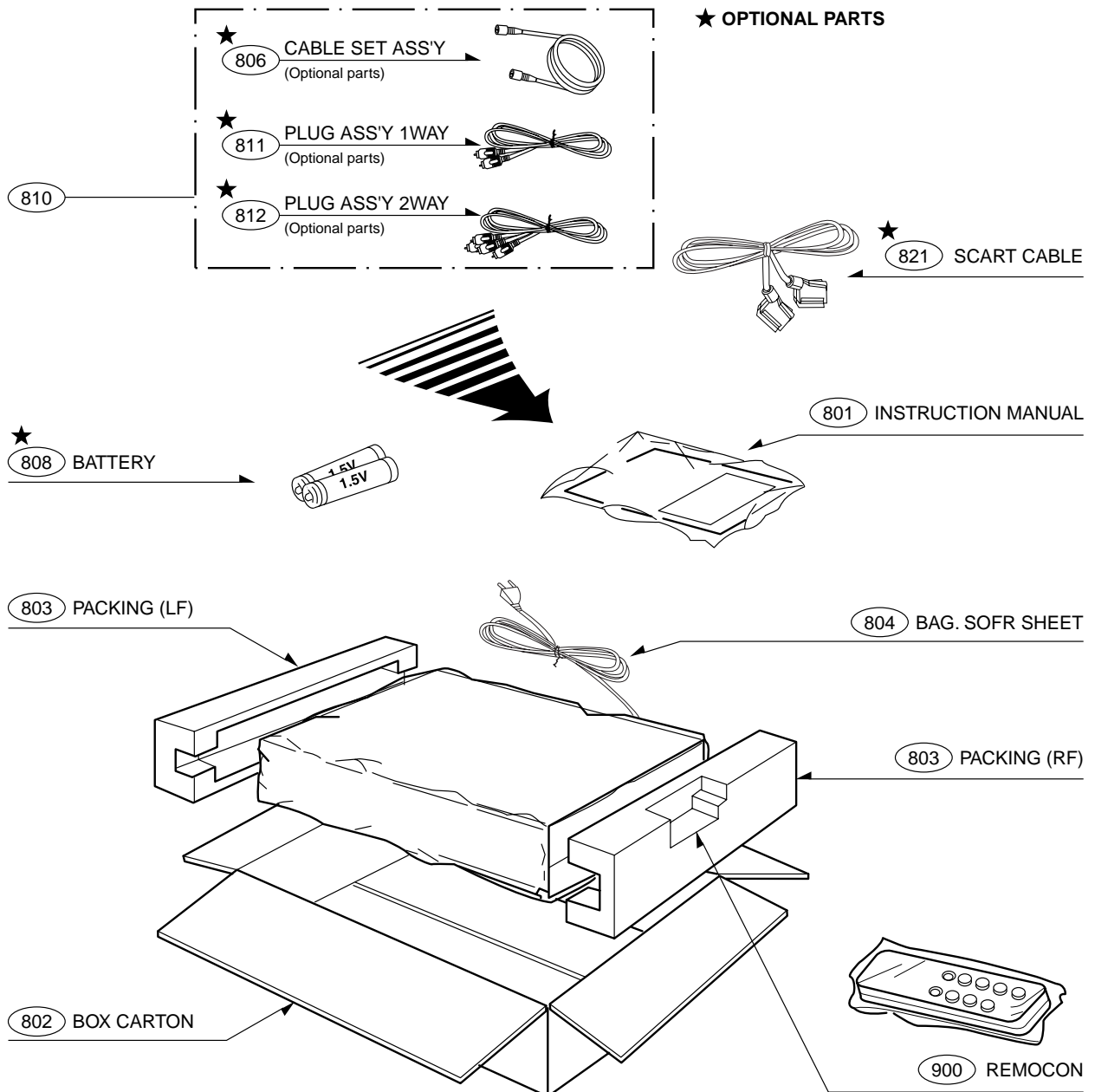
C

D



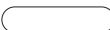

2.Packing Accessory Section

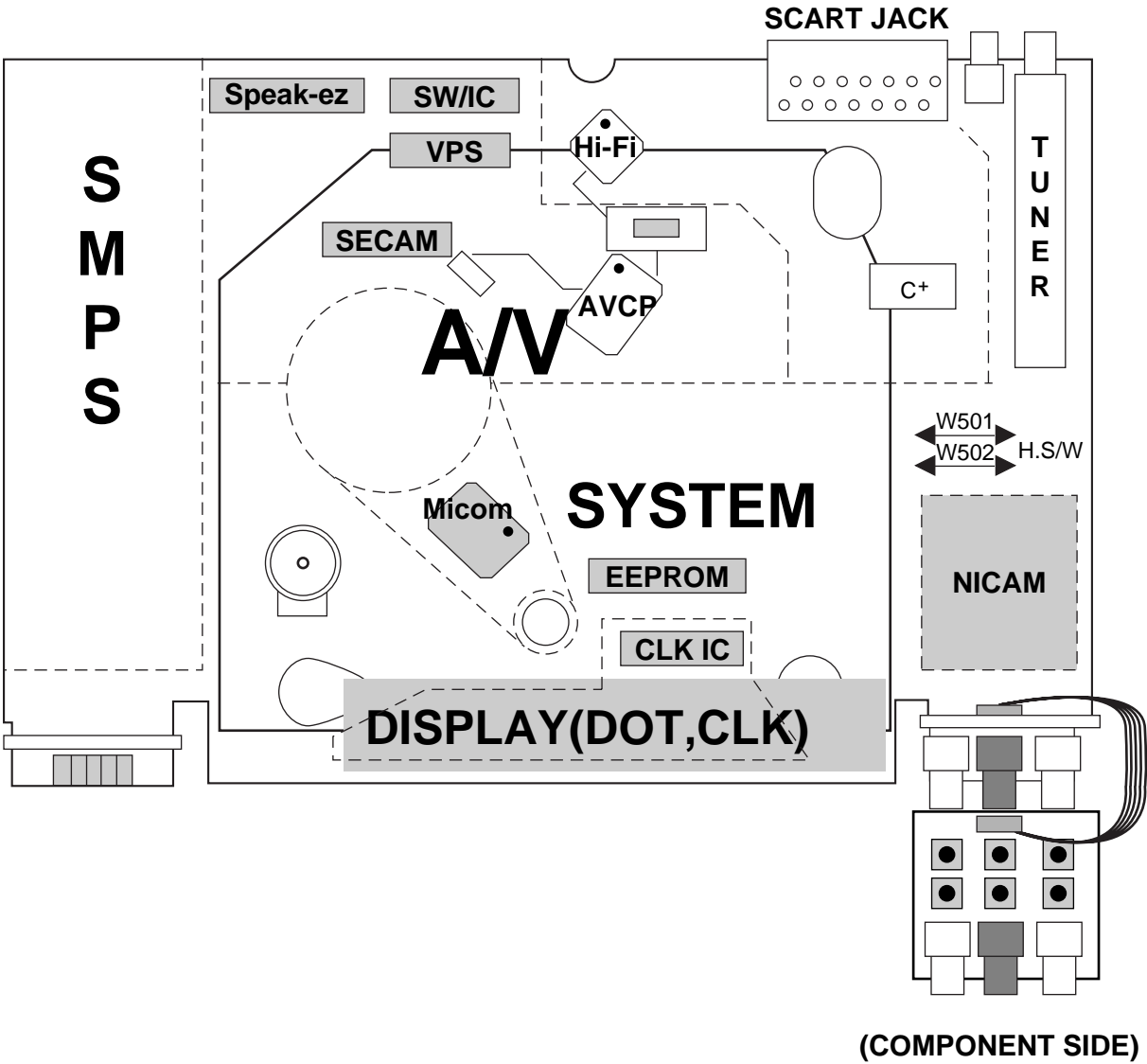
NOTE) Refer to "SECTION REPLACEMENT PARTS LIST" in order to look for the part number of each part.



SECTION 3 ELECTRICAL

ELECTRICAL ADJUSTMENT POINTS ARRANGEMENT

 : Measurement point
 : Adjustment point



ELECTRICAL ADJUSTMENT PROCEDURES

1. Servo Adjustment

1) PG Adjustment

- Test Equipment

- a) OSCILLOSCOPE
- b) PAL TEST TAPE (VHS SP)
- c) JIG REMOCON (AUTO PG SETTING)

- Adjustment And Specification

MODE	MEASUREMENT POINT	ADJUSTMENT POINT	SPECIFICATION
PLAY	V.Out H/SW(W501, W502)		$6.5 \pm 0.5H$

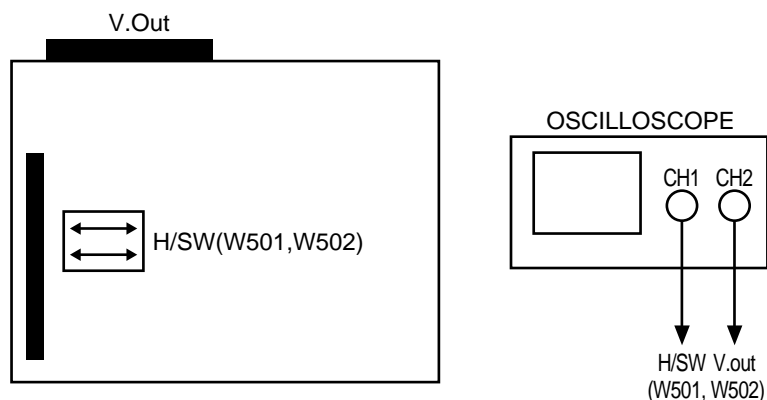
• Adjustment Procedure

- a) Insert the PAL SP Test Tape and play.
Note - Adjust the distance of X, pressing the Tracking(+) or Tracking(-) when the "ATR(OSD on monitor)" is blink after PAL SP test Tape is inserted.
- b) Press the Auto PG KEY on JIG Remocon(1'st) or Press "Play" key on set and "0" key on Remocon.(Then check the light 4 Dot LED on CLK/LED - TRK is a Initial)
- c) Press the Auto PG Key on JIG Remocon again (2'nd) or press "Play" key on set and "0" key on Remocon again.(Then check the blink 4 Dot LED - At regular 0.25sec internal, Then check blink "PG waveform" on oscilloscope(MONO Model)).

• Check the PG

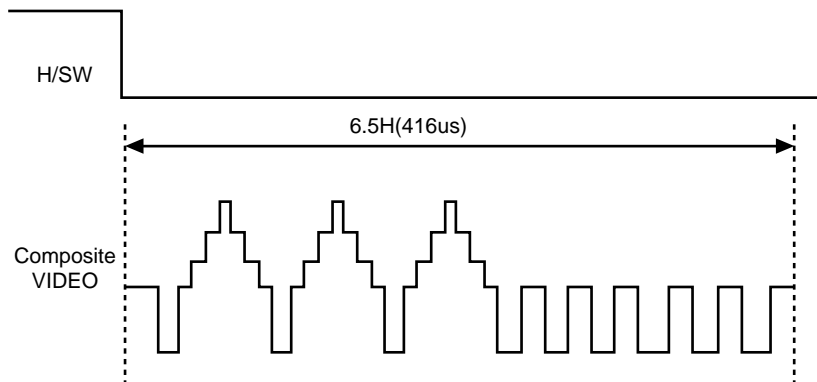
- a) Connect the CH1 of the oscilloscope to the H/SW and CD2 to the Video out for the VCR.
- b) Trigger the mixed Video Signal of CH2 to the CH1 H/SW(W501, W502), and then check the distance (time difference), which is from the selected A(B) Head point of the H/SW(W501, W502) signal to the starting point of the vertical synchronized signal, to $6.5H \pm 0.5H$ ($416\mu s$, $1H=64.0\mu s$).

• CONNECTION



ELECTRICAL ADJUSTMENT PROCEDURES

- **WAVEFORM**



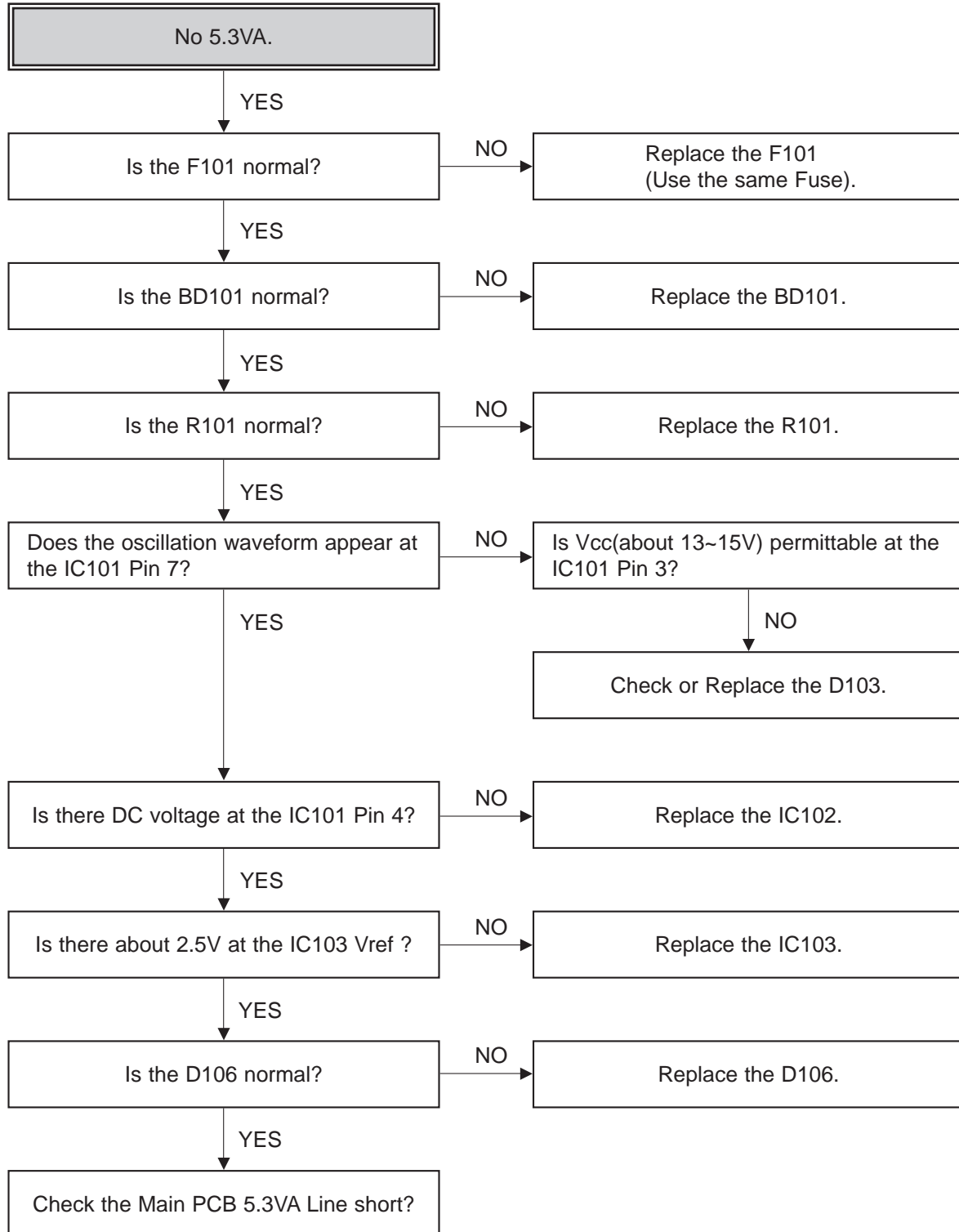
- **Attension and Reference**

- a) The PG checking must do when RF Level is Maximum and SERVO system is Locking (MTR MODE)
- b) V.H/SW Level is 2Vpp.

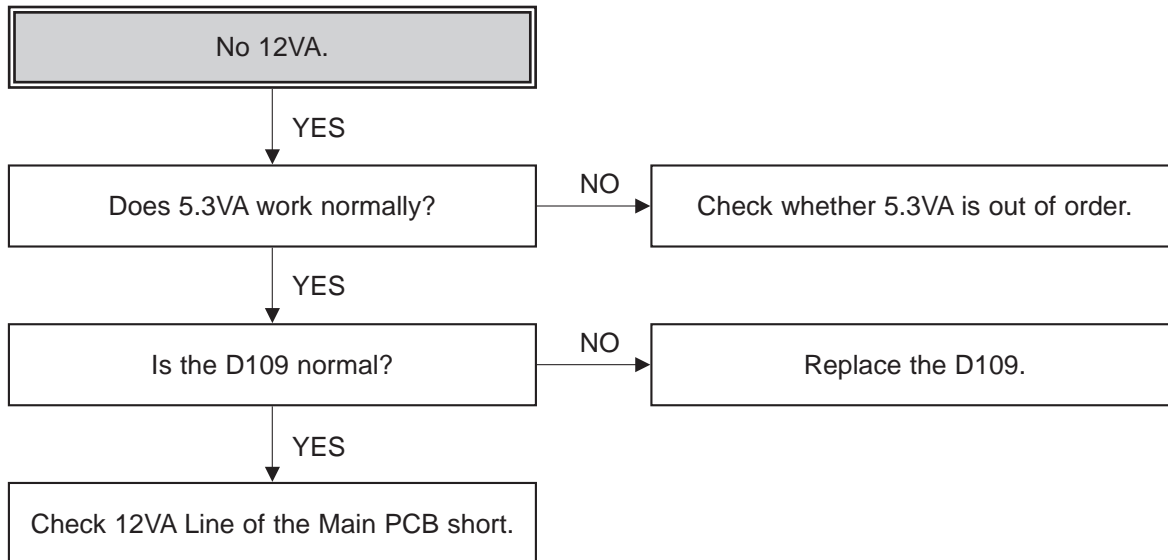
ELECTRICAL TROUBLESHOOTING GUIDE

1. Power Circuit(SMPS)

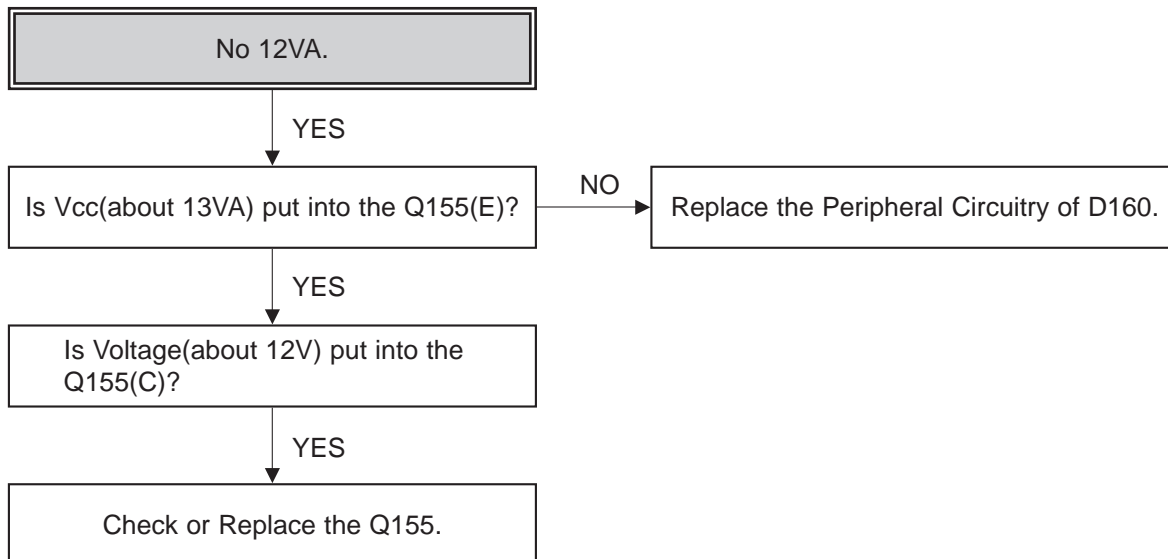
(1) No 5.3VA.



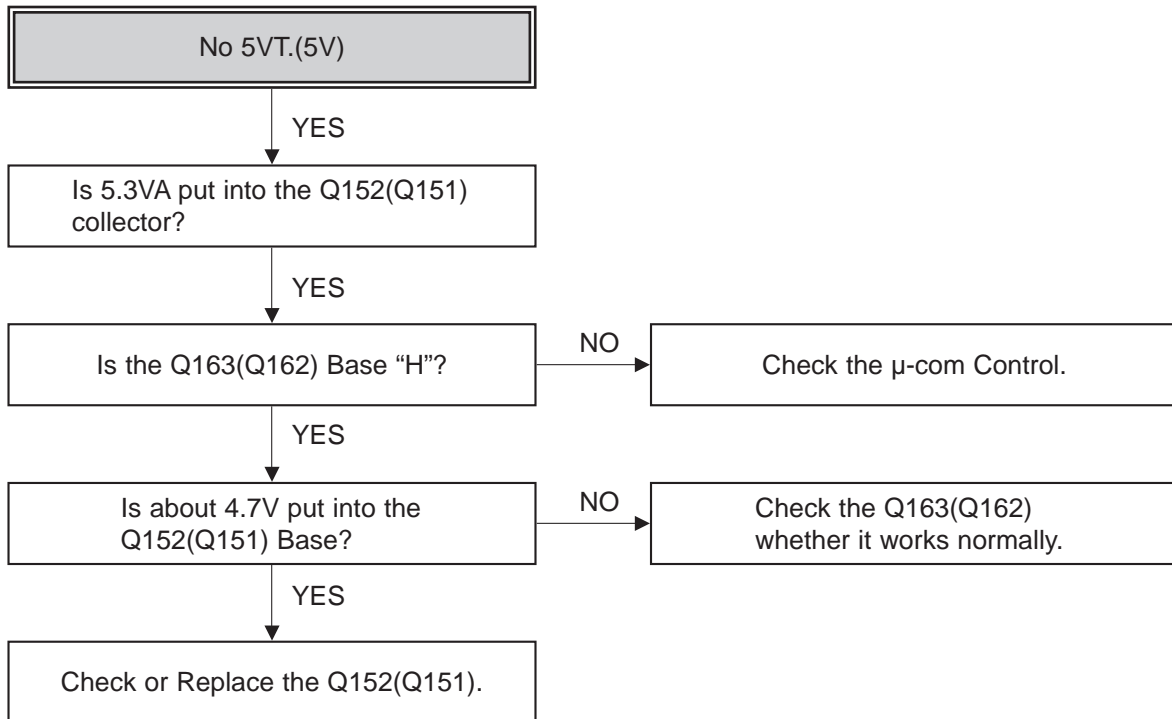
(2) No 12VA.(Capstan)



(3) No 12VA (CANAL, Buffer)

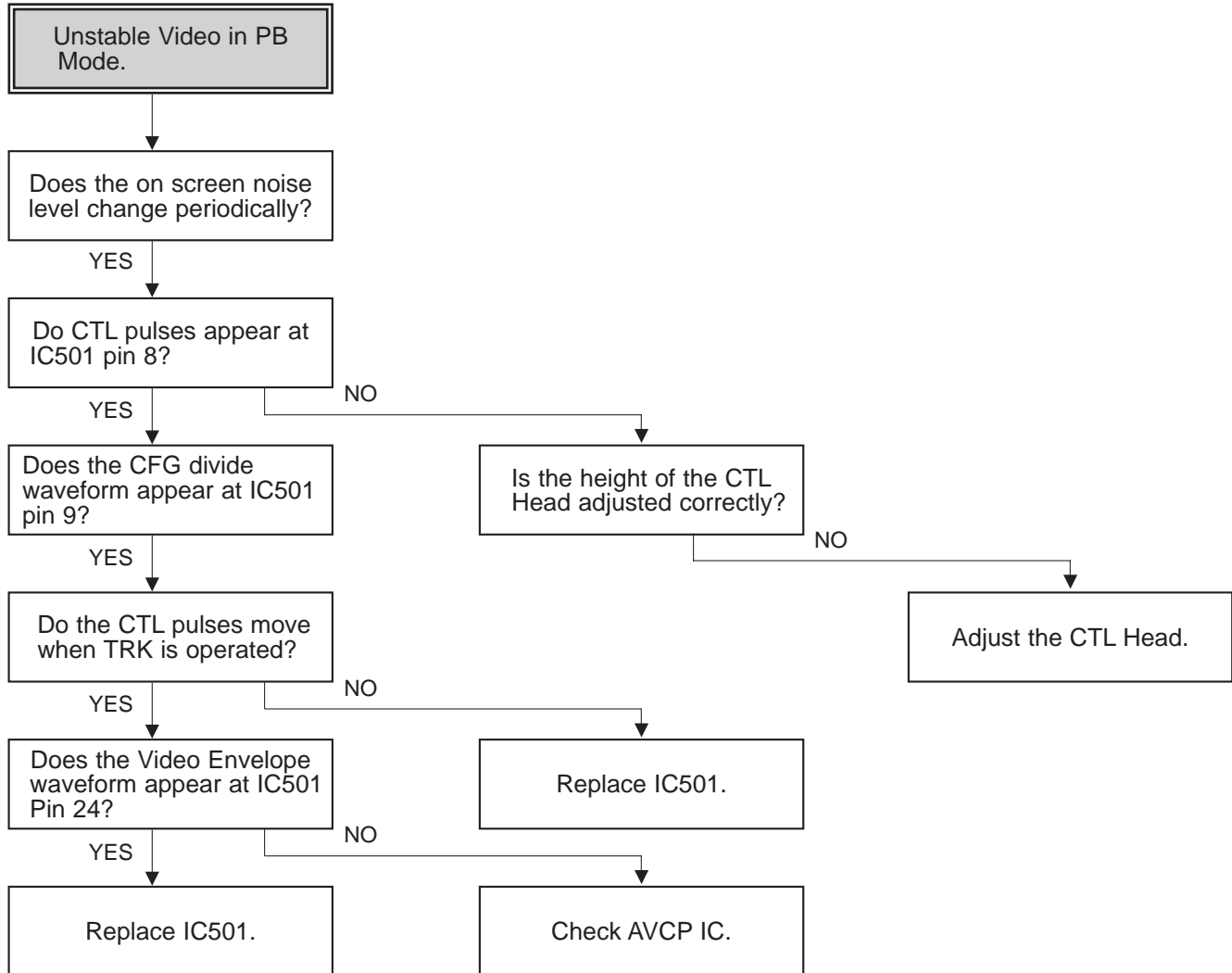


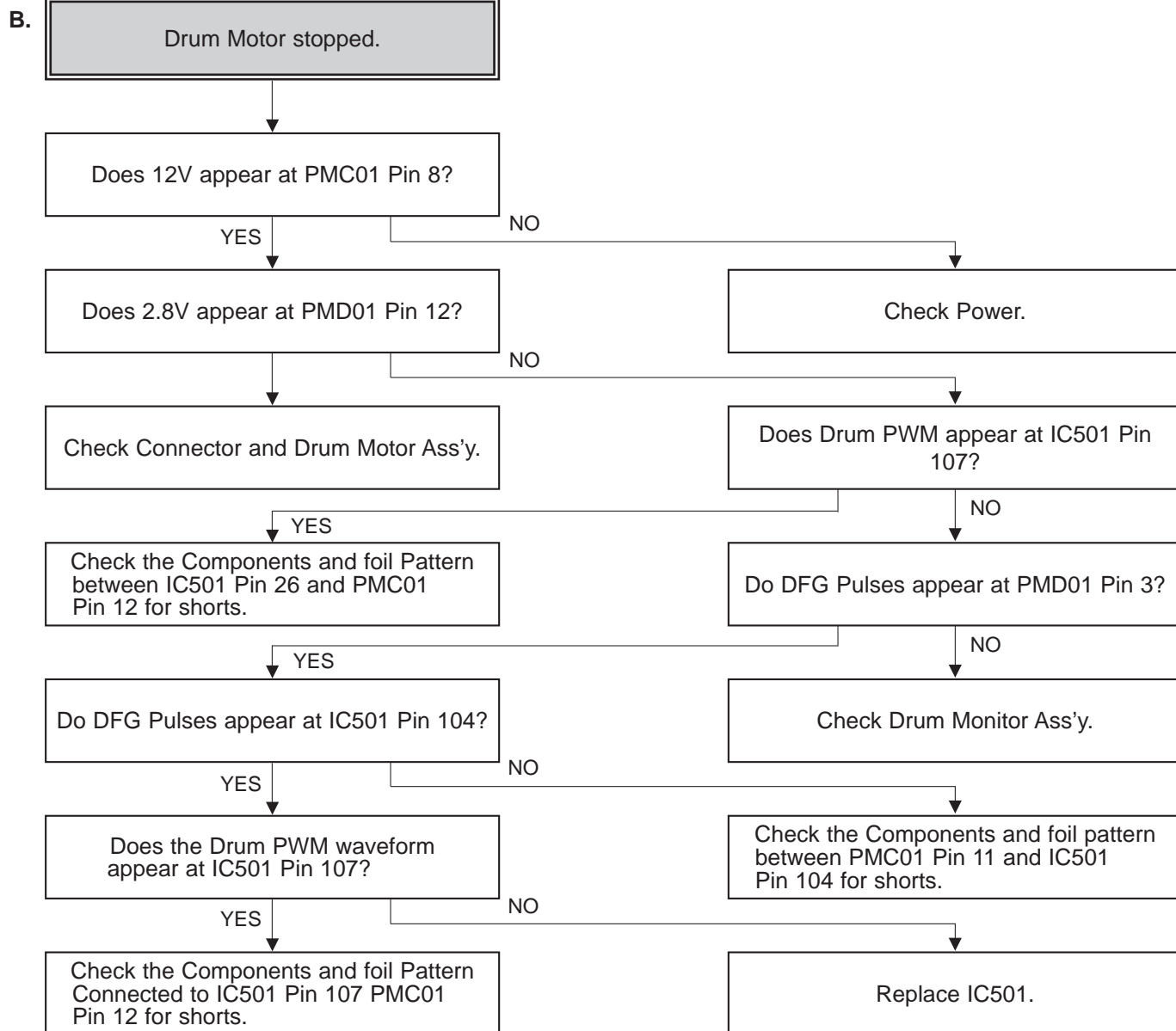
(4) No 5VT(5V)



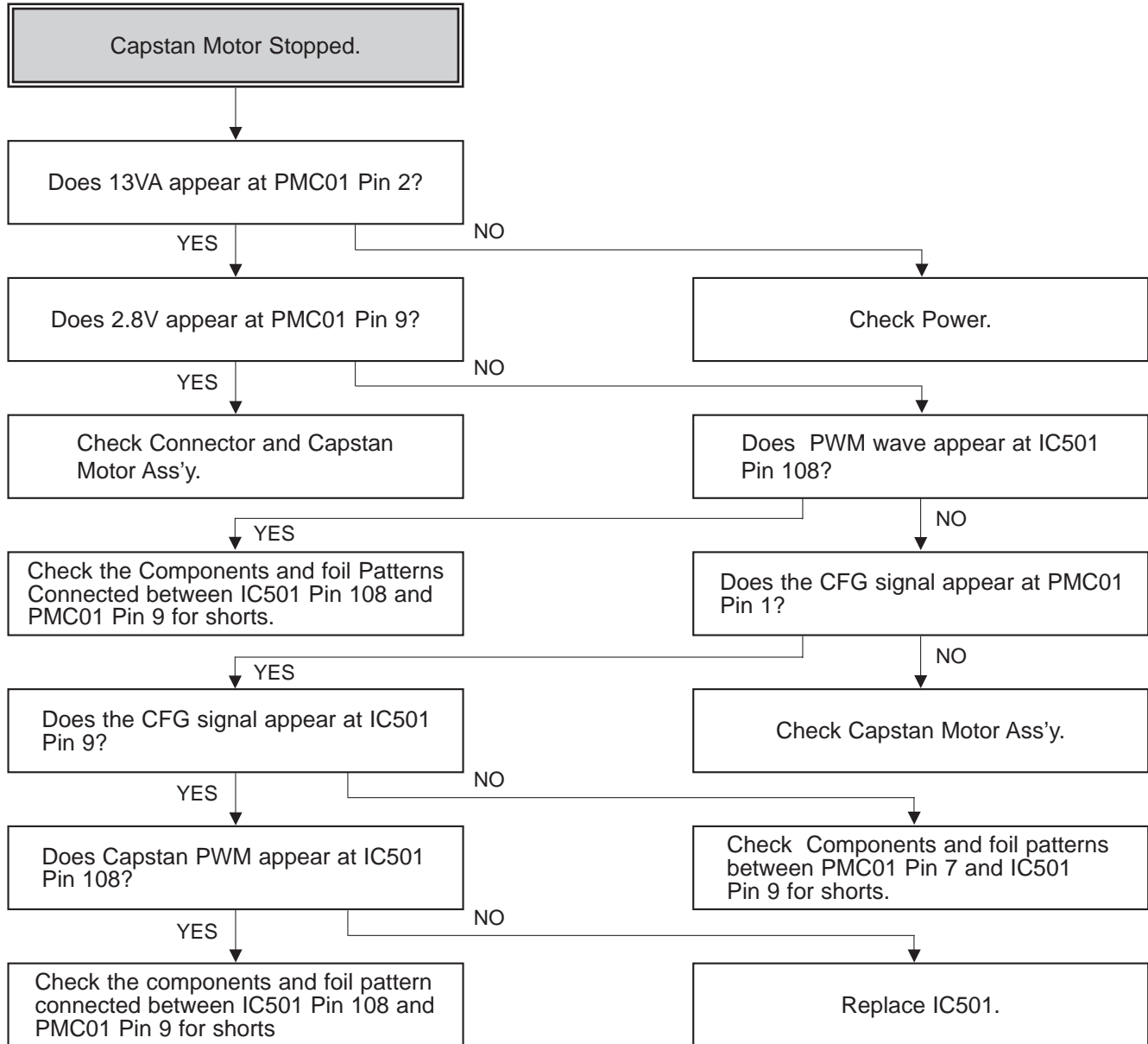
2. Servo Circuit

A.

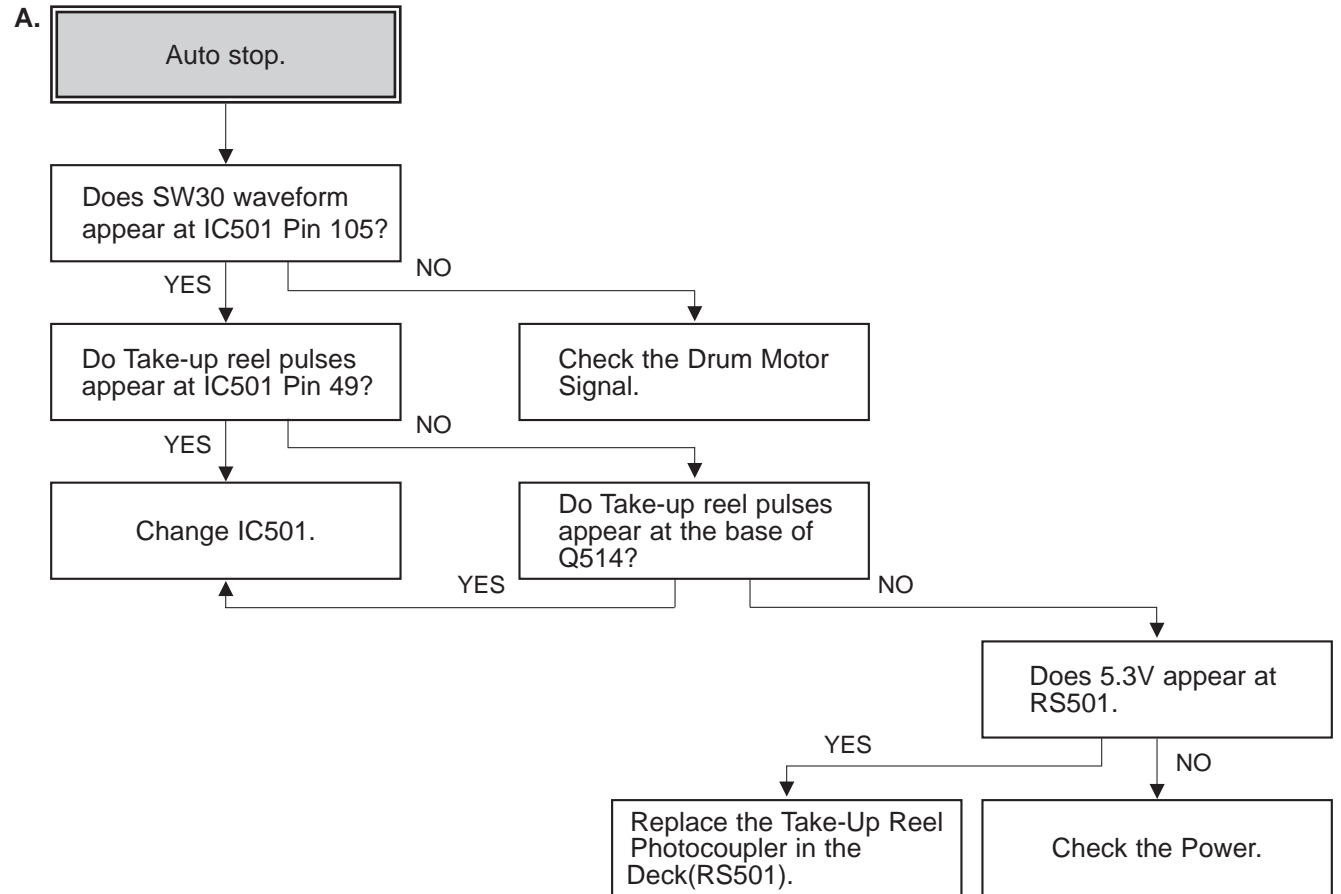


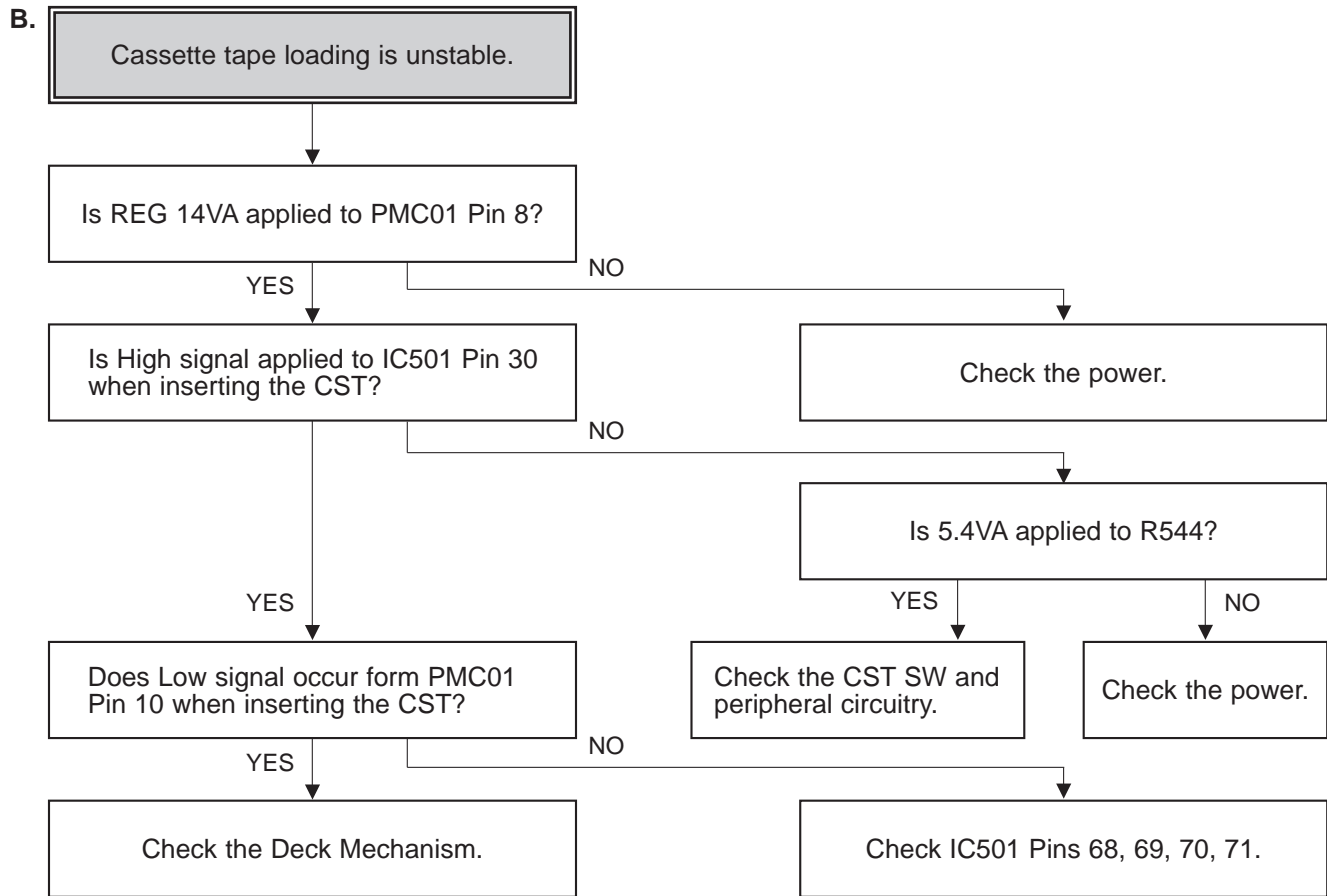


C.

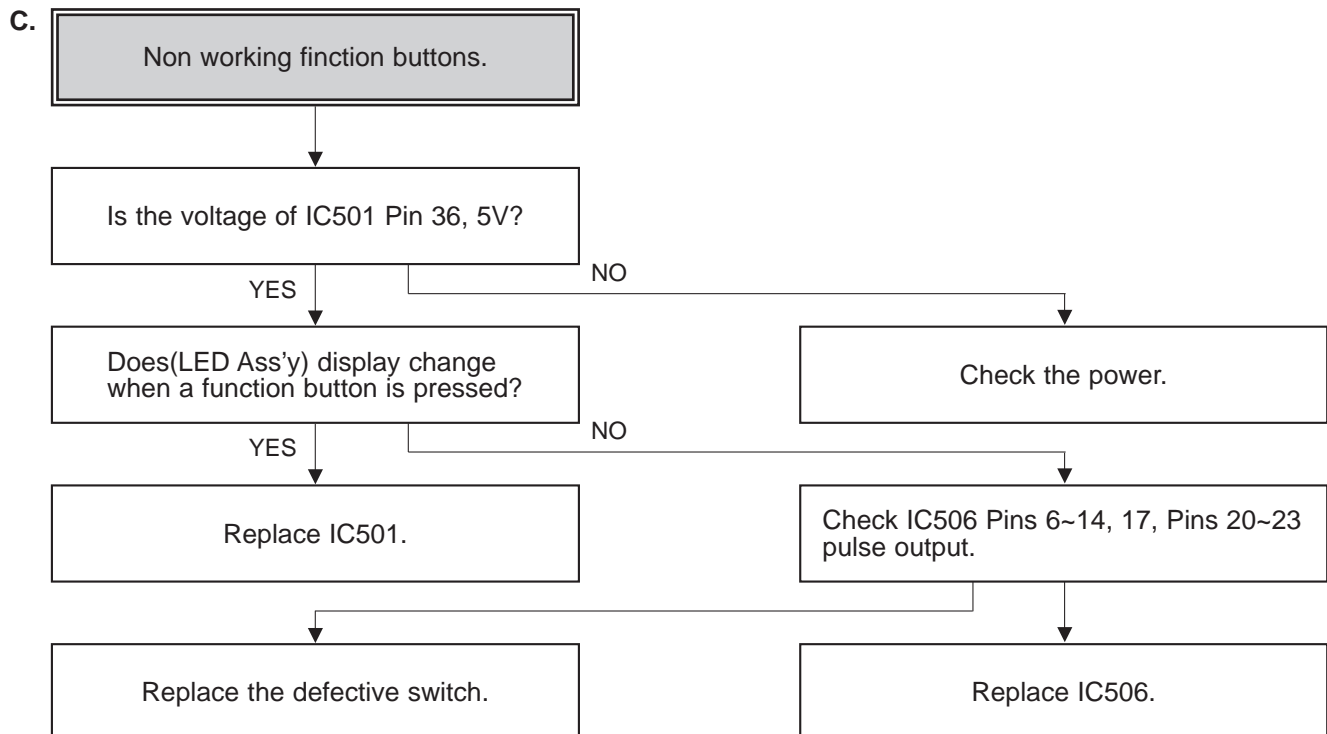


3. System & Front Panel Circuit



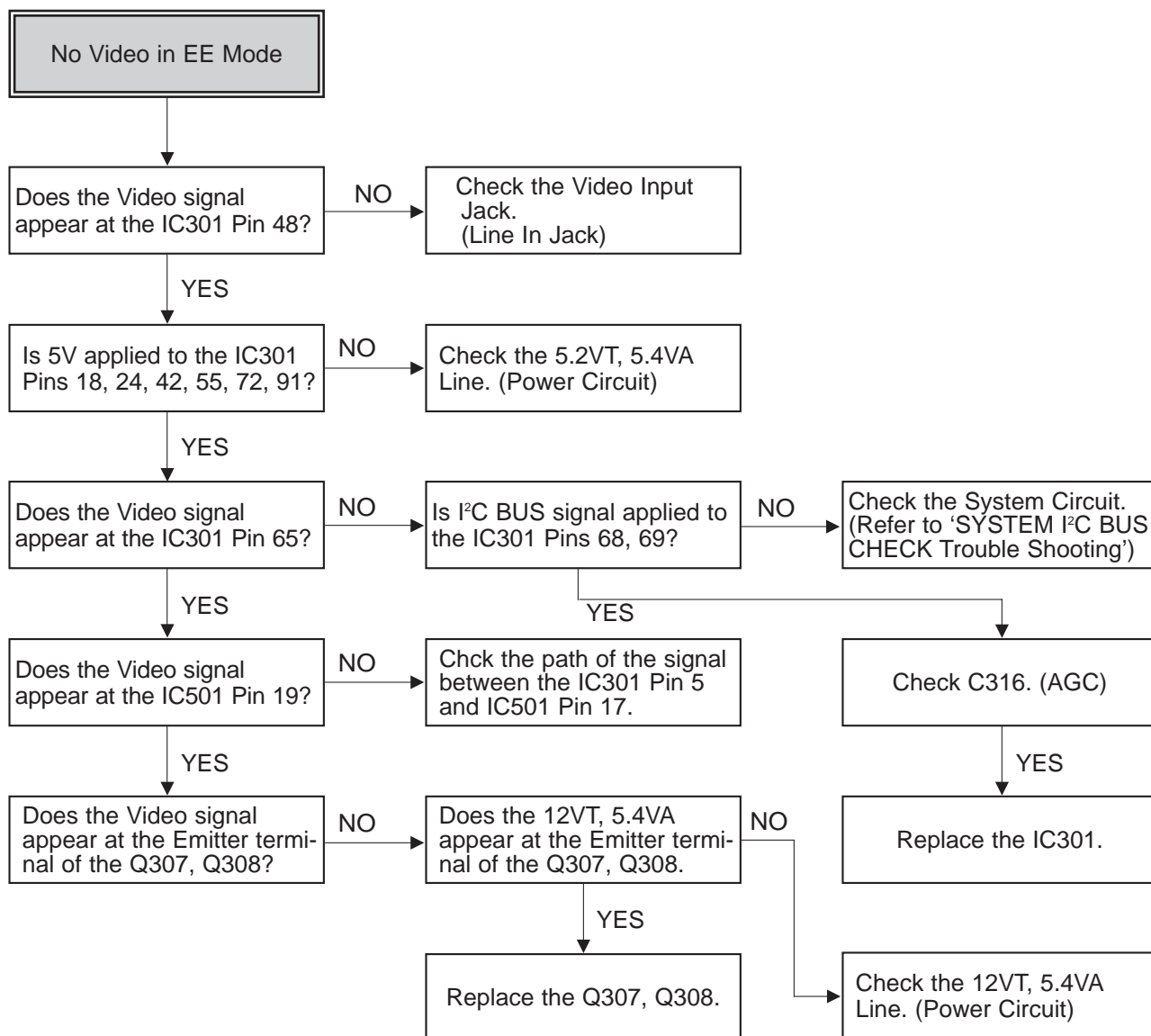


NOTE : Auto stop may also be caused by lack of lubrication,due to dried grease or oil.

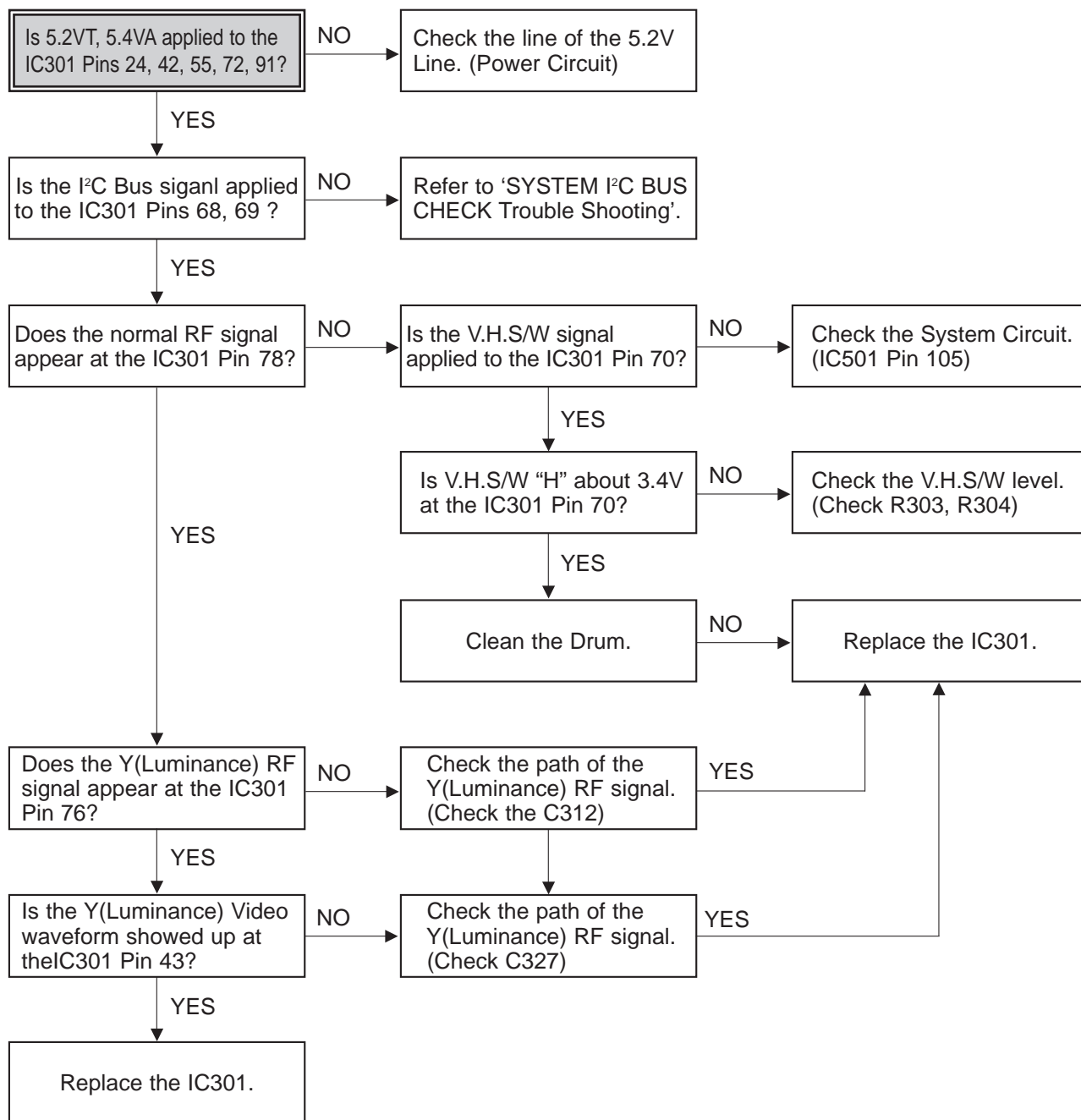


4. Y/C CIRCUIT

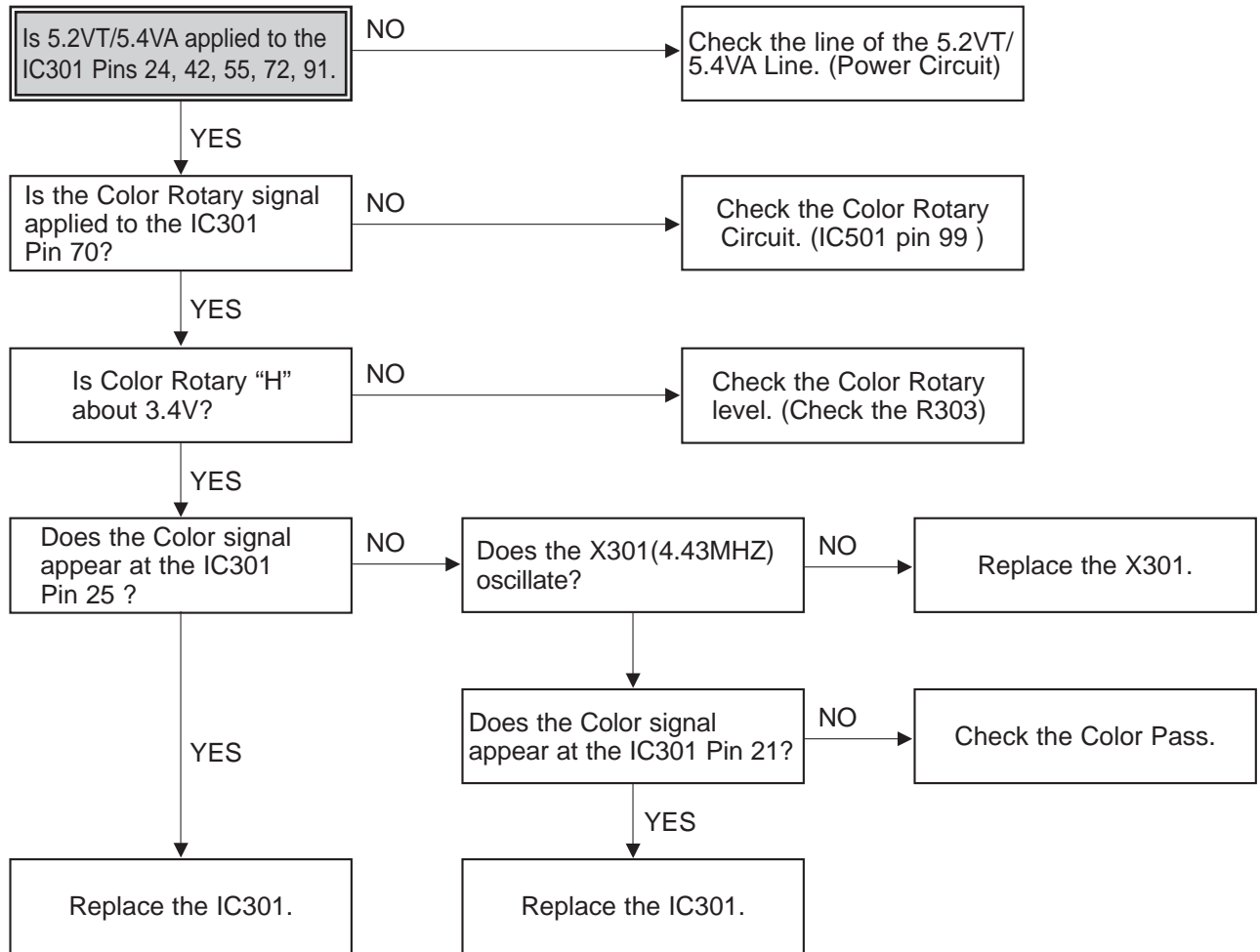
(1) No Video in EE Mode,



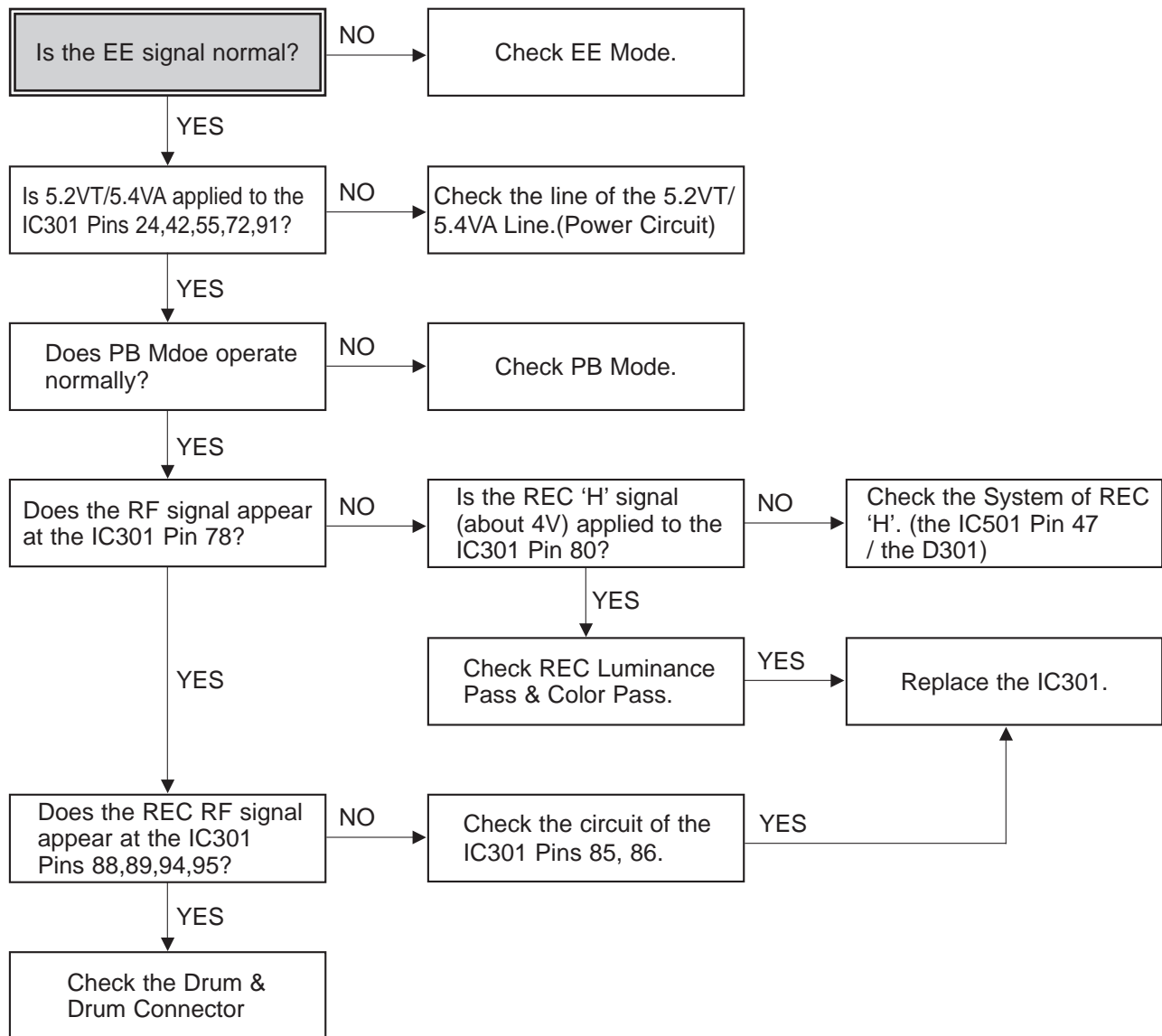
(2) When the Y(Luminance) signal doesn't appear on the screen in PB Mode,



(3) When the C(Color) signal doesn't appear on the screen in PB Mode,

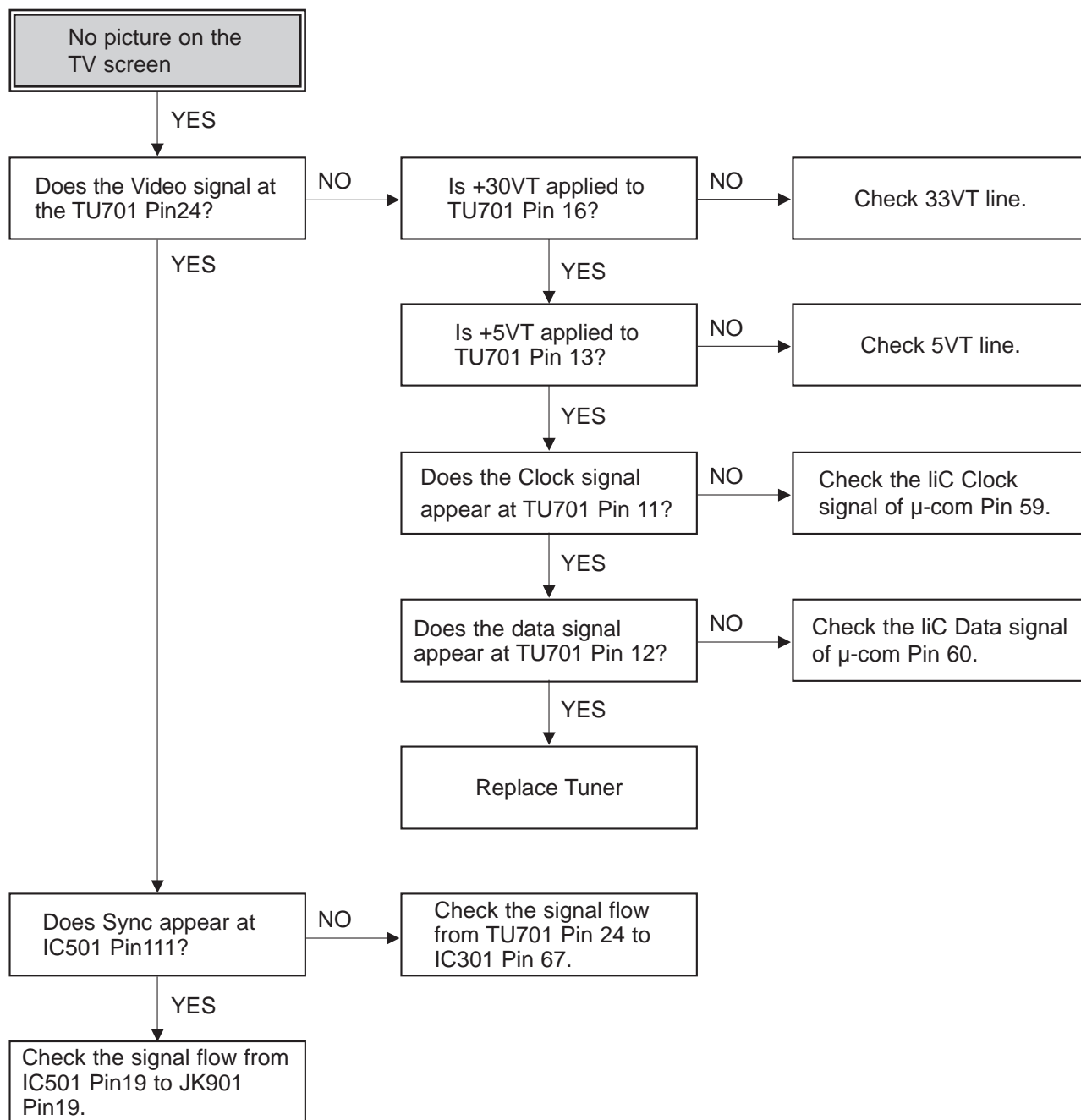


(4) When the Video signal doesn't appear on the screen in REC Mode,

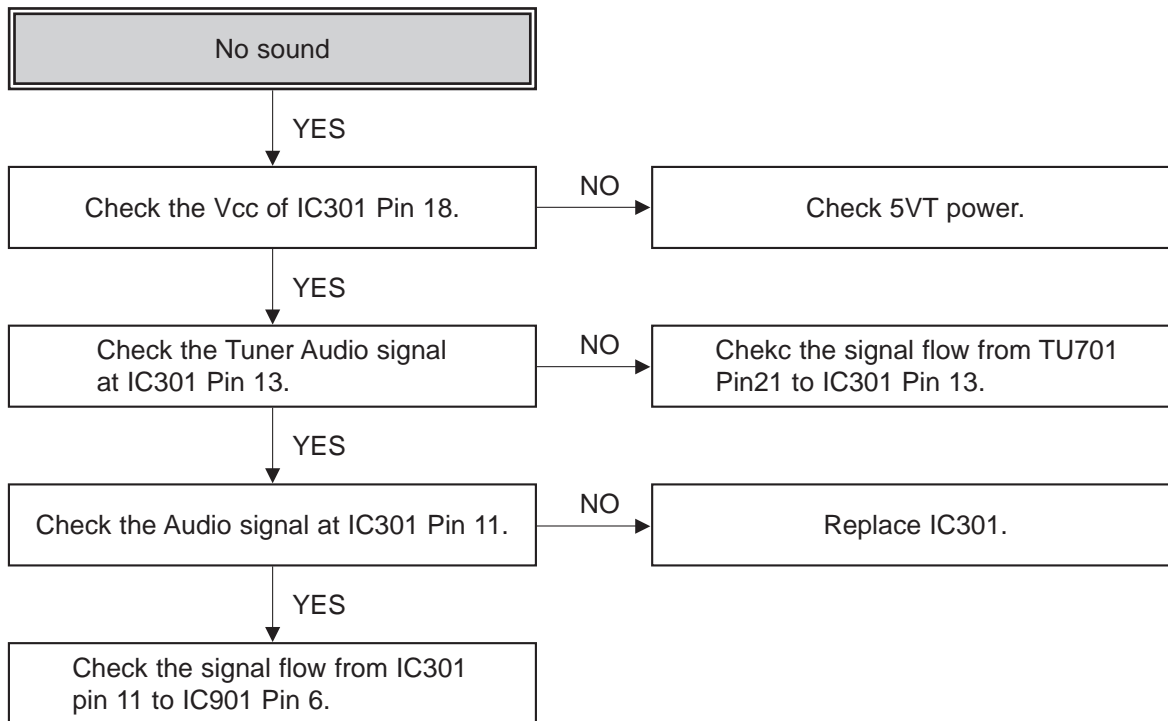


5. Tuner/IF circuit

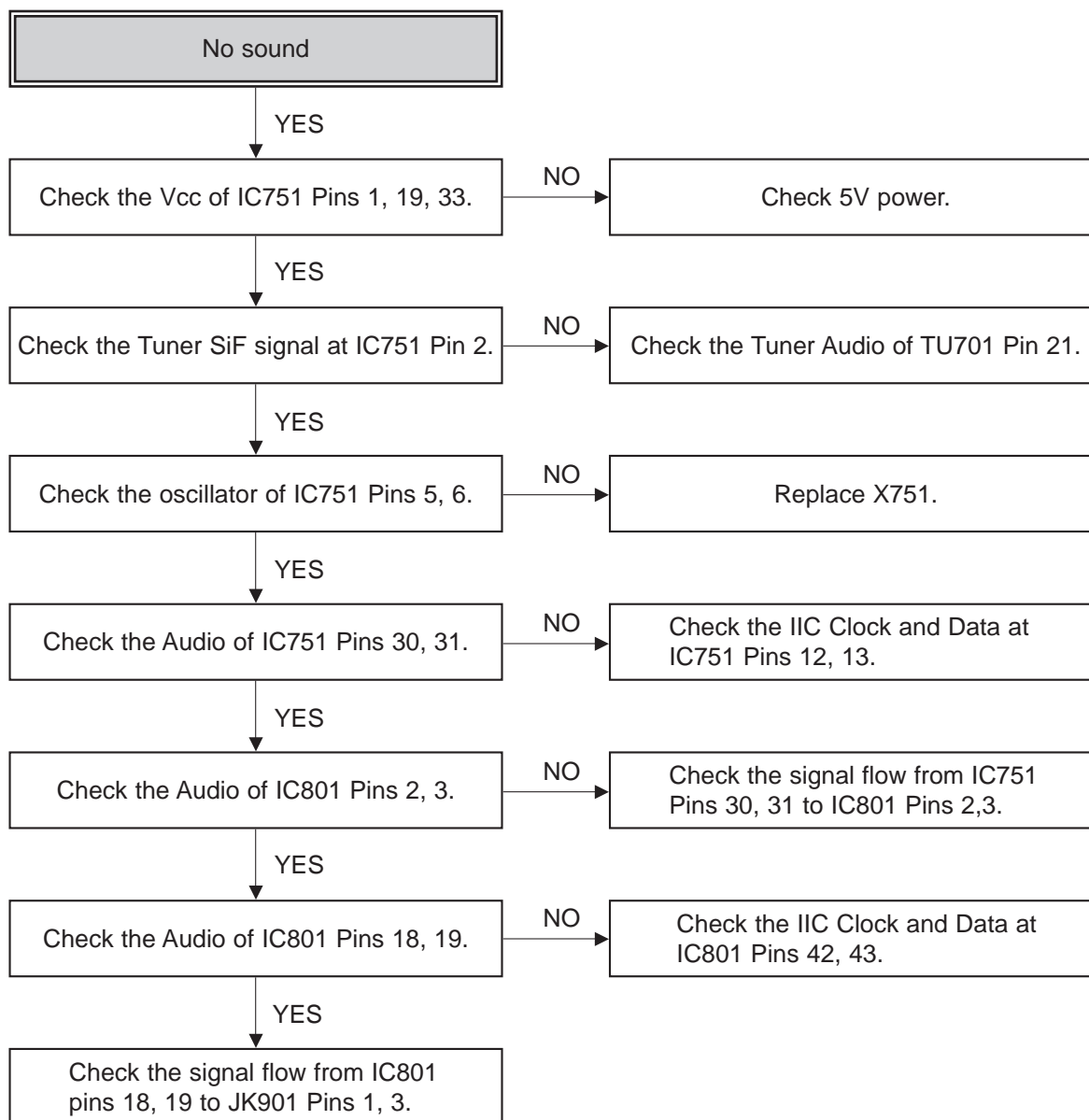
(1) No picture on the TV screen



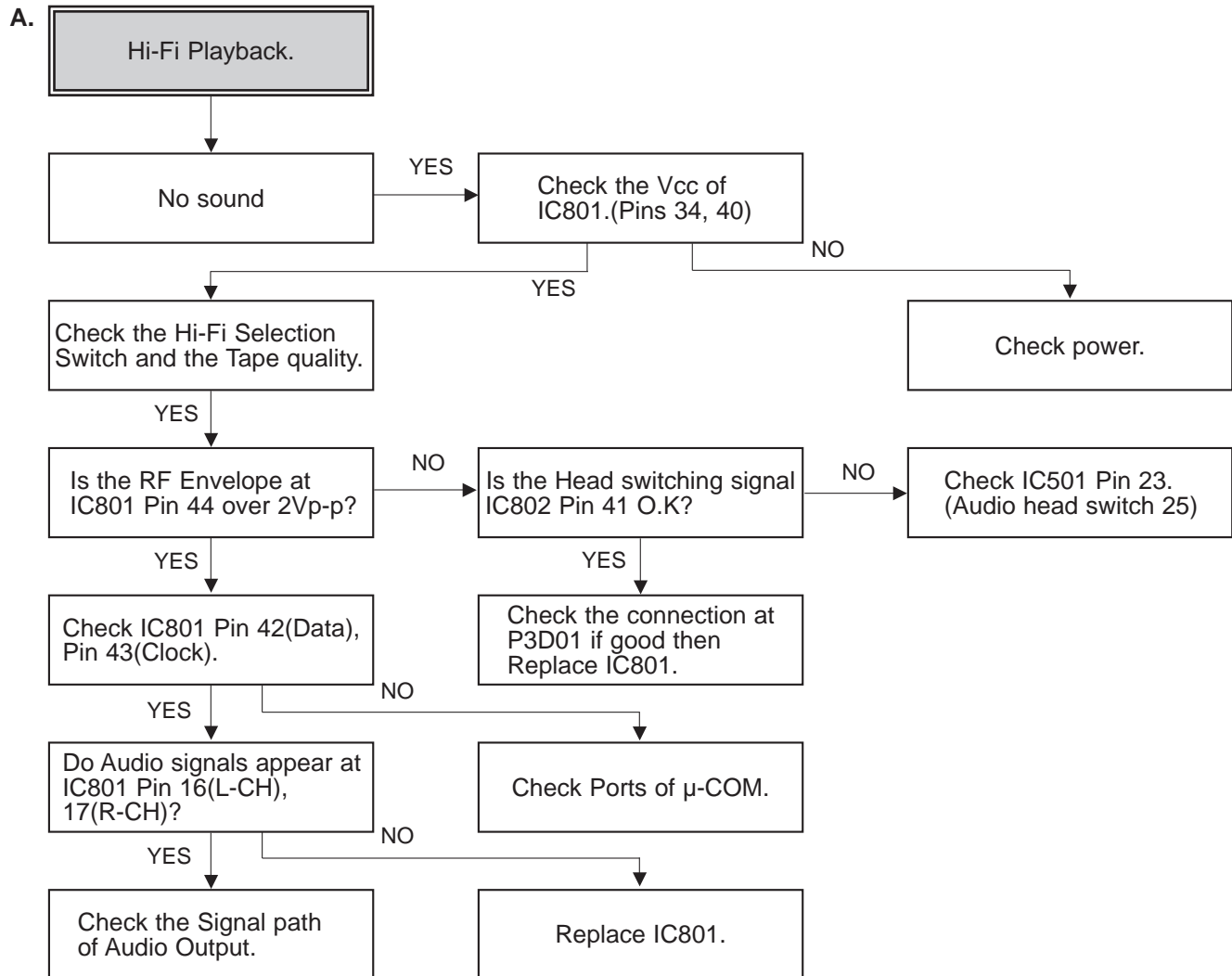
(2) No sound (Mono Model)



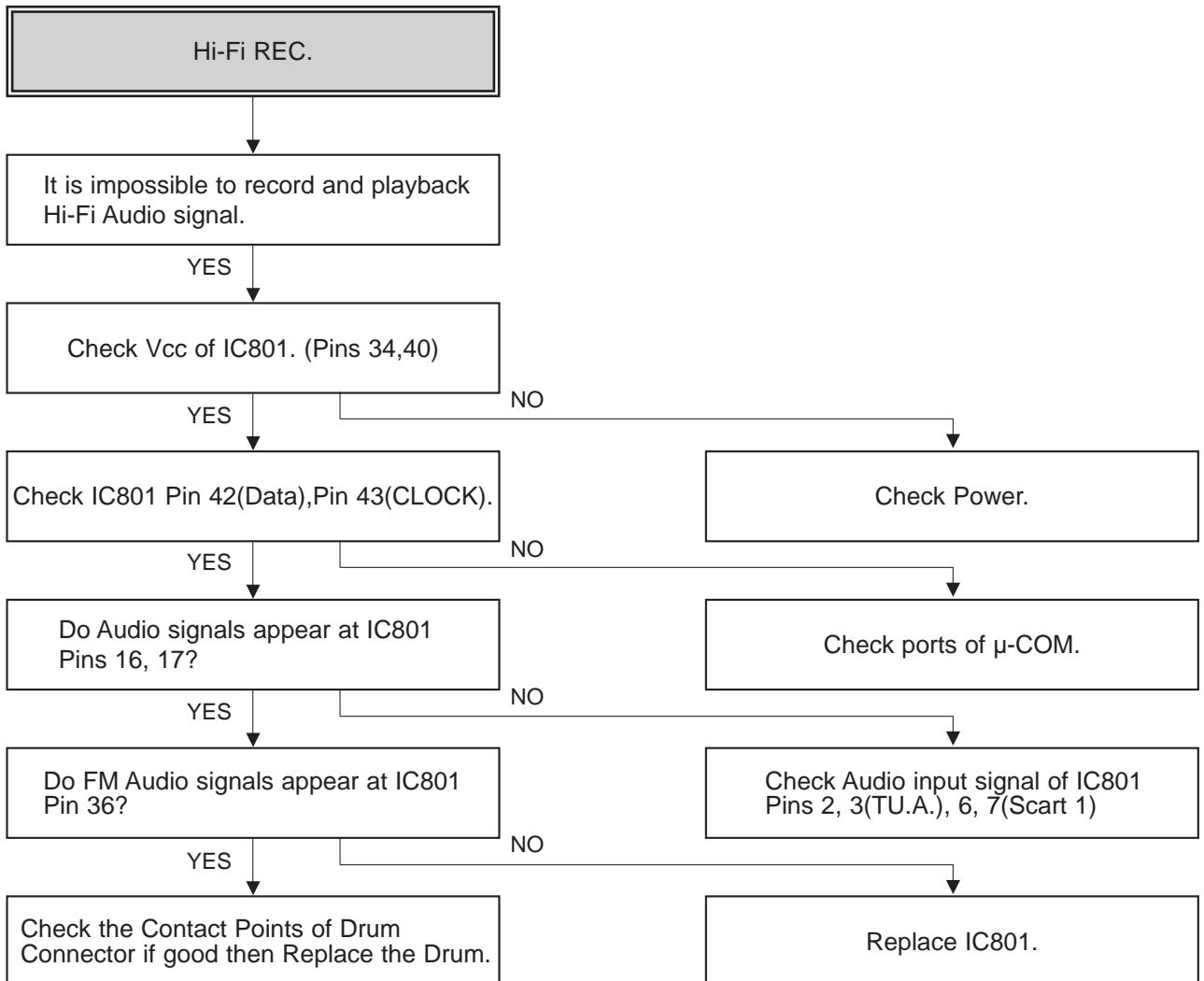
(3) No sound (Hi-Fi Model)



6. Hi-Fi Circuit (Hi-Fi Model)



B.



SECTION 4 MECHANISM

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MECHANISM TROUBLESHOOTING GUIDE

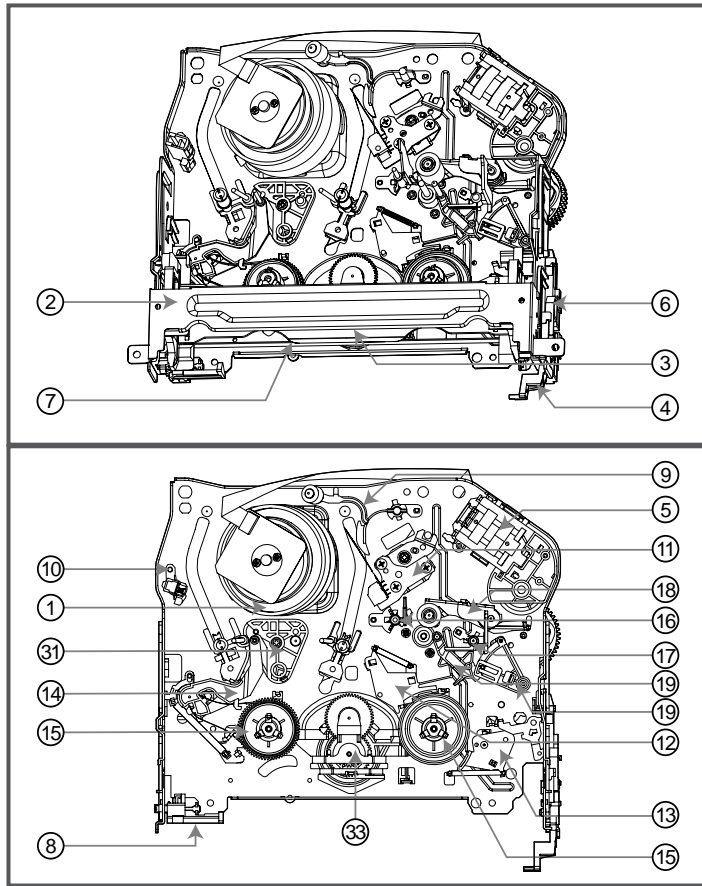
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EXPLODED VIEWS

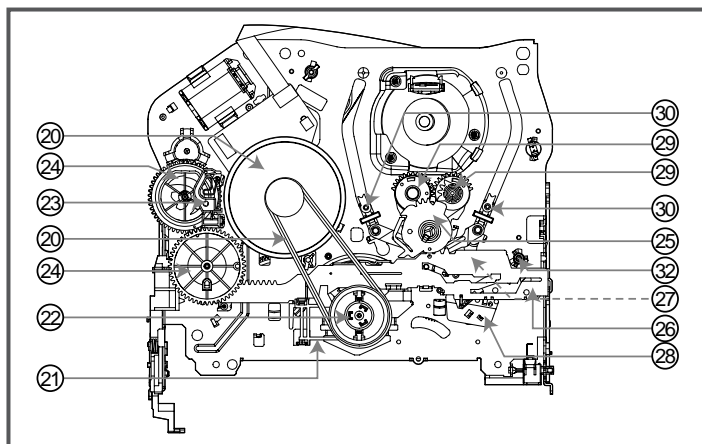
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3. Moving Mechanism Section (2).....4-30

DECK MECHANISM PARTS LOCATIONS

• Top View



• 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 4-14)
- 2) When disassembling, the Parts for Starting No. Should be removed first.

Pracedure Starting No.	Part	Fixing Type	Fig-ure	Vi-ew
1	Drum Assembly	3 Screw	A-1	T
2	Plate Top	2 Hook	A-2	T
2	3 Holder Assembly CST	Chassis Hole	A-2	T
2	4 Opener Door	Chassis Hole	A-2	T
	5 Bracket Assembly L/D Motor	3 Hook	A-2	T
2,3,4	6 Gear Assembly Rack F/L	1 Hook, Chassis Hole	A-2	T
2,3,4,6	7 Arm Assembly F/L	Chassis Hole	A-2	T
	8 Lever Assembly S/W	1 Hook	A-2	T
	9 Arm Assembly Cleaner	Chassis Embossing	A-3	T
	10 Head F/E	Chassis Embossing	A-3	T
	11 Base Assembly A/C Head	1 Screw	A-3	T
2,3	12 Brake Assembly RS	1 Hook	A-4	T
2,3	13 Brake Assembly T	1 Hook	A-4	T
2,3	14 Arm Assembly Tension	2 Hook	A-4	T
2,3,12,13, 14	15 Reel S/Reel T		A-4	T
	16 Base Assembly P4	Chassis Embossing	A-5	T
	17 Opener Lid	Chassis Embossing	A-5	T
17	18 Arm Assembly Pinch	Shaft	A-5	T
17	19 Lever T/Up / Arm T/Up	1 Hook	A-5	T
17,18	20 Belt Capstan/Motor Capstan	3 Screw	A-6	B
	21 Lever F/R	Locking Tab	A-6	B
20, 21	22 Clutch Assembly D35	Washer	A-6	B
	23 Break Assembly Capstan	Locking Tab	A-6	B
	24 Gear Drive/Gear Cam	Washer/Hook	A-7	B
	25 Gear Sector	1 Hook	A-7	B
20,21,23, 24,25	26 Plate Slider	Shaft Guide	A-7	B
20,21,23, 24,25,26	27 Lever Tension	1 Hook	A-7	B
2,3,14,20, 21,25,23, 24,26	28 Lever Spring	Locking Tab	A7	B
25	29 Gear Assembly P2/Gear Assembly P3	Boss	A-8	B
2,3,14,25, 29	30 Base Assembly P2/Base Assembly P3	Chassis Slot	A-8	B
2,3,14,25, 29	31 Base Loading	1 Screw	A-9	T
2,3,14	32 Base Tension	Chassis Embossing	A-9	B
2,3,20,21, 22	33 Arm Assembly Idler	Locking Tab	A-9	T

R: Top, B:Bottom

DECK MECHANISM DISASSEMBLY

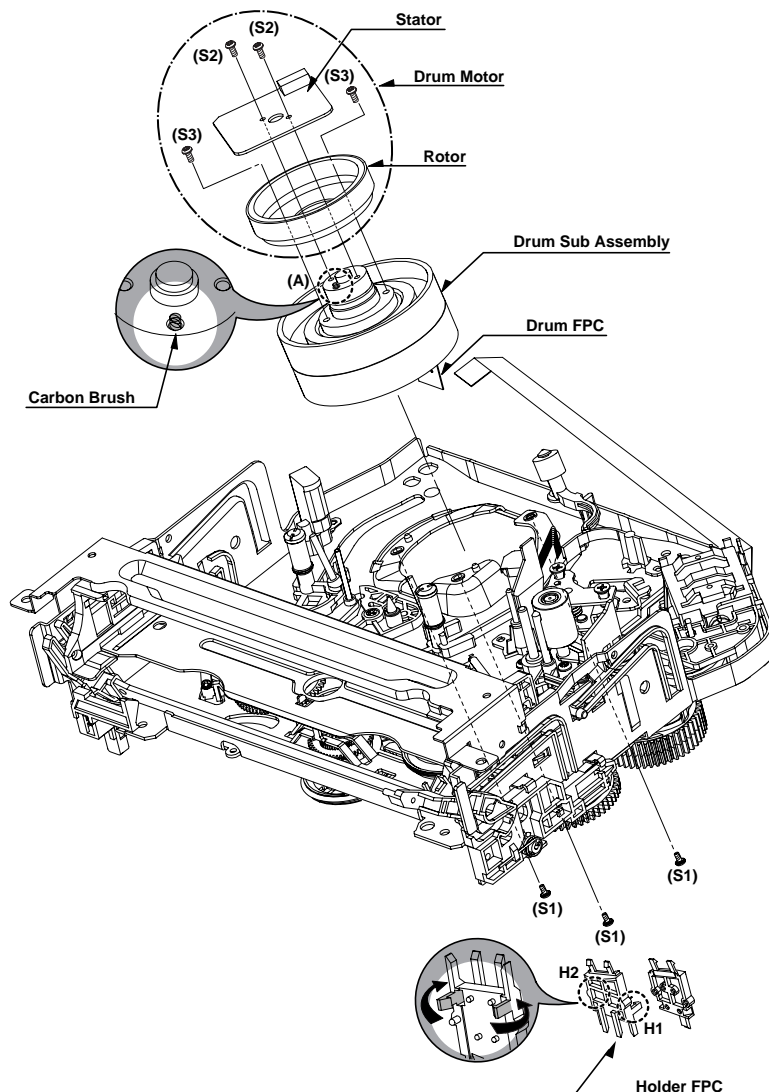


Fig. A-1

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

- 1) Unplug the Drum FPC Connector.
- 2) Remove three Screws(S1) on bottom side and separate the Drum assembly.
- 3) Unhook (H1), (H2) and separate the Holder FPC and Cap FPC.

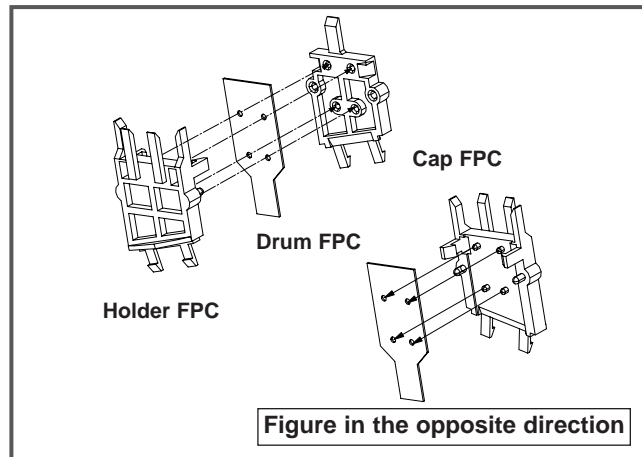
1-1. Drum Motor

- 1) Remove two Screws(S2) and disassemble the Stator of the Drum Motor.
- 2) Remove two Screws(S3) and separate the Rotor of the Drum Motor from the Drum Sub assembly.

NOTE

When reassembling, confirm (A) portion of the Drum Sub assembly whether the Carbon Brush is in there or not.

(Fig. B-1)



DECK MECHANISM DISASSEMBLY

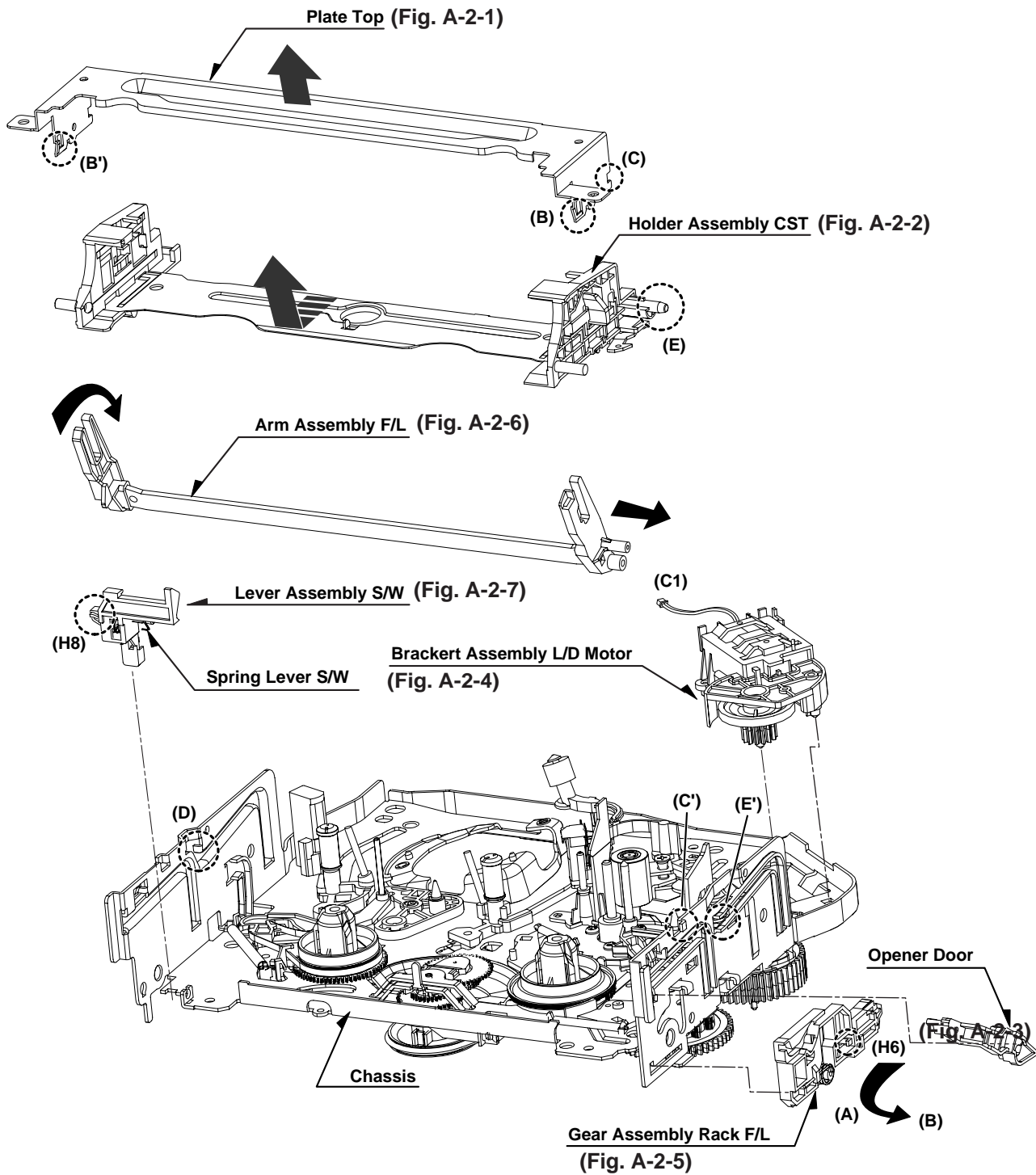


Fig. A-2

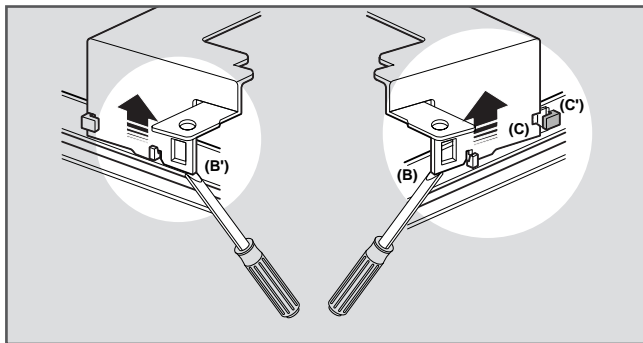
DECK MECHANISM DISASSEMBLY

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

- 1) Pull the (B) portion of the Plate Top back in direction of arrow and separate the right side of it.
- 2) pull the (B') portion of the Plate Top back in direction of arrow and separate the left side of it.
(Used tools : (-) type Drive, anything tool with sharp point or flat point.)

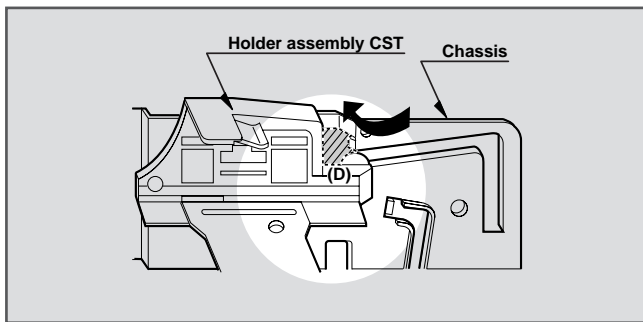
NOTE

- (1) When reassembling, push the Plate Top after alignment the two position(C), (C') as Fig.



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

- 1) Move the Holder assembly CST in direction of arrow and separate the left side of it first through the (D) position of the Chassis.



- 2) Disassemble the right side of the Holder assembly CST from each guided hole of the Chassis.

NOTE

When reassembling, insert the (E) part of the Holder assembly CST in the (E') hole of the Chassis first and assemble the left side of it.

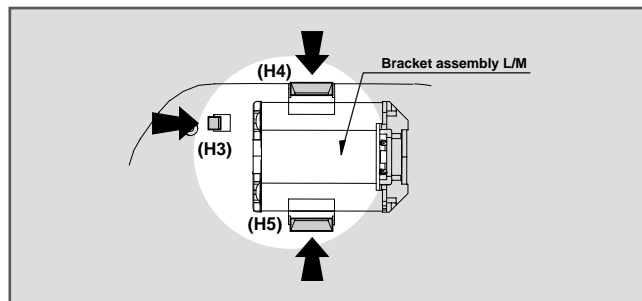
4. Opener Door (Figure. A-2-3)

- 1) Turn the Opener Door clockwise and remove it through the guide hole of the chassis.

5. Bracket assembly L/D Motor(Fig. A-2-4)

- 1) Unplug the Connector(C1).

- 2) Unhook three Hooks(H3,H4,H5) on bottom side of the Chassis, lift up the Bracket assembly L/M and disassemble the Bracket assembly L/D Motor.

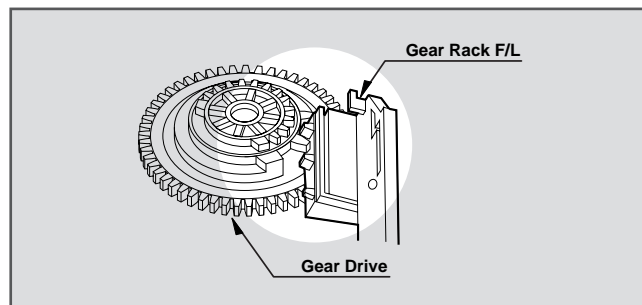


6. Gear Assembly Rack F/L (Fig. A-2-5)

- 1) Move the Gear Assembly Rack F/L in direction of arrow(A) and unhook the Hook(H6) pulling back in front.
- 2) Separate the Rear Rack F/L in direction of arrow(B).

NOTE

When reassembling, align the Gear part of the Gear Assembly Rack F/L with the Gear Drive as below Fig.

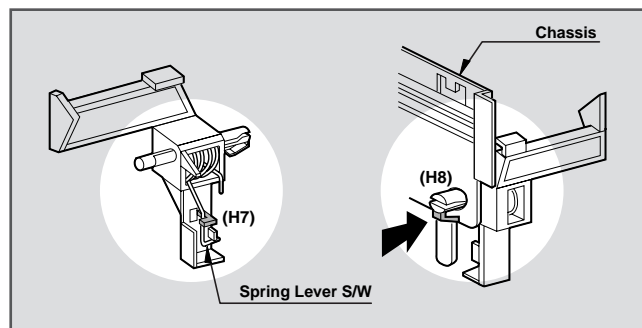


7. Arm assembly F/L (Fig. A-2-6)

- 1) Move the Arm assembly F/L in direction of arrow and separate the left side of it first.
- 2) Disassemble the Arm assembly F/L from each guided Hole of the Chassis.

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

- 1) Hook the Spring Lever S/W on the Hook(H7) first as below Fig.
- 2) Unhook the Hook(H8) in the left side of the Chassis and move the Lever assembly S/W.



DECK MECHANISM DISASSEMBLY

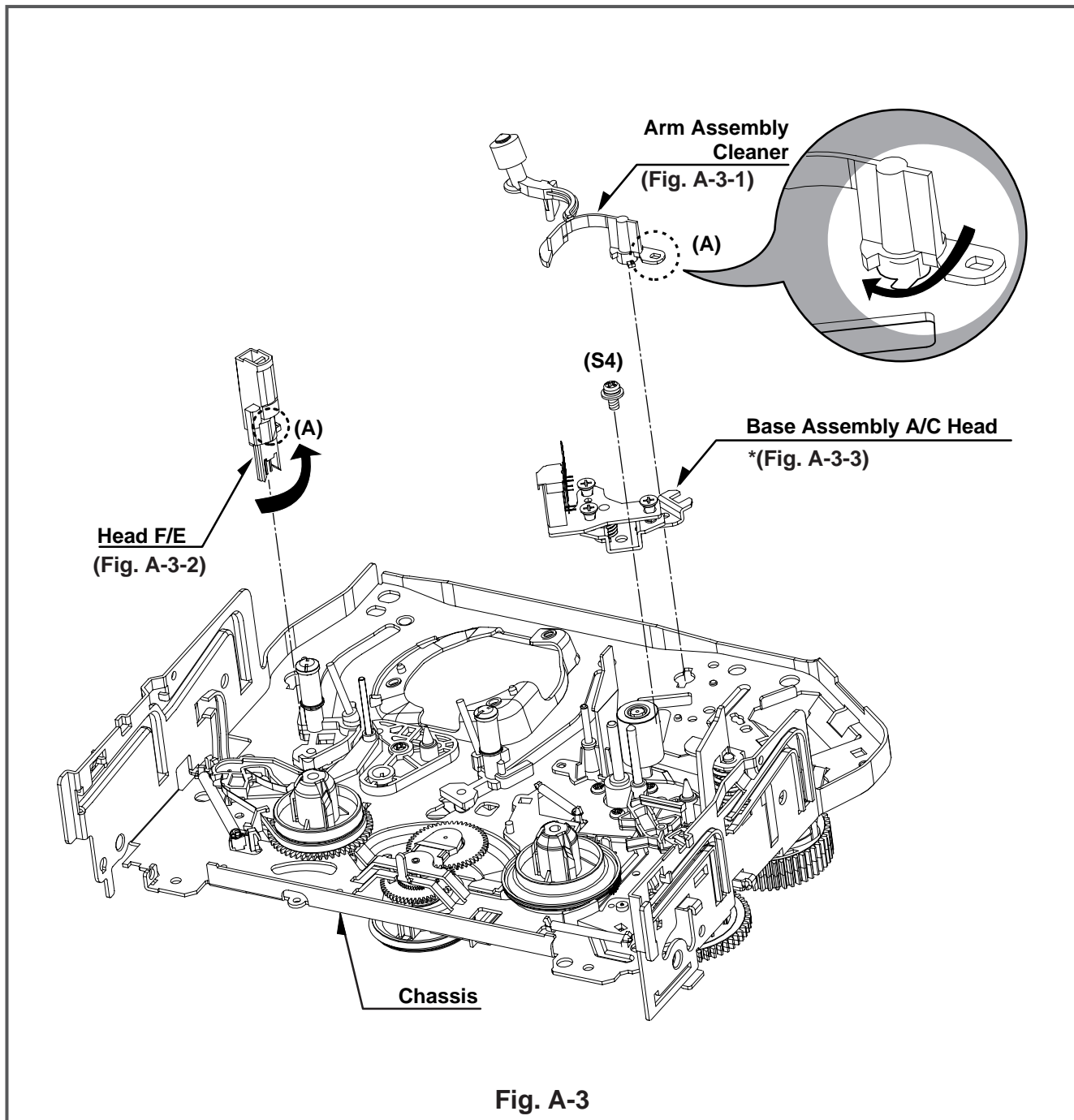


Fig. A-3

9. Arm assembly Cleaner (Fig. A-3-1)

- 1) Breakaway the (A) portion as Fig. A-3-1 from the Embossing of the Chassis, turn the Arm assembly Cleaner to clockwise direction and lift it up.

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

- 1) Breakaway the (A) portion of the Head F/E from the Embossing of the Chassis, turn it to counterclockwise direction and lift it up.

11. Base assembly A/C Head (Fig. A-3-3)

- 1) Remove the Screw(S4) and lift the Base assembly A/C Head up.

DECK MECHANISM DISASSEMBLY

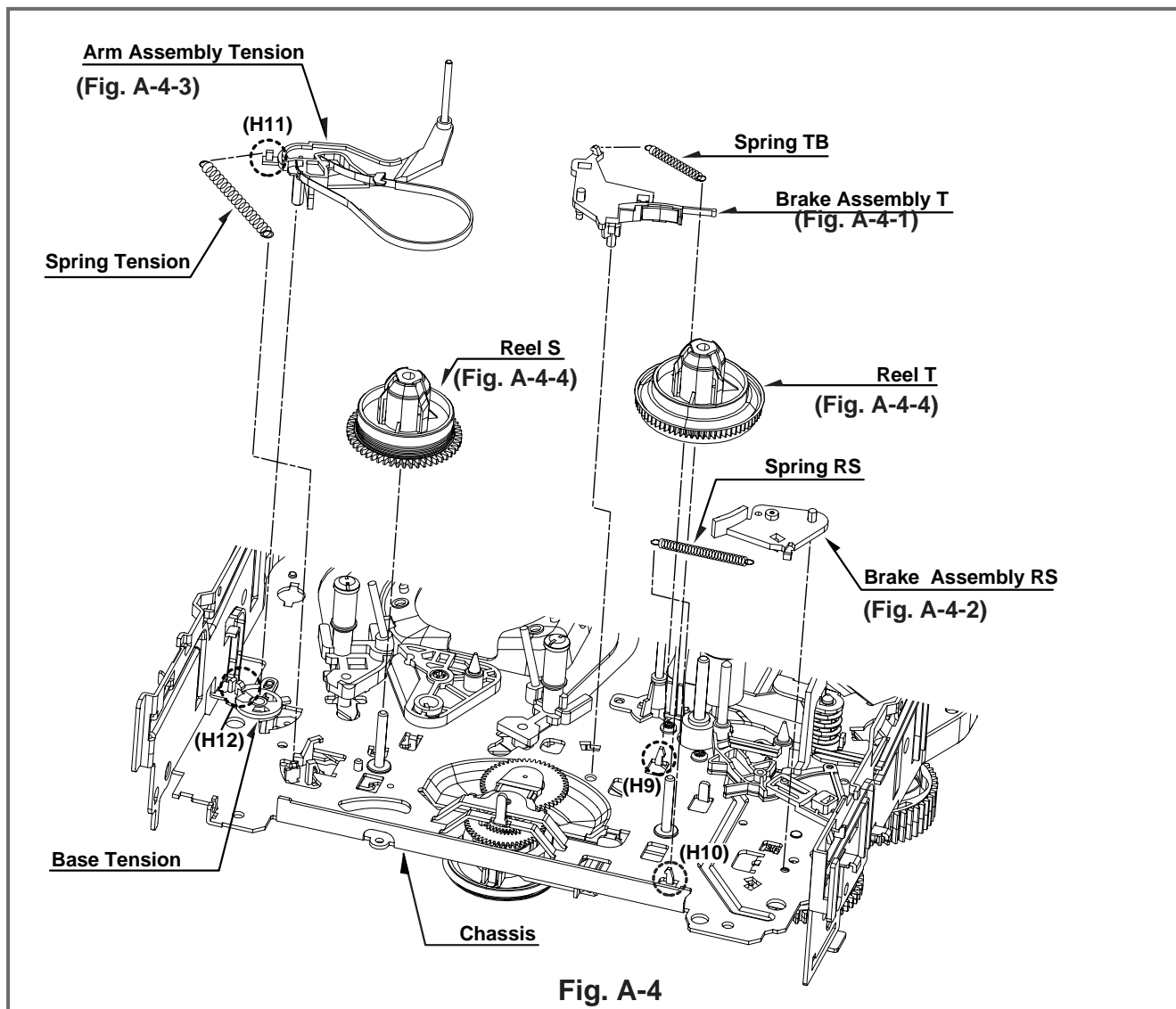


Fig. A-4

12. Brake assembly T (Fig. A-4-1)

- 1) Unhook the Spring TB from the Hook(H9) of the Chassis.
- 2) Lift the Brake assembly T up.

13. Brake assembly RS (Fig. A-4-2)

- 1) Unhook the Spring RS from the Hook(H10) of the Chassis..
- 2) Lift the Brake assembly T up.

14. Arm assembly Tension (Fig. A-4-3)

- 1) Unhook the Spring Tension from the Hook(H11) of the Arm assembly tension.
- 2) Unhook the Hook(H12) of the Base Tension and lift the Arm assembly Tension up.

NOTE

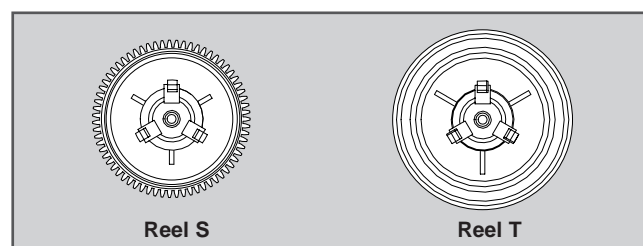
Difference for Springs

(Difference for Springs)

	Spring TB
	Spring RS Color (Black)
	Spring Tension

15. Reel S / Reel T (Fig. A-4-4)

- 1) Difference for Reel S / Reel T



DECK MECHANISM DISASSEMBLY

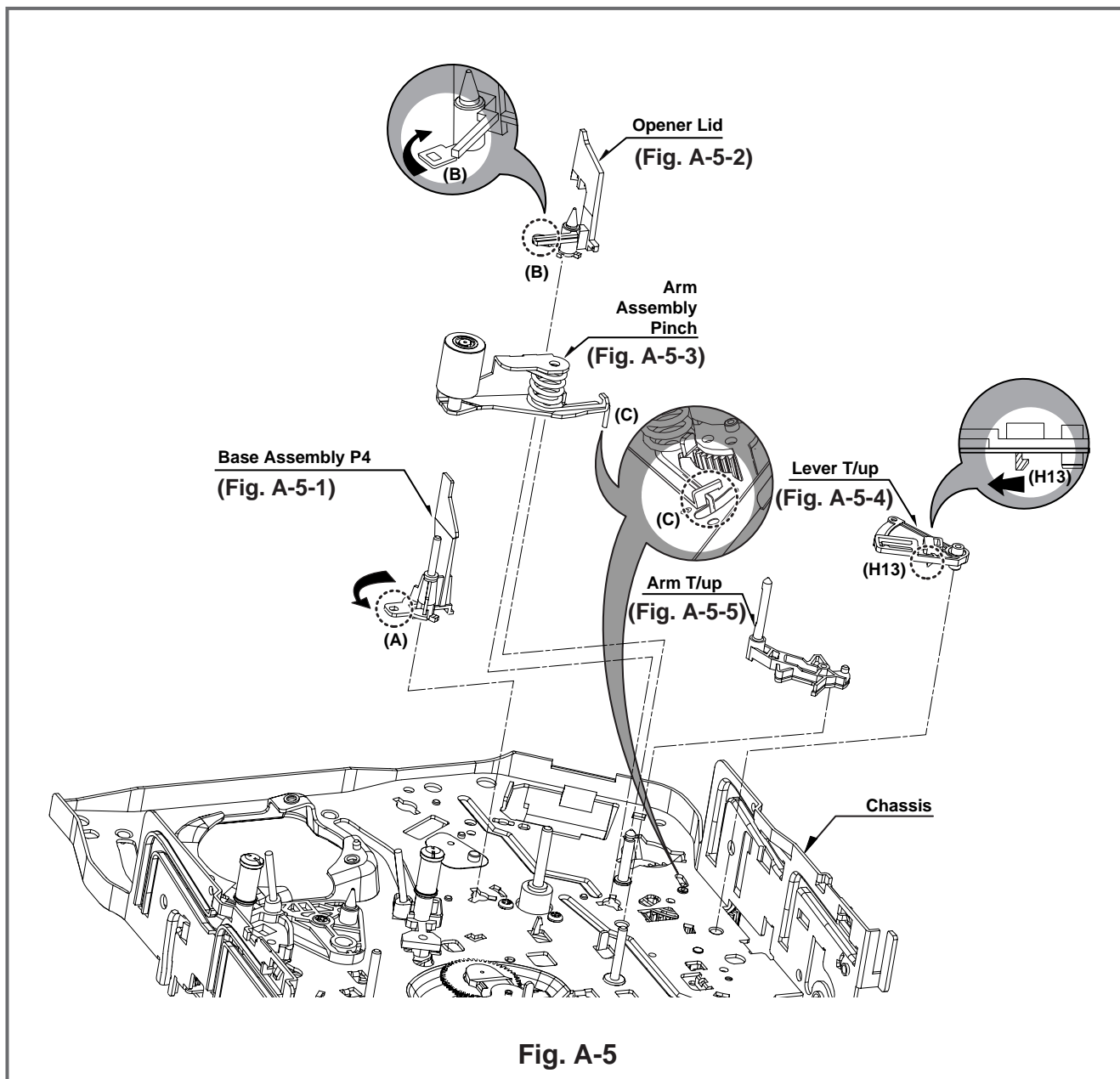


Fig. A-5

16. Base assembly P4 (Fig. A-5-1)

- 1) Breakaway the (A) portion of the Base assembly P4 from the Embossing of the Chassis.
- 2) Turn the Base assembly P4 to counterclockwise direction and lift it up.

17. Opener Lid (Fig. A-5-2)

- 1) Breakaway the (B) portion of the Opener Lid from the Embossing of the Chassis.
- 2) Turn the Opener Lid to clockwise direction and lift it up.

18. Arm assembly Pinch (Fig. A-5-3)

- 1) Lift the Arm assembly Pinch up.

19. Lever T/up (Fig. A-5-4)/ Arm T/up (Fig. A-5-5)

- 1) Unhook the Hook(H13) of the bottom Chassis and lift the Lever T/up up.
- 2) Lift the Arm T/up up.

NOTE

When reassembling, confirm the (C) portion of the Arm assembly Pinch is inserted to the Chassis Hole correctly as Fig.

Place the Mechanism face down, or up side down.

DECK MECHANISM DISASSEMBLY

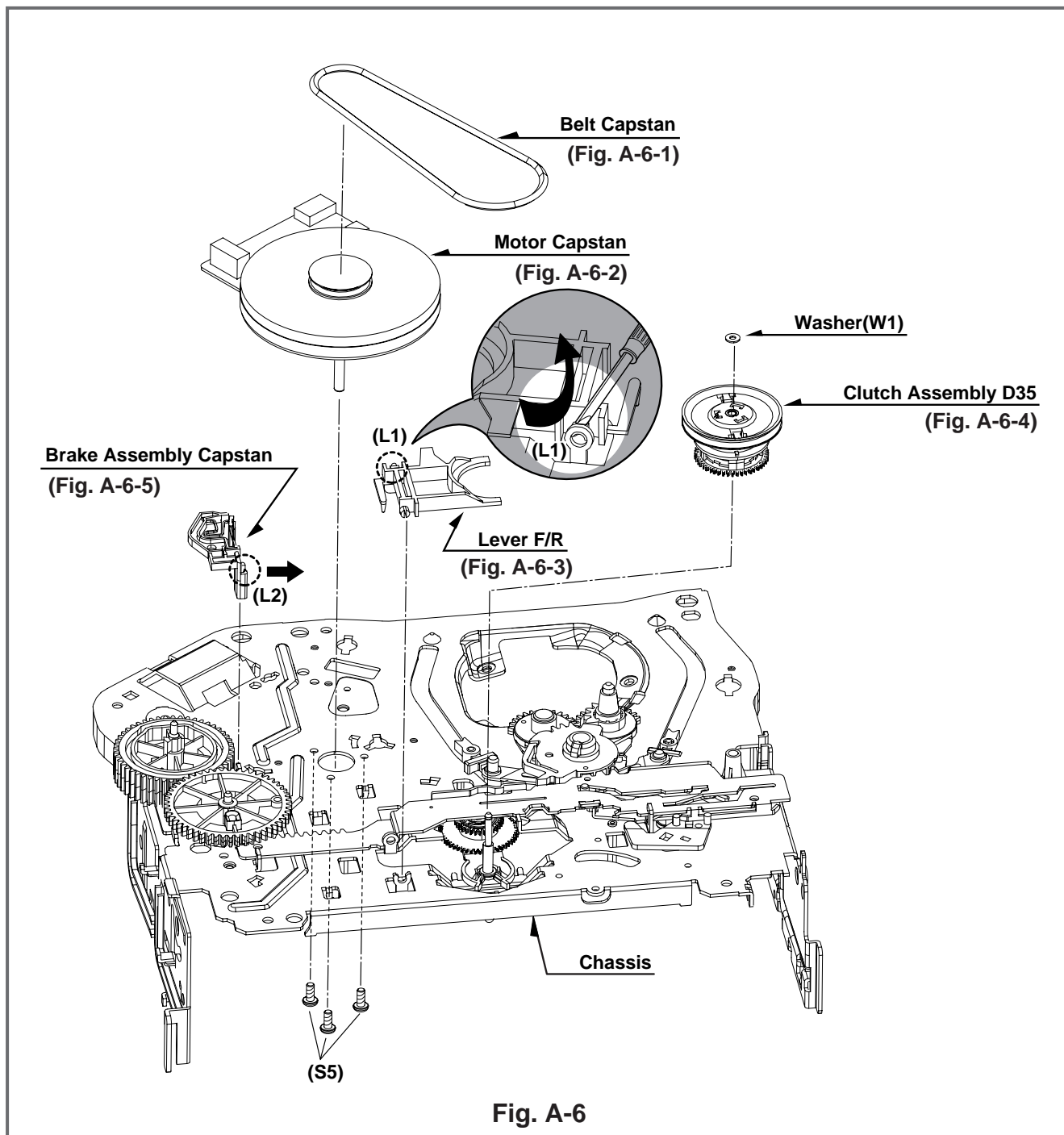


Fig. A-6

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

- 1) Remove the Belt Capstan.
- 2) Remove the three Screws(S5) on bottom Chassis and lift the Motor Capstan up.

21. Lever F/R (Fig. A-6-3)

- 1) Unlock the Locking Tab(L1) as Fig. A-6-3 and lift the Lever F/R up.

22. Clutch assembly D35 (Fig. A-6-4)

- 1) Remove the Washer(W1) and lift the Clutch assembly D35 up.

23. Brake assembly Capstan (Fig. A-6-5)

- 1) Pull the Locking Tab(L2) back in direction of arrow and lift it up.

DECK MECHANISM DISASSEMBLY

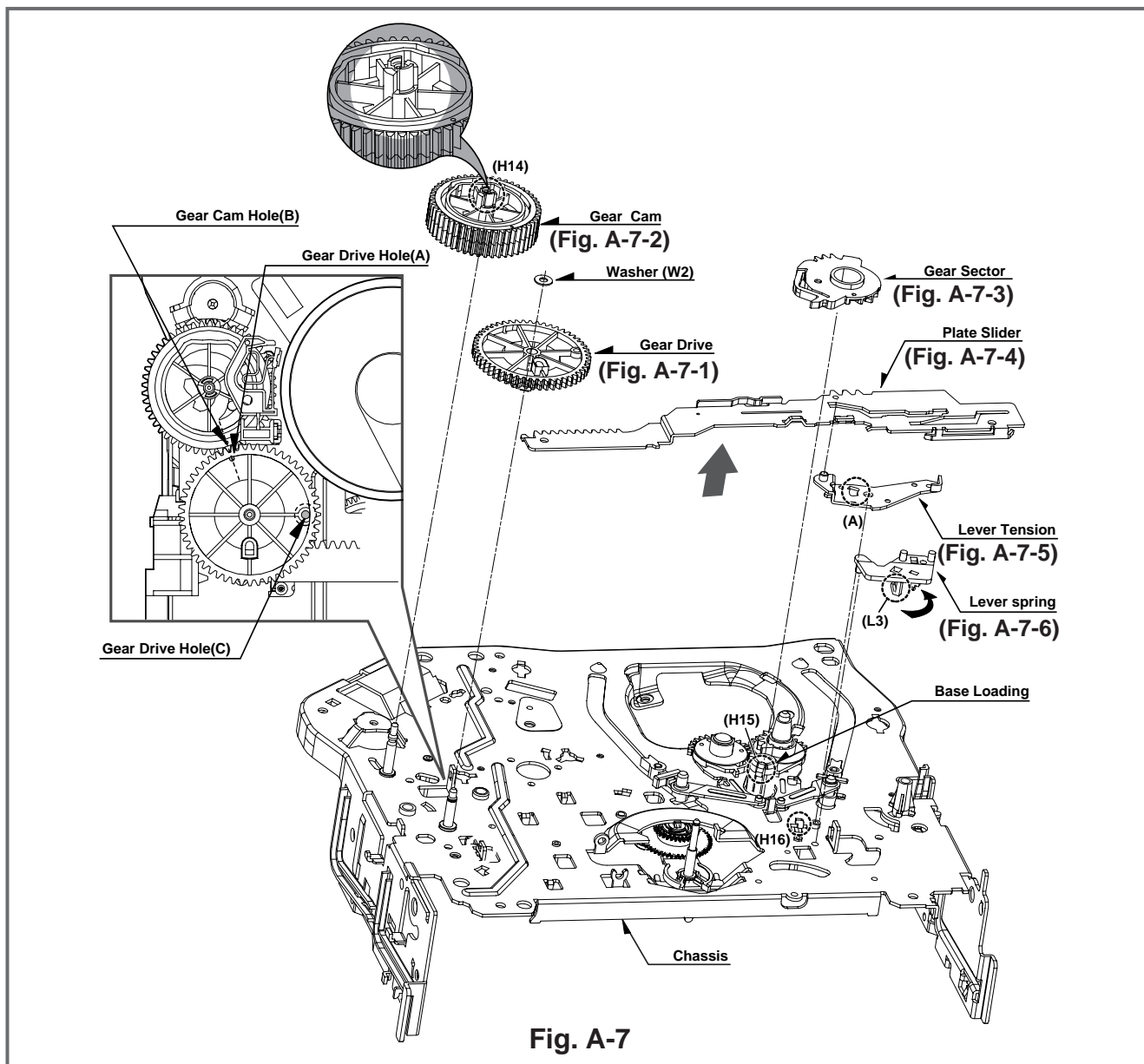


Fig. A-7

24. Gear Drive (Fig. A-7-1)/ Gear Cam (Fig. A-7-2)

- 1) Remove the Washer(W2) and lift the Gear Drive up.
- 2) Unhook the Hook(H14) of the Gear Cam and lift the Gear Cam up.

NOTE

When reassembling, align the Gear Drive Hole(A) and the Gear Cam Hole(B) in a straight line after the Gear Drive Hole(C) is aligned with the Chassis Hole as Fig.

25. Gear Sector (Fig. A-7-3)

- 1) Unhook the Hook(H15) of the Base Loading on bottom Chassis and lift the Gear Sector up.

26. Plate Slider (Fig. A-7-4)

- 1) Just lift the Plate Slider up.

27. Lever Tension (Fig. A-7-5)

- 1) Unhook the (A) portion of the Lever Tension from the Hook(H16) of the Chassis.
- 2) Turn the Lever Tension to counterclockwise direction and lift it up.

28. Lever Spring (Fig. A-7-6)

- 1) Unlock the Locking Tab(L3) of the bottom Chassis and lift the Lever Spring up.

DECK MECHANISM DISASSEMBLY

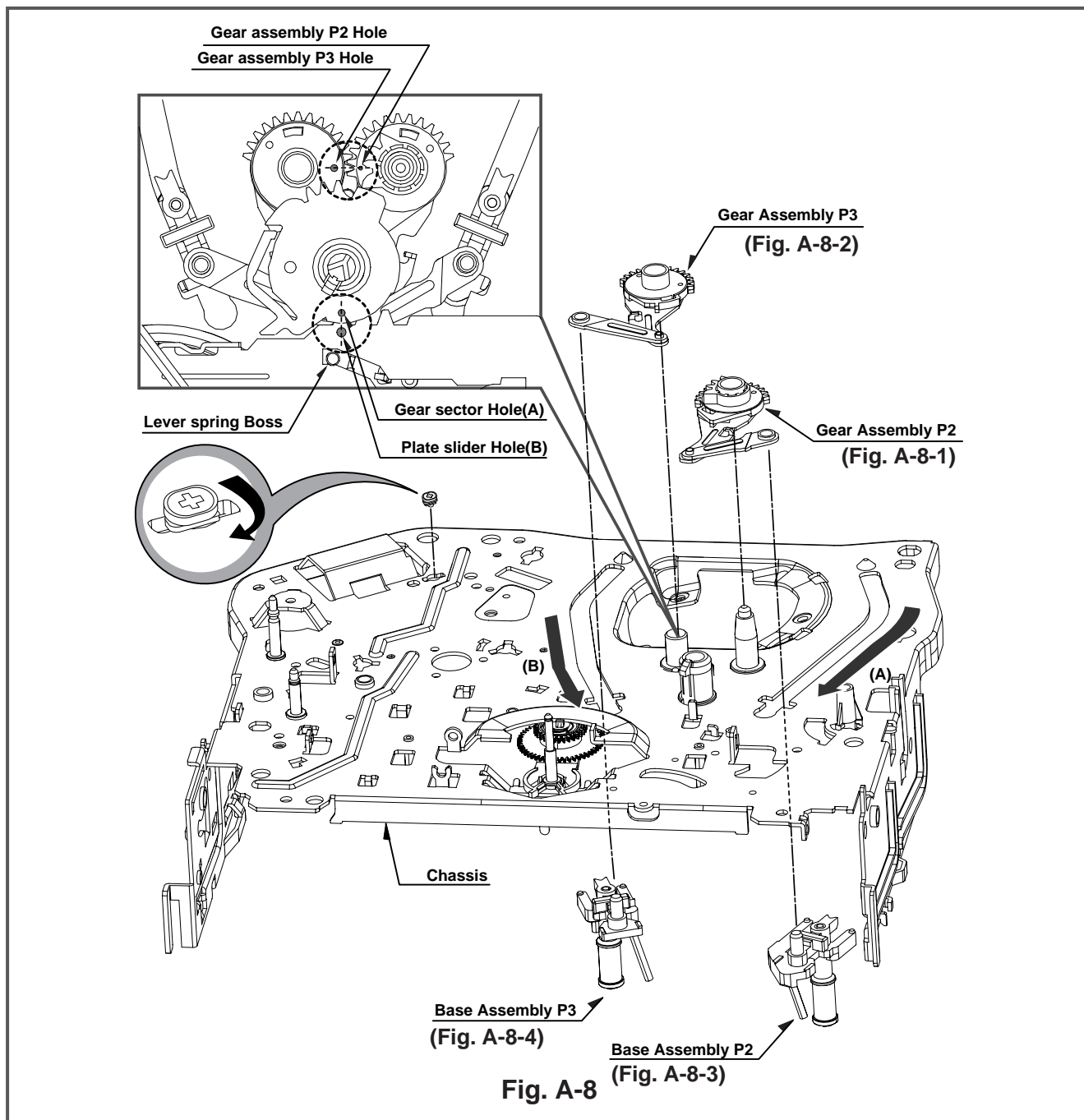


Fig. A-8

29. Gear assembly P2 (Fig. A-8-1)/ Gear assembly P3 (Fig. A-8-2)/

- 1) Just lift the Gear assembly P2 up.
- 2) Just lift the Gear assembly P3 up.

NOTE

When reassembling, align the two Holes of the Gear assembly P2 and P3 in a straight line after confirmation whether the Gear Sector Hole(A) and the Plate Slider Hole(B) are aligned or not as Fig.

30. Base assembly P2 (Fig. A-8-3)/ Base assembly P3 (Fig. A-8-4)

- 1) Move the Base assembly P2 in direction of arrow(A) along the Guided Hole of the Chassis and disassemble it on bottom side.
- 2) Move the Base assembly P3 in direction of arrow(B) along the Guided Hole of the Chassis and disassemble it on bottom side.

Place the Mechanism face down, or return to original position.

DECK MECHANISM DISASSEMBLY

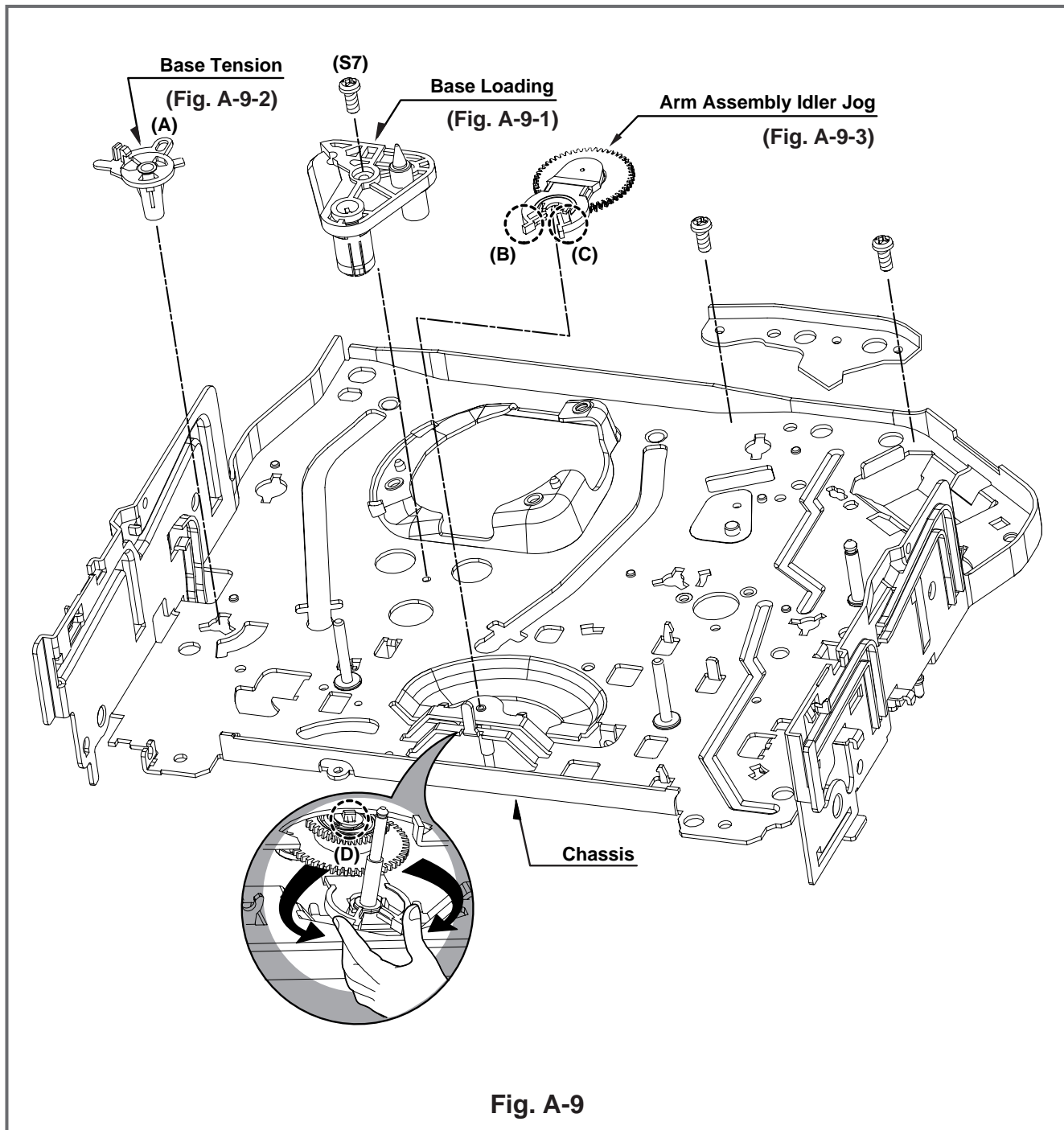


Fig. A-9

31. Base Loading (Fig. A-9-1)

- 1) Remove the Screw(S7).
- 2) Lift the Base Loading up.

32. Base Tension (Fig. A-9-2)

- 1) Breakaway the (A) portion of the Base Tension from the Embossing of the Chassis.
- 2) Turn the Base Tension to counterclockwise direction and lift it up.

33. Arm assembly Idler (Fig. A-9-3)

- 1) Make narrower the two parts, (A) and (B), as Fig. A-9-3.
- 2) Lift the Arm assembly Idler up.

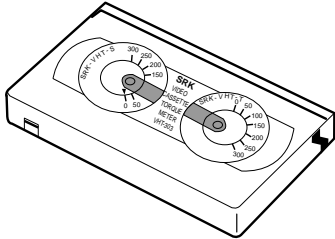
NOTE

When disassembling, be careful not to be caught the (D) part by the Chassis as Fig.

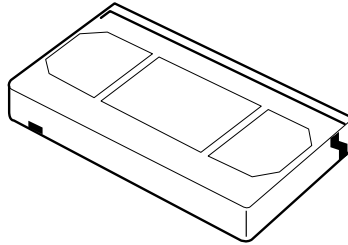
DECK MECHANISM ADJUSTMENT

• Tools and Fixfures for Service

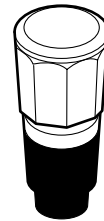
**1. Cassette Torque meter
PUJ42881**



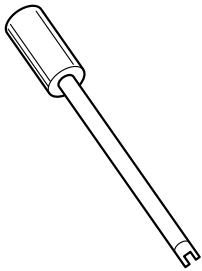
**2. Alignment tape
MHPE**



**3. Torque gauge
PUJ48075-2**



**4. Post height adjusting driver
(Roller driver)
PTU94002**



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

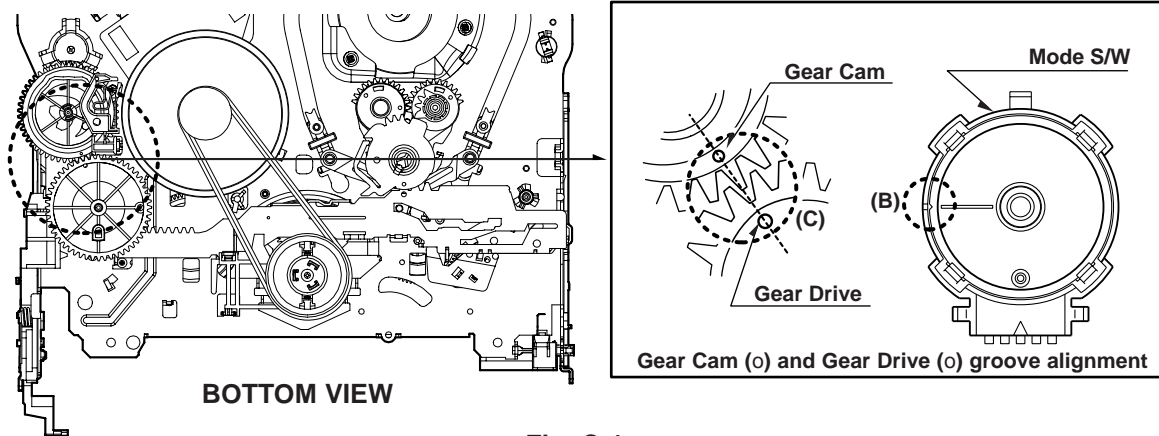


Fig. C-1

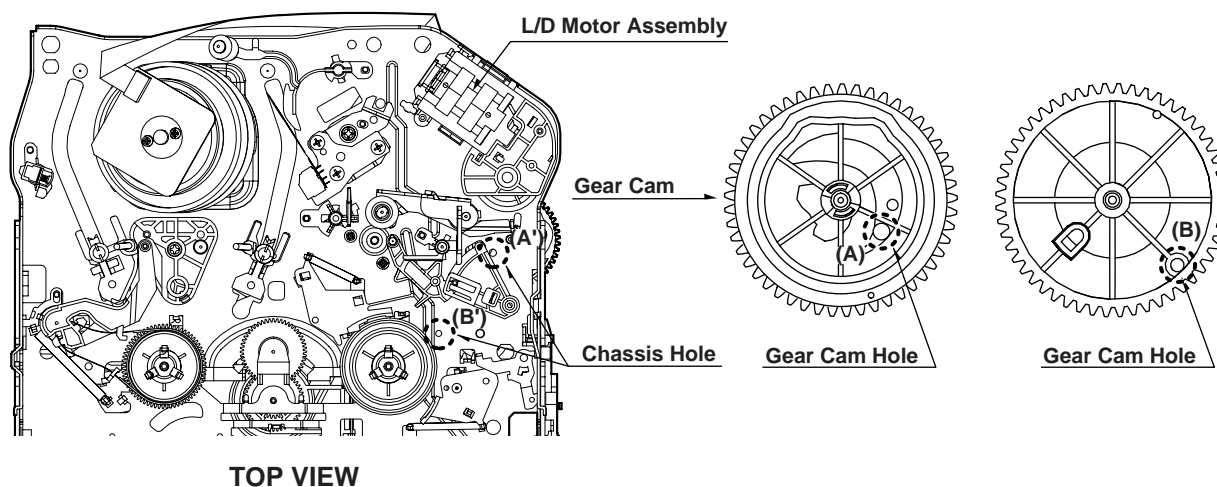


Fig. C-2

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 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		
• Torque Gauge(600g/cm ATG) • Torque Gauge Adaptor • Cassette Torque Meter		• Play (FF) or Review (REW) Mode	• 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	40~100g/cm	
Review Torque	Review	Cassette Torque Meter	Supply Reel	120~210g/cm	

NOTE:

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

• Cassette Torque Meter

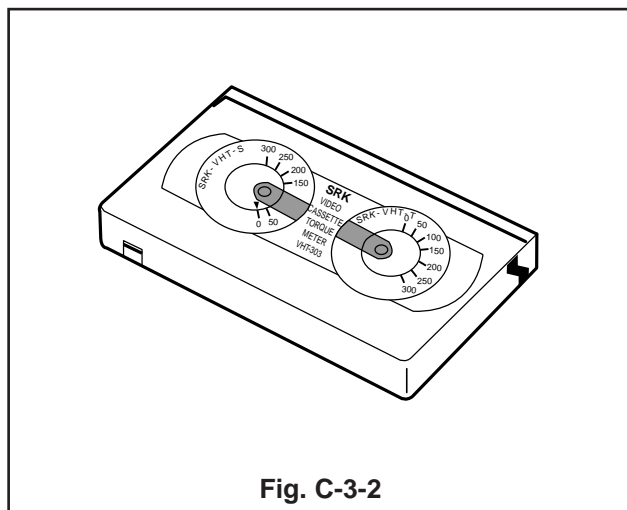


Fig. C-3-2

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

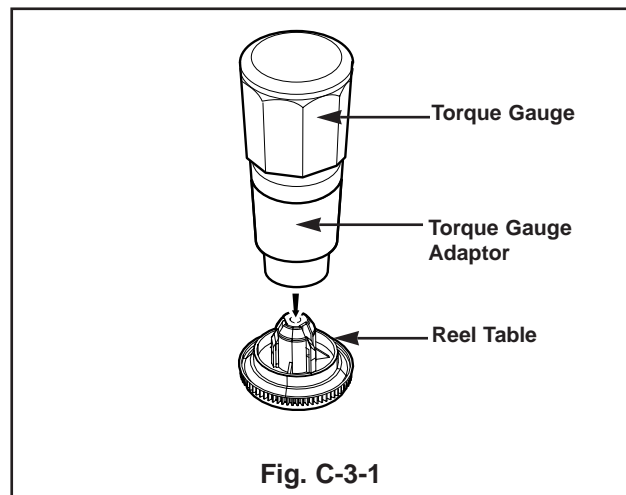


Fig. C-3-1

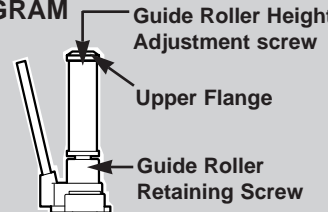
DECK MECHANISM ADJUSTMENT

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.

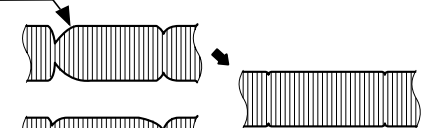
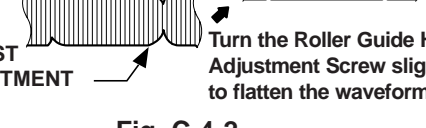
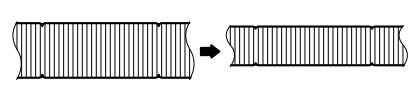
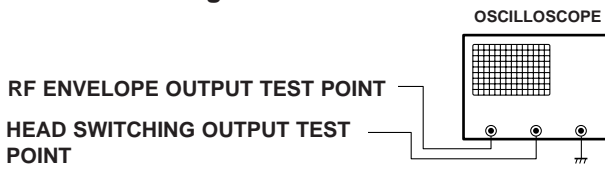
4-1. Preliminary Adjustment

Test Equipment/ Fixture	Test Conditions (Mechanism Condition)	Adjustment Point
• Post Height Adjusting Driver	• Play or Review Mode	• Guide Roller Height Adjustment screws on the Supply and Take-Up Guide Rollers.

Adjustment Procedure <ol style="list-style-type: none"> 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. 	ADJUSTMENT DIAGRAM  <p>Fig. C-4-1</p>
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4-2. Precise Adjustment

Test Equipment/Fixture	Test Equipment Connection Points	Test Conditions VCR(VCP) State	Adjustment Point
• Oscilloscope • Alignment Tape • Post Height Adjusting Driver	• CH-1:PB RF Envelope • CH-2:NTSC: SW 30Hz PAL: SW 25Hz • Head Switching Output Point • RF Envelope Output Point	• Play an Alignment Tape	• Guide Roller Height Adjustment Screws

Adjustment Procedure <ol style="list-style-type: none"> 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. 	Waveform Diagrams <p>P2 POST ADJUSTMENT</p>  <p>P3 POST ADJUSTMENT</p>  <p>Fig. C-4-2</p> <p>Tracking control at center</p>  <p>Fig. C-4-3</p> <p>Connection Diagram</p> 		
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NOTE <p>If the adjustment is excessive or insufficient the tape will jam or fold.</p>			
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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)

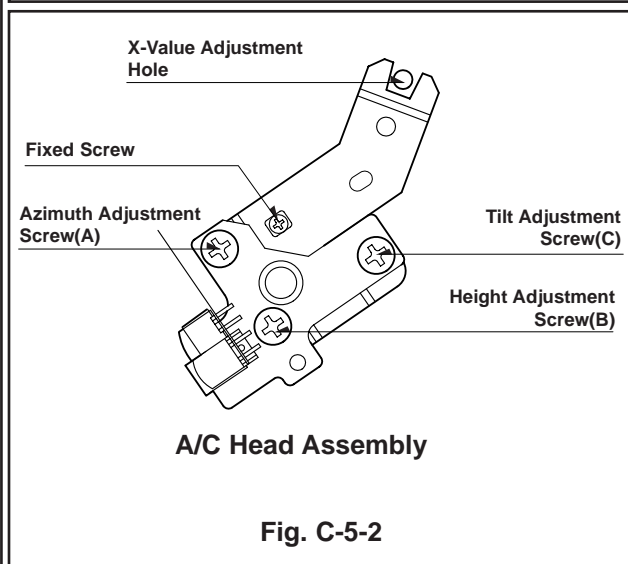
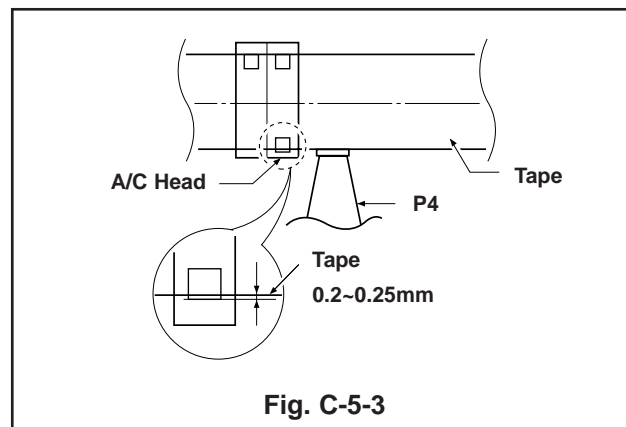
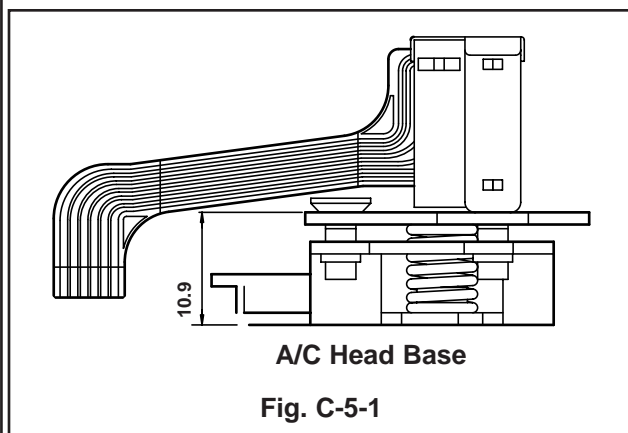
Adjustment Procedure/Diagrams

- 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 6KHz Section 	<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 6Khz segment. 			

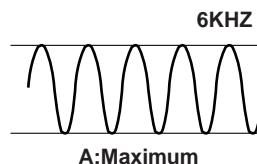


Fig. C-5-4

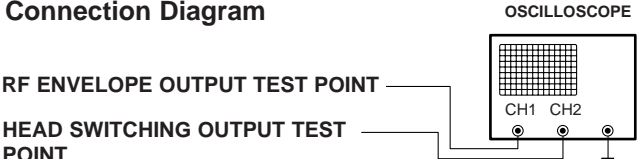
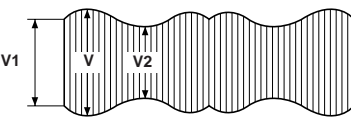
6. X-Value Adjustment

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) Release the Automatic Tracking to run long enough for Tracking to complete it's Cycle. 2) Loosen the Fixed Mounting Screw and move the Base Assembly A/C Head in the direction as shown in the Diagram to find the center of the peak that allows for the maximum Waveform Envelope. This method should allow the 31um Head to be centrally located over the 58um Tape Track. 3) Tighten the Base Assembly A/C Head mounting 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: <ol style="list-style-type: none"> CUE is fast forward mode (FF) REV is the rewind mode (REW) 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 begining, 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 <ol style="list-style-type: none"> 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 begining, middle and end sections of the cassette. 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 Assembly D33K 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 4-22) for the sections to be lubricated and greased.

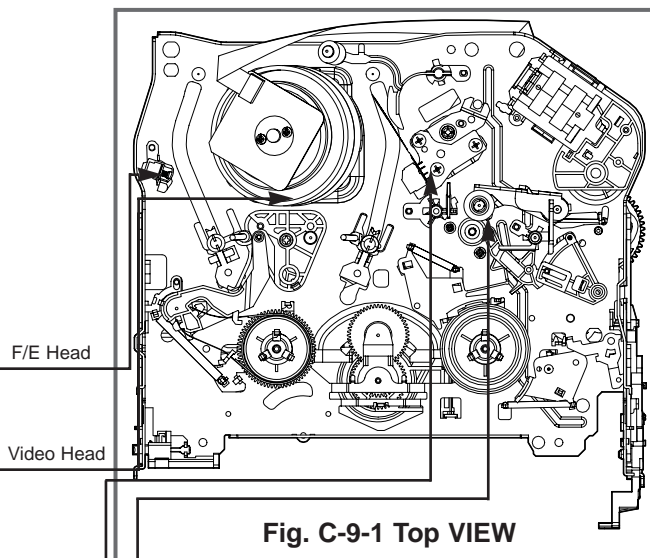


Fig. C-9-1 Top VIEW

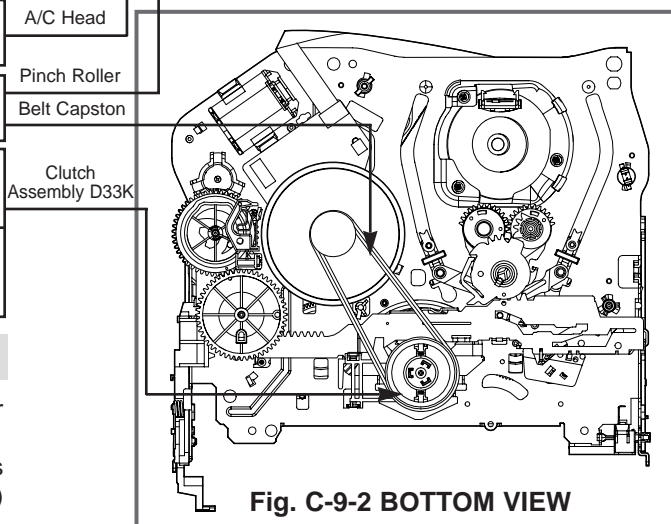


Fig. C-9-2 BOTTOM VIEW

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

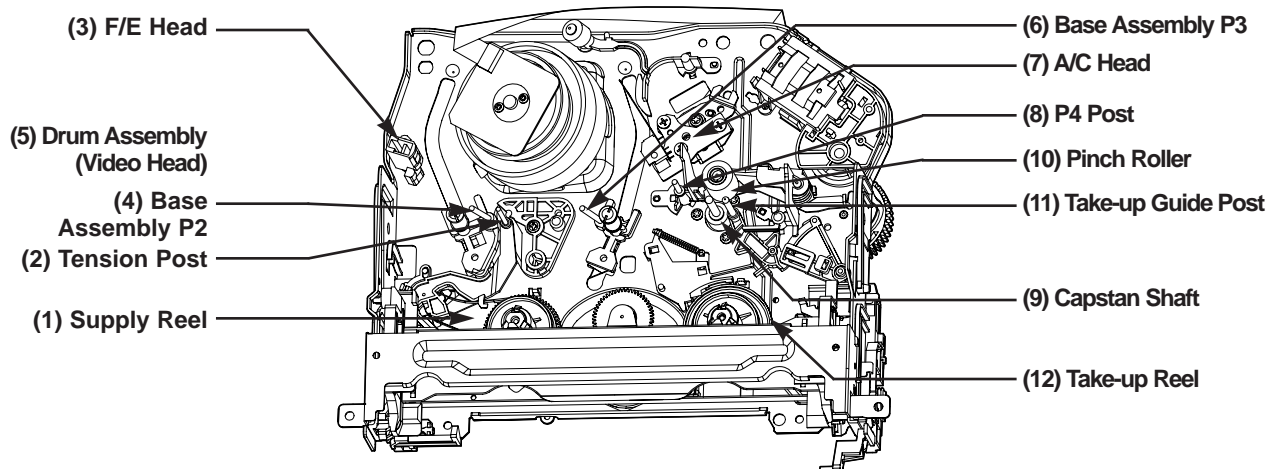


Fig. C-9-3 Tape Transport System

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 Average hours used per day	About 1 year	About 18 months	About 3 years
One hour			
Two hours			
Three hours			

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)

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.

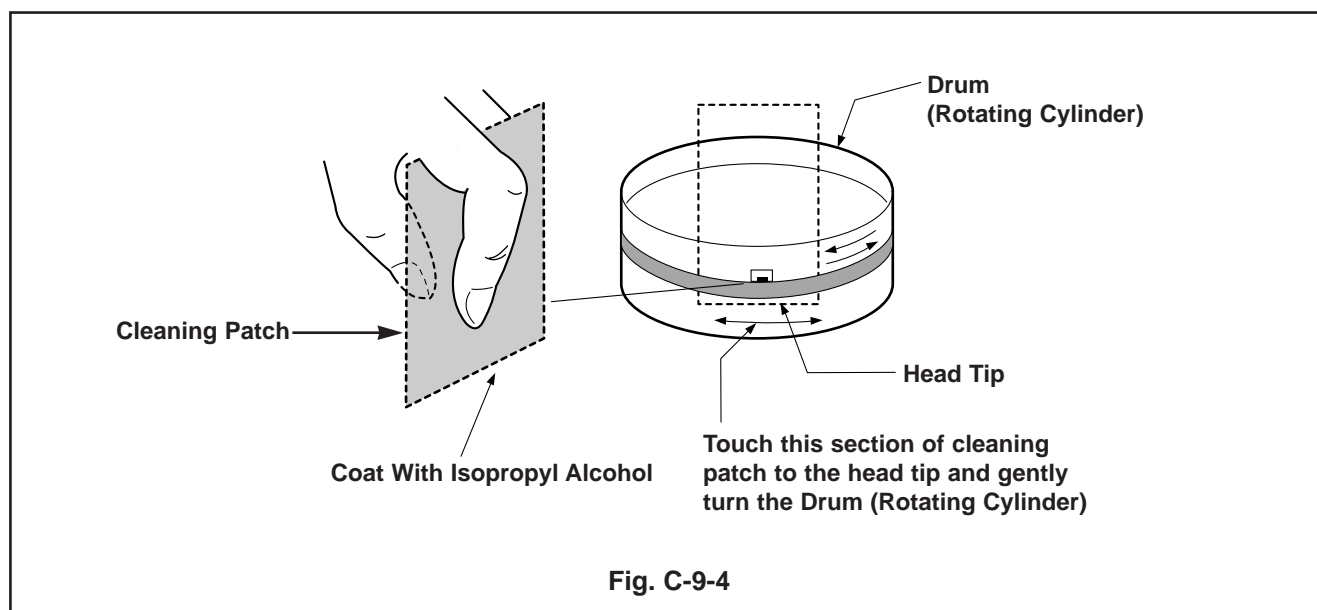
(Do not move the cleaning patch vertically. Make sure that only the buckskin on the cleaning patch comes into contact with the head. Otherwise, the head may be damaged.)

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.



MAINTENANCE/INSPECTION PROCEDURE

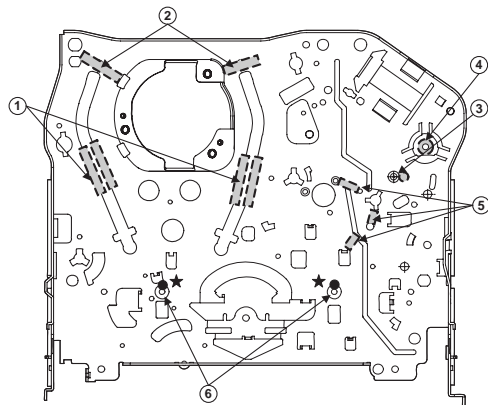
5-2) Greasing

(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.

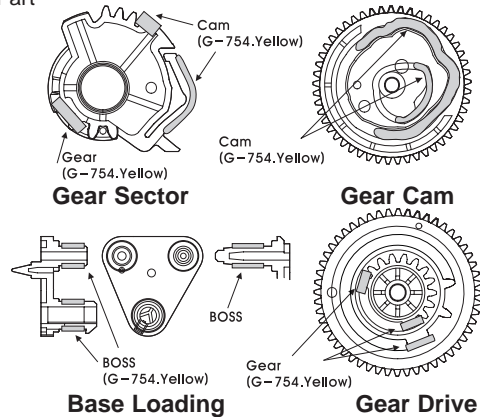
NOTE: Greasing Points

- | | |
|-----------------------------------|--|
| 1) Loading Path Inside & Top side | 6) Shaft |
| 2) Base Tension Boss inside Hole | 7) Arm Assembly F/L of Burning 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 Gear Wheel Part | |



Chassis (Top)

Gear Part



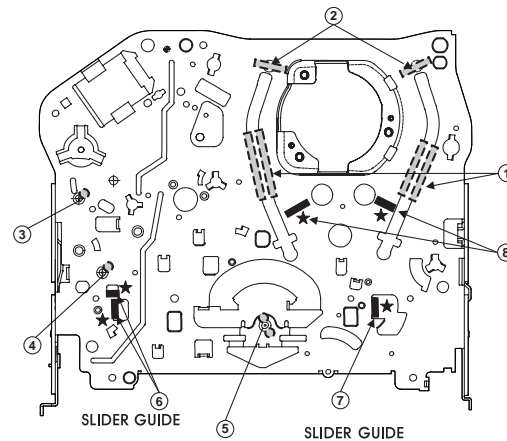
Bracket Side (L)

Bracket Assembly Door

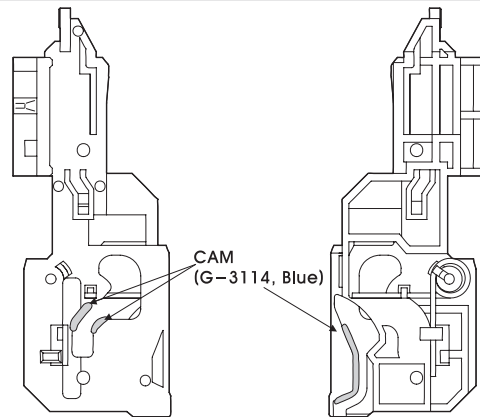
(2) Periodic greasing

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 | |

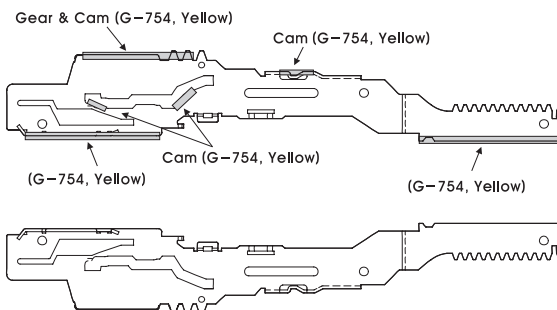


Chassis (Bottom)

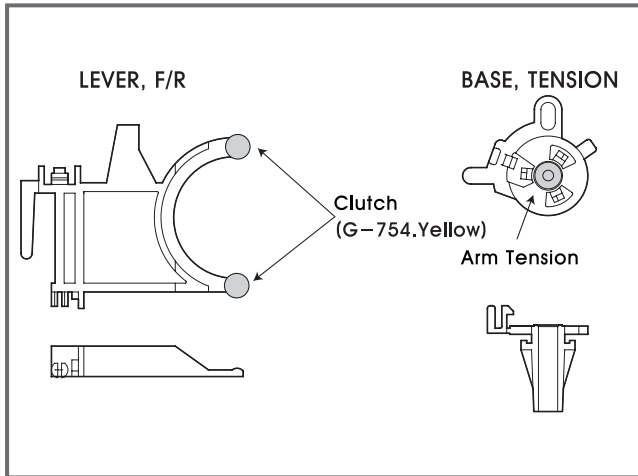


Guide Rack F/L

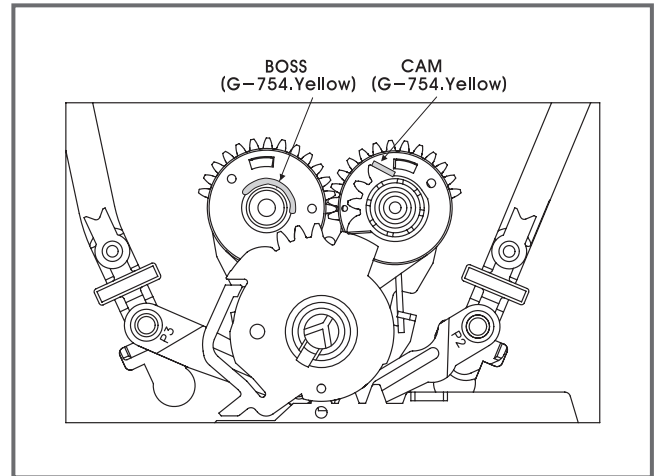
Gear Rack F/L



GEAR , F/R



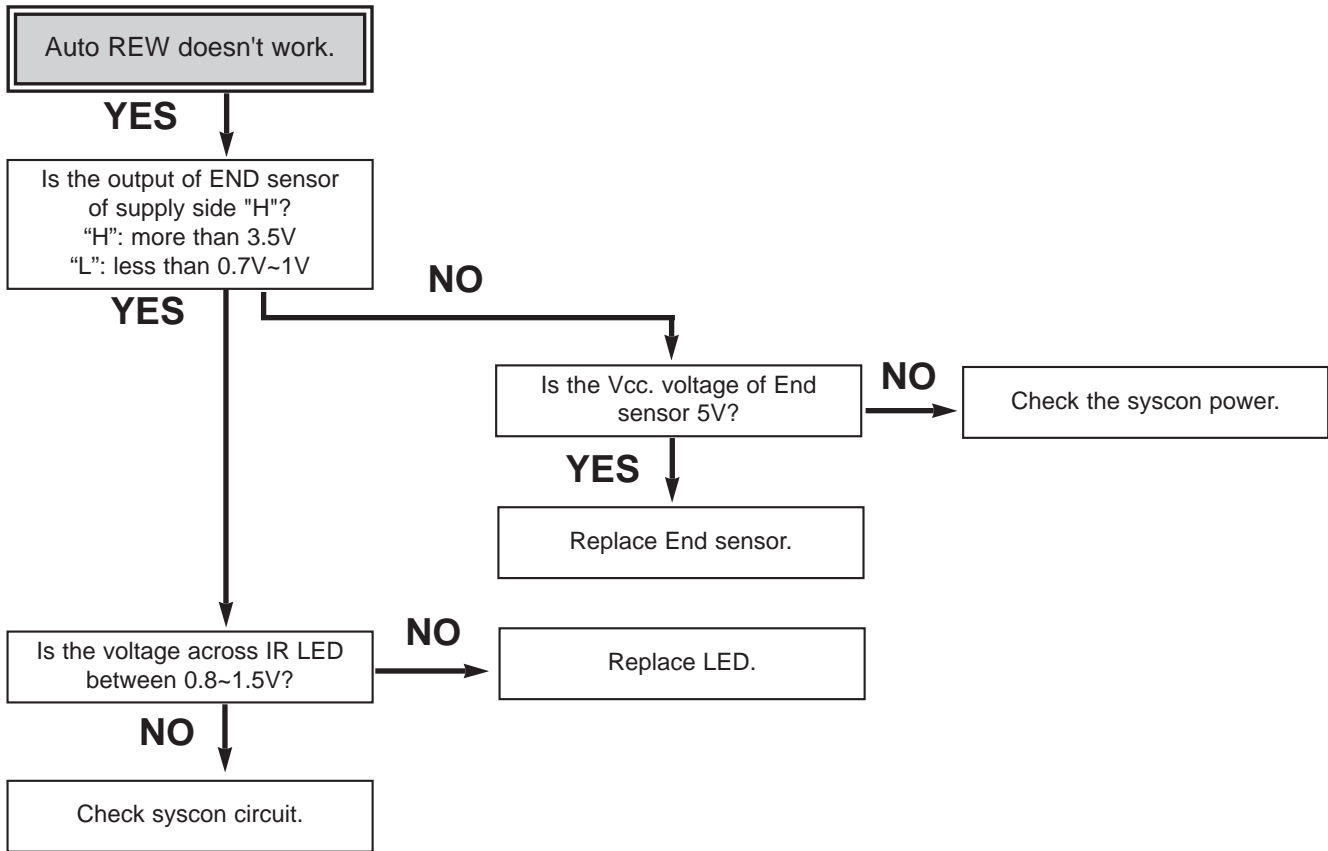
GEAR AY, P2 & P3



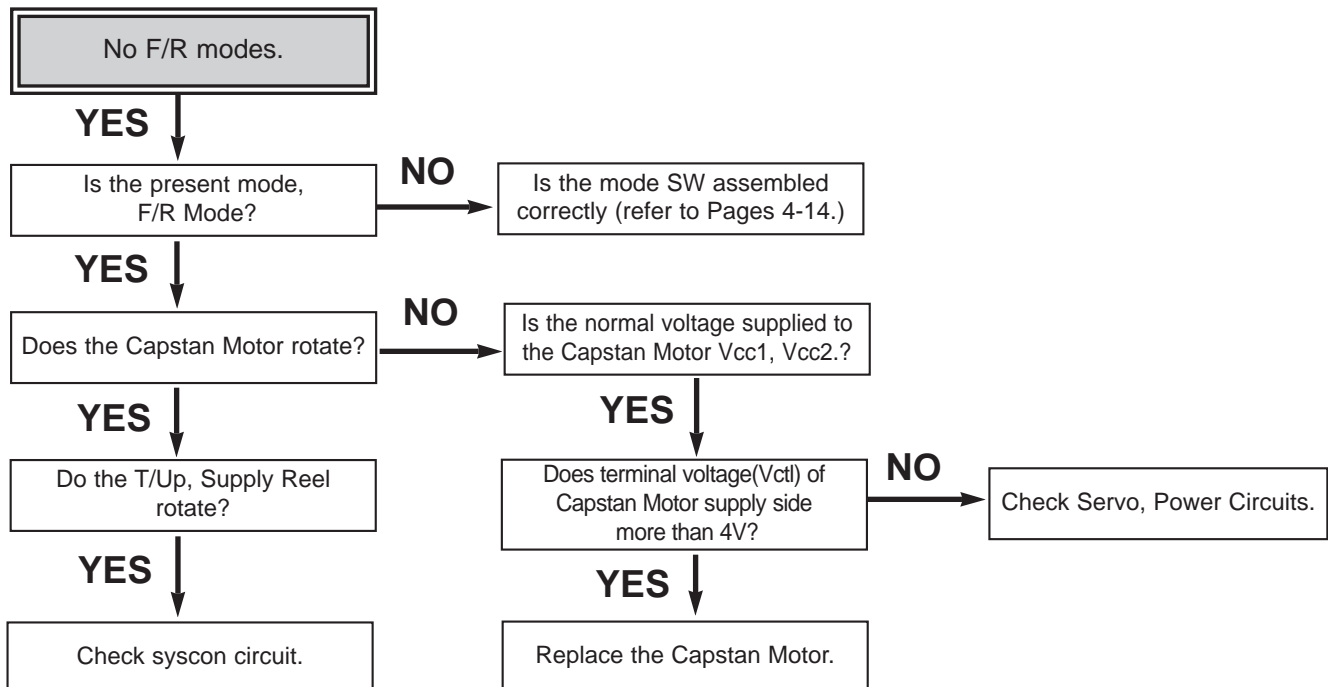
MECHANISM TROUBLESHOOTING GUIDE

1. Deck Mechanism

A.

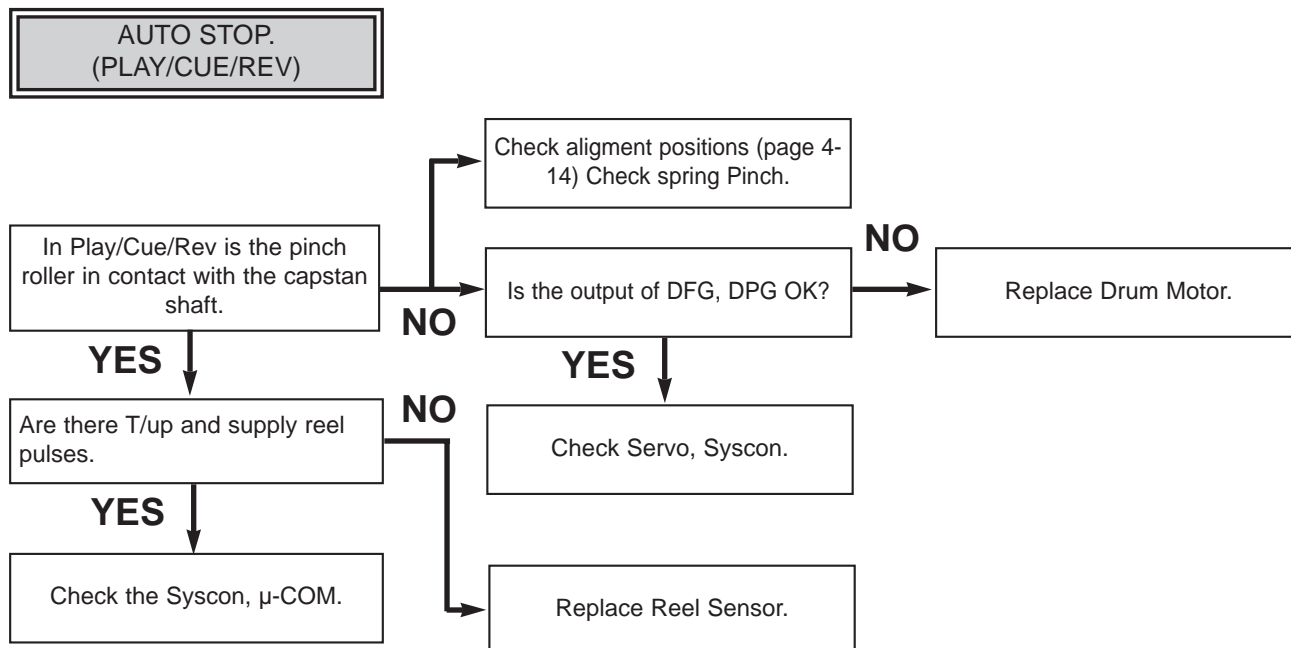


B.

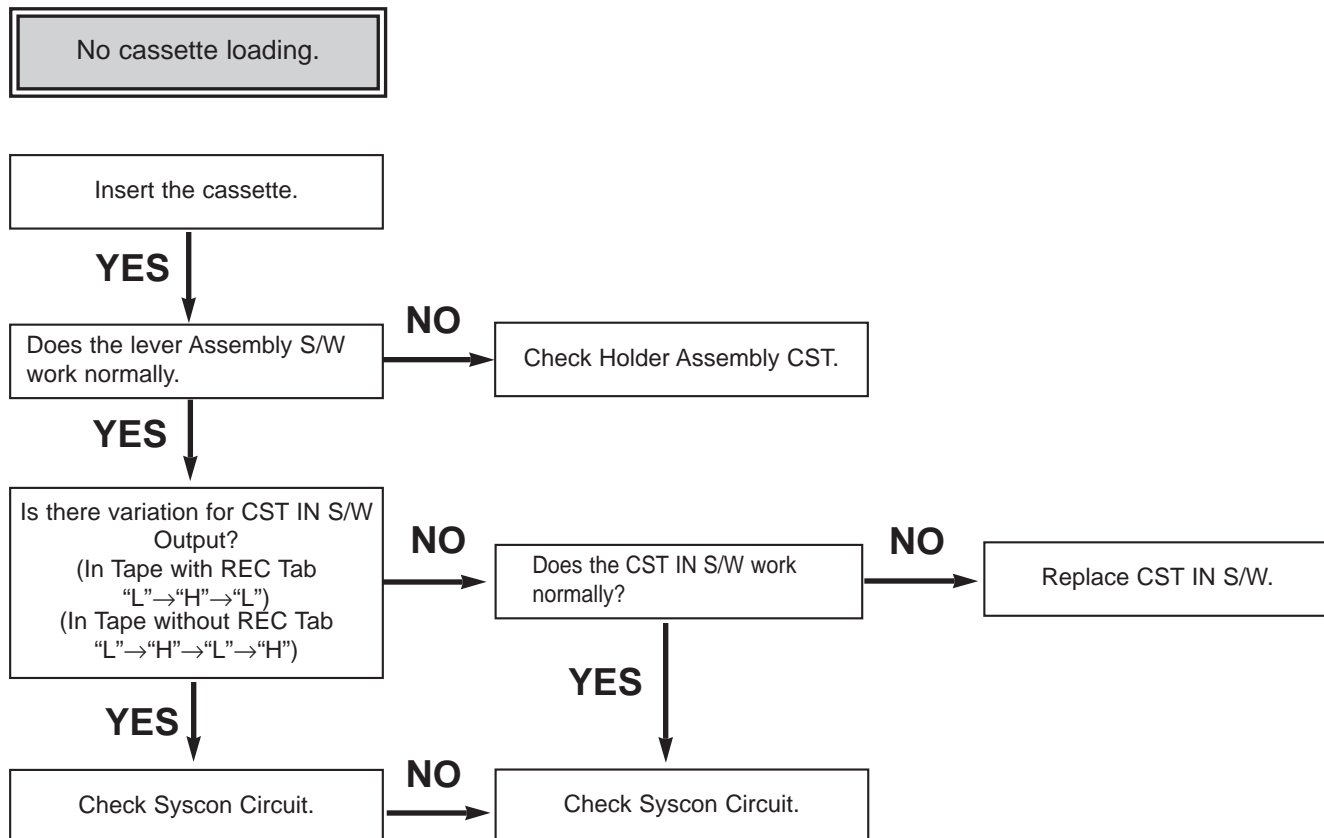


MECHANISM TROUBLESHOOTING GUIDE

C.

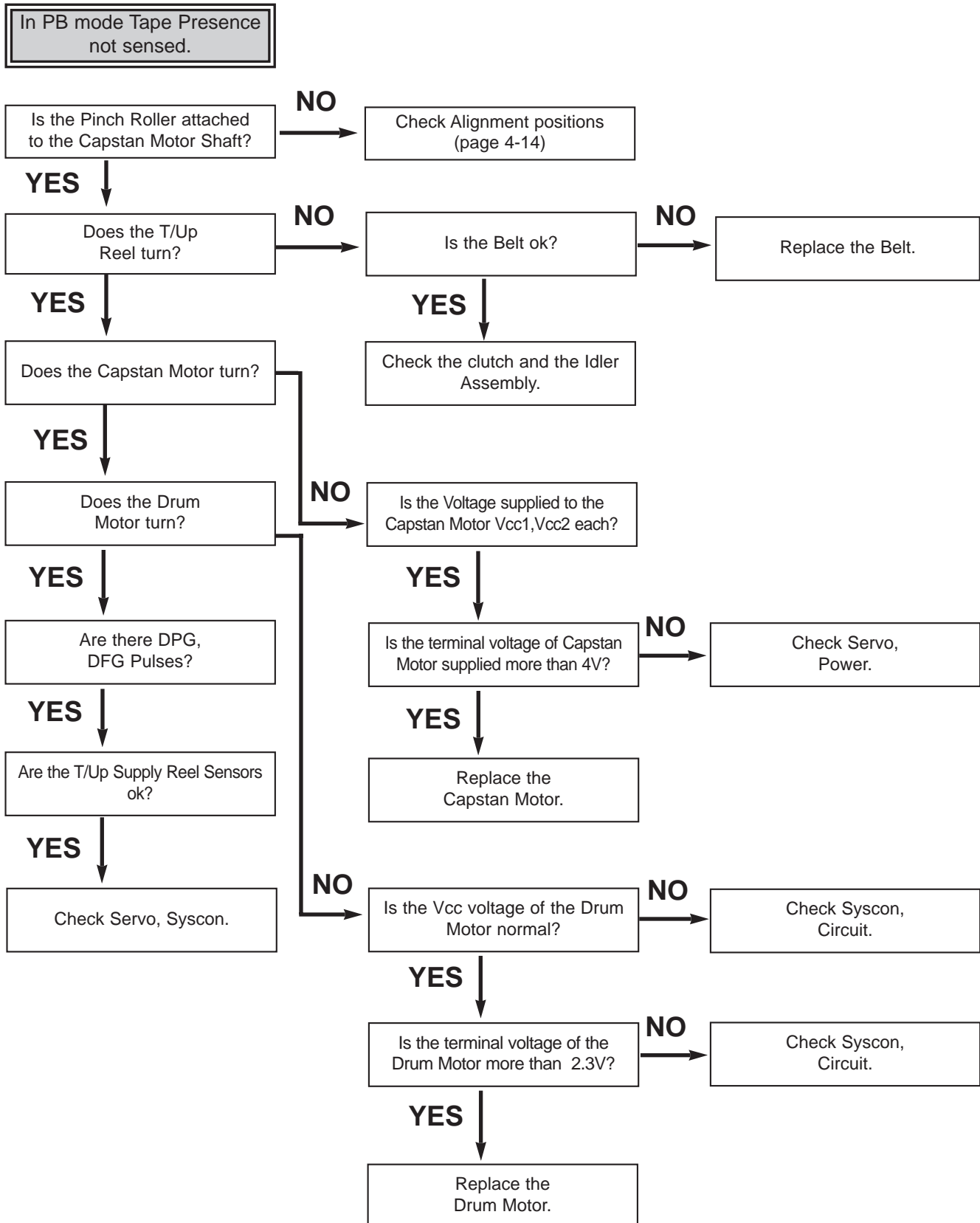


D.



MECHANISM TROUBLESHOOTING GUIDE

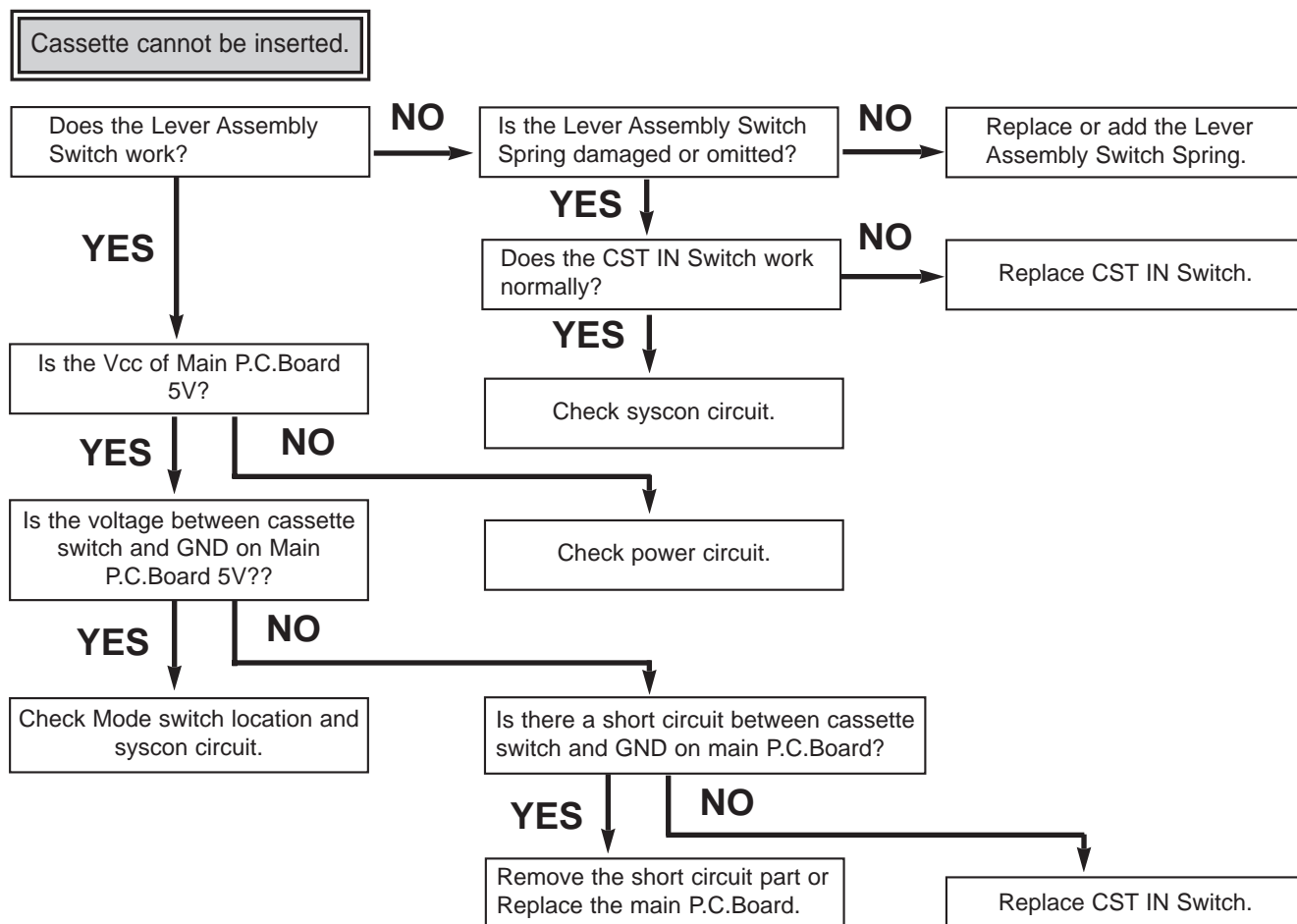
E.



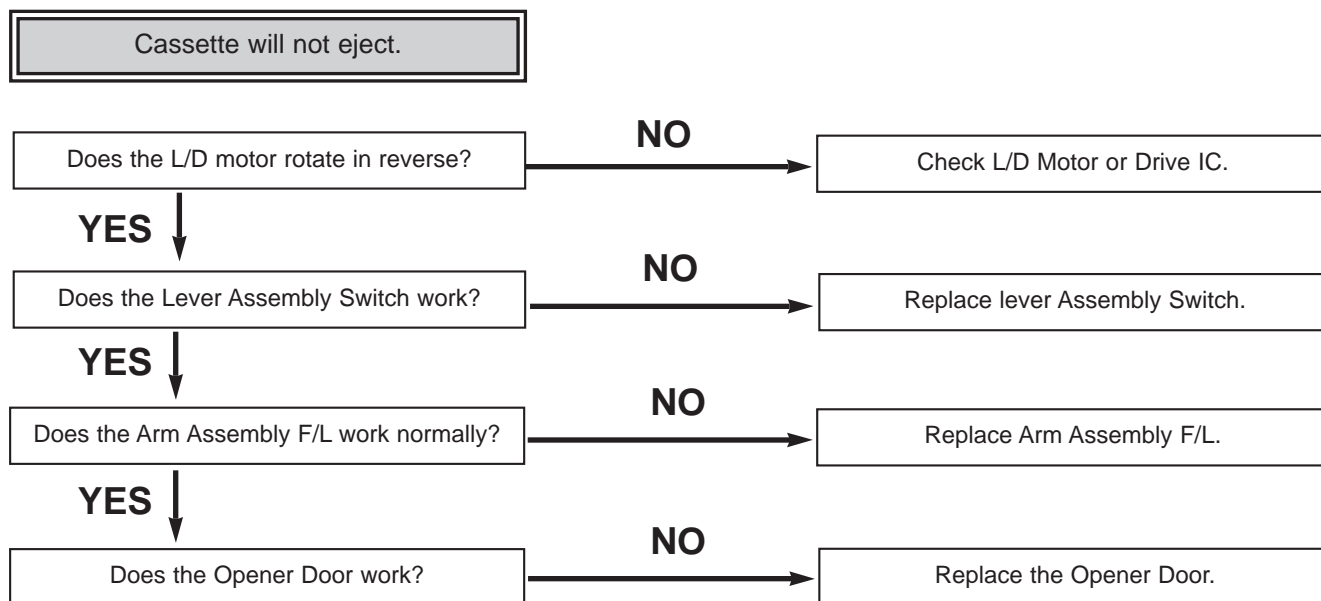
MECHANISM TROUBLESHOOTING GUIDE

2. Front Loading Mechanism

A.

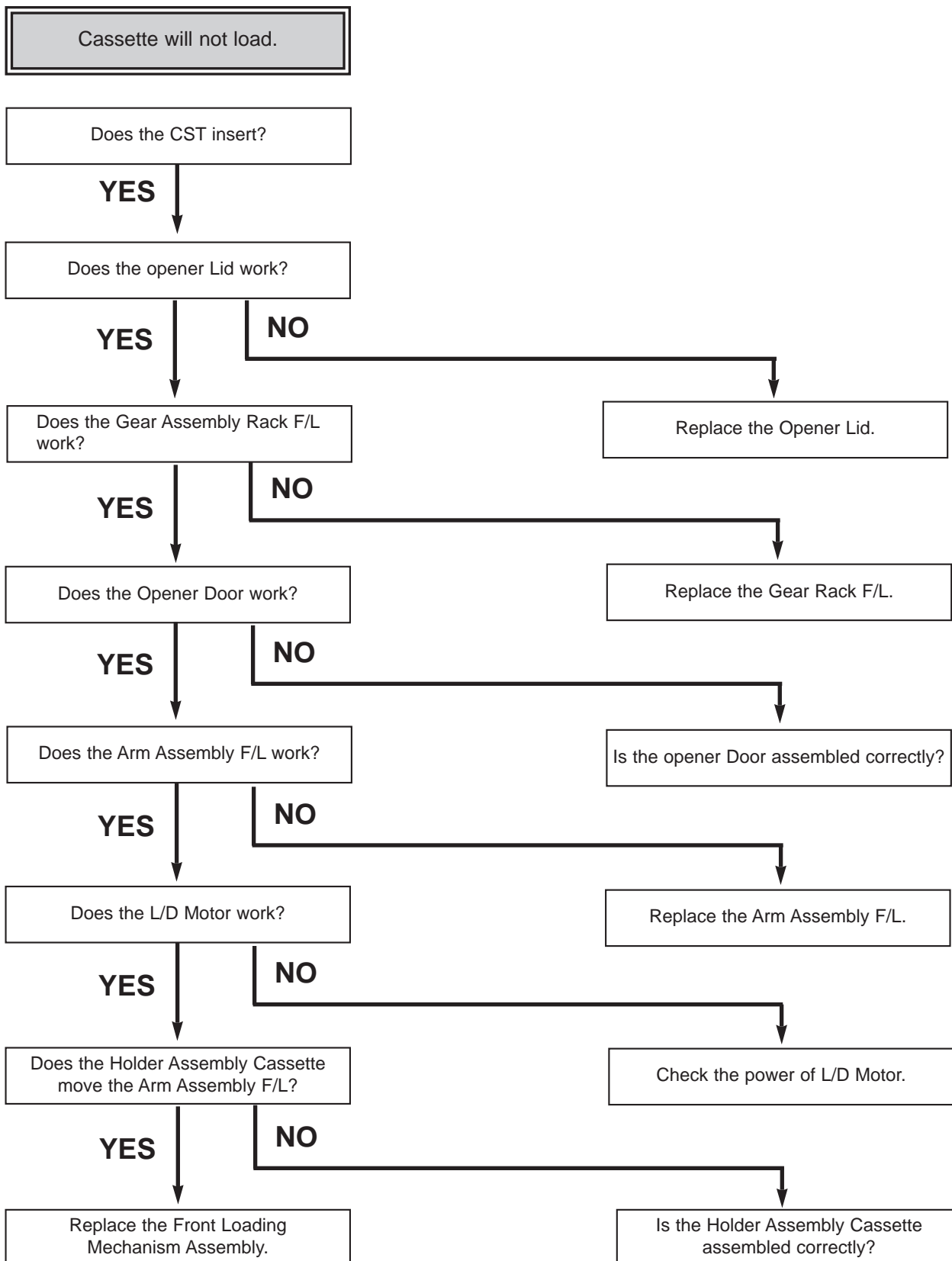


B.



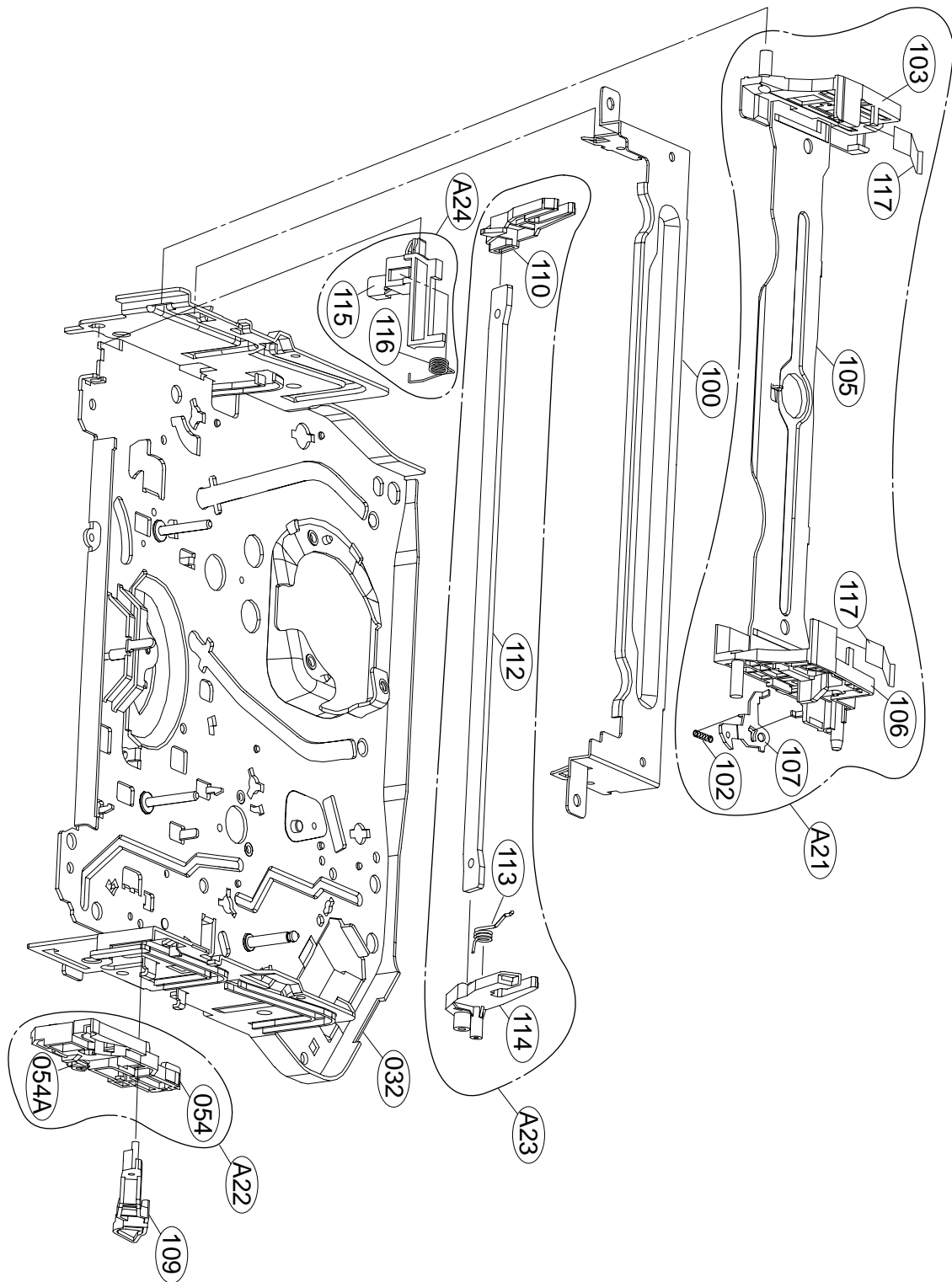
MECHANISM TROUBLESHOOTING GUIDE

C.



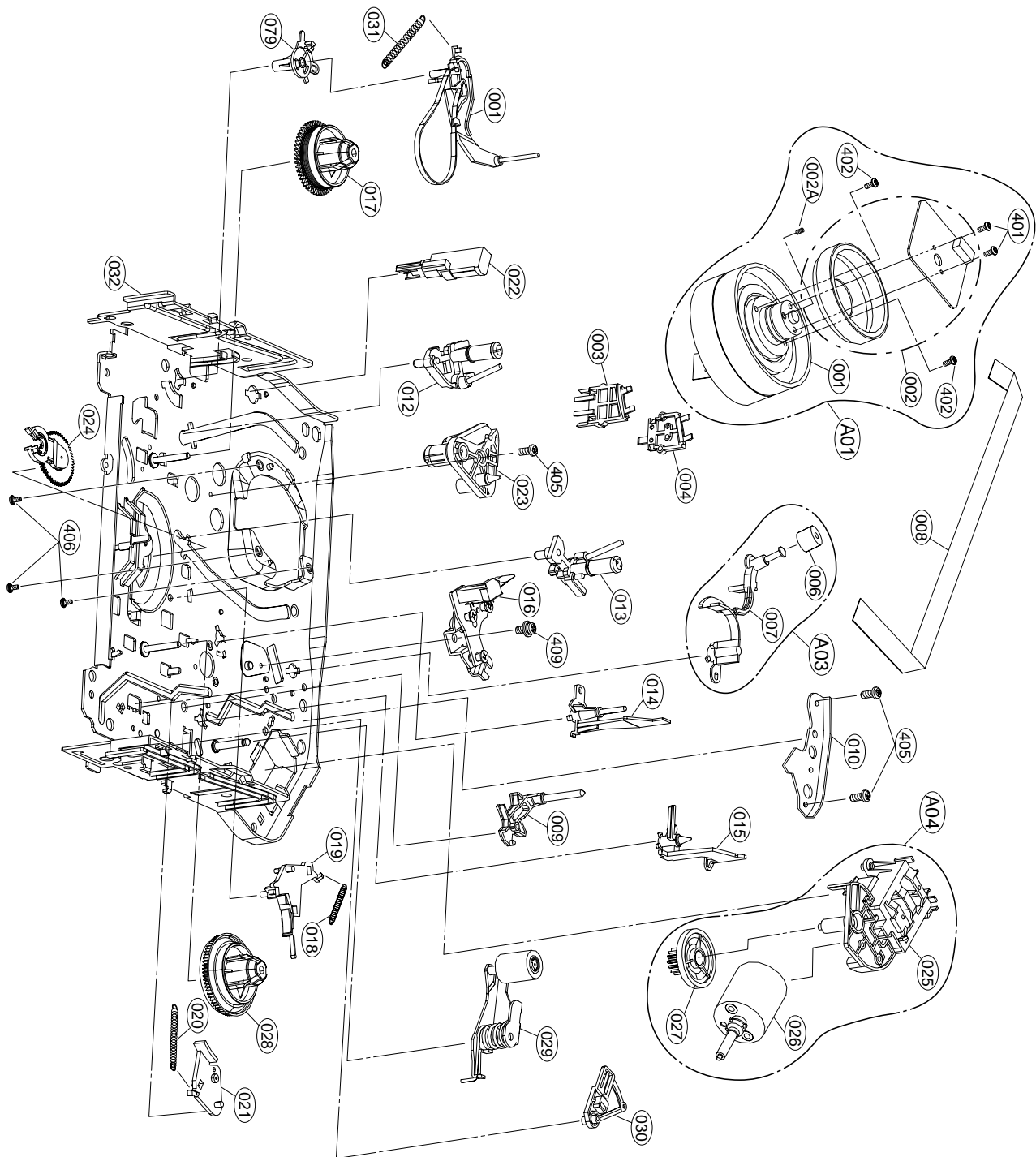
EXPLODED VIEWS

1. Front Loading Mechanism Section



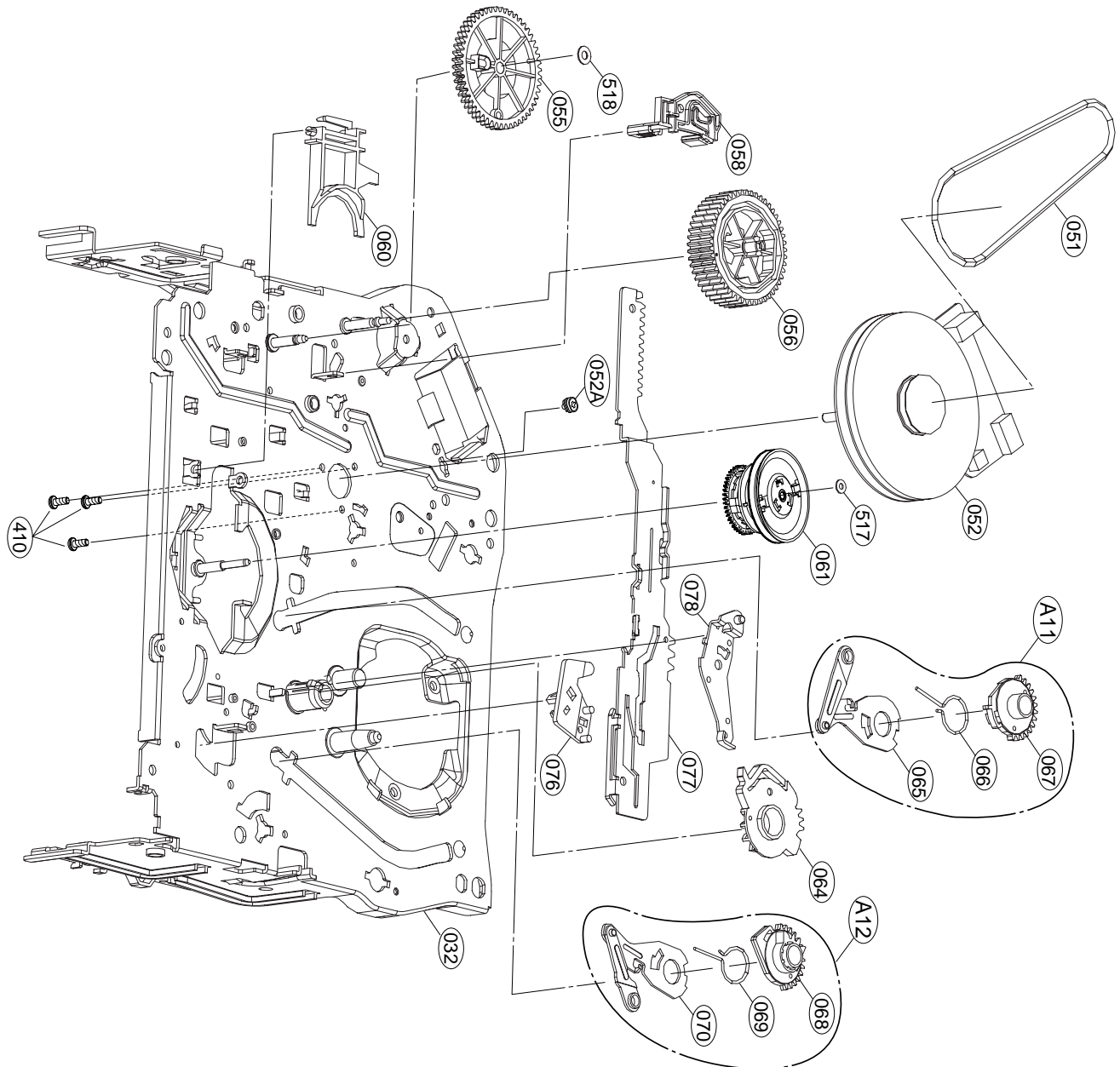
EXPLODED VIEWS

2. Moving Mechanism Section(1)



EXPLODED VIEWS

3. Moving Mechanism Section(2)



MEMO

A series of horizontal dotted lines for writing.



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