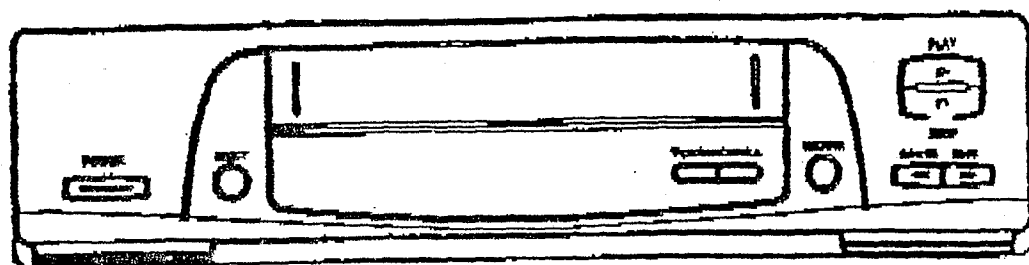


Ergänzung / Abgleich



Service Manual

Mechanik

SEC[®]

VCR 4100/3100/2100

und Baugleiche

DAEWOO

DAEWOO ELECTRONICS CO., LTD.

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1. DESCRIPTION OF THE MECHANISM

1. CHARACTERISTIC OF THE FM-DECK MECHANISM

- 1) FM-MECHA DECK follows the VHS standard and NTSC/PAL standard.
- 2) FM-MECHA DECK has 3 motors (DRUM MOTOR, CAPSTAN MOTOR and L/C MOTOR).
- 3) FM-MECHA DECK uses L/C MOTOR to drive FRONT LOADING.
- 4) FM-MECHA DECK has 8 MODES (EJECT/H.REW/INITIAL/IDLE/REV/SLOW/PLAY/FF & REW) and each mode is composed of 4 bit mode Signals and realized by the mode switch which is driven by the L/C MOTOR.
- 5) FM-MECHA uses the FULL LOADING system in which mode shifting time (especially, picture appearing time) is short (the tape always wrapped around the DRUM).
- 6) FM-MECHA DECK has the high speed rewind function.
- 7) FM-MECHA DECK is removed the DECK PCB and connected to MAIN PCB by using the B to B TYPE CONNECTOR.

2. DESCRIPTION OF THE MODE

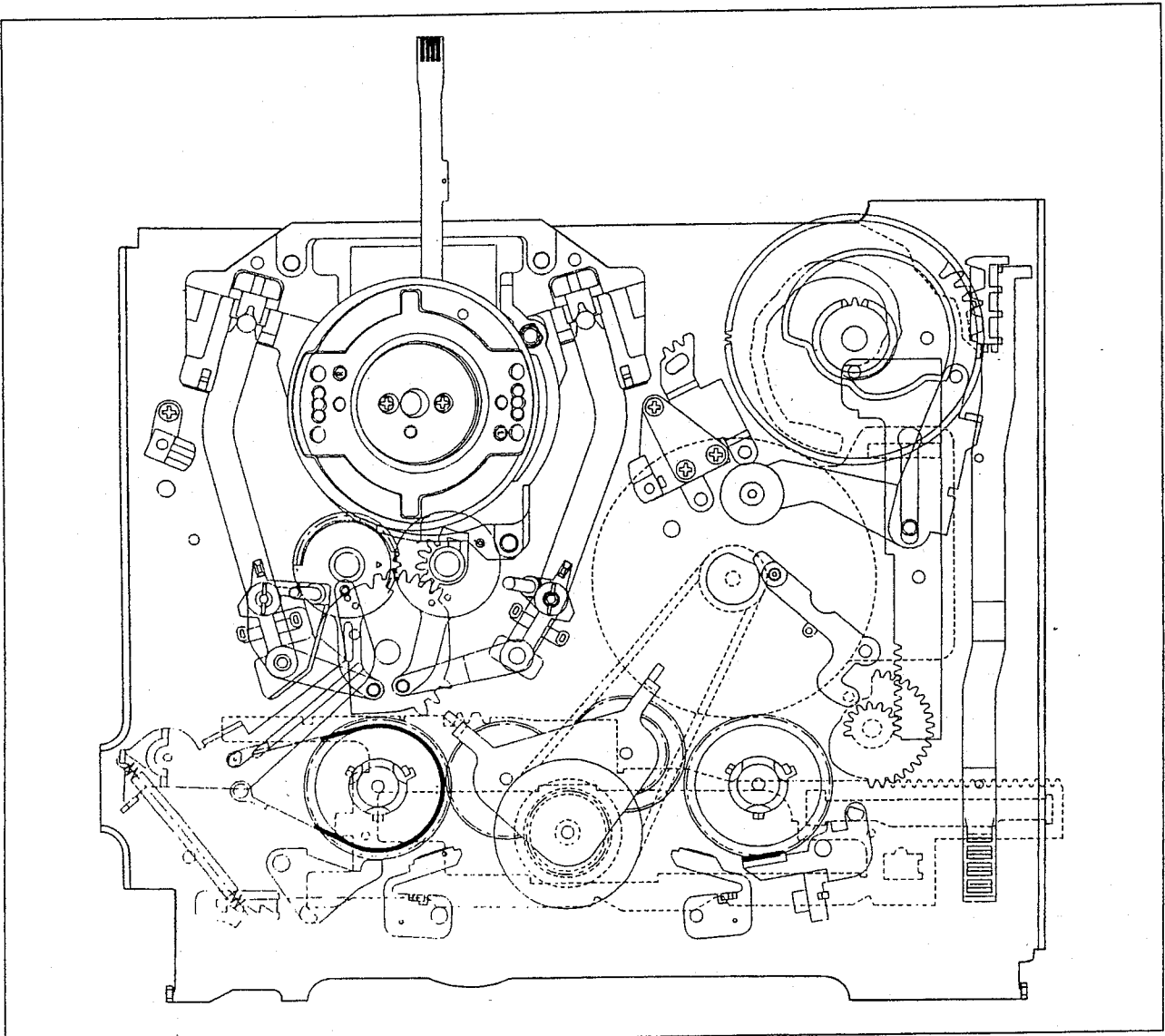
1) EJECT MODE

A. In this mode, the cassette In/Out operation is performed by the CW/CCW rotation of the L/C motor to which the Front Loading driving parts are directly related.

- CASSETTE IN : If the cassette is inserted into the entrance with proper insertion force, Mode Switch is rotated by insertion force and break from Eject mode. At the same time the Cassette In is detected. And instantly the cassette loading is performed and the L/C motor proceeds to the PLAY/STOP mode.
- CASSETTE OUT: In this state the Cassette Holder is located at the entrance of the front panel, and only the Cassette In operation can be executed.

B. Mechanical Arrangement

- a. The BAND BRAKE is released from the S REEL TABLE.
- b. The S & T MAIN BRAKE is released from the S & T REEL TABLE.
- c. The S & T SUB BRAKE is released from the S & T REEL TABLE.
- d. The IDLER GEAR is separated from the S & T REEL TABLE.



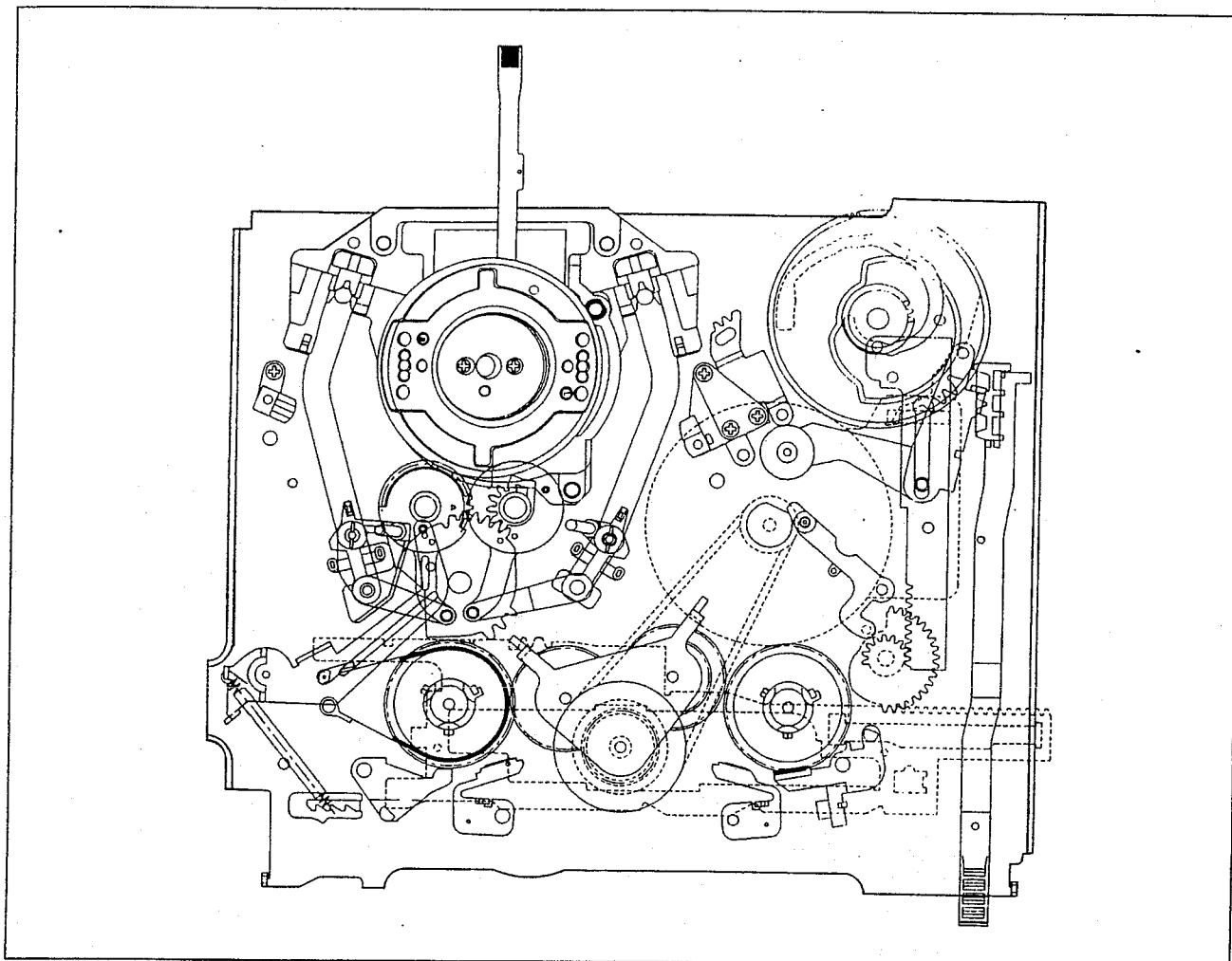
EJECT MODE

2) H. REW MODE

A. In this mode, the cassette tape is rewound at the high speed.

B. Mechanical Arrangement

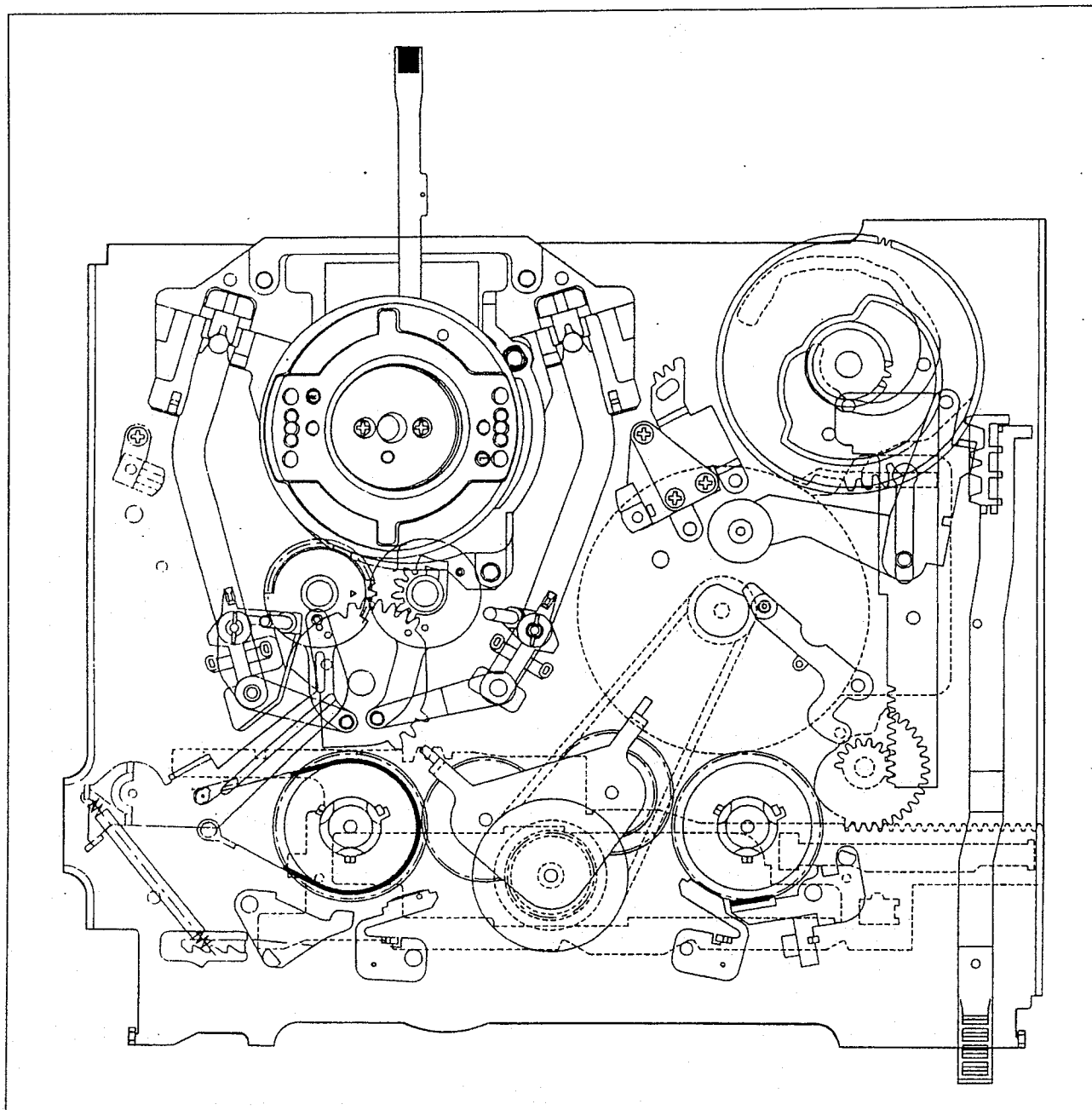
- a. The S & T POLE BASE AS is shifted to its predetermined position.
- b. The BAND BRAKE is released from the S REEL TABLE.
- c. The S & T MAIN BRAKE is released from the S & T REEL TABLE.
- d. The S & T SUB BRAKE is released from the S & T REEL TABLE.



H.REW MODE

3) INITIAL MODE

- A. The INITIAL MODE is existed between H.REW MODE and LOADING MODE. This mode is used as a reference mode for unloading location when power is off and used to prevent looseness of tape when H. REW is ended.
- B. Mechanical Arrangement
- a. The BAND BRAKE is released from the S REEL TABLE.
 - b. The S MAIN BRAKE is released from the S REEL TABLE.
 - c. The T MAIN BRAKE is applied to the T REEL TABLE.
 - d. The S & T BRAKE is released from the S & T REEL TABLE.



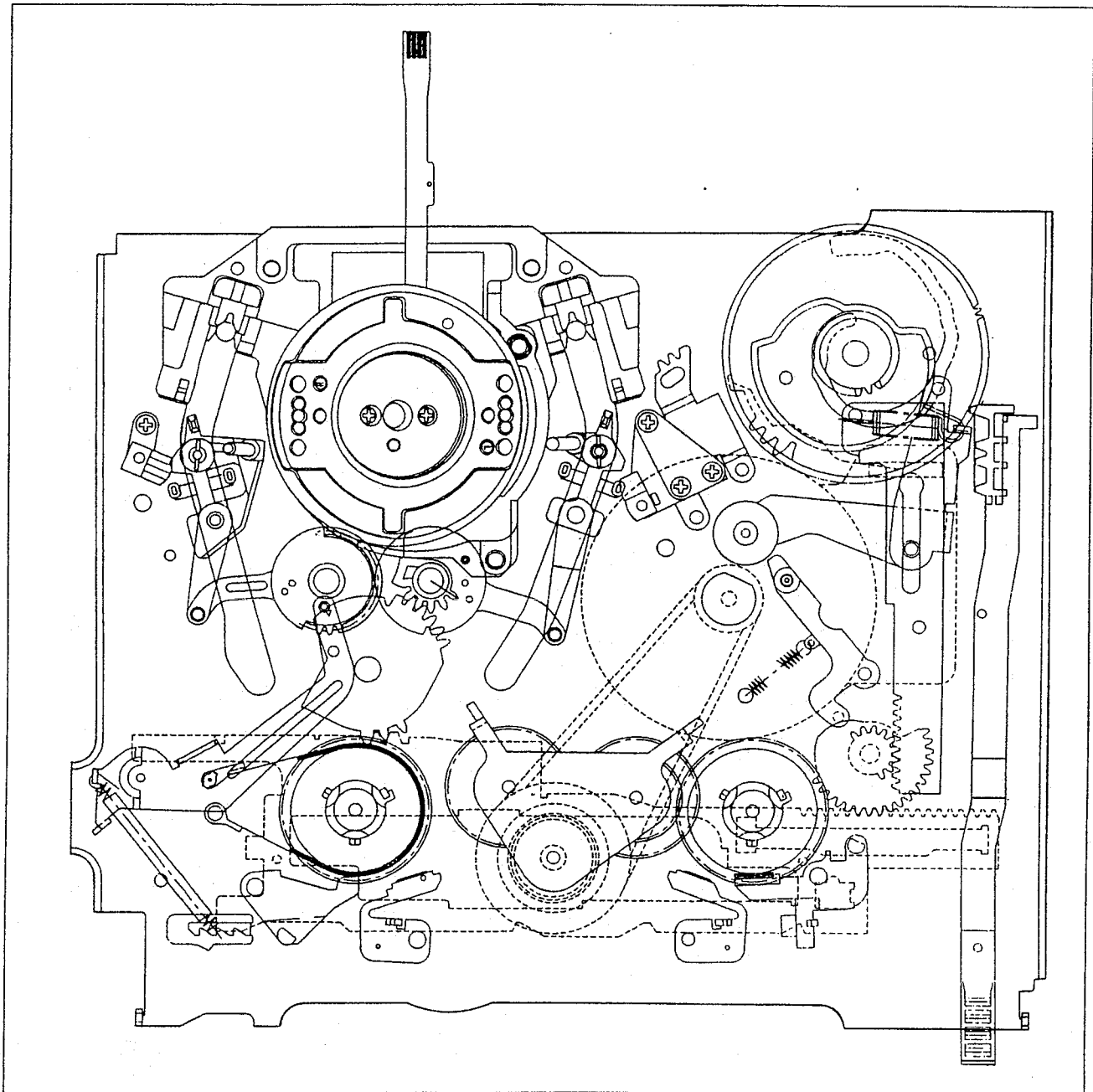
INITIAL MODE

4) LOADING SECTION

A. LOADING SECTION is used to lead a tape to either transporting situation or initial situation by forwarding and backwinding of POLE BASE AS.

B. Mechanical Arrangement

- a. The BAND BRAKE is released from the S REEL TABLE.
- b. The S & T MAIN BRAKE is released from the S & T REEL TABLE.
- c. The S & T SUB BRAKE is applied to the S & T REEL TABLE.
- d. The IDLE GEAR is separated from the S & T REEL TABLE.



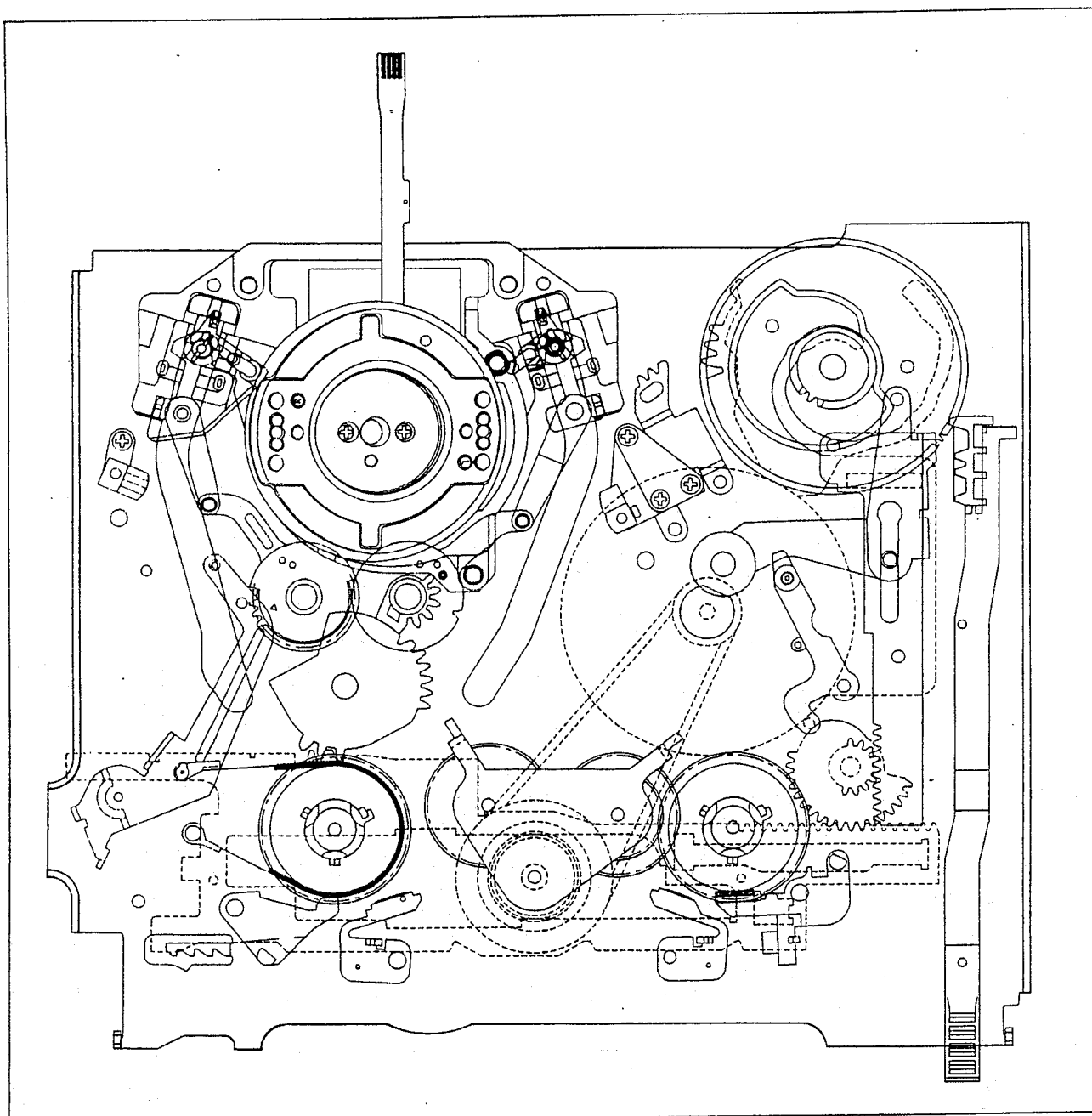
LOADING MODE

IDLE MODE

Idle mode is used to reduce the tape tension and load in drum and posts which are used for tape transportation by separating PINCH ROLLER from CAPSTAN SHAFT when DECK is performed from forward tape running to backward tape running or from backward tape running to forward tape running.

Mechanical Arrangement

- a. The S & T MAIN BRAKE is released from the S & T REEL TABLE.
- b. The S & T SUB BRAKE is applied to the S & T REEL TABLE.
- c. The PINCH ROLLER is separated from the CAPSTAN SHAFT.



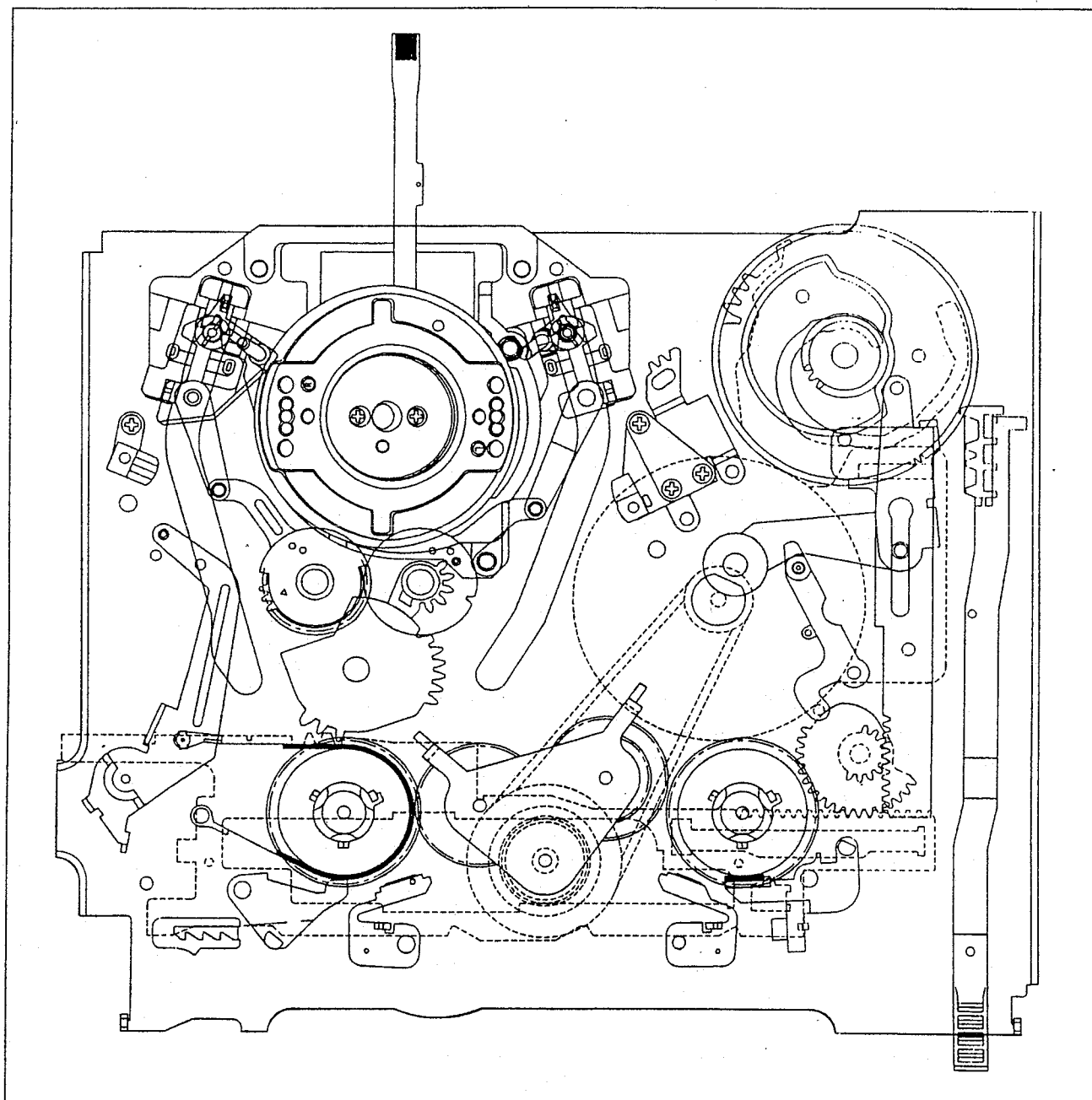
IDLE MODE

6) REVIEW MODE

A. The Review Search operation is performed in this mode. This mode is obtained by pressing the REW button in the state of playing. The L/C motor rotated until the Cam switch detects the REVIEW mode. When the Cam switch detects the REVIEW mode, the L/C motor is stopped and at the nearly time the Capstan starts to rotate CCW to transport the tape reversely.

B. Mechanical Arrangement

- a. The BAND BRAKE is released from the S REEL TABLE.
- b. The S & T MAIN BRAKE are released from the S & T REEL TABLE.
- c. The S SUB BRAKE is applied to the S REEL TABLE.
- d. The PINCH ROLLER is applied to the CAPSTAN SHAFT to transport the tape reversely.
- e. The REVIEW ARM is moved forward to perform the role of the tape transporting POST.



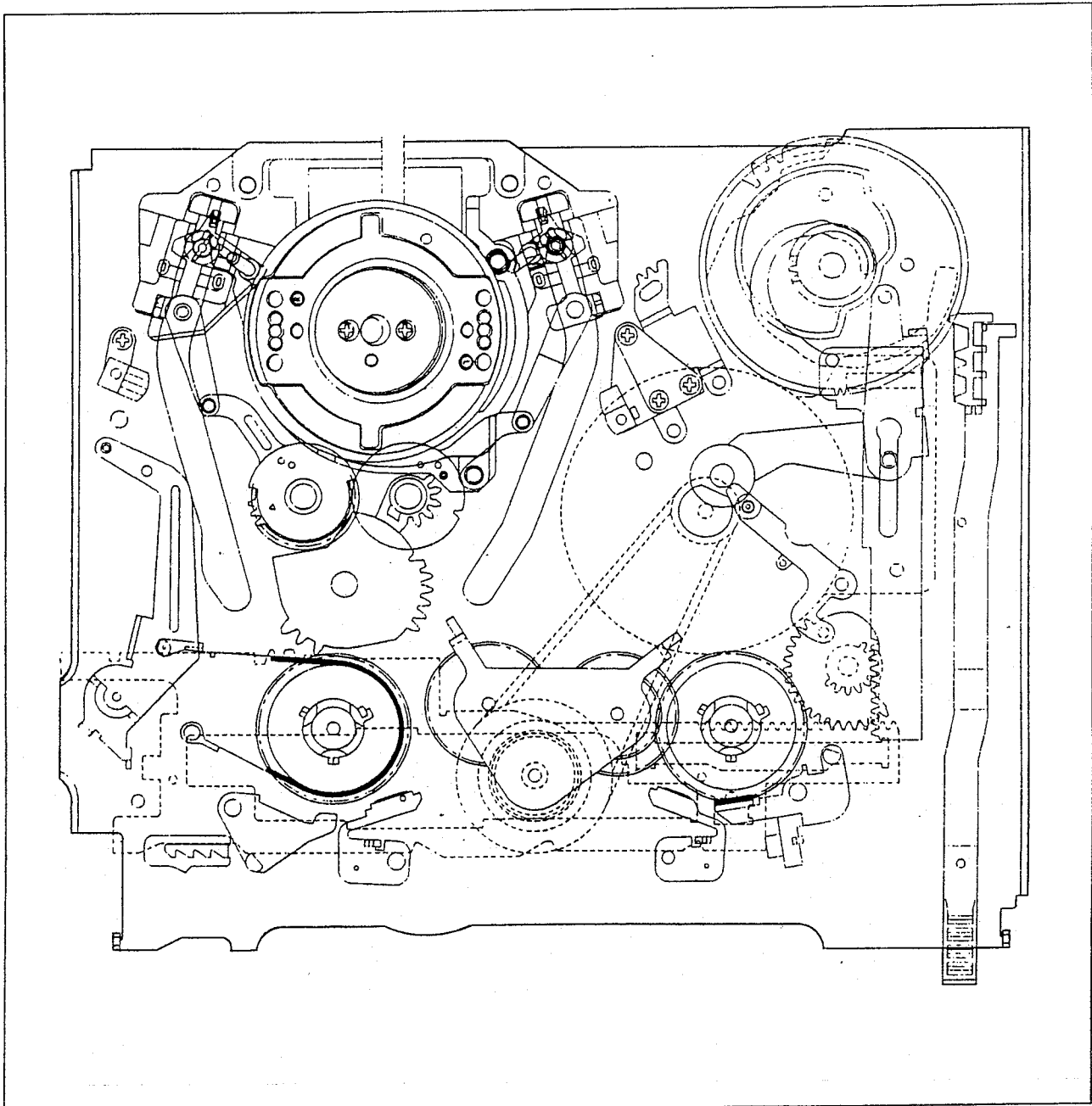
REVIEW MODE

7) SLOW MODE

A. This mode is performed the forward and backward slow searching.

B. Mechanical Arrangement

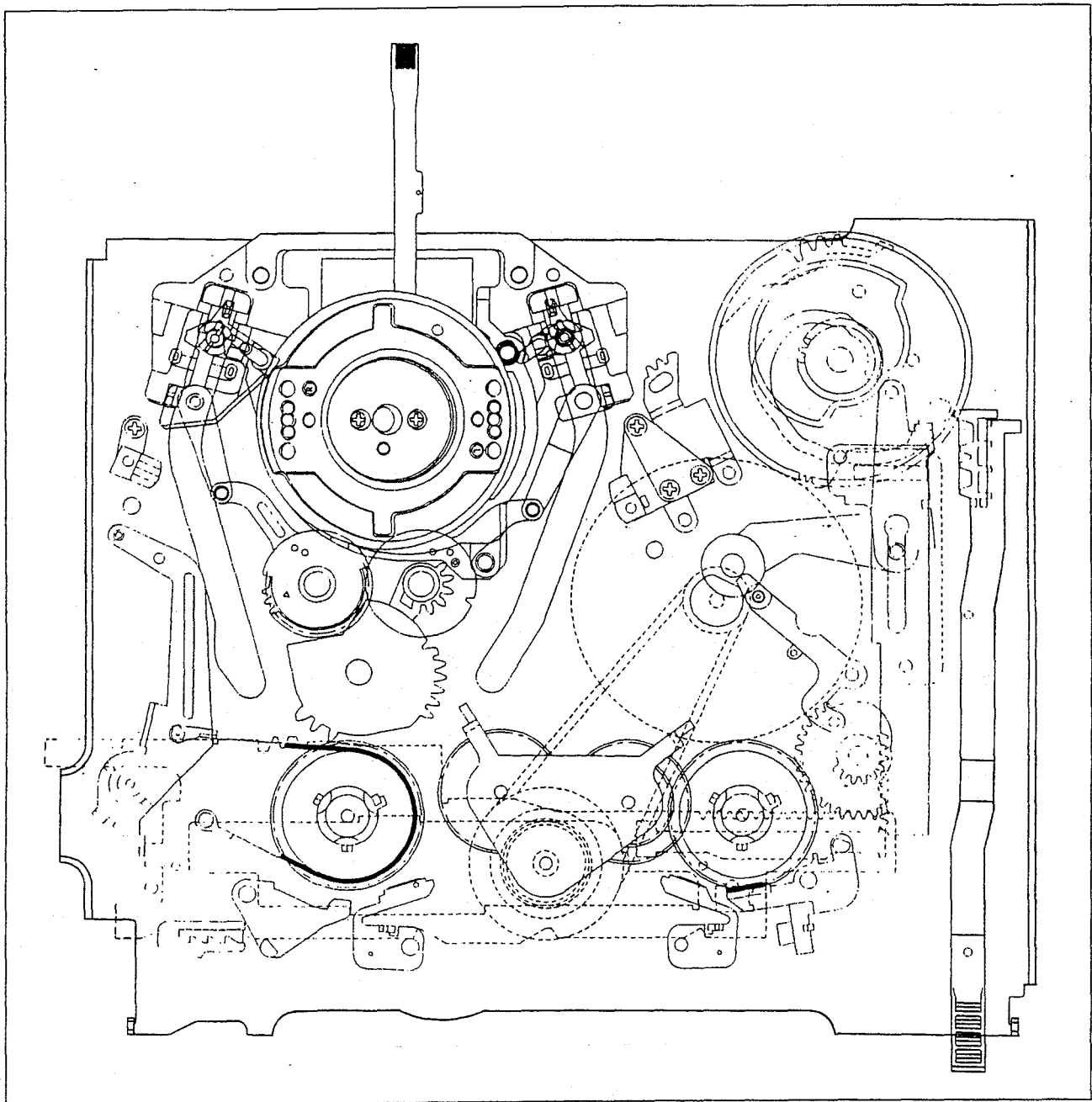
- a. The BAND BRAKE is applied to the S REEL TABLE.
- b. The S & T MAIN BRAKE is released from the S & T REEL BRAKE.
- c. The S & T SUB BRAKE is released from the S & T REEL TABLE.
- d. The REVIEW ARM is located at the initial position.
- e. The CAPSTAN BRAKE is applied to the CAPSTAN MOTOR.



F/R SLOW MODE

8) PLAY/RECORD/STOP MODE

- A. The PLAY/RECORD/STOP mode transport the tape from the S REEL TABLE to the T REEL TABLE in the regular speed to perform the recording and playback. Also this mode is to STAND-BY the next operation of key-in.
- B. Mechanical Arrangement
- The TENSION POLE is located at the appointed position.
 - The BAND BRAKE is applied to the S REEL TABLE for excute the tape tension servo.
 - The S & T MAIN BRAKE and S & T SUB BRAKE is released from the S & T REEL TABLE.
 - The PINCH ROLLER is applied to the CAPSTAN MOTOR.



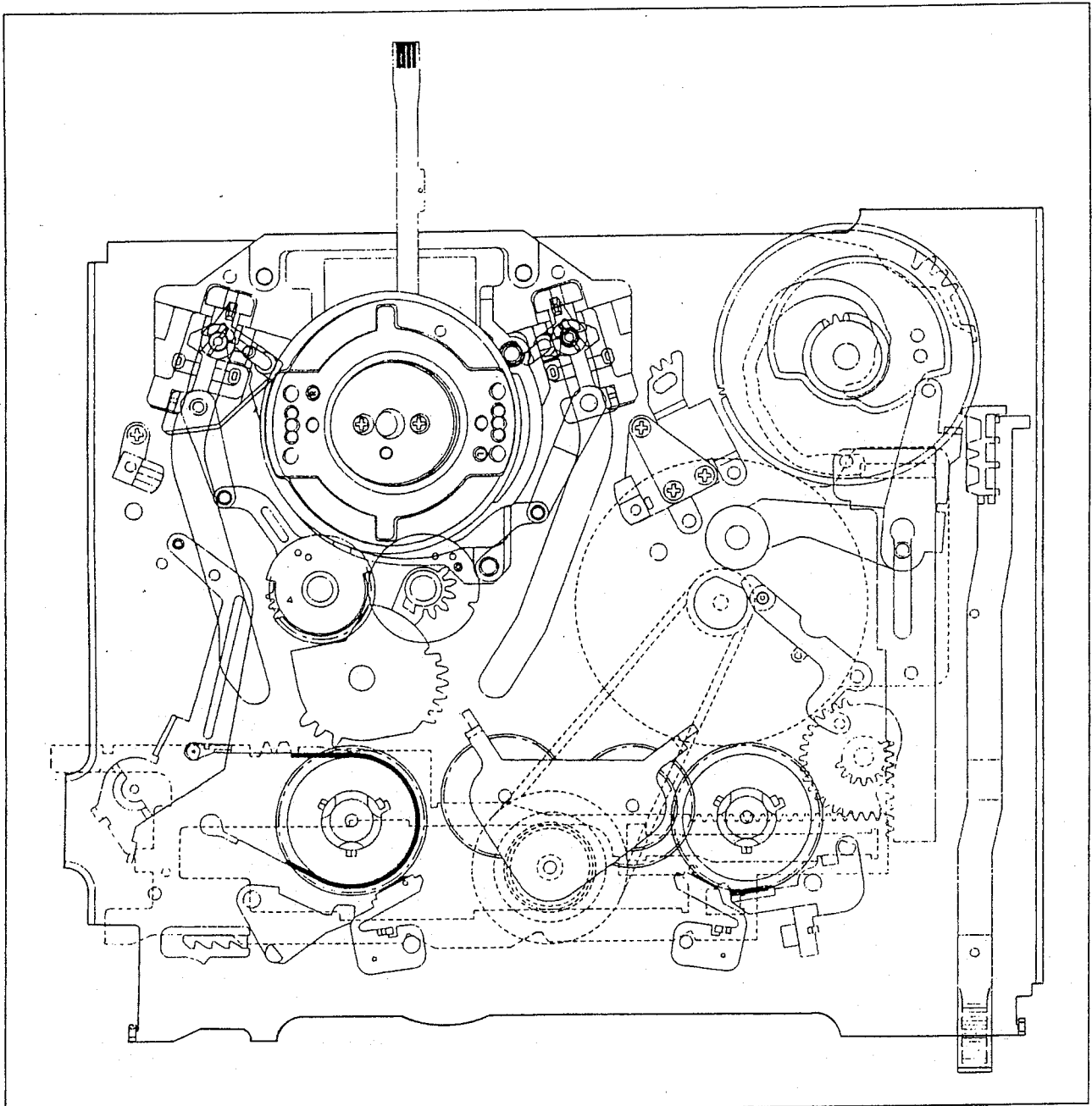
PLAY MODE

9) BRAKE MODE

A. This mode is a mechanical mode which lies in between PLAY mode and FF/REW mode. If EJECT, STOP or PLAY button is pressed in the FF/REW mode, S & T MAIN BRAKES are applied to the S & T REEL TABLE quickly. So, It can be prevented to loosen of the tape.

B. Mechanical Arrangement

- a. The BAND BRAKE is released from the S REEL TABLE.
- b. The S & T MAIN BRAKE are applied to the S & T REEL TABLE.
- c. The S & T SUB BRAKE are released from the S & T REEL TABLE.
- d. The PINCH ROLLER is released from the CAPSTAN SHAFT.



BRAKE MODE

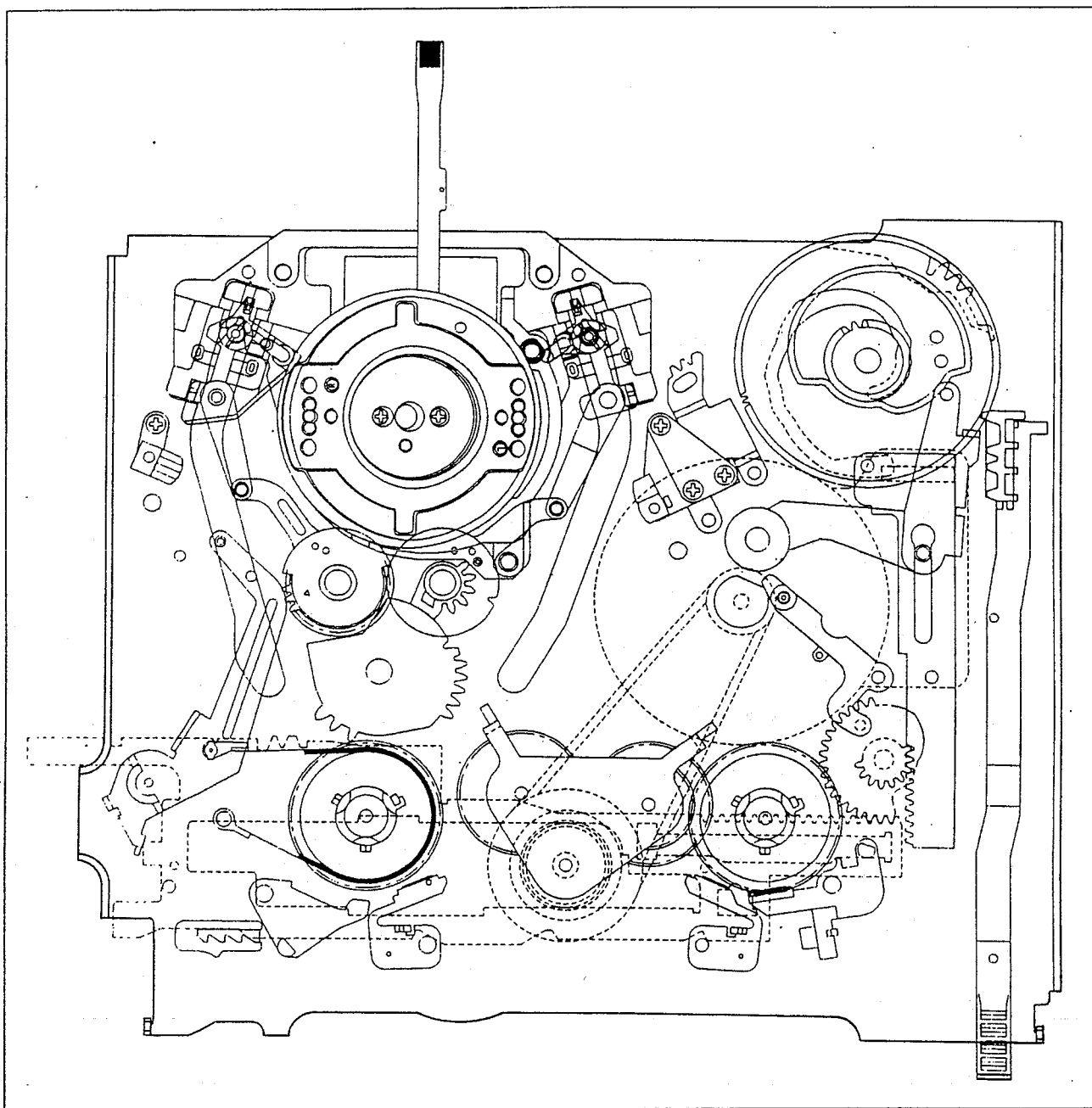
10) FF/REW MODE

A. In this mode, the cassette tape is rewound to the S & T REEL Table at the high speed by the CW/CCW rotation of the Capstan Motor which is directly related to the S & T REEL Table. If the START/END SENSOR is on during this operation, it returns to the STOP MODE and executes CUE/REV.

During the FF/REW operation, the Drum continues to rotate with the tape wrapped around it and the tape is contacted to the CONTROL HEAD that reads the VISS signal.

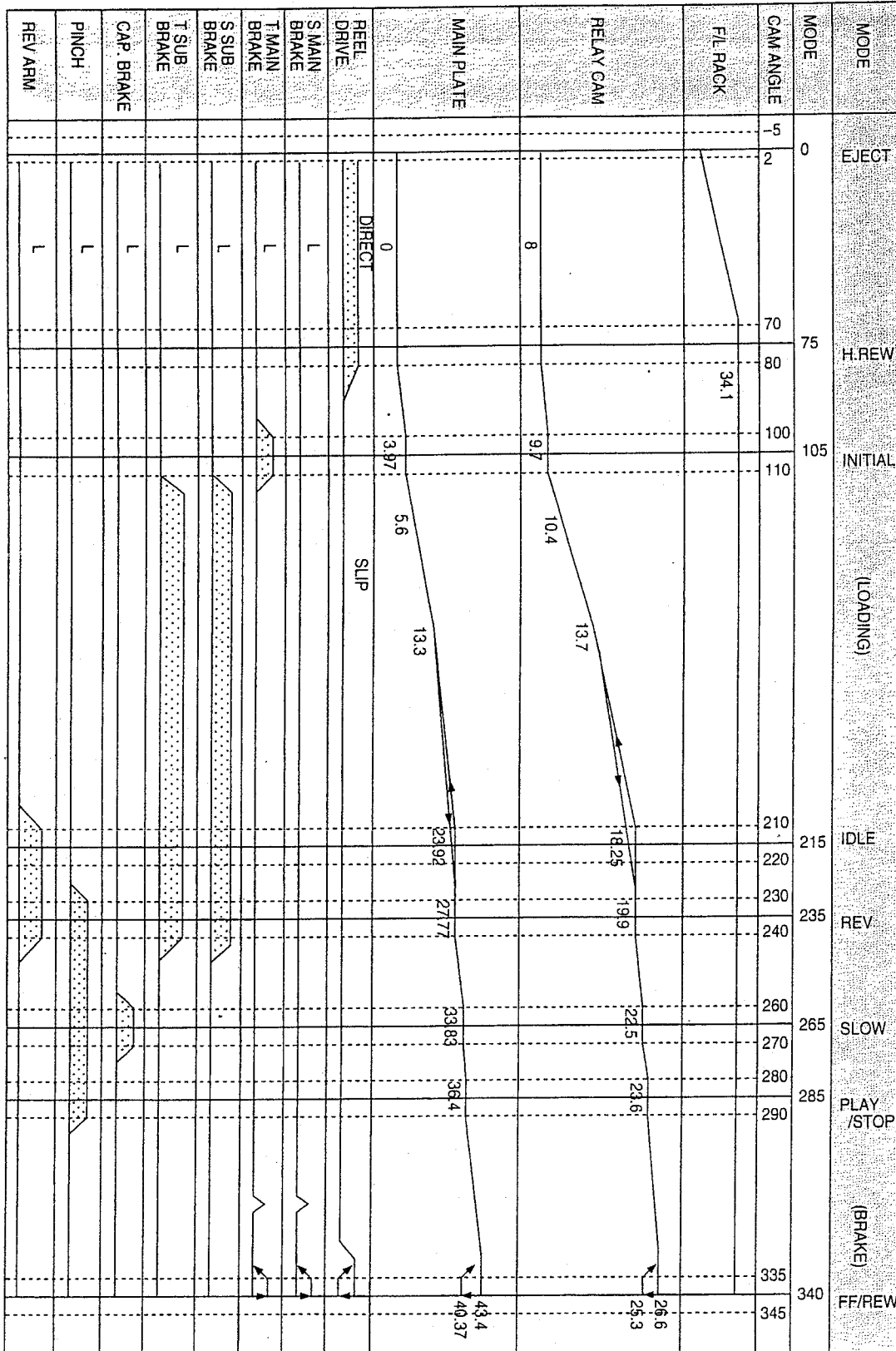
B. Mechanical Arrangement

- a. The BAND BRAKE and the S & T MAIN BRAKE are released from the S & T REEL TABLE.
- b. The PINCH ROLLER is separated from the CAPSTAN SHAFT.



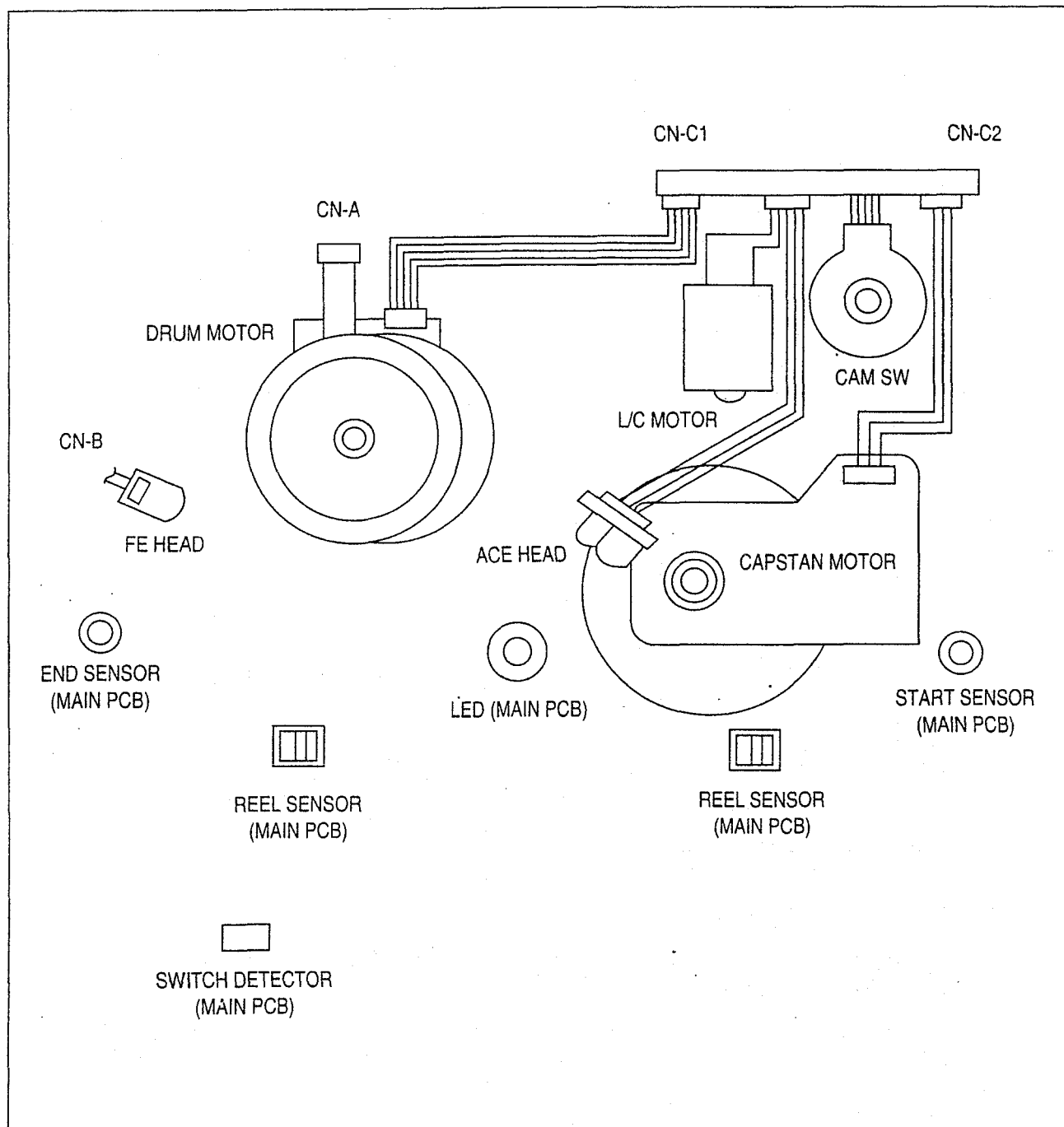
FF/REW MODE

3. FM DECK TIMING CHART



4. WIRING DIAGRAM

1) WIRE DIAGRAM



2) CONNECTOR PIN ARRANGEMENT

CN-A (2 HEAD MONO: ELCO)

1	VR 1
2	COMMON
3	VL 1
4	GND

CN-A (4 HEAD MONO)

1	VL 2
2	COMMON
3	VR 2
4	GND
5	VR 1
6	COMMON
7	VL 1

CN B (JAE)

1	FE HEAD
2	GND

CN-C1 (TAICO)

1	DRUM FG
2	DRUM M/T GND
3	DRUM PG
4	DRUM SPP CTL
5	DRUM M/T 12V
6	CAM A
7	CAM B
8	CAM C
9	CAM D
10	LM (+)
11	LM (—)
12	A/E HEAD
13	AUDIO GND
14	AUDIO HEAD
15	AUDIO HEAD
16	CTL HEAD (—)
17	CTL HEAD (+)
18	CAP CTL REF

CN-2 (TAICO)

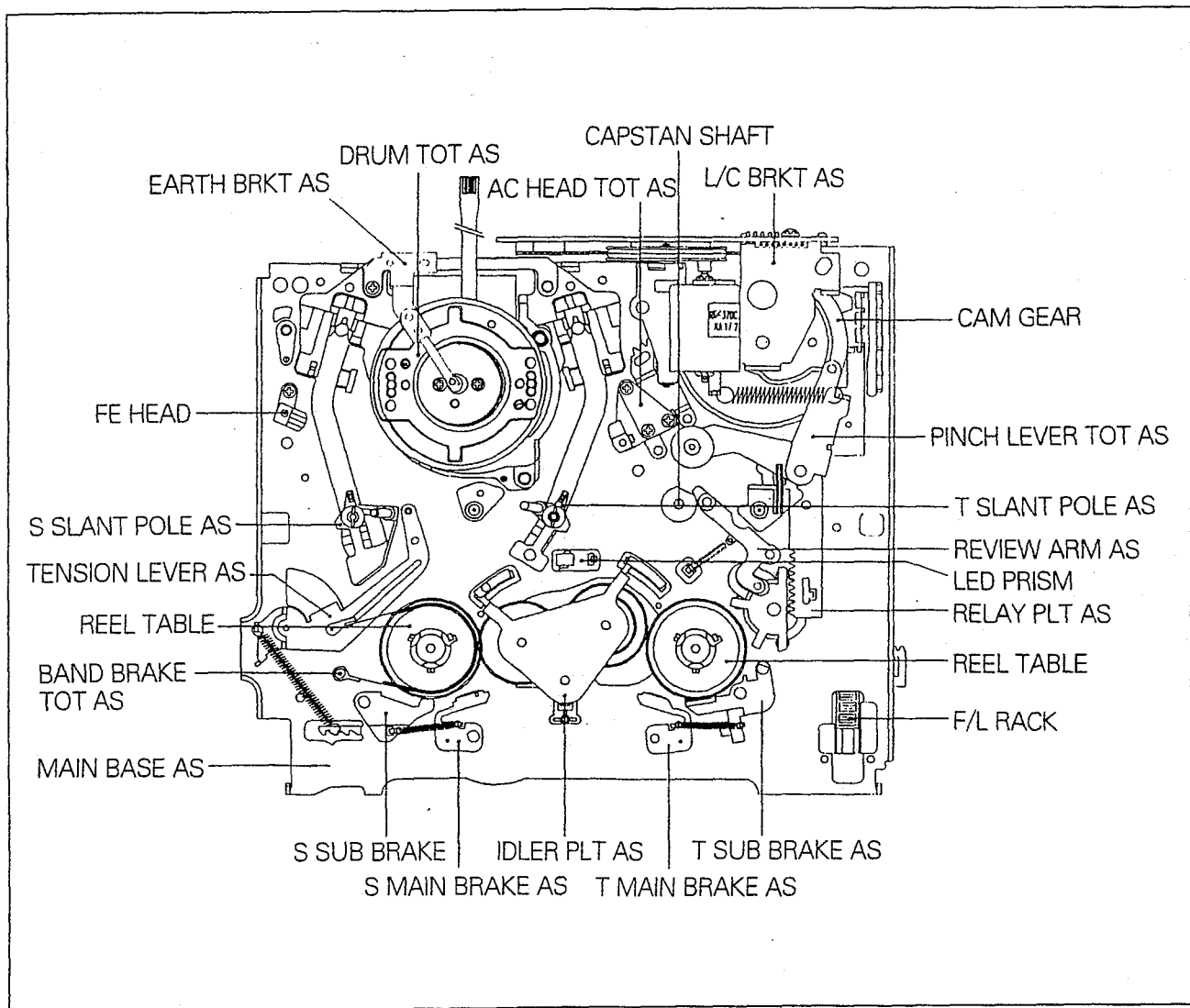
1	CAPSTAN I LM.
2	CONTROL
3	CAP IC GND
4	CAP M/T GND
5	CAPSTAN F/R
6	CAPSTAN FG
7	EVER 5V
8	CAP M/T 12V

2. ARRANGEMENT AND CHECK FOR THE MAJOR PARTS

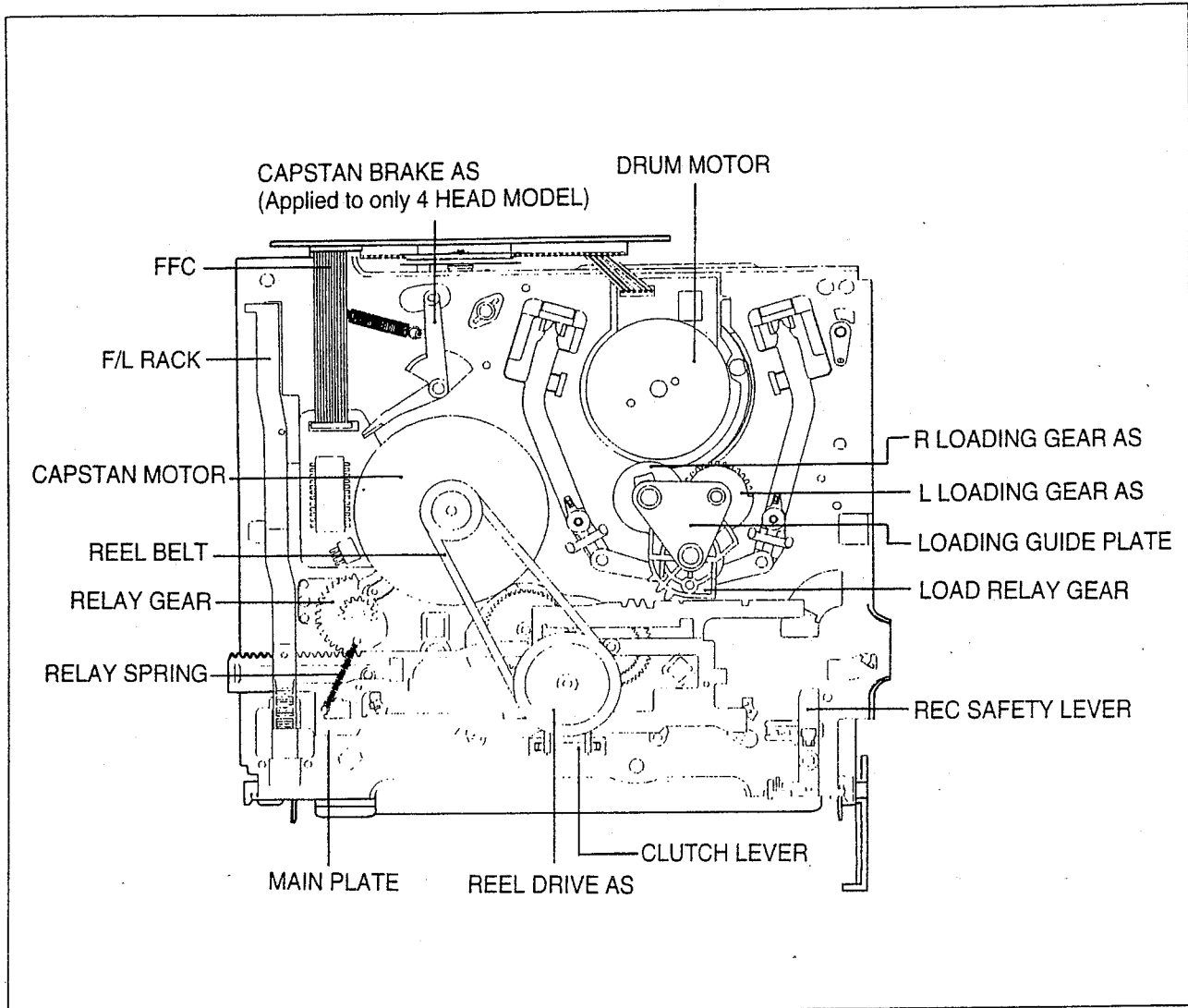
1. PARTS LOCATION

1) PARTS LOCATION OF DECK ASS'Y

A. TOP VIEW

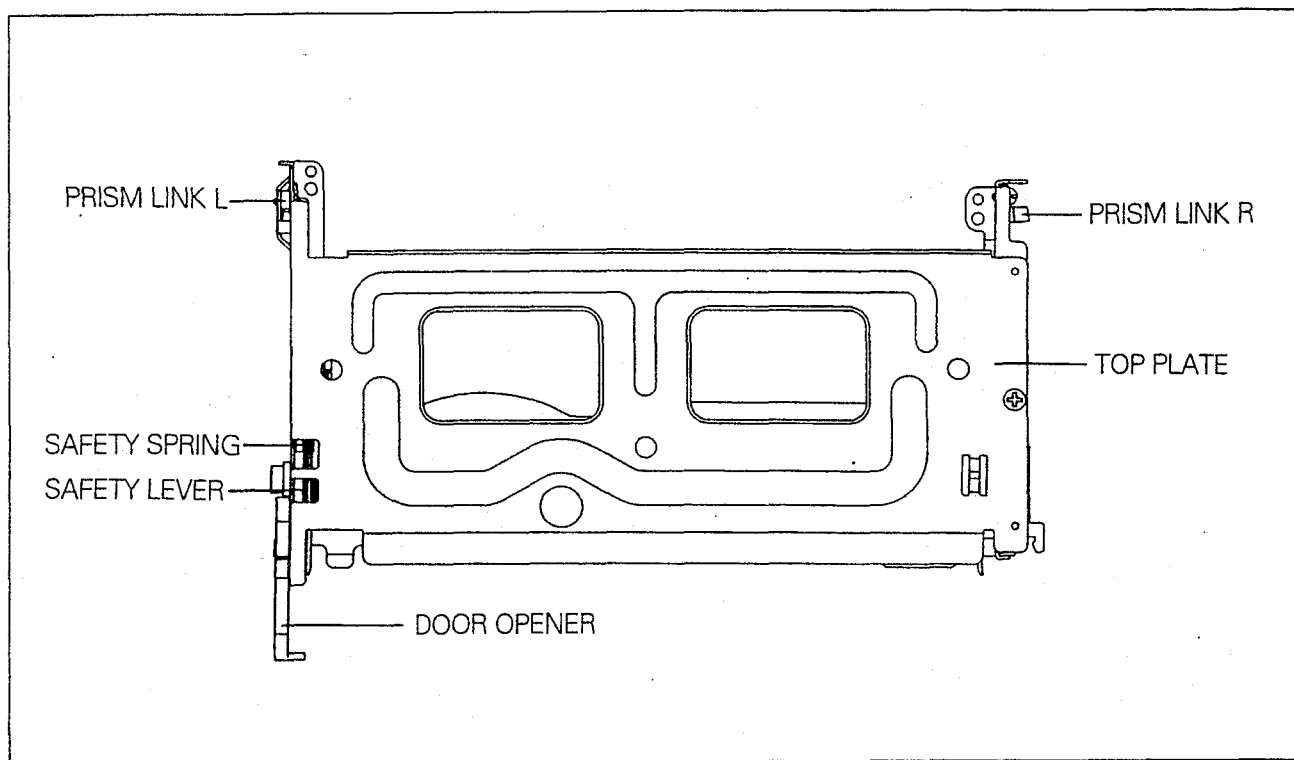


B. BOTTOM VIEW

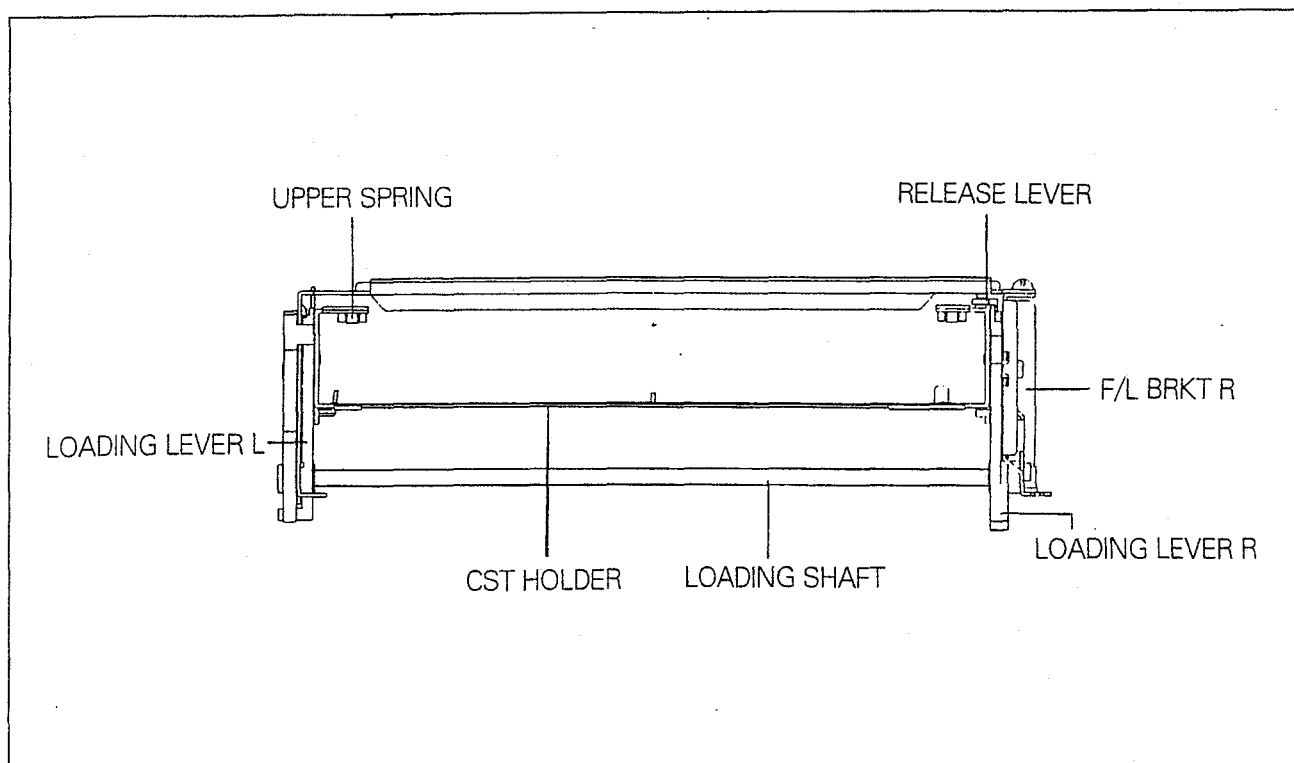


2) PARTS LOCATION OF FRONT LOADING ASS'Y

A. TOP VIEW



B. FRONT VIEW



2. PERIODIC MAINTENANCE AND SERVICE SCHEDULE

1) PERIODIC MAINTENANCE AND SERVICE SCHEDULE

- A. In order to effectively maintain the excellent performance and fully utilize the features of this apparatus, and to lengthen the life of mechanism and tapes, we strongly urge you to perform the periodic maintenance and inspection as described below.
- After repairing, do the maintenance as described below irrespective of the length of time in use.
- B. Cleaning of the Head Drum Ass'y
- Clean the Drum assembly with a cleaning cloth soaked in liquid cleaner (alcohol) by placing lightly against the Drum slowly revolving the rotating HEAD DRUM Ass'y by hand (Do not rotate it by applying the electric power to the motor for cleaning).
 - Do not move the cleaning cloth in the vertical direction against the heat-tip.
- C. Cleaning of the tape transporting section
- Cleaning the tape transporting parts with a cleaning cloth soaked in the alcohol.
- D. Cleaning of driving section
- Cleaning the driving section with the cloth soaked in the alcohol.
- E. Routine inspection
- Perform the maintenance and inspection as separately described depending on the period of time in use.

2) CLEANING AND LUBRICATION

- A. Cleaning of Tape Transporting System
- a. Cleaning of Tape Transporting System
- Following parts should be cleaned every 500 hours of use.
- | | | |
|------------------|-------------------|-------------------|
| • TENSION POLE | • S SLANT POLE | • AC HEAD/AE HEAD |
| • S GUIDE POST | • VIDEO HEAD/DRUM | • T GUIDE POST |
| • FE HEAD | • T SLANT POLE | • CAPSTAN SHAFT |
| • S GUIDE ROLLER | • T GUIDE ROLLER | • PINCH ROLLER |
- Since the above parts contact with video tape, they tend to collect dust particles if they are stained with dust or foreign substance it have a bad effect on the picture and lead to damage of the tape.
 - After cleaning with alcohol, allow the parts to dry thoroughly before using a cassette tape.
- b. Cleaning of driving system
- | | | |
|----------------|----------------|---------------------------|
| • REEL TABLE | • T MAIN BRAKE | • CAPSTAN FLYWHEEL/PULLEY |
| • S MAIN BRAKE | • T SUB BRAKE | • REEL PULLEY |
- B. LUBRICATION
- | | | |
|---------------------|---------------------|--------------|
| • S REEL TABLE POST | • T REEL TABLE POST | • IDLER POST |
|---------------------|---------------------|--------------|
- After cleaning components with alcohol, lubricate these with one or two drops oil.

3) SERVICE SCHEDULE FOR THE MAJOR PARTS

Following parts should be receive perodic service according to the recommended intervals.

NAME	PERIODIC SERVICE (TIME)				
	1000	2000	3000	4000	5000
DRUM TOTAL ASS'Y	*	O	*	O	*
CAPSTAN MOTOR		O		O	
L/C BRKT ASS'Y		O		O	
REEL BELT		O		O	
IDLER PLATE TOTAL ASS'Y		*		O	
REEL TABLE			O		
T SUB BRAKE ASS'Y		O		O	
BAND BRAKE ASS'Y		O		O	
S MAIN BRAKE ASS'Y		O		O	
T MAIN BRAKE ASS'Y		O		O	
PINCH ROLLER ASS'Y		*	O	*	
AC HEAD ASS'Y			O		
FE HEAD					O
REEL GEAR TOTAL ASS'Y		*		O	

* : Check and Replace if necessary O: Replace

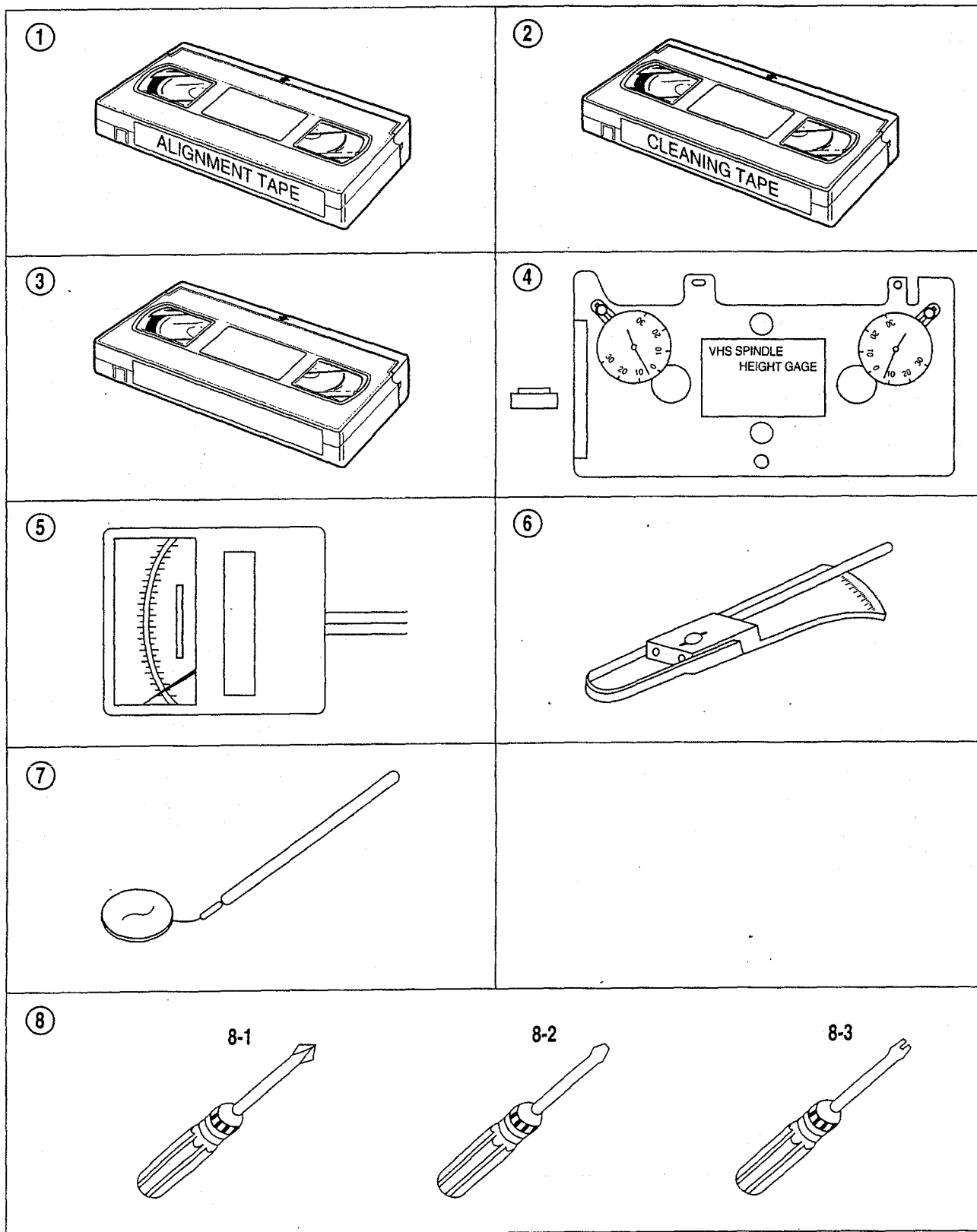
Note: Even though the unit is not used frequently, cleaning, lubrication and replacement of the belt should be undertaken every 2 years.

3. JIGS AND TOOLS

1) LIST OF JIGS AND TOOLS

NO	ITEMS	MODEL	FIG. NO	REMARKS
1	ALIGNMENT TAPE	NTSC: SP MONOSCOPE 7KHz SP COLOR BAR 1KHz (EP MONOSCOPE) PAL: SP MONOSCOPE 6 KHz SP COLOR BAR 1KHz (LP MONOSCOPE)	①	CHECKING OF THE TAPE TRANSPORTING SYSTEM
2	CLEANING TAPE (DAEWOO)	DHC-602V	②	CLEANING OF THE TAPE TRANSPORTING SYSTEM
3	CASSETTE TAPE (KOKUSAI)	KT-300NV KT-300RV	③	MEASUREMENT OF REEL TORQUE
4	VHS SPINDLE HEIGHT GAUGE	TSH-V4	④	MEASUREMENT OF REEL TABLE HEIGHT
5	TENTELO METER (TENTELO)	T2-H7-UM	⑤	MEASUREMENT OF THE BACK TENSION
6	FAN TYPE TENSION METER	BELOW 3KG	⑥	MEASUREMENT OF THE PRESSING FORCE FOR THE PINCH ROLLER
7	DENTAL MIRROR		⑦	CHECKING OF THE TAPE TRANSPORTING SYSTEM
8	+ DRIVER - DRIVER ADJUSTMENT DRIVER		⑧ -1 ⑧ -2 ⑧ -3	ASSEMBLY, DISASSEMBLY AND ADJUSTMENT

2) SKETCH OF JIGS AND TOOLS



3. DISASSEMBLY AND REPLACEMENT

CAUTION : The DECK MECHANISM can be removed only in the EJECT mode.

1. DISASSEMBLY OF THE DECK TOTAL ASS'Y AND F/L ASS'Y (See Fig. 3-1)

- 1) Remove the top cover and front panel.
- 2) Separate the Drum FPC ① and F/E HEAD CONNECTOR ②.
- 3) Remove the 3 screws ③ and disassemble the DECK ④.
- 4) Remove the 2 screws ⑤ from the F/L ASS'Y.
- 5) Remove F/L ASS'Y from the Hook which is formed in the Main Base by pushing it while pulling the upper part of F/L ASS'Y ⑥.

NOTE:

- Please be careful not to bend or deform the Hooks formed in the MAIN BASE and Claws in the F/L Ass'y.

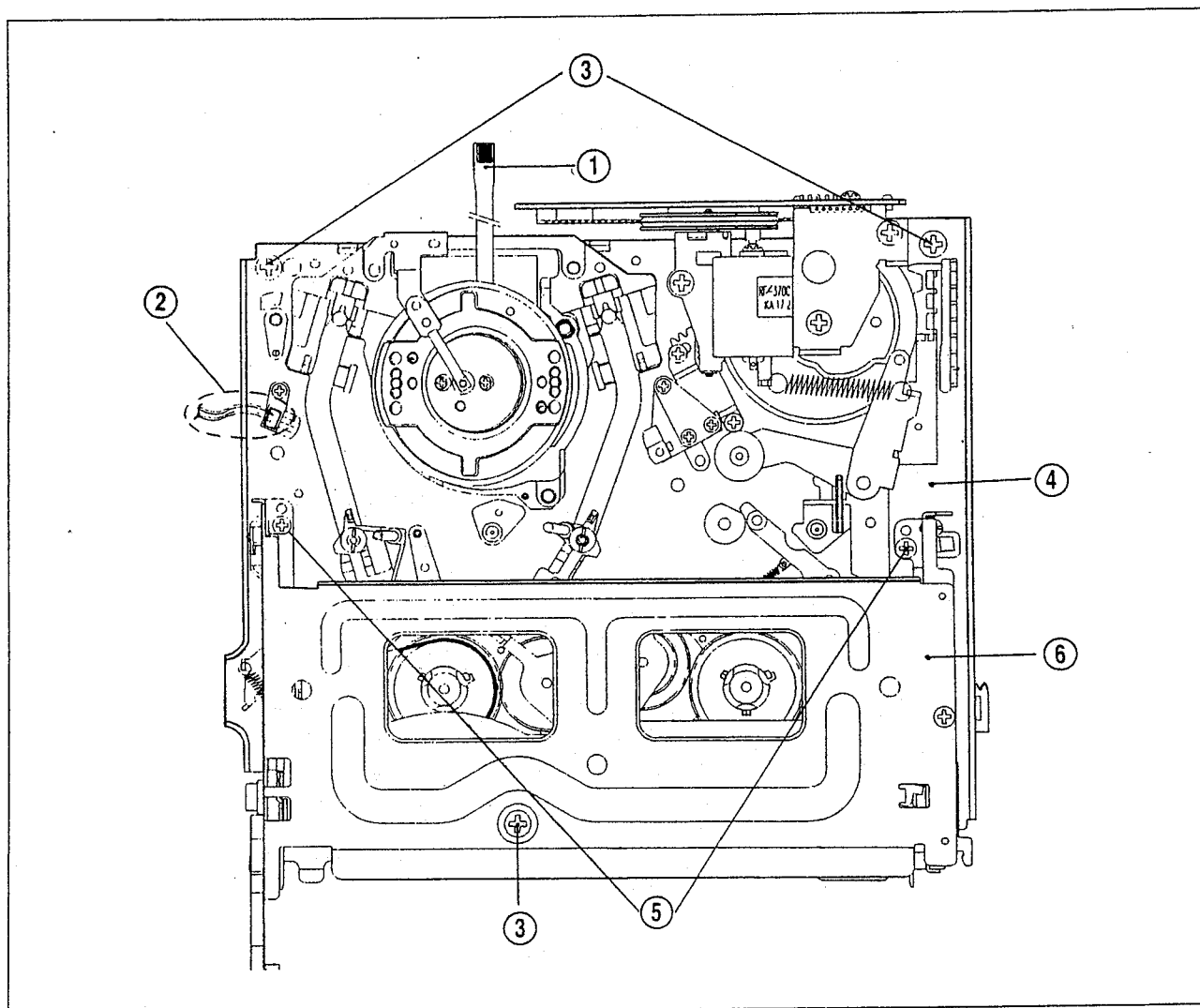


Fig. 3-1

2. REPLACEMENT OF THE DRUM TOTAL ASS'Y (See Fig. 3-2)

- 1) Turn over the DECK ASS'Y.
- 2) Separate the L/C-DRUM CONN. AS ② from the DRUM PCB ①.
- 3) Turn over the DECK ASS'Y again and remove the 3 screws ③ and remove the DRUM TOTAL ASS'Y ④.
- 4) After changing new DRUM ASS'Y please assemble it in the reverse order.
- 5) After completing this procedure, check and confirm the state of tape running and adjust the tape transporting system (Refer to SEC. 5) if necessary.

NOTE:

- Avoid damaging the HEAD or getting the HEAD dirty.
- If playback picture is poor, try cleaning the HEAD and checking the connectors before replacing DRUM ASS'Y.

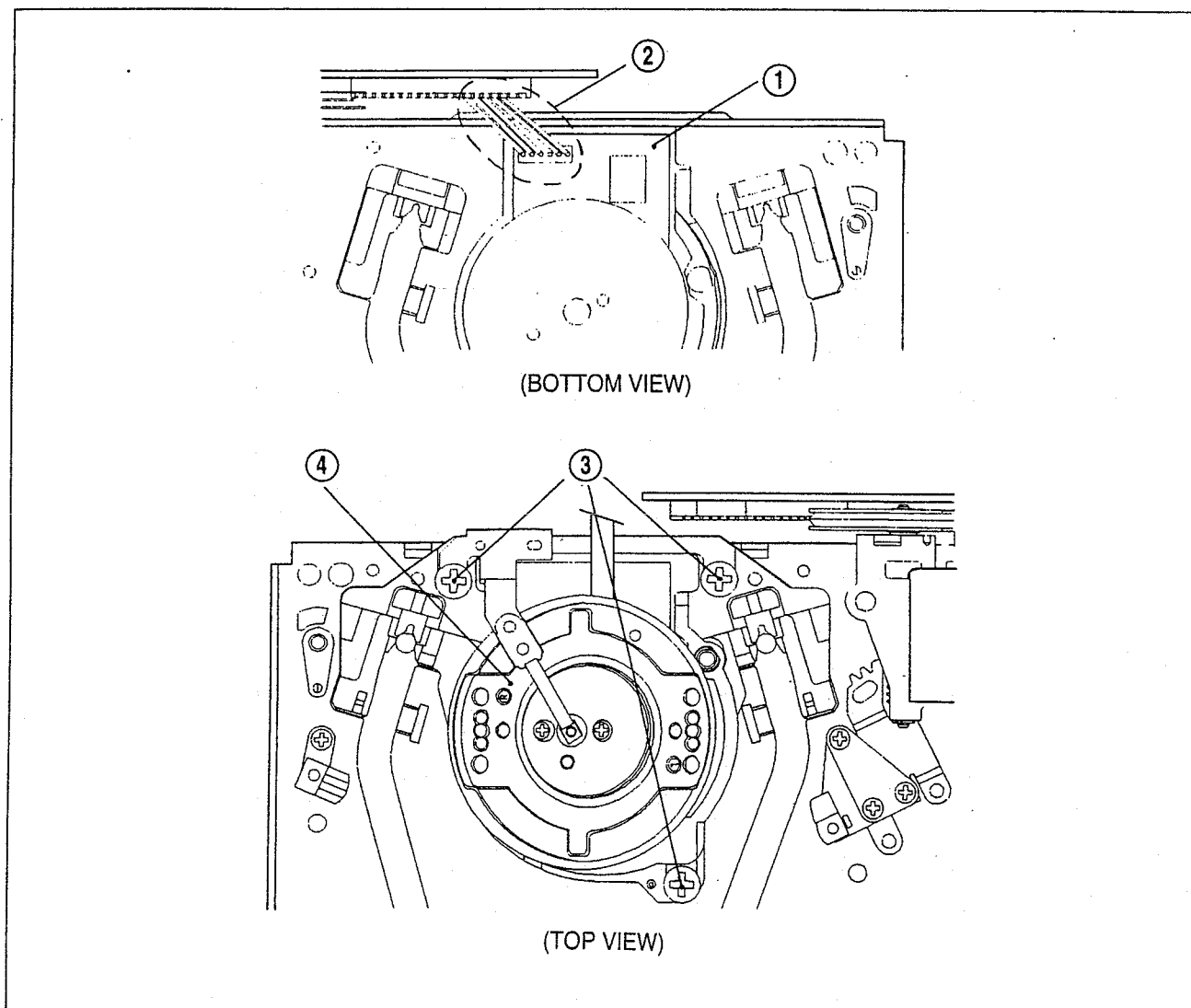


Fig. 3-2

3. REPLACEMENT OF THE S, T SLANT POLE ASS'Y (See Fig. 3-3)

- 1) Remove the DRUM TOTAL ASS'Y according to the method of the SEC. 3-2.
- 2) Remove the 2 screws ① and the LOADING GUIDE PLATE ②.
- 3) Remove the R & L LOADING GEAR ASS'Y ③, ④.
- 4) Remove the S & T SLANT POLE ASS'Y ⑤, ⑥ after moving them to the point "A" by pulling them in the direction of the arrow ↑.
- 5) After changing new SLANT POLE ASS'Y please assemble it in the reverse order.
- 6) Be careful not to get grease on the GUIDE ROLLER.

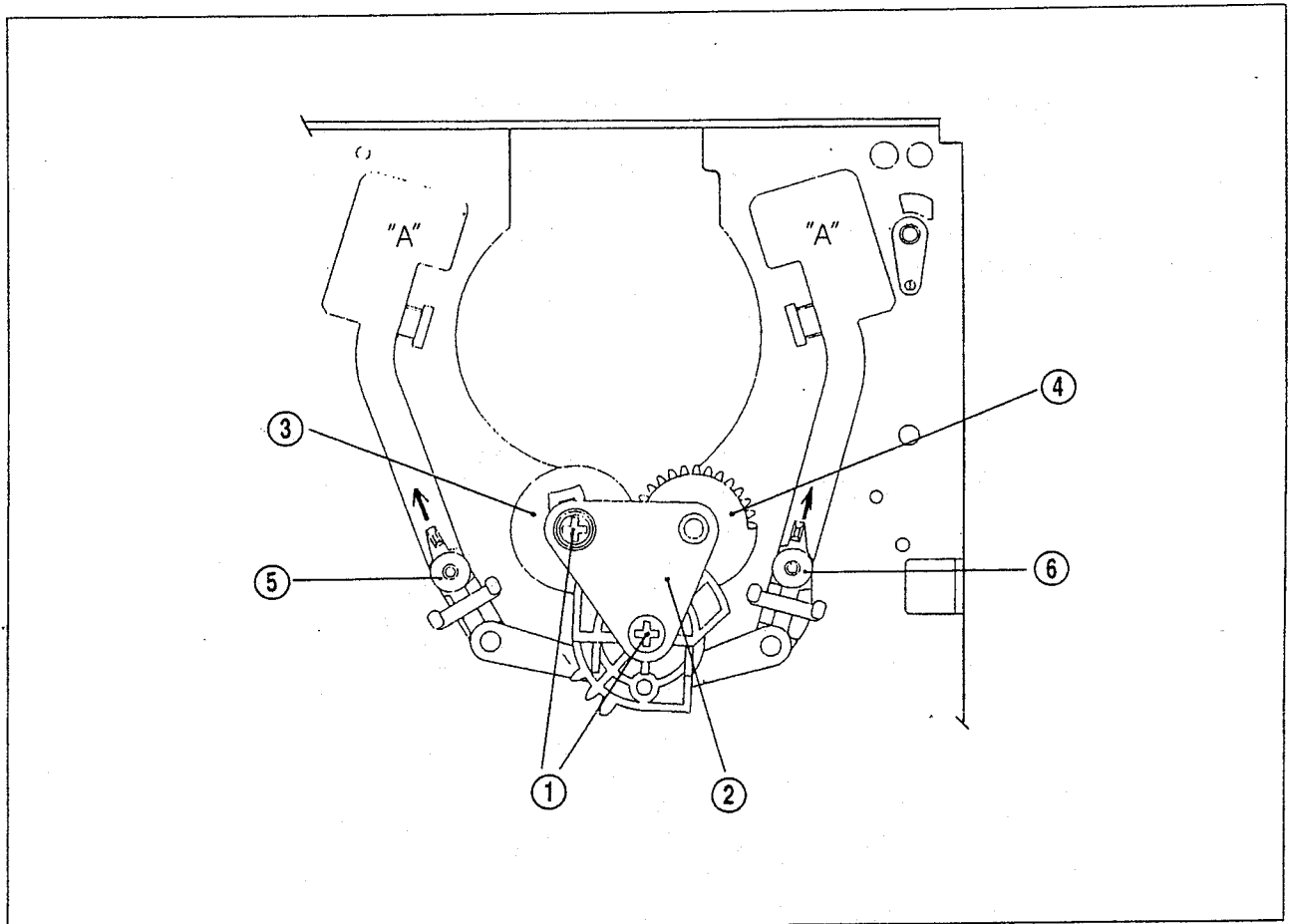


Fig. 3-3

4. REPLACEMENT OF THE PINCH LEVER TOTAL ASS'Y (See Fig. 3-4)

- 1) Unhook the PINCH SPRING HOOK ② which is hanging on the L/C BRKT ASS'Y ①.
- 2) After removing the POLY WASHER ③ disassemble the PINCH LEVER TOTAL ASS'Y ④.
- 3) After changing new PINCH LEVER TOTAL ASS'Y, assemble it in reverse order.

NOTE:

- Pay attention to be located the BOSS of the PINCH LEVER ASS'Y to the outside of the CAM. (See Fig. 4-2)
- Pay attention to avoid staining with grease or oil on the outside of the PINCH ROLLER.

5. REPLACEMENT OF THE A/C HEAD TOTAL ASS'Y (See Fig. 3-4)

- 1) After removing the 2 screws ⑤ from the A/C HEAD TOTAL ASS'Y, remove the A/C HEAD TOTAL ASS'Y ⑥.
- 2) After changing new A/C HEAD TOTAL ASS'Y, please assemble it in the reverse order.
- 3) After changing it, please re-adjust the tape transporting system and audio bios. (Refer to SEC. 5)

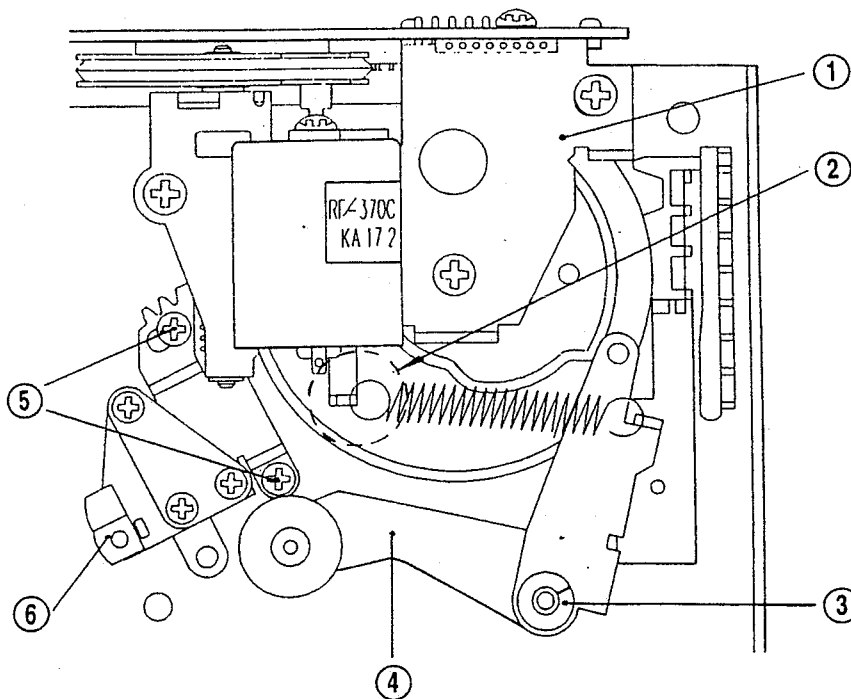


Fig. 3-4

6. REPLACEMENT OF THE L/C BRKT ASS'Y (See Fig. 3-5)

- 1) Turn over the DECK.
- 2) Separate the CAPSTAN EFC ① from the CONNECTOR of the L/C BRKT ASS'Y ④.
- 3) Separate the L/C-DRUM CONN. AS ② from the CONNECTOR of the DRUM ASS'Y.
- 4) Return the DECK over.
- 5) After removing the 3 screws ③ from the L/C BRKT ASS'Y.
- 6) After changing to the new L/C BRKT ASS'Y, reassemble the above-mentioned parts in the reverse order.
- 7) Pay attention to the assembly datum position, when reassembling the MODE SWITCH. (Refer to Fig. 4-2)

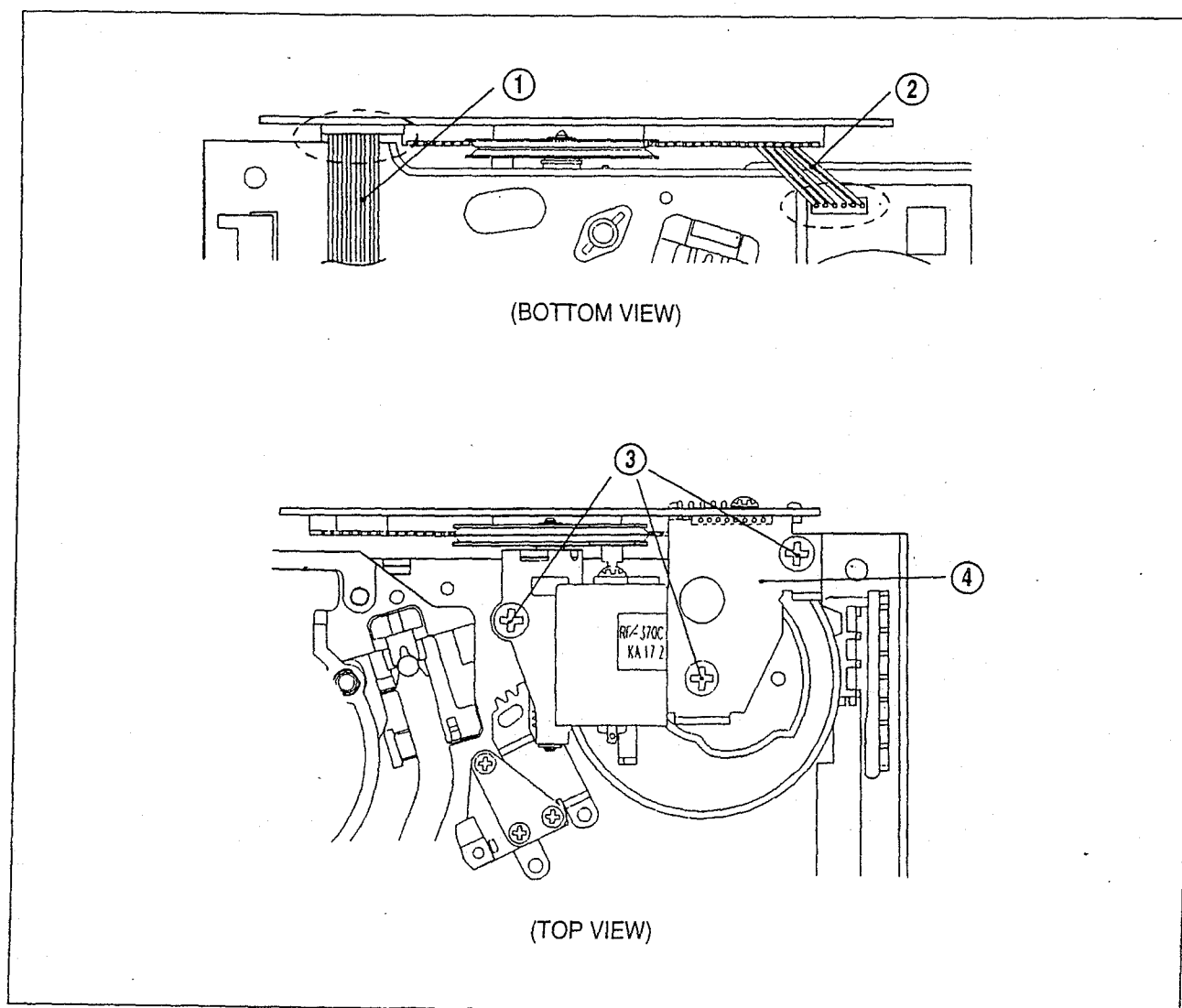


Fig. 3-5

7. REPLACEMENT OF THE MAIN PLATE (See Fig. 3-6)

- 1) After turning over the deck, separate RELAY SPRING ② from the MAIN PLATE ①..
- 2) After removing the one screw ③, disassemble the RELAY GEAR ④.
- 3) After removing the REEL BELT ⑤, remove the POLY WASHER ⑥.
- 4) Remove the REEL DRIVE TOTAL ASS'Y ⑦ and CLUTCH LEVER ⑧.
- 5) Push the MAIN PLATE to left side and remove it.

NOTE:

- When removing the MAIN PLATE in the state that the F/L RACK is assembled, pay attention to avoid the transformation of the MAIN PLATE by interfering of each other.
- When reassembling, pay attention to the assembly position of the MAIN PLATE and RELAY GEAR. (See Fig. 4-3)
- Before assembling the REEL DRIVE TOTAL ASS'Y, make sure of the state of POLY SLIDER on the REEL DIRVE POST.
- When assembling or disassembling, pay attention to avoid touching oil or glease on the REEL BELT.

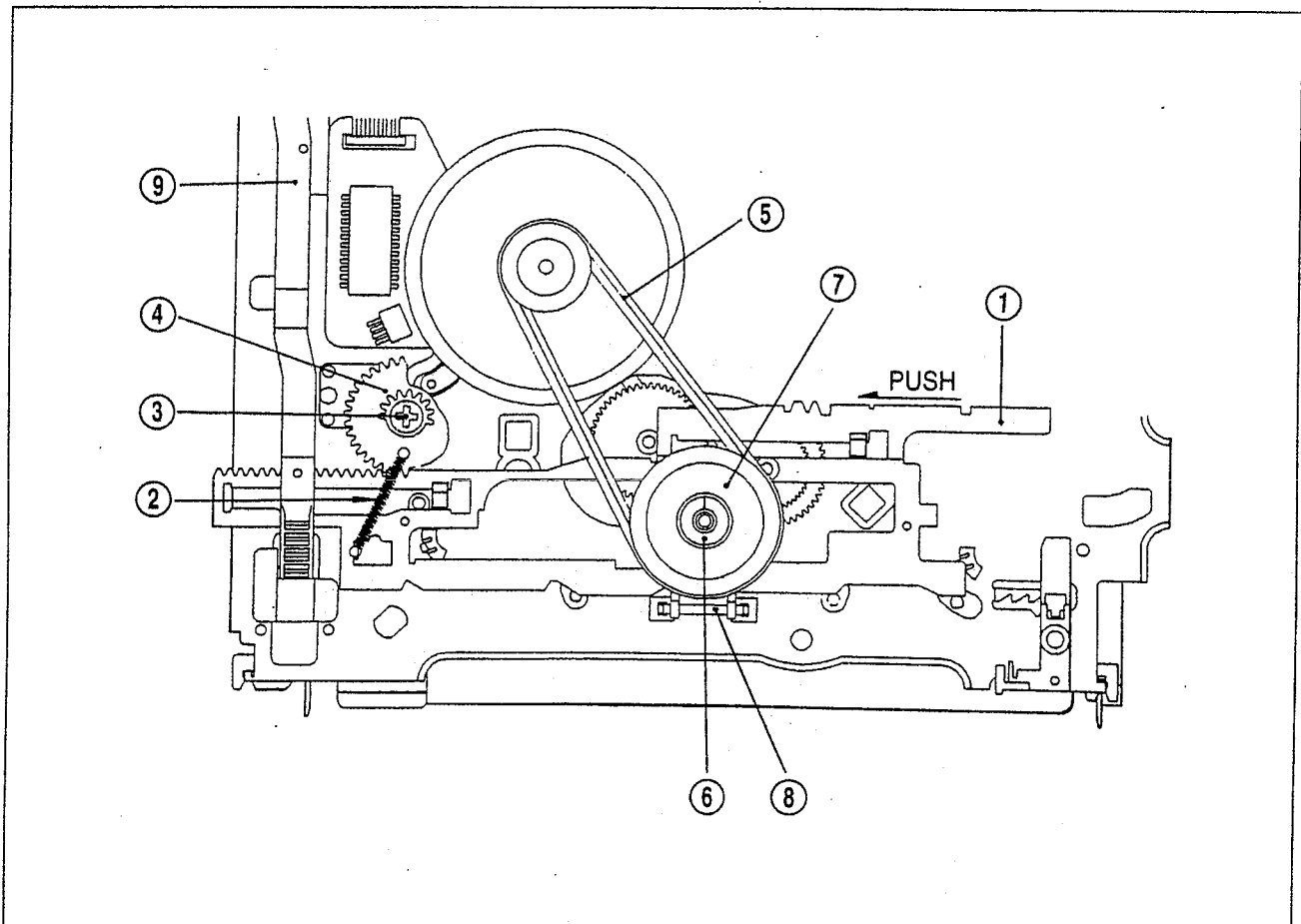


Fig. 3-6

8. REPLACEMENT OF THE CAM GEAR, RELAY PLATE, F/L RACK (See Fig. 3-7)

- 1) Remove the RELAY GEAR according to the SEC. 3-7.
- 2) Remove the PINCH LEVER TOTAL ASS'Y and L/C BRAKT ASS'Y according to SEC. 3-4 and 3-7.
- 3) Remove the CAM GEAR ①.
- 4) Remove the RETURN LEVER ②.
- 5) Slide the RELAY PLATE ⑤ until the HOLE ③ formed in RELAY PLATE meets the PINCH POST ④ and disassemble the RELAY PLATE.
- 6) Slide the F/L RACK ⑥ in the direction of arrow and then remove the F/L RACK backward.
- 7) After changing new components, assemble it in reverse order.
- 8) Pay attention to the location of assembling when re-assemble. (See Fig. 4-1)

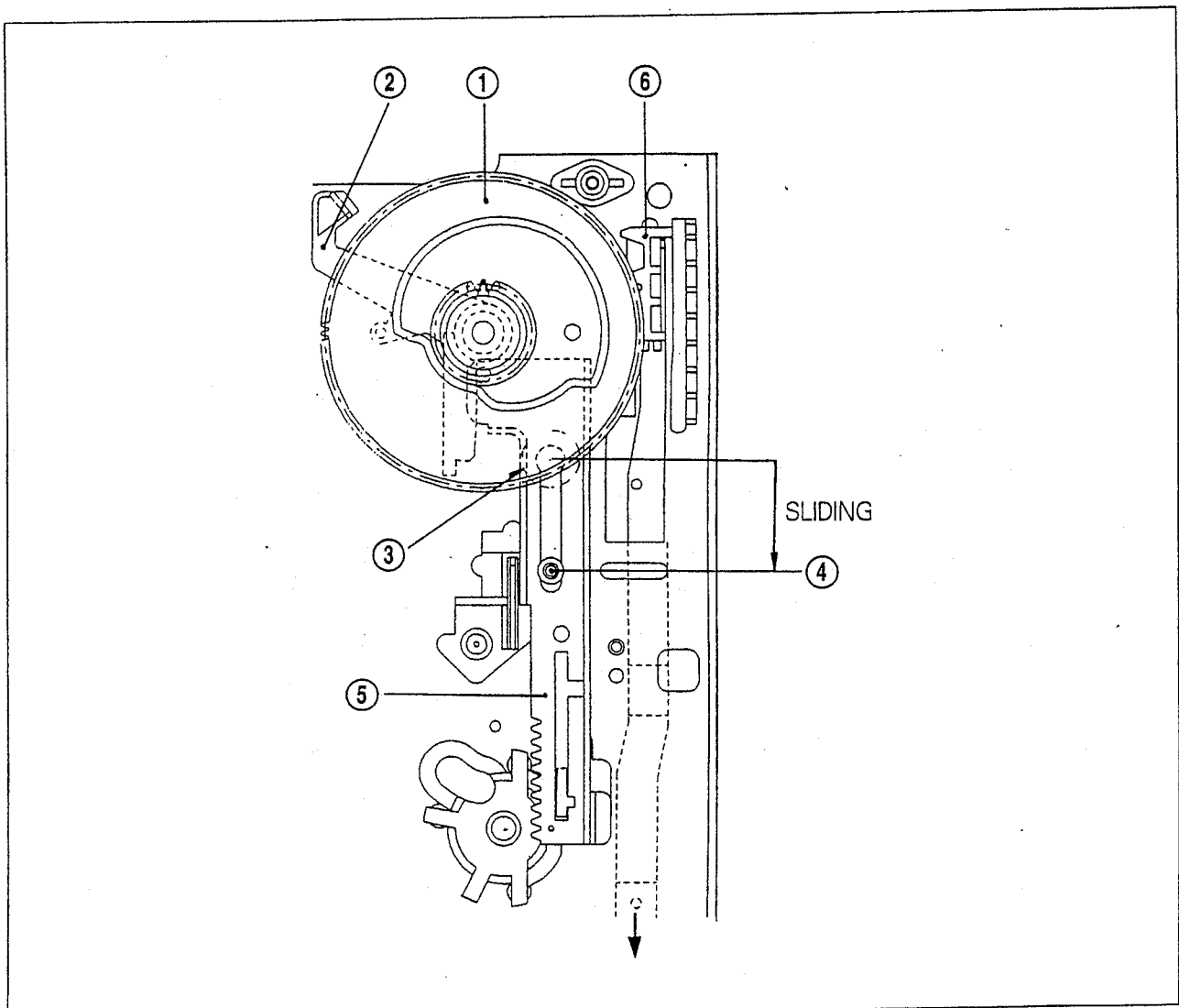


Fig. 3-7

9. REPLACEMENT OF THE TENSION LEVER ASS'Y (See Fig. 3-8)

- 1) Separate the TENSION SPRING ② from the HOOK "A" of the MAIN BASE ①.
- 2) Remove the BAND BRAKE CAP ③ by means of lift with proper force.
- 3) Disassemble the TENSION LEVER ASS'Y ④ in the state of pulling back the HOOK "B".
- 4) Remove the BAND BRAKE ASS'Y ⑤ from the TENSION LEVER ASS'Y while rotating in the direction of the arrow.
- 5) Re-assemble in the reverse order.
- 6) After re-assembling it, adjust the position of the TENSION POLE. (See SEC. 4-4)
- 7) If necessary, adjust and measure the BACK TENSION (See SEC. 4-5).
- 8) Avoid getting grease or oil on the FELT of the BAND BRAKE ASS'Y.
Also avoid damaging the HOOK "B".

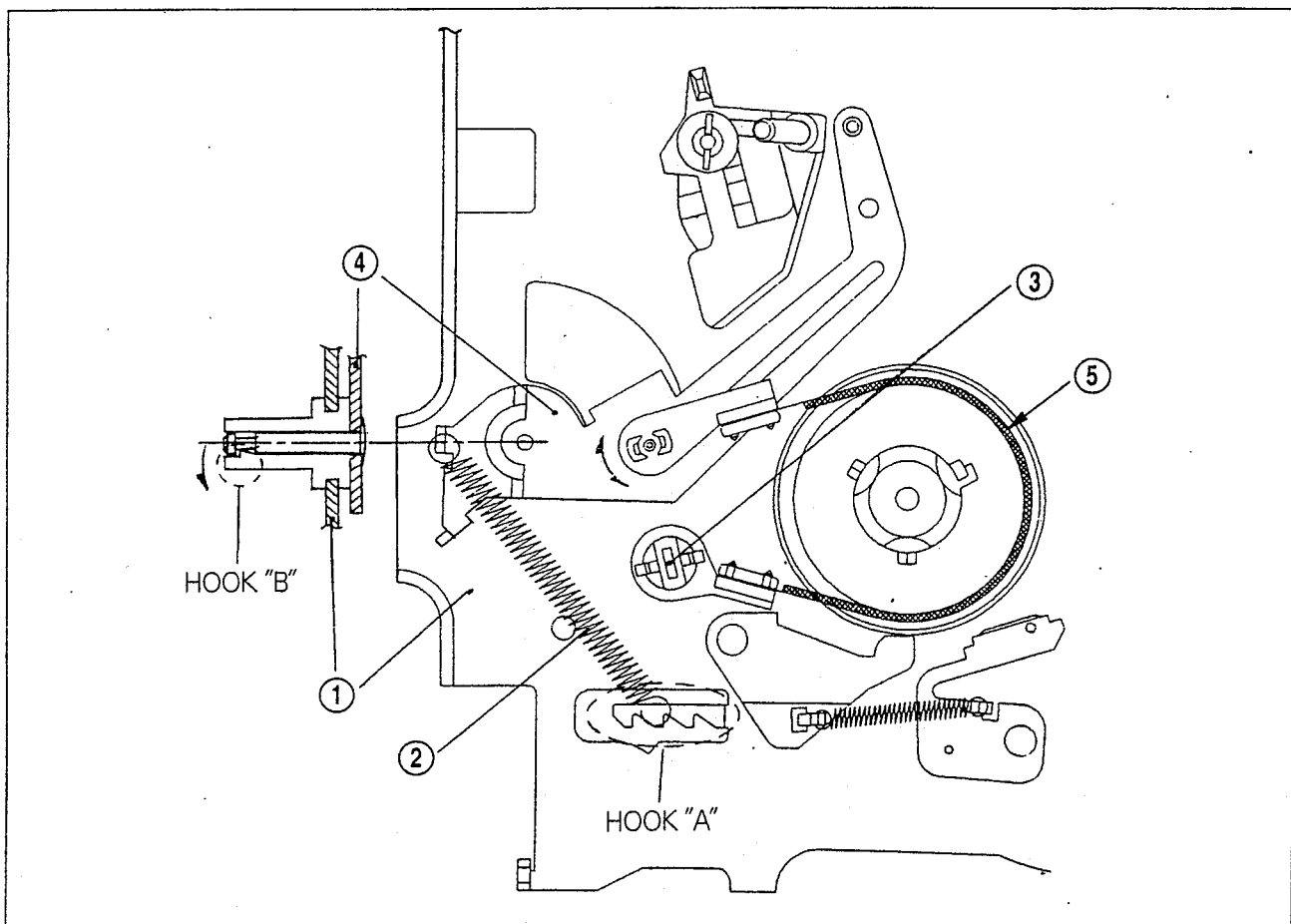


Fig. 3-8

10. REPLACEMENT OF THE CAPSTAN MOTOR (See Fig. 3-9)

- 1) After turning over the DECK ASS'Y, separate the CAPSTAN FFC ① from the CONNECTOR ②.
- 2) Disassemble the REEL BELT ③.
- 3) Separate the CAPSTAN BRAKE SPRING ④ from the HOOK "A".
- 4) Disassemble the CAPSTAN BRAKE ASS'Y ⑤ in the state of pulling back the HOOK "B".
- 5) After turning over the DECK ASS'Y again, separate the REVIEW ARM SPRING ⑥ from the HOOK "C".
- 6) After removing the POLY WASHER ⑦, disassemble REVIEW ARM ASS'Y ⑧.
- 7) After removing the 3 screws ⑨ from the CAPSTAN MOTOR, disassemble the CAPSTAN MOTOR ⑩.

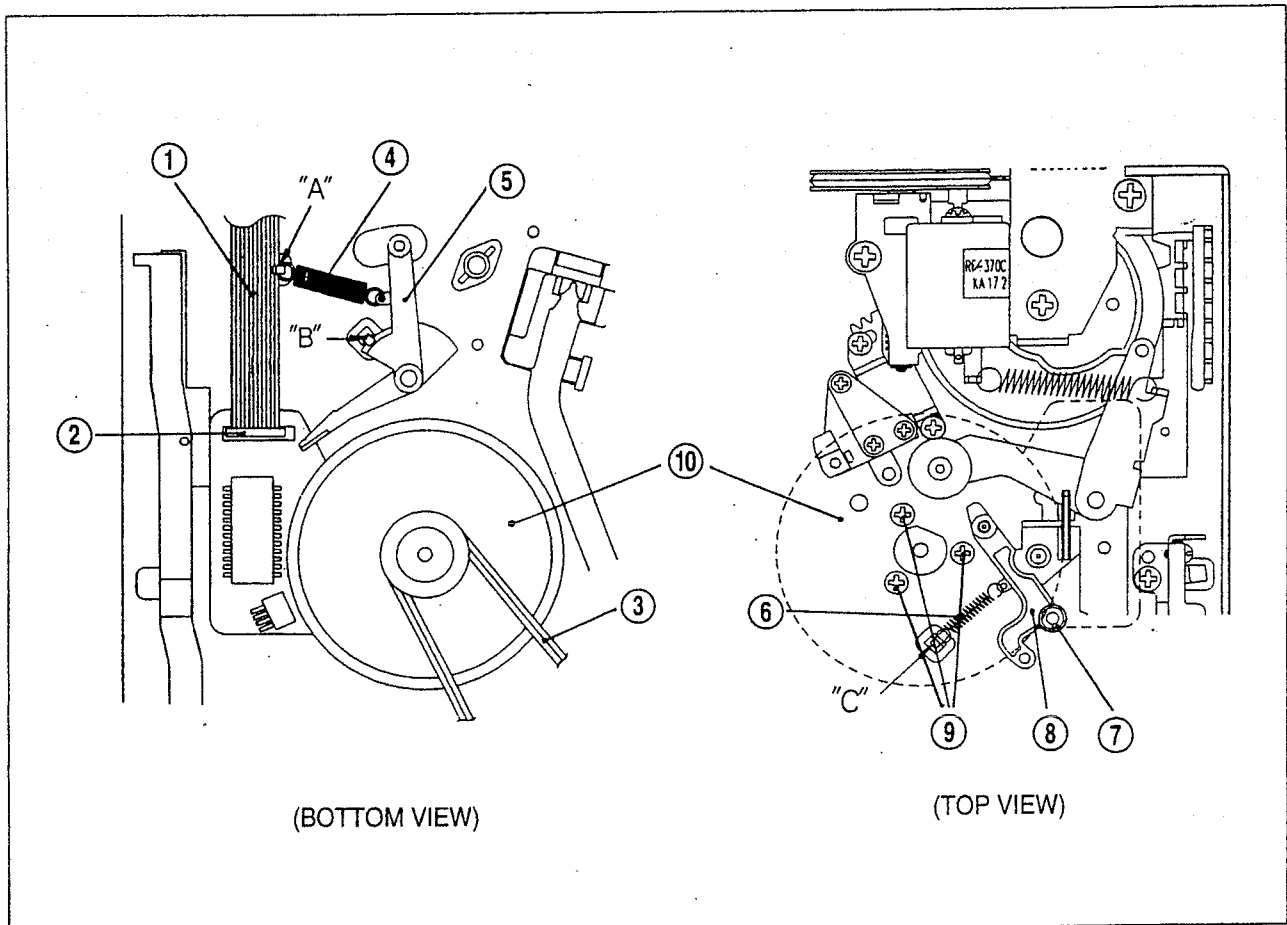


Fig. 3-9

4. MECHANICAL ADJUSTMENTS

1. MECHANICAL CHECKS

If irregular operation occurs or when reassembling a part, please check the following.

- 1) Make sure that the datum hole of the RELAY PLATE meets that of the MAIN BASE in the Eject Mode as shown in Fig. 4-1.
- 2) Make sure that the datum hole of the CAM GEAR meets that of the MAIN BASE in the Eject Mode as shown in Fig. 4-1.
- 3) There are two triangle mark in the MODE SWITCH. When installing the L/C BRKT ASS'Y, make sure that the one marks meets the other in the Eject Mode as shown in Fig. 4-2.
- 4) Make sure the that the BOSS of the PINCH LEVER ASS'Y is located outside of the CAM of the CAM GEAR in the Eject Mode as shown in Fig. 4-2.
- 5) Make sure that the datum hole of the MAIN PLATE meets that of the MAIN BASE in the Eject Mode as shown in Fig. 4-3.
- 6) When installing the RELAY GEAR, make sure that the triangle mark meets the last groove of the teeth of the MAIN PLATE in the Eject Mode as shown in Fig. 4-3.
- 7) Make Sure that the triangle mark of the L LOADING GEAR ASS'Y meets the ζ -Shaped mark of the R LOADING GEAR ASS'Y in the Eject Mode as shown in Fig. 4-4.
- 8) Make sure that the 1'st tooth of the R LOADING GEAR ASS'Y meets the 1'st groove of the LOADING GEAR ASS'Y in the Eject Mode as shown in Fig. 4-4.

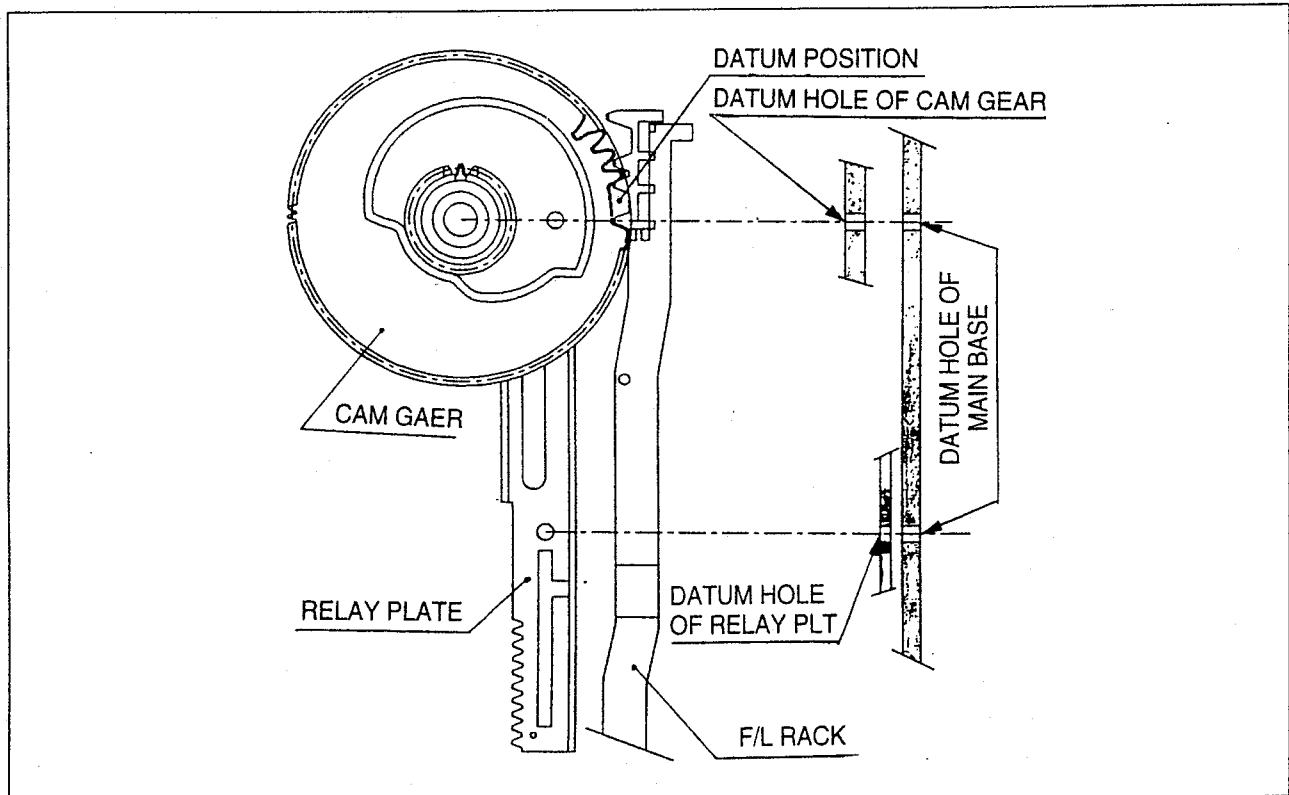


Fig. 4-1 DATUM POSITION OF RELAY PLATE & CAM GEAR

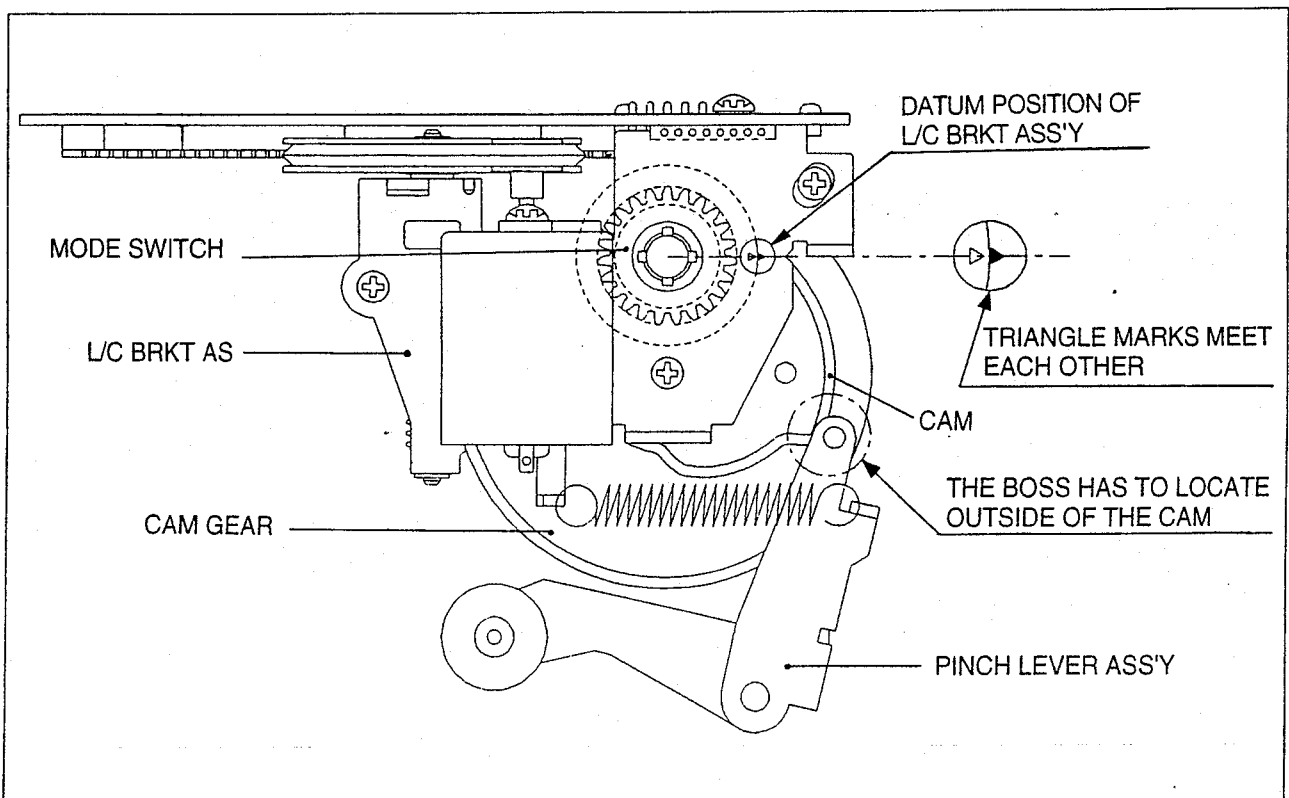


Fig. 4-2 DATUM POSITION OF L/C BRKT AS & PINCH LEVER AS

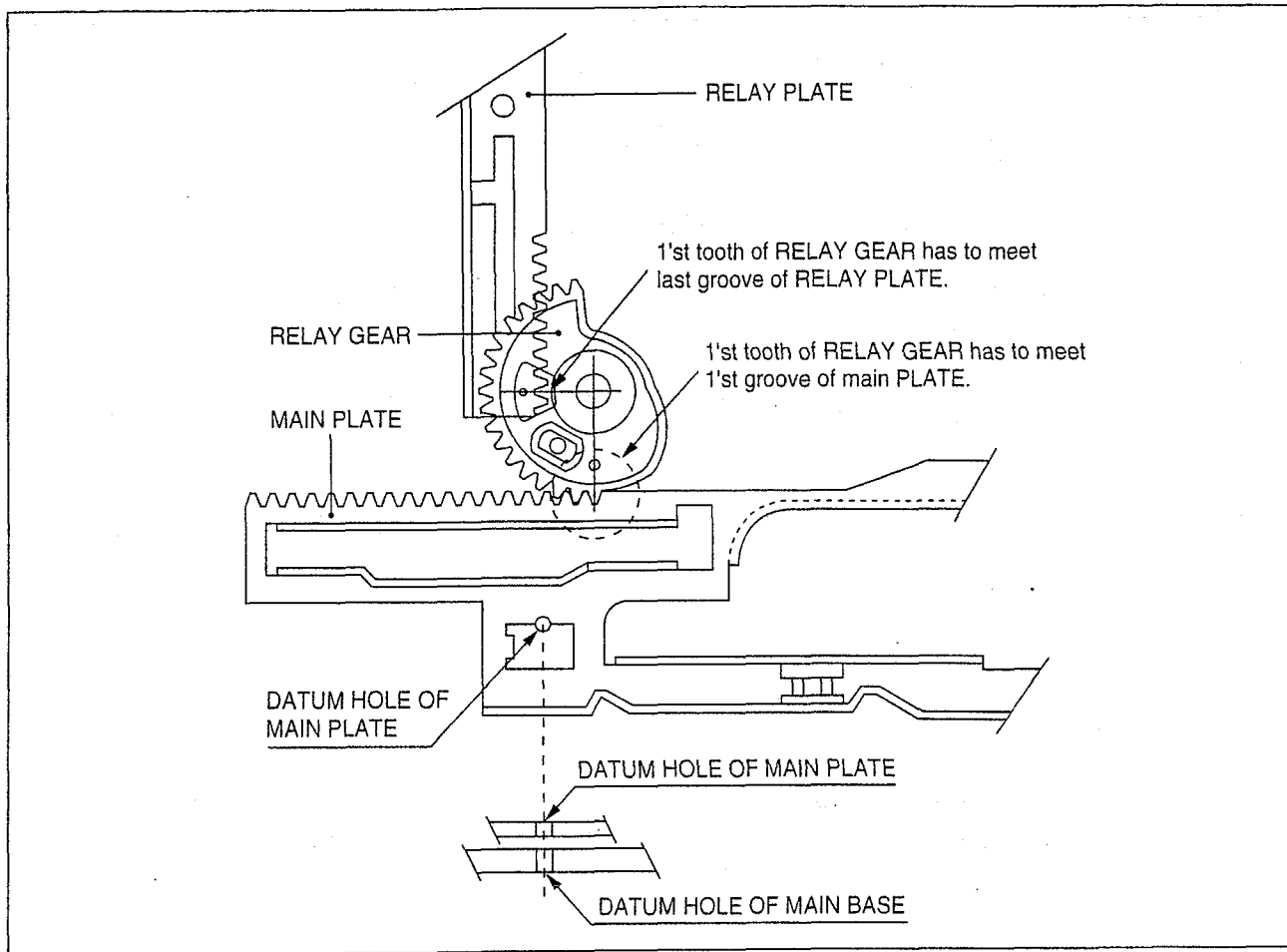


Fig. 4-3 DATUM POSITION OF MAIN PLATE & RELAY GEAR

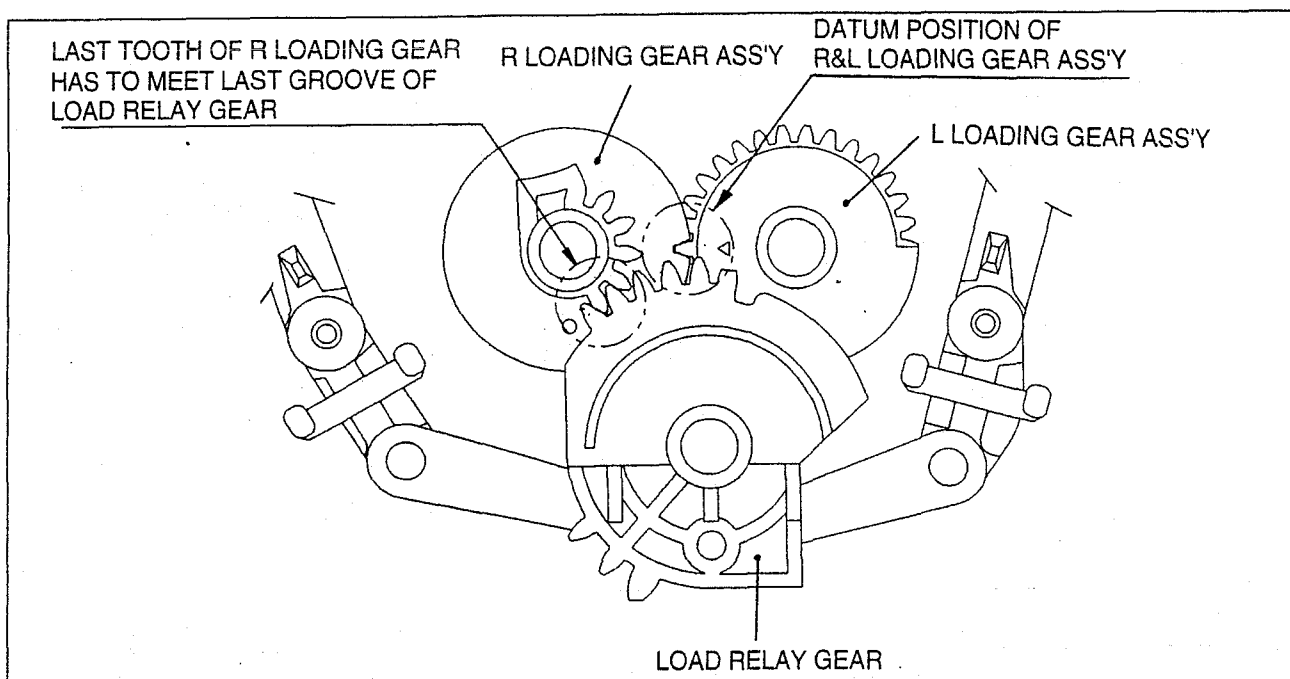


Fig. 4-4 DATUM POSITION OF LOADING GEAR ASS'Y & LOAD RELAY GEAR

2. HOW TO SET MECHANICAL MODE

- 1) With the F/L ASS'Y removed, turn on the POWER.
- 2) If rotate the WORM PULLEY 2 or 3 times manually, it will start loading and move to PLAY/STOP mode.
- 3) Press the desired button.
- 4) On performing the desired mode, pull out the power plug from the outlet.
- 5) Assemble and disassemble the F/L ASS'Y in the only EJECT mode.

3. MEASUREMENT OF PRESSING FORCE FOR PINCH ROLLER

- 1) In the state of loading the cassette tape, playback the tape by pressing the PLAY button.
- 2) After hanging the PUSH-PULL GUAGE on the HOOK of PINCH LEVER TOTAL AS, pulling it to the direction of (A) indicated by the arrow as shown Fig. 4-5.
- 3) The very moment tape stop, read the scale of PUSH-PULL GUAGE. (SPEC: 1.1 ± 0.2 kg).

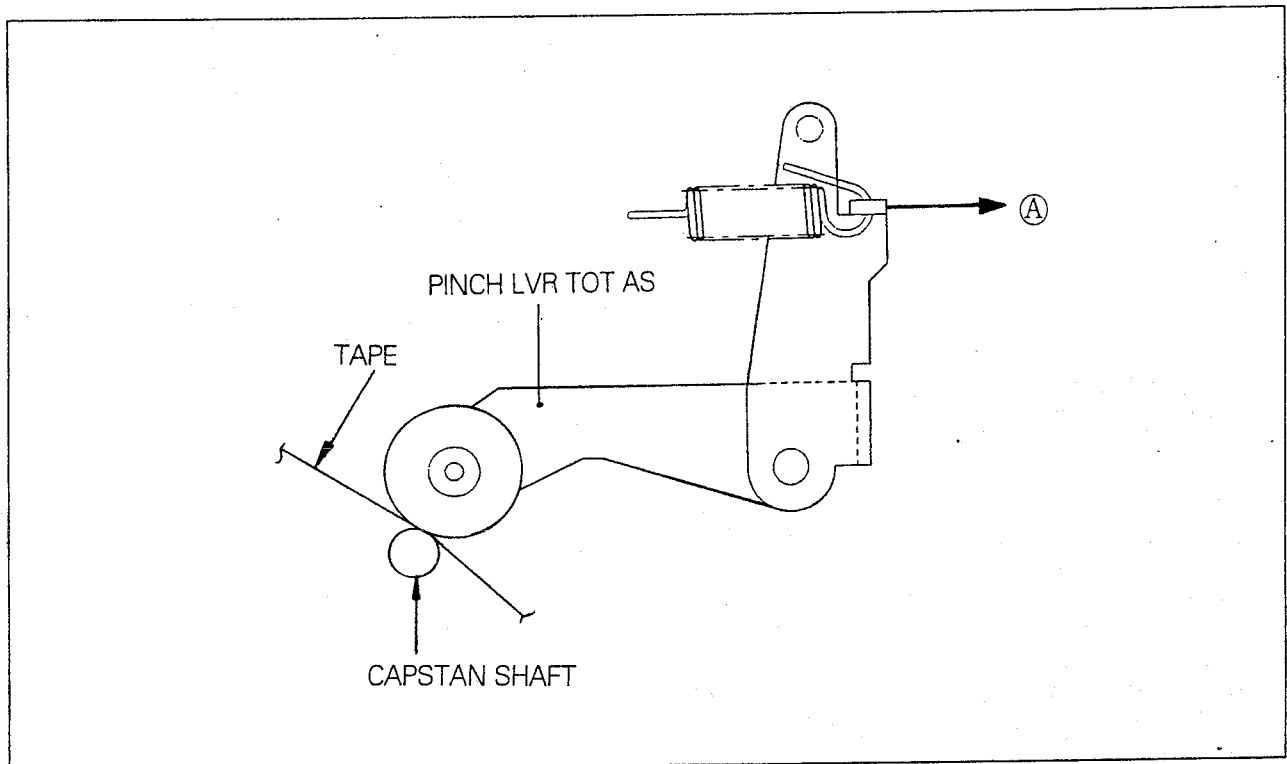


Fig. 4-5 MEASUREMENT OF PRESSING FORCE FOR PINCH ROLLER

4. ADJUSTMENT OF TENTION POLE POSITION

- 1) Turn on the Power and set to PLAY Mode by turning the WORM WHEEL without cassette.
- 2) Confirm with your eyes whether the datum hole of TENSION LEVEL meets that of the MAIN BASE.
- 3) If they do not meet, turn the BAND BRAKE CAP to the CW or the CCW direction until holes meet each other (See Fig. 4-6).

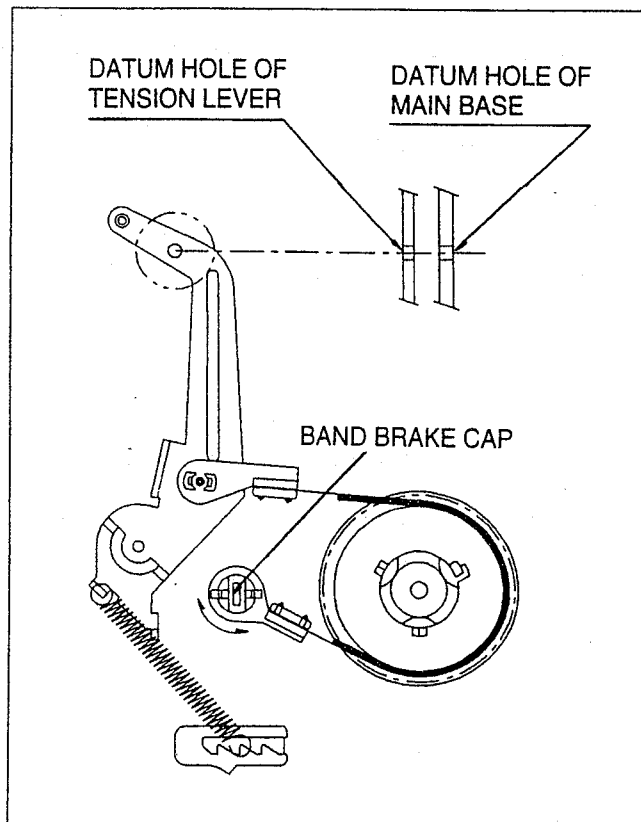


Fig. 4-6 ADJUSTMENT OF THE TENTION POLE POSITION

5. MEASUREMENT OF THE BACK TENTION

- 1) Before mesuring the BACK TENTION, make sure that the position of TENSION POLE is adjusted correctly.
- 2) Play back T-120 tape at its center position without F/L ASS'Y, wait until the tape running is stabilized (about 10-20 seconds).
- 3) Set the Tentelometer as shown in Fig. 4-7 and confirm the scale (SPEC: 20-27 gr/cm).
- 4) If the scale indicates more than 27 gr/cm, move the TENSION SPRING to "A" direction and less than 20 gr/cm, move to "B" direction. (See Fig. 4-7)

NOTES:

- Make sure that the three probes of the TENTELOMETER as all in good contact with tape.
- It is recomended to be measured three times as TENTELOMETER is very sensitive.

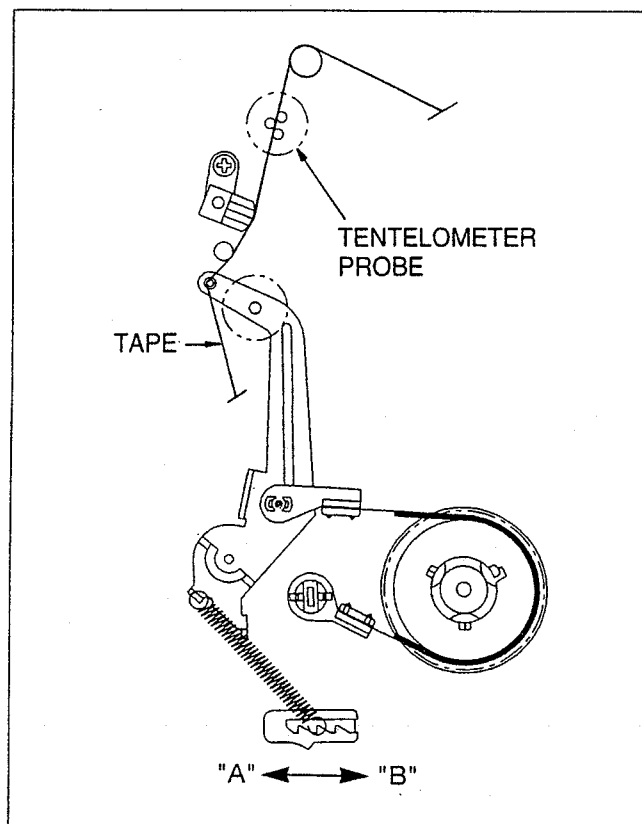


Fig. 4-7 MEASUREMENT OF THE BACK TENTION

5. THE ADJUSTMENT OF THE TAPE TRANSPORTING SYSTEM

The tape transporting system has been precisely adjusted at the factory and does not ordinary require readjustment. But when the noise and tape damage takes place and parts that compose the tape transporting system are replaced due to troubles by long usage or unexpected accidents, check and readjust the tape transporting system.

5-1. THE SCHEMATIC DIAGRAM OF TAPE TRANSPORTING SYSTEM

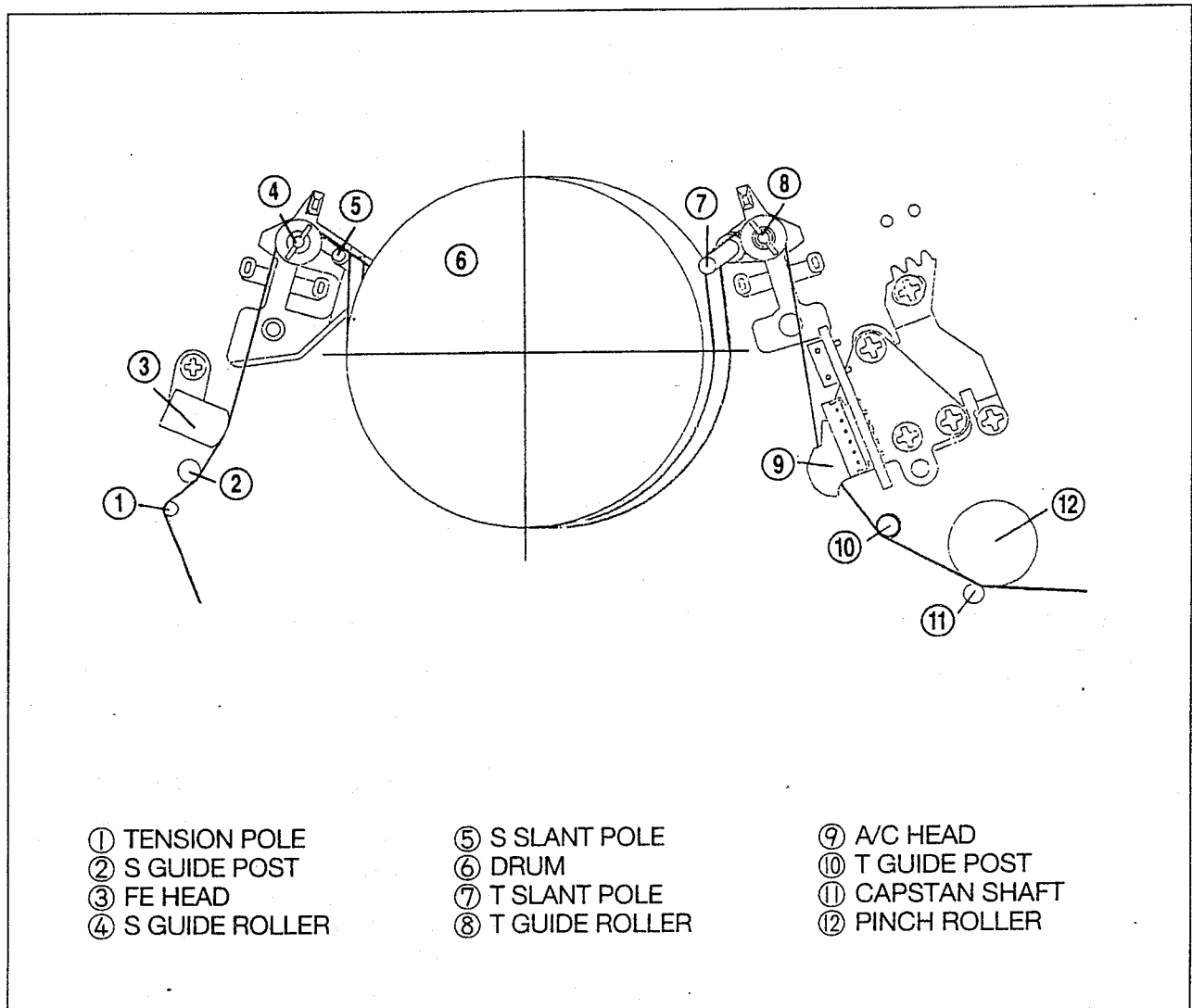
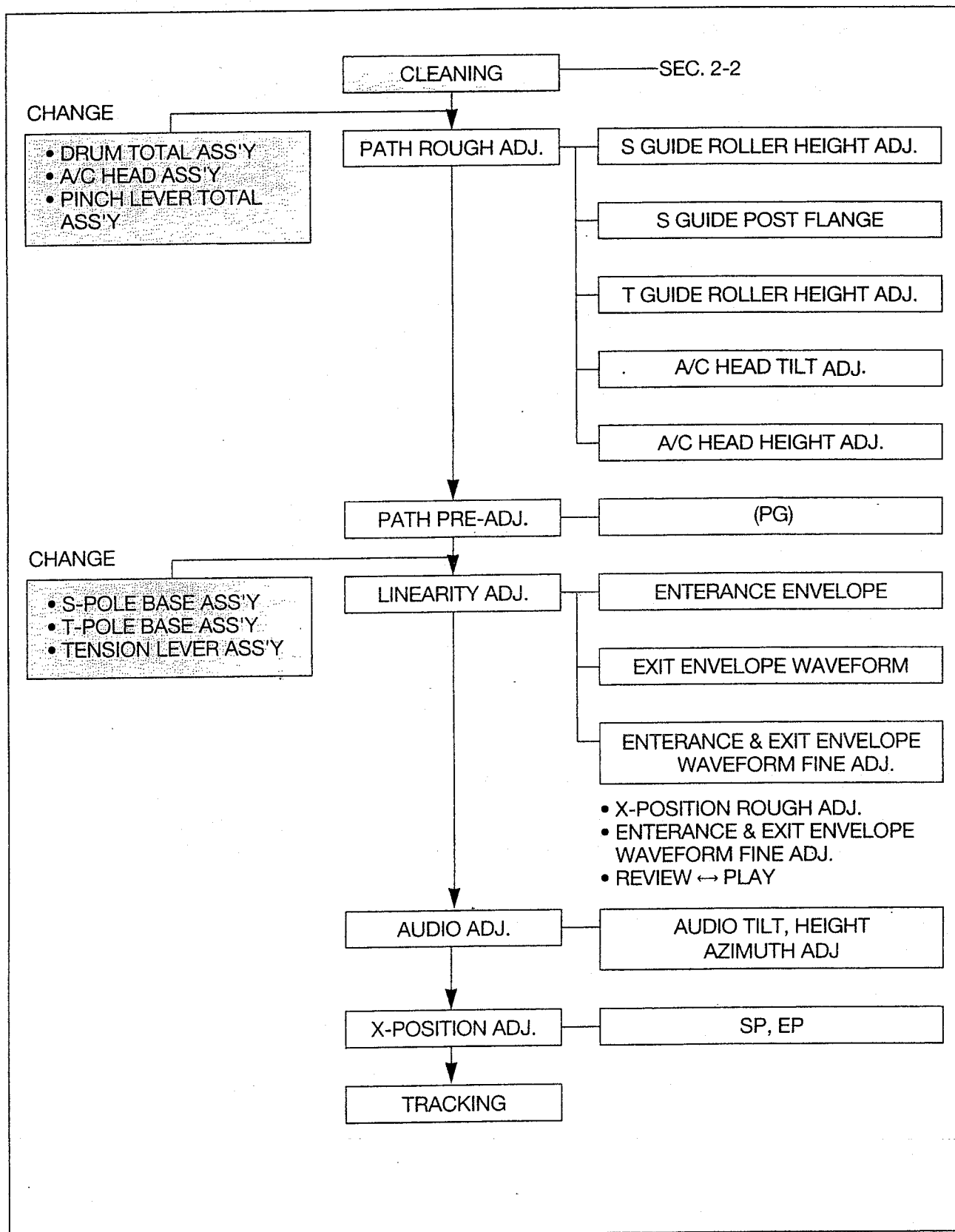


Fig. 5-1

2. ADJUSTMENT FLOW



3. ADJUSTMENT PROCEDURES

1) ROUGH ADJUSTMENT OF THE TAPE PATH

After loding T-160 Tape, play it.

1-1) THE HEIGHT ADJUSTMENT OF S & T GUIDE ROLLER

A. Make sure that the tape is creased or gapped at the UPPER FLANGE of S & T GUIDE ROLLER (refer to Fig. 5-1 ④, ⑧) and entrance and exit side of the LEAD LINE which was formed in the LOWER DRUM.

B. If the tape is creased or gapped, turn S, T GUIDE ROLLER and adjust the tape running to go smoothly.

1-2) TILT ADJUSTMENT OF A/C HEAD

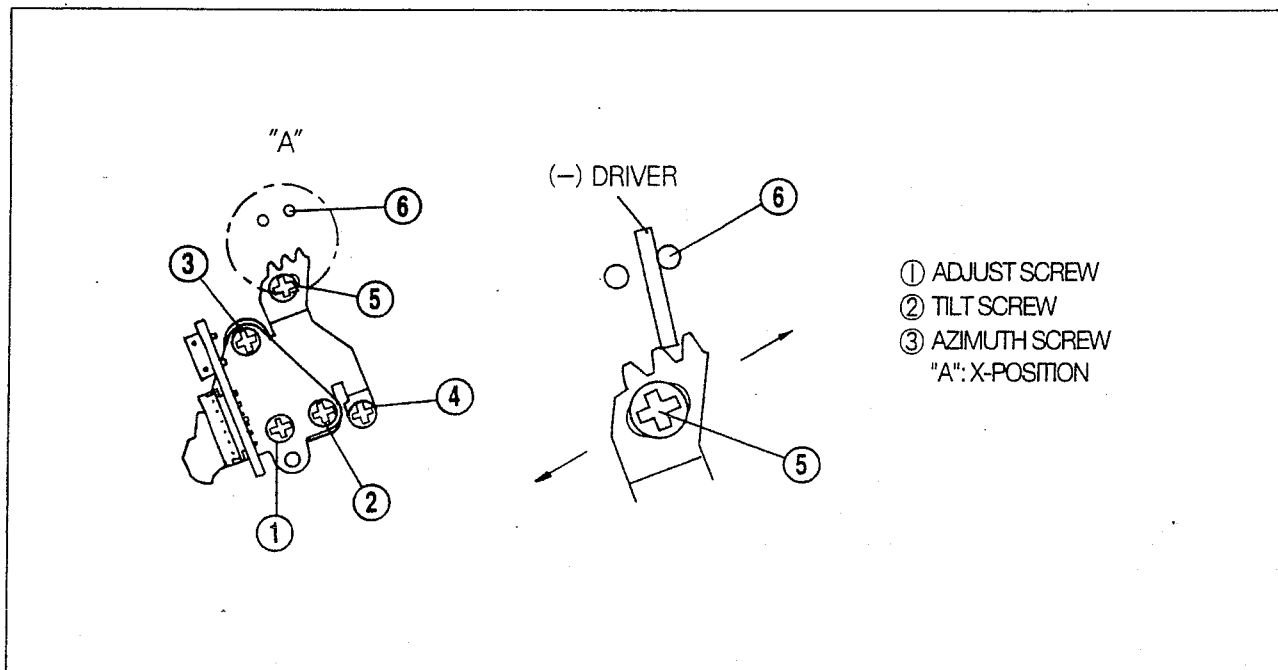


Fig. 5-2

A. Check the running state of the tape at the lower end of T GUIDE POST.

B. If the running state is extraordinary, adjust the TILT SCREW (refer to Fig. 5-2 ②) to obtain the running of tape normal as shown in Fig. 5-3.

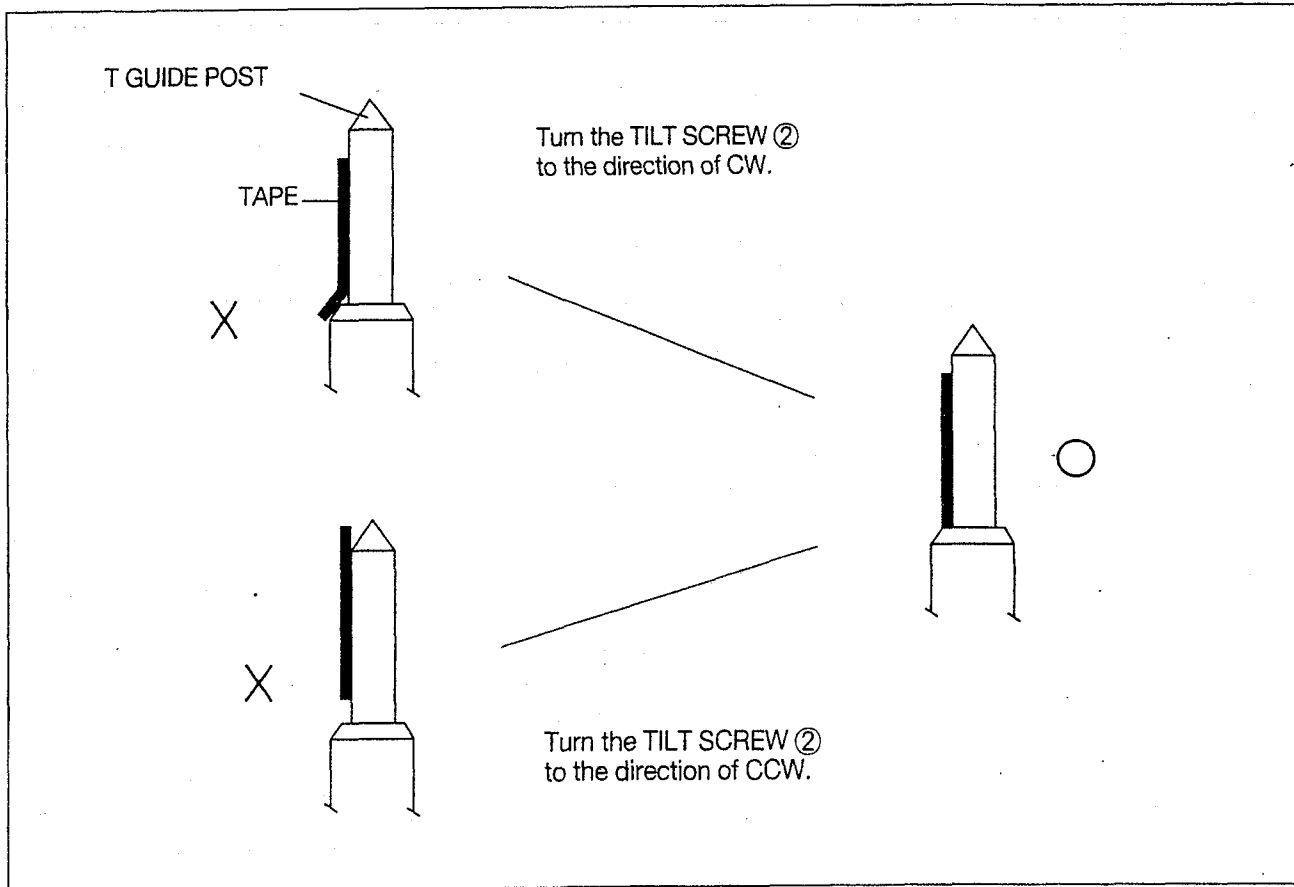


Fig. 5-3

1-3) THE HEIGHT ADJUSTMENT OF A/C HEAD

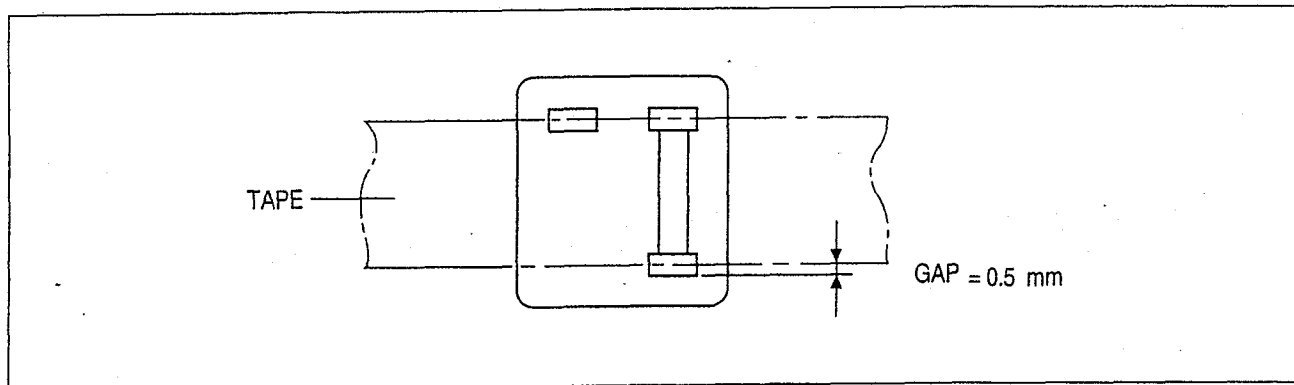


Fig. 5-4

- A. Make sure that the gap is 0.5mm between the lower end of tape and that of CTL HEAD.
- B. Turn and adjust the screw to CCW in order ① → ② → ③ when the gap is longer than 0.5mm.
- C. Turn and adjust the screw to CW in order ① → ② → ③ when the gap is shorter than 0.5mm.

2) PLAYBACK PHASE ADJUSTMENT (PG ADJUSTMENT)

- A. Connect the CH 1 of OSCILLOSCOPE to the TP 01-3 (HEAD SWITCHING PULSE) and connect the CH 2 to the VIDEO OUT and adjust the TRACKING VR to the center.
- B. Play back the STAIR STEP SIGNAL TAPE (DN-2).
- C. Adjust the PG VOLUME for time interval of $6.5H \pm 0.5H$ between switching pulse and V-sync signal.

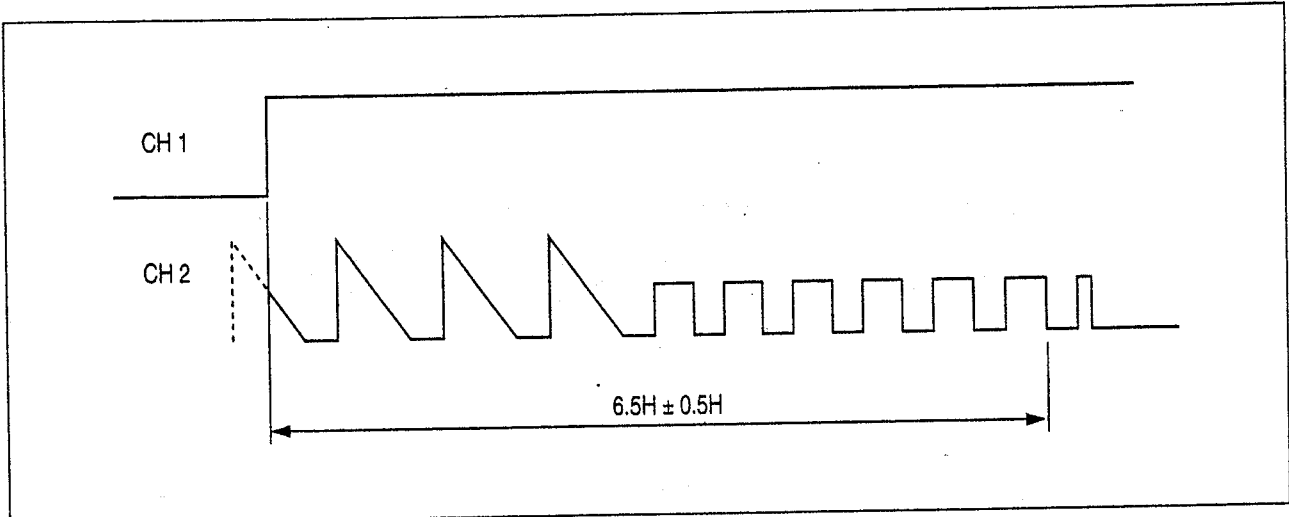


Fig. 5-5

3) LINEARITY ADJUSTMENT

Connect the CH1 of the OSCILLOSCOPE to the TP01-2 (CTL PULSE).
CH2 to the TP01-4 (ENVELOPE WAVEFORM) and EXT. TRIGGER to the TP01-3 (SWITCHING PULSE)
and play back the TEST TAPE in SP mode.

3-1) AJUSTMENT OF THE S, T GUIDE ROLLER

- A. Adjust the TRACKING VR to obtain maximum FM SIGNAL of the TEST TAPE.
- B. Adjust the S, T GUIDE ROLLER (refer to Fig. 5-1 ④, ⑧) until the ENVELOPE waveform at the entrance and the exit sides is as shown in Fig. 5-6.

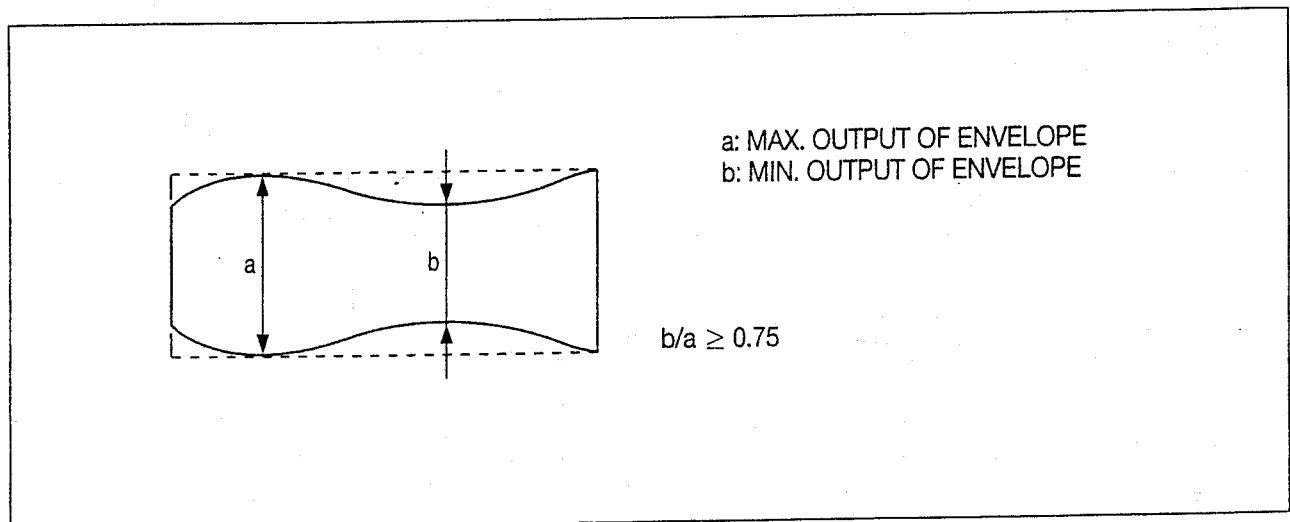


Fig. 5-6

3-2) ROUGH ADJUSTMENT OF THE X-POSITION

- A. Turn the TRACKING VR to center.
- B. Release the ④, ⑤ screw of the AC HEAD in Fig.5-2 about 90-120 degrees.
- C. Turn the AC HEAD TOT AS to obtain maximum ENVELOPE waveform by using the (-) driver as shown in Fig. 5-2.

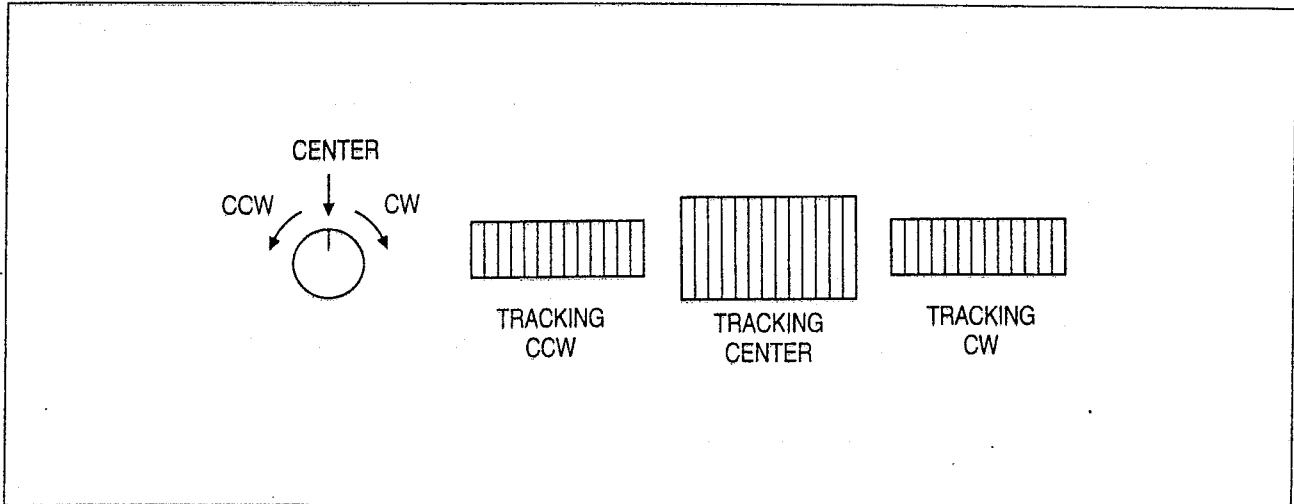


Fig. 5-7

3-3) THE FINE ADJUSTMENT OF THE ENTRANCE AND THE EXIT SIDES OF ENVELOPE WAVEFORM

- A. Turn the TRACKING VR to CW or CCW and check the ENVELOPE waveform is changed uniformly.
- B. If the ENVELOPE waveform as shown in Fig.5-8, 9, 10 is not uniform, adjust the S, T GUIDE ROLLER repeatedly at the point of nonflat.

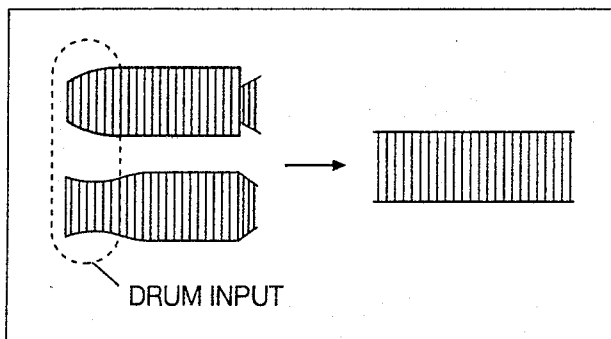


Fig. 5-8

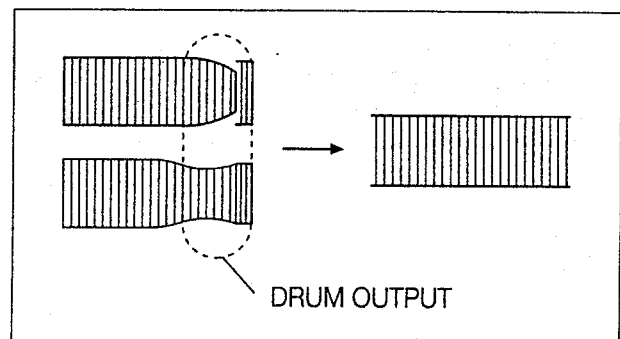


Fig. 5-9

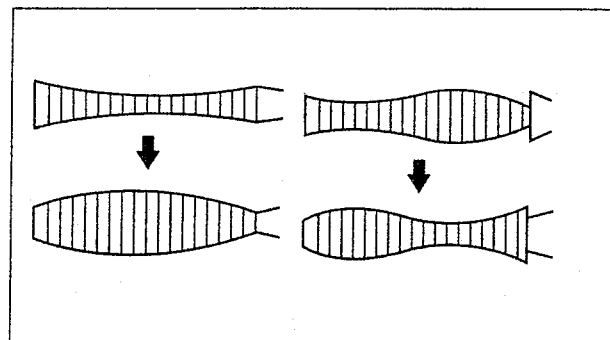


Fig. 5-10

3-4) CHECK FOR TRANSITIONAL OPERATION FROM REVIEW WAVEFORM TO PLAY WAVEFORM

A. Play back DN-2 test tape (Recorded Stairstep signal in SP mode).

B. Make sure the ENVELOPE waveform is maximum.

C. Review the tape and push the PLAY BUTTON after 5 seconds at least.

Check whether the ENVELOPE waveform is returned to the normal PLAY waveform or not within 3 seconds and there is any noise at the upper and lower side of monitor.

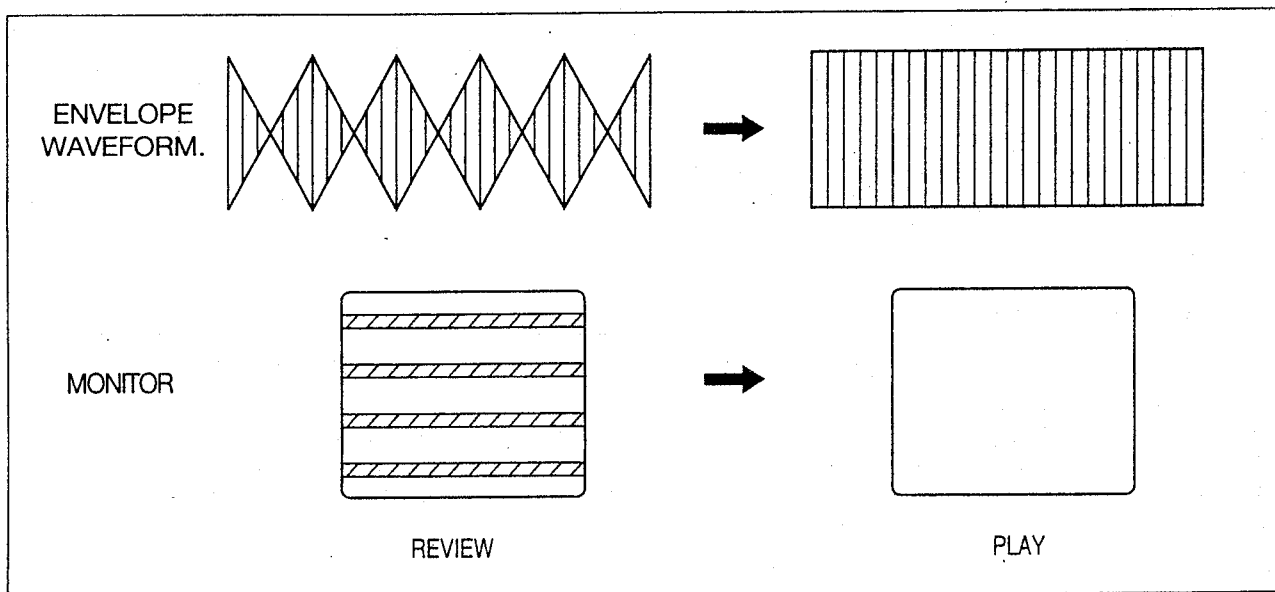


Fig. 5-11

D. In case return of the ENVELOPE waveform at the entrance and the exit sides is slow or the noise is occurred at the upper or lower side of monitor, check the running state of tape at the lower end of T GUIDE POST. If the tape is creased, re-adjust the S, T GUIDE ROLLER.

4) AUDIO ADJUSTMENT

Make sure no tape wrinkle is caused at the lower end of T GUIDE POST during play and if not, perform the audio adjustment.

4-1) ADJUSTMENT OF THE AUDIO TILT AND HEIGHT

A. Connect the AUDIO OUTPUT to the AUDIO LEVEL METER.

B. Play back the DN-1 (COLOR BAR) and check the level of the AUDIO OUTPUT.

SPEC.: MIN. OUTPUT -4.5~-8.5dBm.

C. In case the output of 1KHz is out of the specification, re-adjust the TILT and the HEIGHT of AC HEAD at the same method as 1-2) and 1-3).

4-2) AUDIO AZIMUTH ADJUSTMENT

A. In state of the connecting AUDIO OUTPUT to AUDIO LEVEL METER, play back the DN-2 tape (STAIRSTEP: 7KHz).

B. Adjust the AUDIO output to be maximum by turning of AC HEAD AZIMUTH SCREW (refer to Fig. 5-2 ③).

SPEC.: MIN OUTPUT: -8.5~-12.5DBM

THE DIFFERENCE BETWEEN 1KHz AND 7KHz: +2~-4dBm

THE RANGE OF CHANGE OF AUDIO LEVEL IN 7KHz: less than 1dBm.

C. After adjusting, check whether the tape is shaken or flickered during running in between T GUIDE ROLLER and AC HEAD.

If the problem is occurred, re-adjust the AUDIO.

D. After adjusting, reconfirm the ENVELOPE waveform.

If the problem is occurred, perform the fine adjustment of the entrance and the exit sides of ENVELOPE WAVEFORM at the article 3-3) method.

5) X-POSITION ADJUSTMENT

A. Connect CH 1 of the OSCILLOSCOPE with TP01-2 (CTL PULSE), CH2 with TP01-4 (ENVELOPE) and EXIT. TRIGGER with TP01-3 (SWITCHING PULSE).

B. After tuning the TRACKING VR to center, play back the TEST TAPE (SP MODE).

C. Turn the AC HEAD TOT AS by using (-) driver in the same method as Fig. 5-2 in order that the ENVELOPE waveform is as shown in Fig. 5-12 when the TRACKING VR is turned to CW or CCW.

D. After adjust the X-POSITION, please confirm the PG.

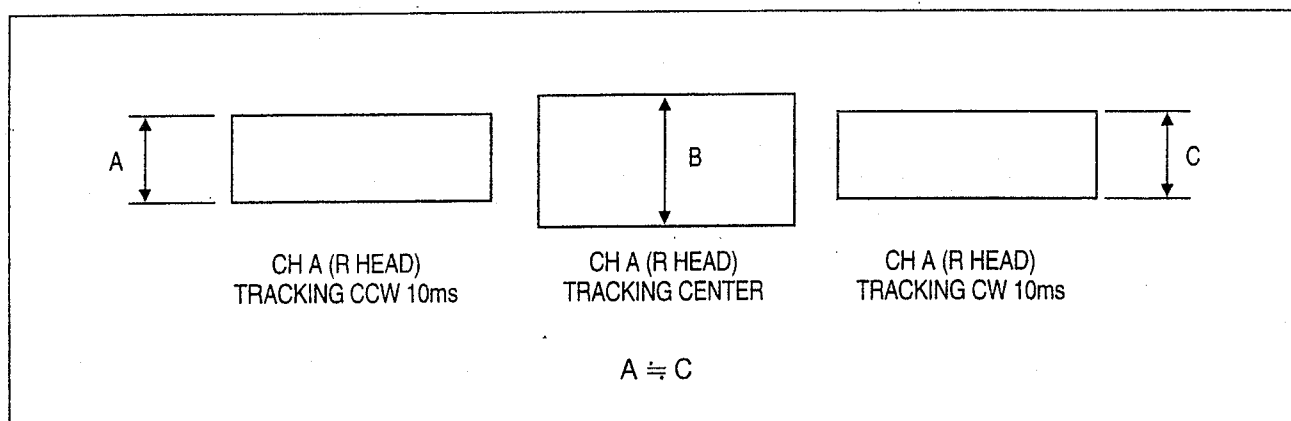


Fig. 5-12

- D. Play back the DN-2E TEST TAPE (EP MODE) and check whether there is the nature of direction as shown Fig. 5-13.
(It has not to change of waveform and there is not any noise in the picture from CCW 4ms to CW 6ms of TRACKING VR)

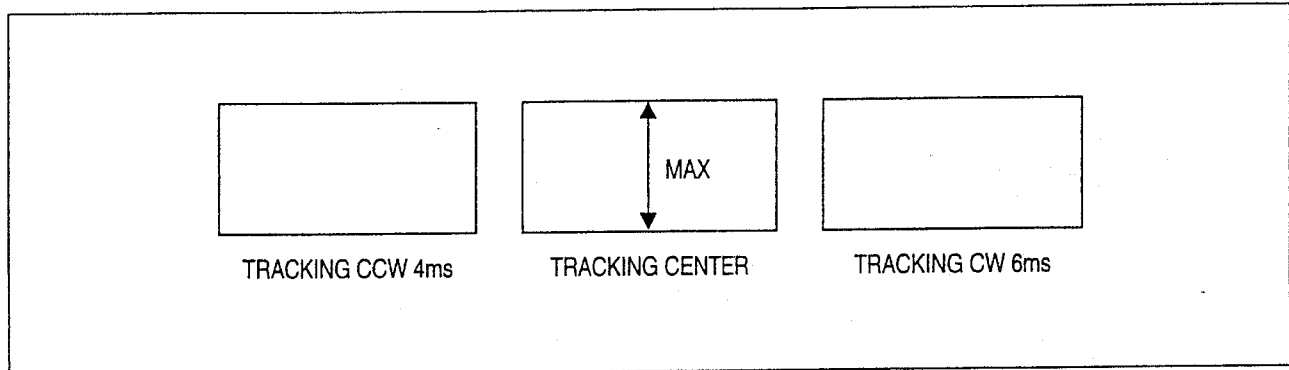
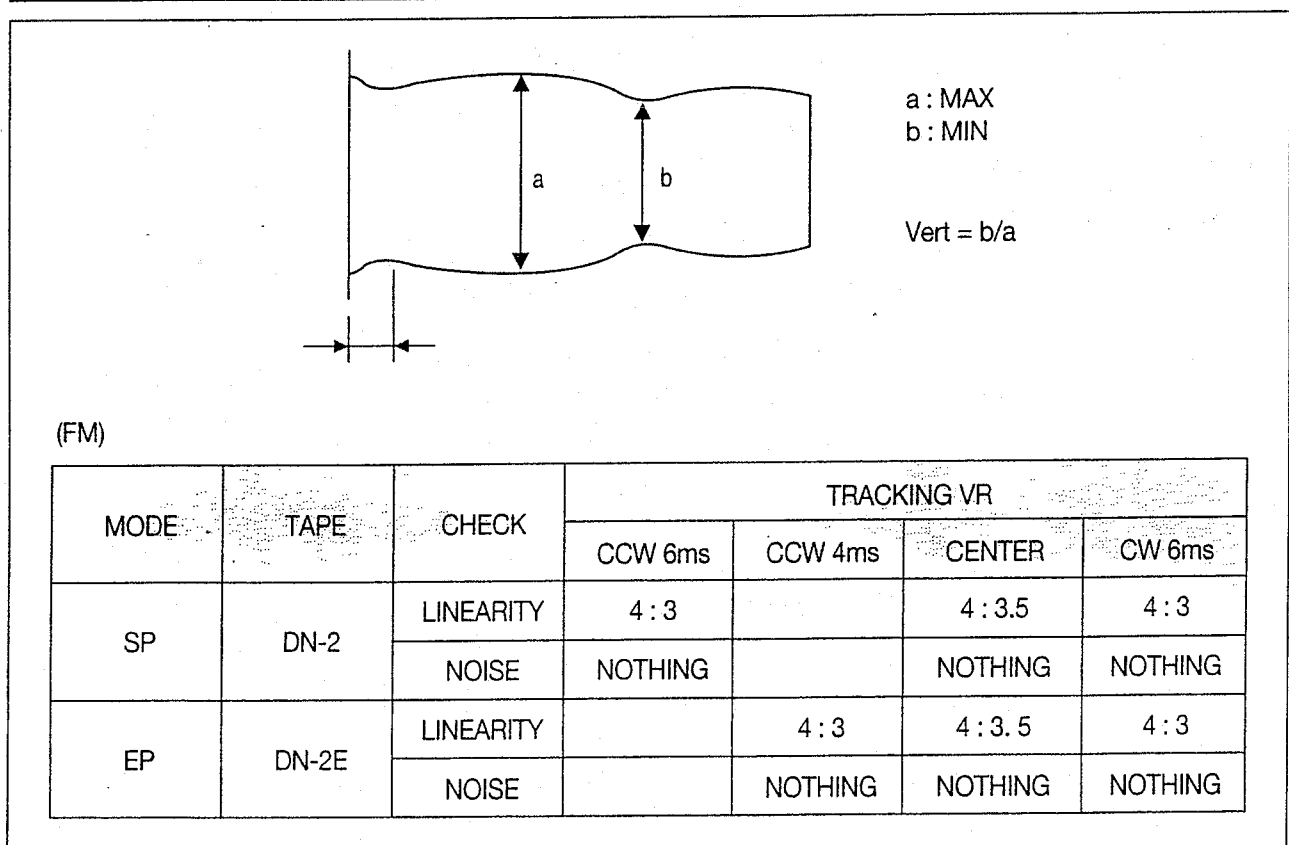


Fig. 5-13

- E. If not, re-adjust from the article B.
F. After adjusting X-POSITION, check whether 7KHz output of DN-2 is maximum.
G. When the adjustment is completed, fasten the AC HEAD SCREW ④, ⑤ suitably.

6) CHECK FOR THE LINEARITY OF CO-EXCHANGING TRACKING

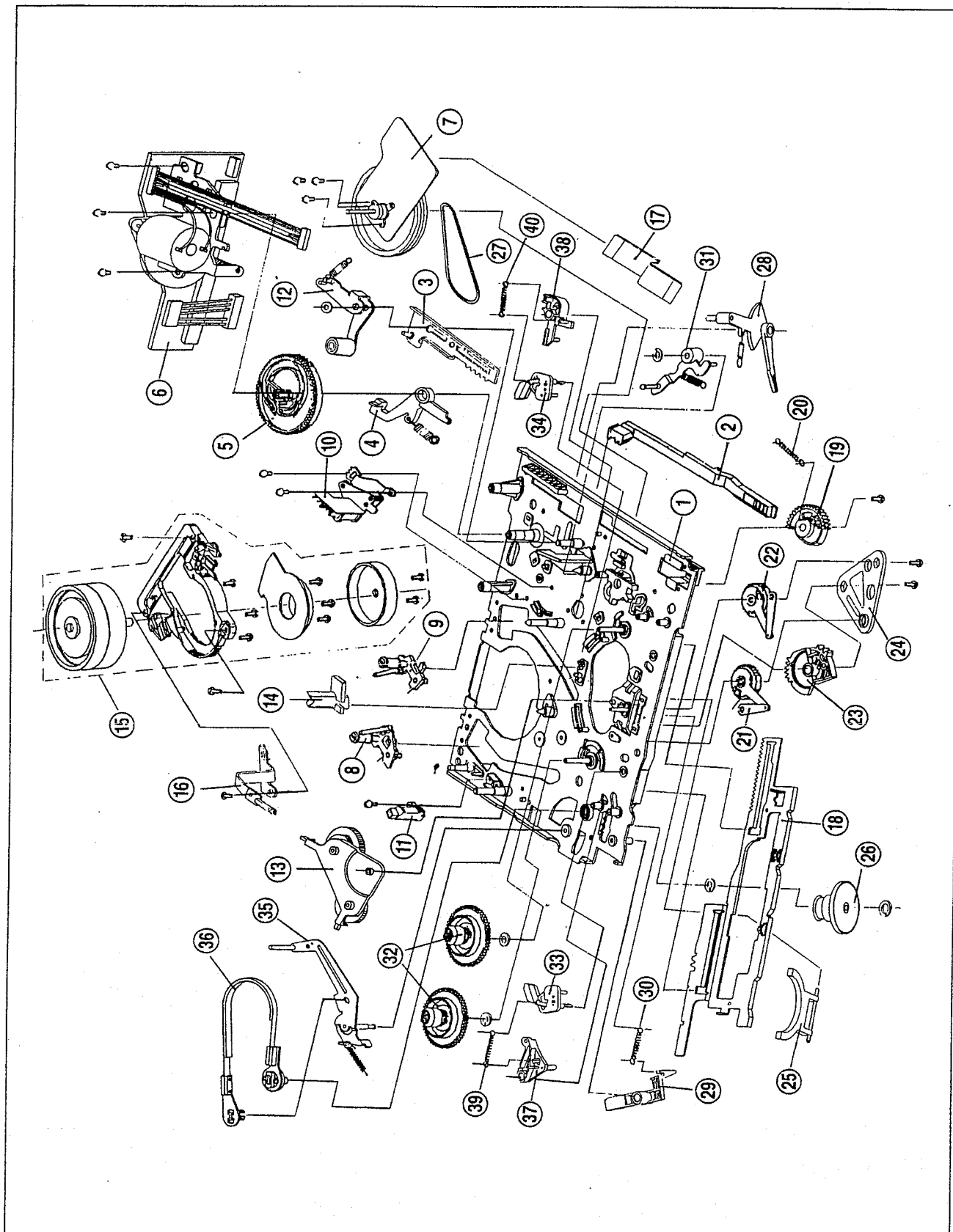


7) FINAL CHECK

Make sure no tape wrinkle is caused at each GUIDER ROLLER and POST.

6. EXPLODED VIEW AND PARTS LIST

1. EXPLODED VIEW OF DECK ASS'Y

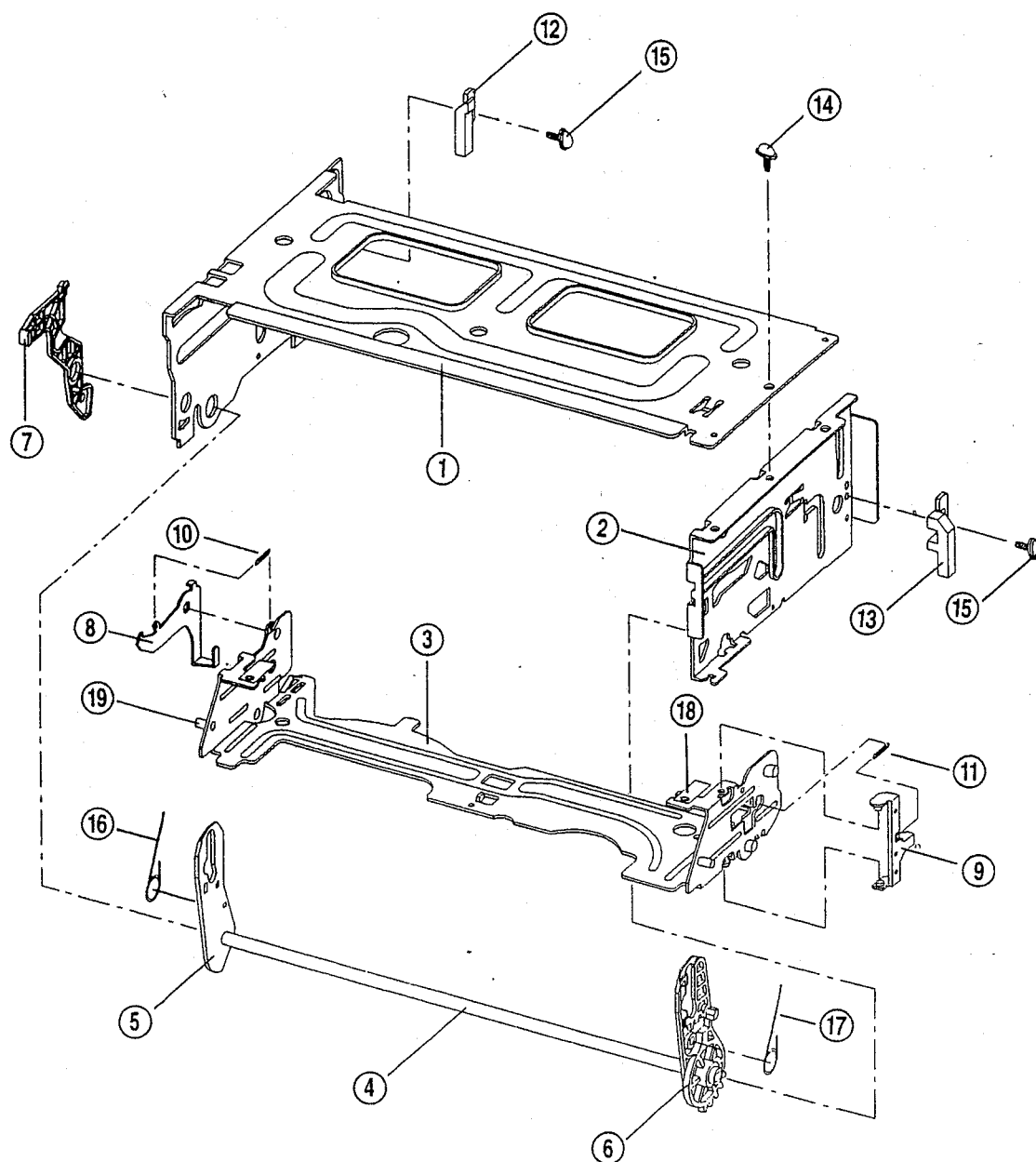


2. PARTS LIST OF DECK ASS'Y

NO	STOCK NO.	PART NAME	Q'TY	REMARKS
1	97SA300400	MAIN BASE AS	1 EA	
2	97S2700100	F/L DRIVE RACK	1 EA	
3	97SA300500	RELAY PLATE AS	1 EA	
4	97SA304700	RETURN LEVER AS	1 EA	
5	97S2700200	CAM GEAR	1 EA	
6	97SA300700	L/C BRKT AS	1 EA	
7	97S8100100	CAPSTAN MOTOR	1 EA	
8	97SA300800	S SLANT POLE AS	1 EA	
9	97SA300900	T SLANT POLE AS	1 EA	
10	97SA302000	A/C HEAD TOT AS	1 EA	
11	97S8000600	FE HEAD	1 EA	
12	97SA300600	PINCH LEVER TOT AS	1 EA	
13	97SA301400	IDLER PLATE AS	1 EA	
14	97S2601300	LED PRISM LINK	1 EA	
15	97SA245800 97SA247000 97SA246000 97SA246200 97SA247200 97SA246200 97SA249600	DRUM TOTAL AS DRUM TOTAL AS DRUM TOTAL AS DRUM TOTAL AS DRUM TOTAL AS DRUM TOTAL AS DRUM TOTAL AS	1 EA 1 EA 1 EA 1 EA 1 EA 1 EA 1 EA	NTSC 2H'D NTSC 4H'D PAL 2H'D SP PAL 2H'D LP PAL 4H'D SECAM 2H'D SECAM 4H'D
16	97SA302100	EARTH BRKT AS	1 EA	
17	97P88F0908	CABLE FFC AS	1 EA	
18	97S0900200	MAIN PLATE	1 EA	
19	97S2700600	RELAY GEAR	1 EA	
20	97S3002400	RELAY SPRING	1 EA	
21	97SA301000	L LOADING GEAR AS	1 EA	
22	97SA301100	R LOADING GEAR AS	1 EA	
23	97S2700700	LOAD RELAY GEAR	1 EA	
24	97S0900300	LOADING GUIDE PLATE	1 EA	
25	97S2600700	CLUTCH LEVER	1 EA	
26	97SA301200	REEL DRIVE TOTAL AS	1 EA	
27	97S5500200	REEL BELT	1 EA	
28	97SA301300	CAPSTAN BRAKE AS	1 EA	4H'D ONLY

NO	STOCK NO.	PART NAME	Q'TY	REMARKS
29	97S2600800	REC SAFETY LEVER	1 EA	
30	97S3000900	REC SAFETY SPRING	1 EA	
31	97SA301900	REVIEW ARM AS	1 EA	
32	97S2900200	REEL TABLE	2 EA	
33	97SA301500	S MAIN BRAKE AS	1 EA	
34	97SA301700	T MAIN BRAKE AS	1 EA	
35	97SA301800	TENSION LEVER AS	1 EA	
36	97SA302400	BAND BRAKE TOTAL AS	1 EA	
37	97S5700100	S SUB BRAKE	1 EA	
38	97SA301600	T SUB BRAKE AS	1 EA	
39	97S3002200	S BRAKE SPRING	1 EA	
40	97S3002300	T BRAKE SPRING	1 EA	

3. EXPLODED VIEW OF F/L ASS'Y



4. PARTS LIST OF F/L ASS'Y

NO	STOCK NO.	PART NAME	Q'TY	REMARKS
1	97S2400500	TOP PLATE	1 EA	
2	97S2400400	F/L BRKT R.	1 EA	
3	97S0900700	CST HOLDER PLATE	1 EA	
4	97S3600200	LOADING SHAFT	1 EA	
5	97S2601800	LOADING LEVER L	1 EA	
6	97S2601600	LOADING LEVER R	1 EA	
7	97S1800400	DOOR OPENER	1 EA	
8	97S2601500	SAFETY LEVER	1 EA	
9	97S2602400	RELEASE LEVER	1 EA	
10	97S3001800	SAFETY SPRING	1 EA	
11	97S3001700	RELEASE SPRING	1 EA	
12	97S2602200	PRISM LINK L	1 EA	
13	97S2602100	PRISM LIMK R	1 EA	
14	7274260611	TAPTITE SCREW (TT3 WAS 3x6 MFZN)	1 EA	
15	7278300611	TAPTITE SCREW (TT3 WAS 3x6 MFZN)	2 EA	
16	97S3002100	LEVER L SPRING	1 EA	
17	97S3002000	LEVER R SPRING	1 EA	
18	97S3001500	UPPER SPRING	2 EA	
19	97S3502200	HOLDER POST	1 EA	

5. MAIN SPARE PARTS LIST OF DECK ASS'Y

NO.	PART NAME	STOSK NO.	DESCRIPTION	Q'TY	REMARKS
1	F/L DRIVE RACK	97S2700100	PBT (DY44100 GF)	3 EA	
2	RELAY PLATE AS	97SA300500	FM-DECK	3 EA	
3	RETURN LEVER AS	97SA304700	FM-DECK	3 EA	
4	CAM GEAR	97S2700200	POM (DELTRIN 500)	3 EA	
5	L/C BRKT AS	97SA300700	FM-DECK	3 EA	
6	CAPSTAN MOTOR	97S8100100	F2QTB00	3 EA	
7	S SLANT POLE AS	97SA300800	FM-DECK	1 EA	
8	T SLANT POLE AS	97SA300800	FM-DECK	1 EA	
9	A/C HEAD TOT AS	97SA302000	FM-DECK	3 EA	
10	FE HEAD	97S8000600	MH-131D	3 EA	RECORD
11	PINCH LEVER TOT AS	97SA300600	FM-DECK	3 EA	
12	IDLER PLATE AS	97AS301400	FM-DECK	3 EA	
13	LED PRISM LINK	97S2601300	PMMA	1 EA	
14	DRUM TOTAL AS	97SA245800 97SA247000 97SA246000 97SA246200 97SA247200 97SA246200 97SA249600	FM-DECK FM-DECK FM-DECK FM-DECK FM-DECK FM-DECK FM-DECK	3 EA 3 EA 3 EA 3 EA 3 EA 3 EA 3 EA	NTSC 2H'D NTSC 4H'D PAL 2H'D SP PAL 2H'D LP PAL 4H'D SECAM 2H'D SECAN 4H'D
15	EARTH BRKT AS	97SA302100	FM-DECK	1 EA	
16	CABLE FFC AS	97P88F0908	FM-DECK	1 EA	
17	MAIN PLATE	97S0900200	EGSAFC 40R	3 EA	
18	RELAY GEAR	97S2700600	POM (DL8502)	1 EA	
19	RELAY SPRING	97S3002400	SWPB	1 EA	
20	L LOADING GEAR AS	97SA301000	FM-DECK	1 EA	
21	R LOADING GEAR AS	97SA301100	FM-DECK	1 EA	
22	LOAD RELAY GEAR	97S2700700	POM (DL8502)	1 EA	
23	LOADING GUIDE PLATE	97S0900300	SECC T1.0	1 EA	
24	CLUTCH LEVER	97S2600700	POM	1 EA	
25	REEL DRIVE TOTAL AS	97SA301200	FM-DECK	3 EA	
26	REEL BELT	97S5500200	CR	3 EA	
27	CAPSTAN BRAKE AS	97SA301300	FM-DECK	1 EA	4H'D ONLY
28	REC SAFETY LEVER	97S2600800	POM	3 EA	

NO.	PART NAME	STOSK NO.	DESCRIPTION	Q'TY	REMARKS
29	REC SAFETY SPRING	97S3000900	SUS304 WPB	1 EA	
30	REVIEW ARM AS	97SA301900	FM-DECK	1 EA	
31	REEL TABLE	97S2900200	POM	1 EA	
32	S MAIN BRAKE AS	97SA301500	FM-DECK	3 EA	
33	T MAIN BRAKE AS	97SA301700	FM-DECK	3 EA	
34	TENSION LEVER AS	97SA301800	FM-DECK	1 EA	
35	BAND BRAKE TOTAL AS	97SA302400	FM-DECK	1 EA	
36	S SUB BRAKE	97S 5700100	POM	3 EA	
37	T SUB BRAKE AS	97SA301600	FM-DECK	3 EA	
38	S BRAKE SPRING	97S3002200	SWPB	1 EA	
39	T BRAKE SPRING	97S3002300	SUS304 WPB	1 EA	
40	F/L AS	97SA245000	FM-DECK	3 EA	
41	POLY WASHER	97S3108200	d2.6xD6xT0.5	5 EA	
42	POLY WASHER	97S3106300	d3.6xD6xT0.5	5 EA	
43	POLY WASHER	97S3904000	d3.1xD6xT0.25	5 EA	
44	POLY WASHER	97S3903600	d3.1xD6xT0.5	5 EA	
45	TAPTITE SCREW	7044301011	TT3 RND 3x10 MFZN	5 EA	
46	TAPTITE SCREW	7274301211	TT3 RND 3x12 MFZN	5 EA	
47	TAPTITE SCREW	7278260611	TT3 RND 2.6x6 MFZN	5 EA	
48	TAPTITE SCREW	7171261011	TT2 RND 2.6x10 MFZN	5 EA	
49	TAPTITE SCREW	7178300811	TT2 RND 3x8 MFZN	10 EA	
50	MACHINE SCREW	7001301011	PAN 3x10 MFZN	5 EA	