TEAC

ADDENDUM
SERVICE MANUAL

MV-4850 \ 3450
TELEVIDEO

Addendum to MV-4850/3450 Service Manual.

This is a Technical Service Guide Only for the Video Mechanism.

Effective: November, 1996

MV4850ADDEN

CONTENTS

1. MECHANICAL DESCRIPTION

1-1. CHARACTERISTIC OF G-MECHA MECHANISM

1) G-Mecha follows the VHS STANDARDS and corresponds to the NTSC/PAL TV.
2) G-Mecha has three motors (Drum Motor, Capstan Motor and L/C Motor).
3) G-Mecha uses L/C Motor to drive Front Loading.
4) G-Mecha realizes its mode by the 4-bit mode signal which is executed by the Mode Switch driven by a L/C Motor.
5) G-Mecha is a slim type DECK with 81.5 mm height.
6) G-Mecha has reduced the consuming time of the mode converting, especially picture appearing time on.TV by so-called, "The Full Loading System" which keeps the type always wrapped around the Drum.

1-2. MODE DESCRIPTION

1) EJECT MODE

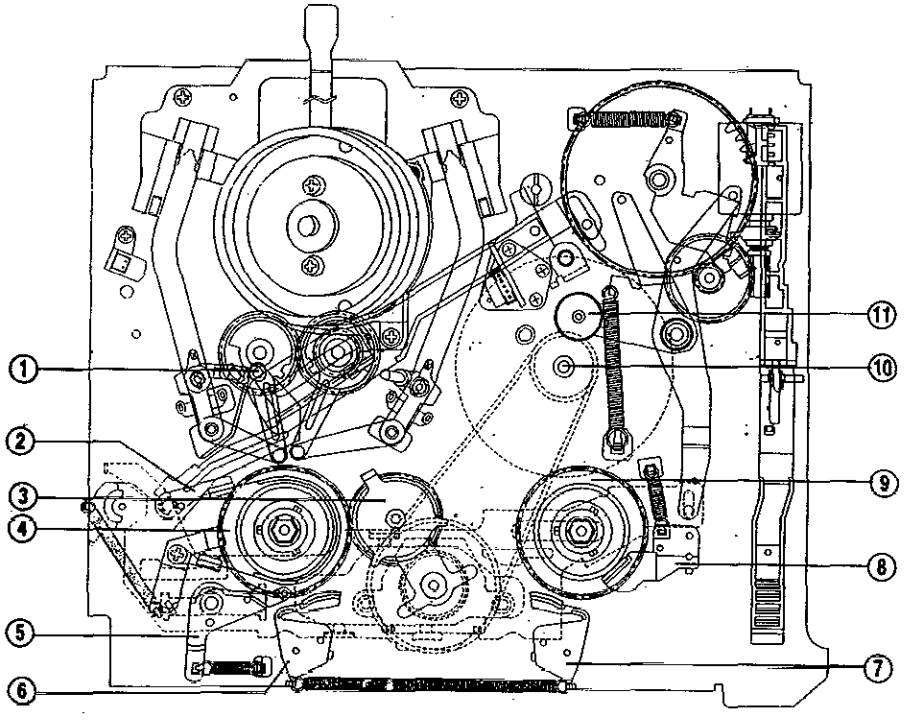
A. In this mode, the Cassette In/Out operation is performed by the CW/CCW rotation of the L/C Motor to which the Front Loading driving parts are directly related.

CASSETTE IN : If the Cassette is completely inserted into the predetermined postion of the Deck, the state of the Start Sensor is changed from OFF to ON and at the same time the Cassette In is detected. And instantly the Cassette loading is performed and the Mode proceeds to the Stop Mode.

CASSETTE OUT : In this state, the Cassette Holder is located at the entrance of the Front Pannel, the Start Sensor is ON 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 are released from the S & T-Reel Table.
c. The S-Sub Brake is released to the S-Reel Table.
d. The T-Sub Brake is applied to the T-Reel Table.
e. The Idler Gear is applied to the S-Reel Table.



① TENSION POLE
② BAND BRAKE
③ IDLER GEAR
④ S-REEL TABLE
⑤ S-SUB BRAKE
⑥ S-MAIN BRAKE
⑦ T-MAIN BRAKE
⑧ T-SUB BRAKE
⑨ T-REEL TABLE
⑩ CAPSTAN SHAFT
⑪ PINCH ROLLER

Fig. 1-1. EJECT MODE

2) INITIAL MODE

A. INITIAL MODE is performed between EJECT MODE and LOADING MODE. Also this is used as the reference mode determining whether or not Cassette Down has finished completely when Cassette In is performed and whether or not the unloading has finished when the state proceeds from STOP MODE to EJECT MODE.

B. Mechanical Arrangement
   a. The S & T-Main Brake are released from the S & T-Reel Table.
   b. The Band Brake is released from the S-Reel Table.
   c. The S-Sub Brake is applied to the S-Reel Table.
   d. The T-Sub Brake is applied to the T-Reel Table.
   e. The Idler Gear is applied to the S-Reel Table.

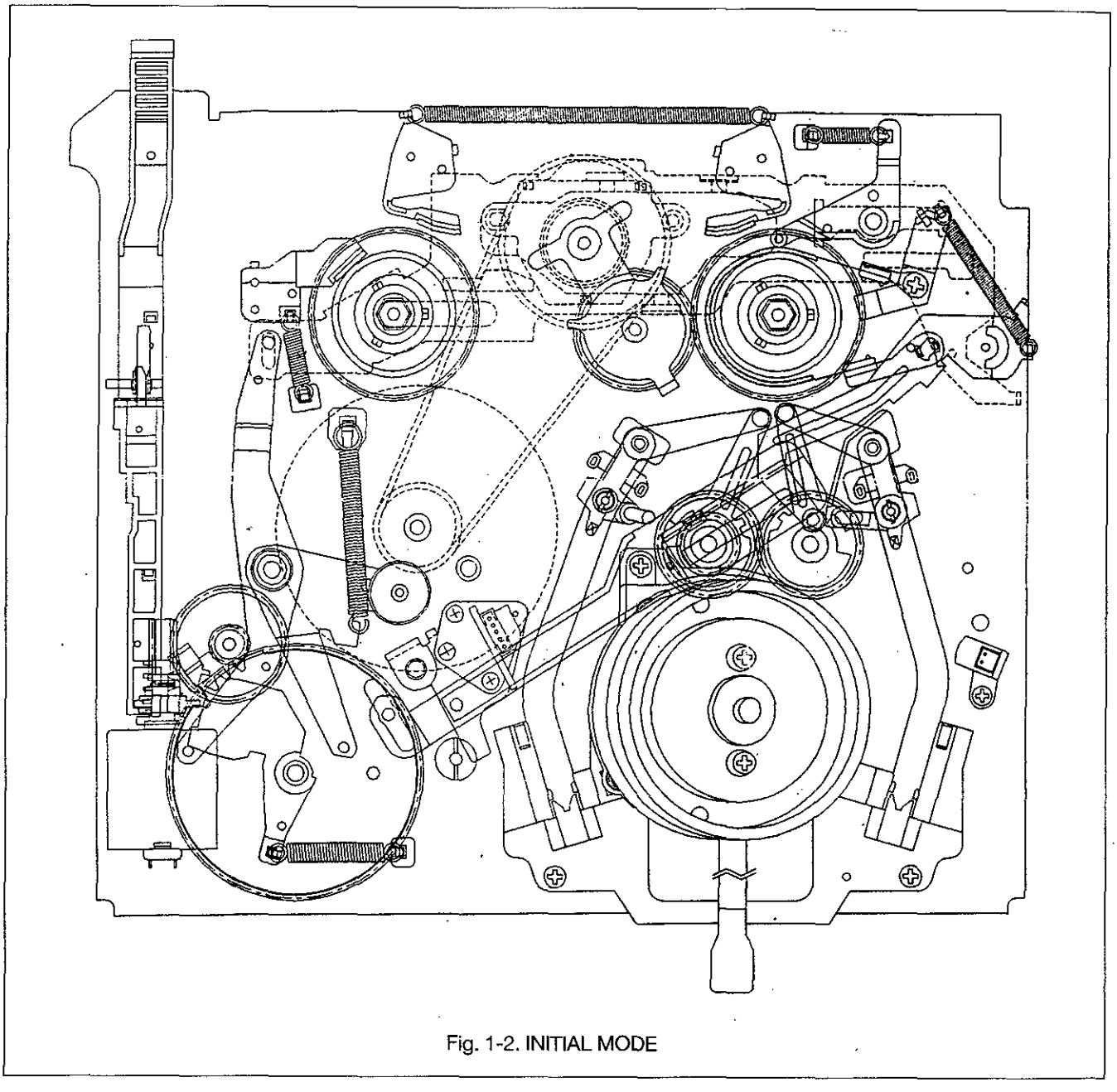


Fig. 1-2. INITIAL MODE

3) LOADING MODE

A. LOADING MODE is performed between INITIAL MODE and STOP MODE. Also this mode is used as the reference mode which checks for the loading and unloading of the Pole Base.

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 T-Sub Brake is applied to the T-Reel Table.
   e. The Idler Gear is located near the T-Reel Table.

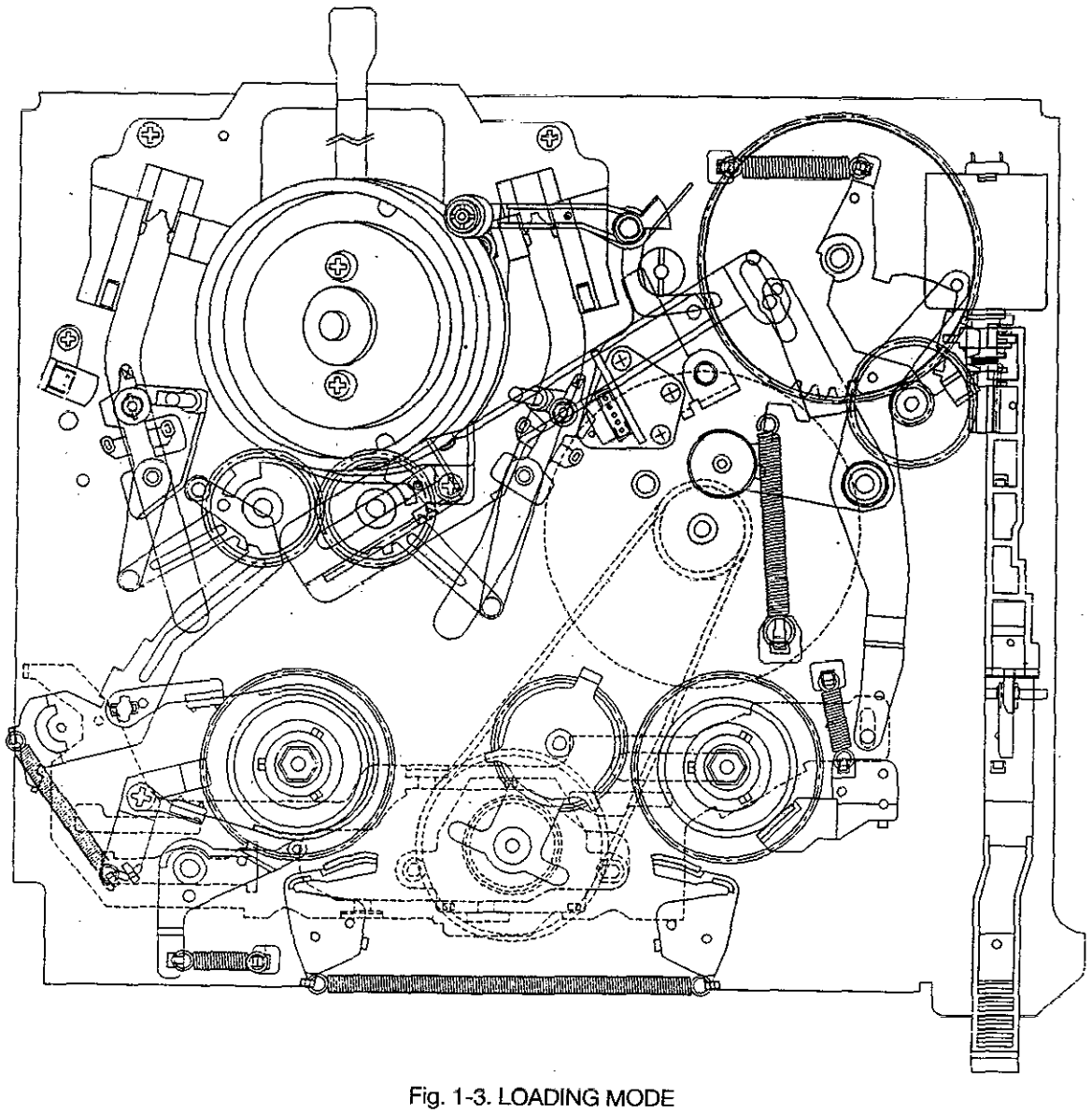


Fig. 1-3. LOADING MODE

4) REVIEW MODE

A. The Review Search operation is performed in this mode. This mode is obtained by pushing the REVIEW BUTTON in the PLAY MODE. The L/C Motor rotates 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 Motor starts to rotate CCW.

B. Mechanical Arrangement
   a. The S & T Pole Base are fully loaded to the V-Block of the Drum Base.
   b. The Band Brake is released from the S-Reel Table.
   c. The S & T-Main Brake are released from the S & T-Reel Table.
   d. The S-Sub Brake is applied to the S-Reel Table
   e. The T-Sub Brake is applied to the T-Reel Table.
   f. The Idler Gear is applied to the S-Reel Table.
   g. The Pinch Roller is applied to the Capstan Shaft to transport the tape reversely.

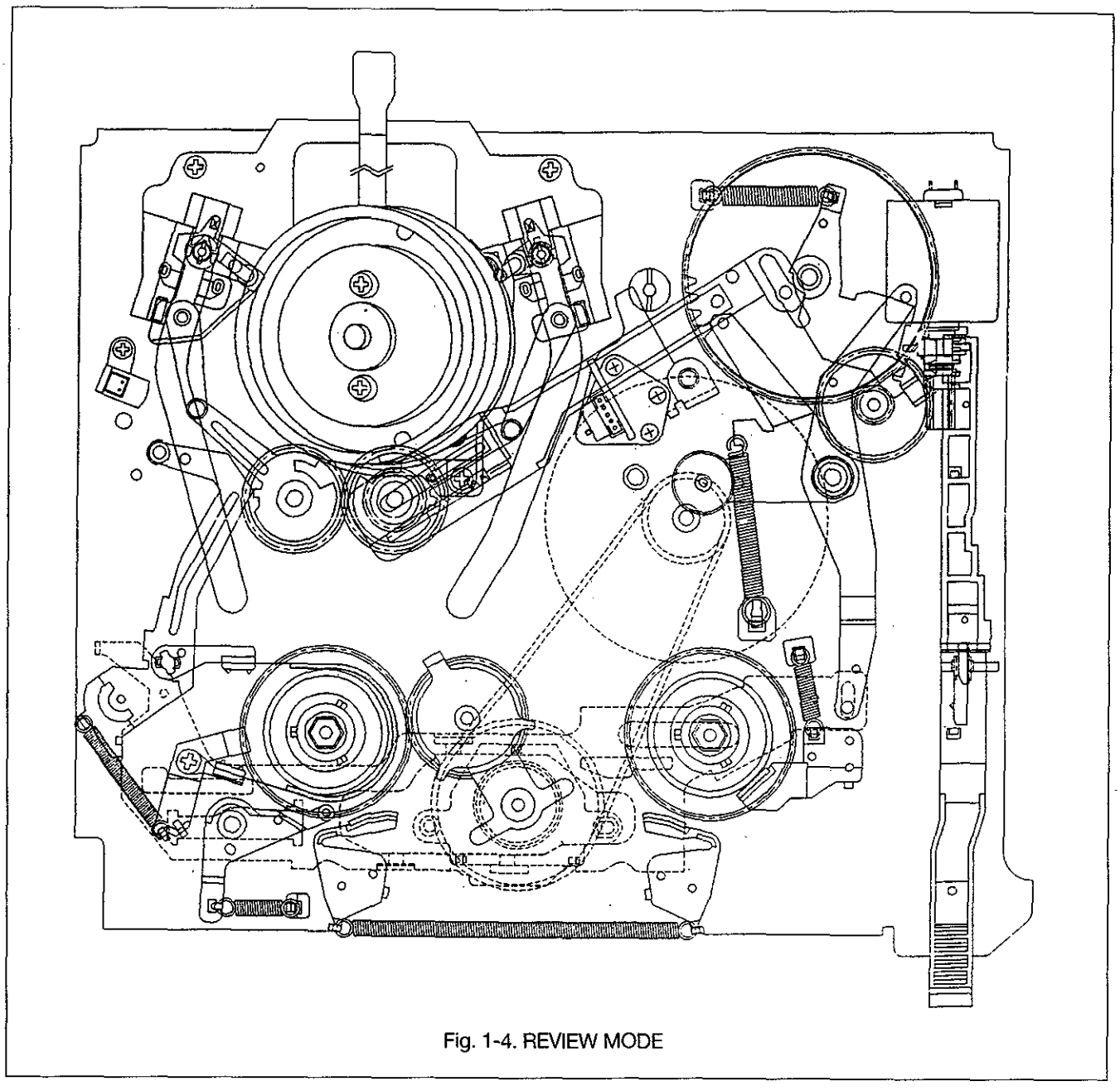


Fig. 1-4. REVIEW MODE

5) STOP MODE

A. This STOP MODE is completely performed by means of the loading operation from the INITIAL MODE.
The cassette tape is wrapped around the Drum to perform the other mode operation quickly (Remind that the Fully Loading System realizes the Quck Response and Quick Start Function).

B. Mechanical Arrangement
a. The Tension Pole is on its predetermined position.
b. The Pinch Roller is waiting to contact to the Capstan Shaft.
c. The Band Brake is applied to the S-Reel Table.
d. The S & T-Main Brake are released from S & T-Reel Table.
e. The S-Sub Brake is released from the S-Reel Table.
f. The T-Sub Brake is applied to the T-Reel Table.
g. The Idler Gear is located near the S-Reel Table.

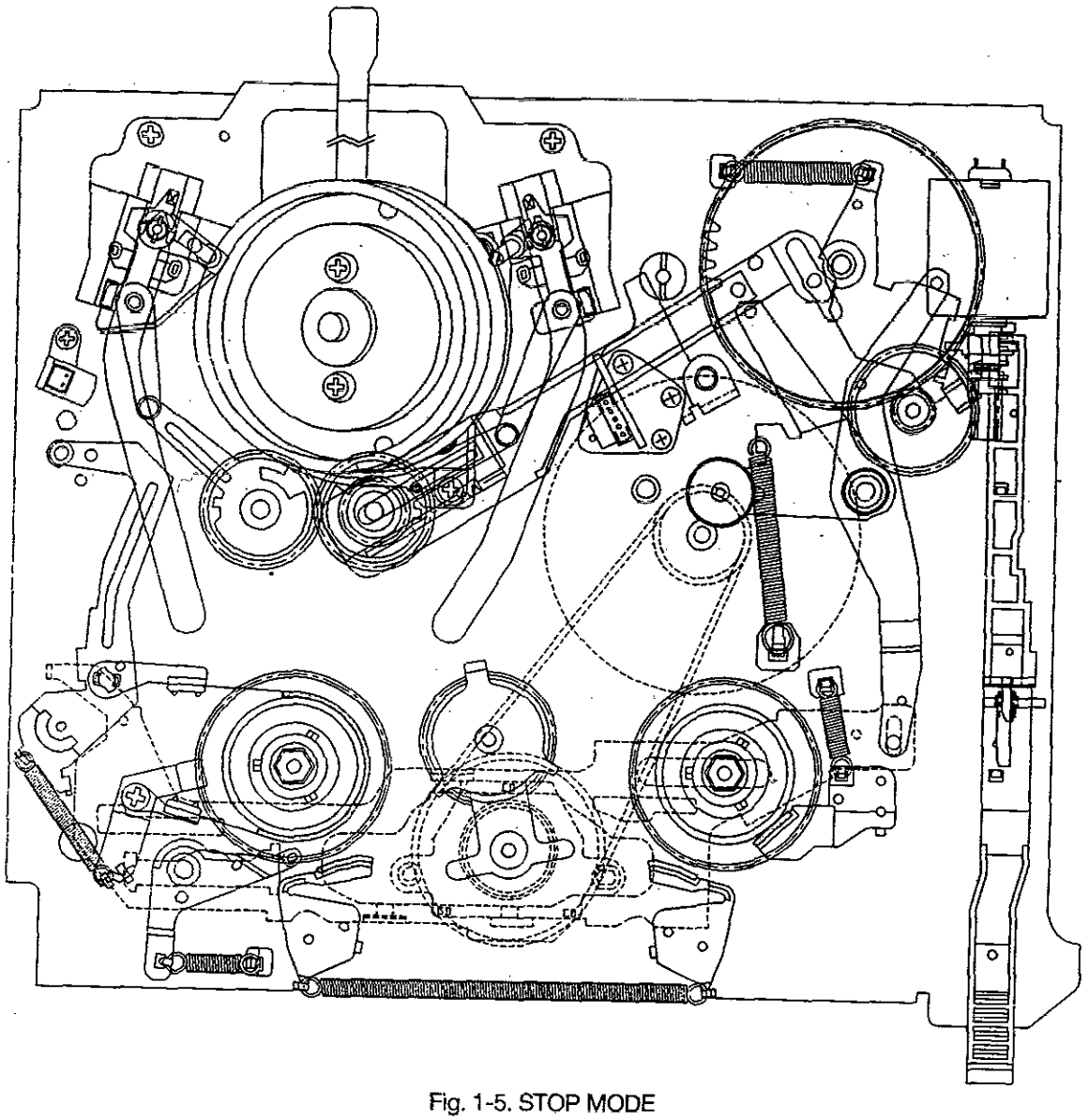


Fig. 1-5. STOP MODE

6) PLAY/RECORDING MODE

A. In this mode, the cassette tape is transported to the T-Reel Table at the constant speed.

B. Mechanical Arrangement
   a. The Tension Pole is on its predetermined position.
   b. The Band Brake is applied to the S-Reel Table to execute the TENSION SERVO.
   c. The Pinch Roller is applied to the Capstan Shaft to transport the tape at the constant speed.
   d. The S & T-Main Brake are released from the S & T-Reel Table.
   e. The S-Sub Brake is released from the S-Reel Table.
   f. The T-Sub Brake is applied to the T-Reel Table.

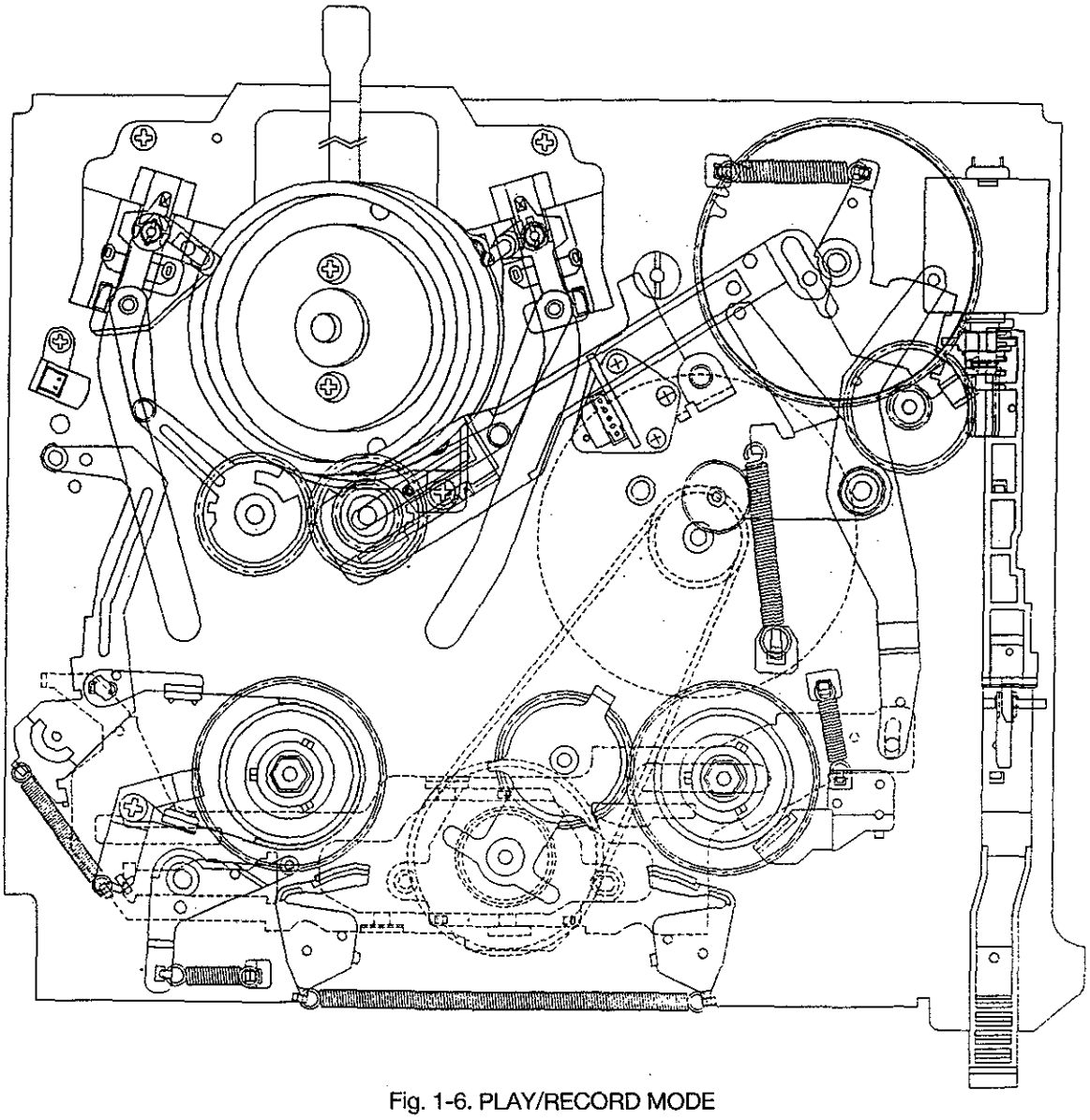


Fig. 1-6. PLAY/RECORD MODE

5) STOP MODE

A. This STOP MODE is completely performed by means of the loading operation from the INITIAL MODE.
The cassette tape is wrapped around the Drum to perform the other mode operation quickly (Remind that the Fully Loading System realizes the Quck Response and Quick Start Function).

B. Mechanical Arrangement
a. The Tension Pole is on its predetermined position.
b. The Pinch Roller is waiting to contact to the Capstan Shaft.
c. The Band Brake is applied to the S-Reel Table.
d. The S & T-Main Brake are released from S & T-Reel Table.
e. The S-Sub Brake is released from the S-Reel Table.
f. The T-Sub Brake is applied to the T-Reel Table.
g. The Idler Gear is located near the S-Reel Table.

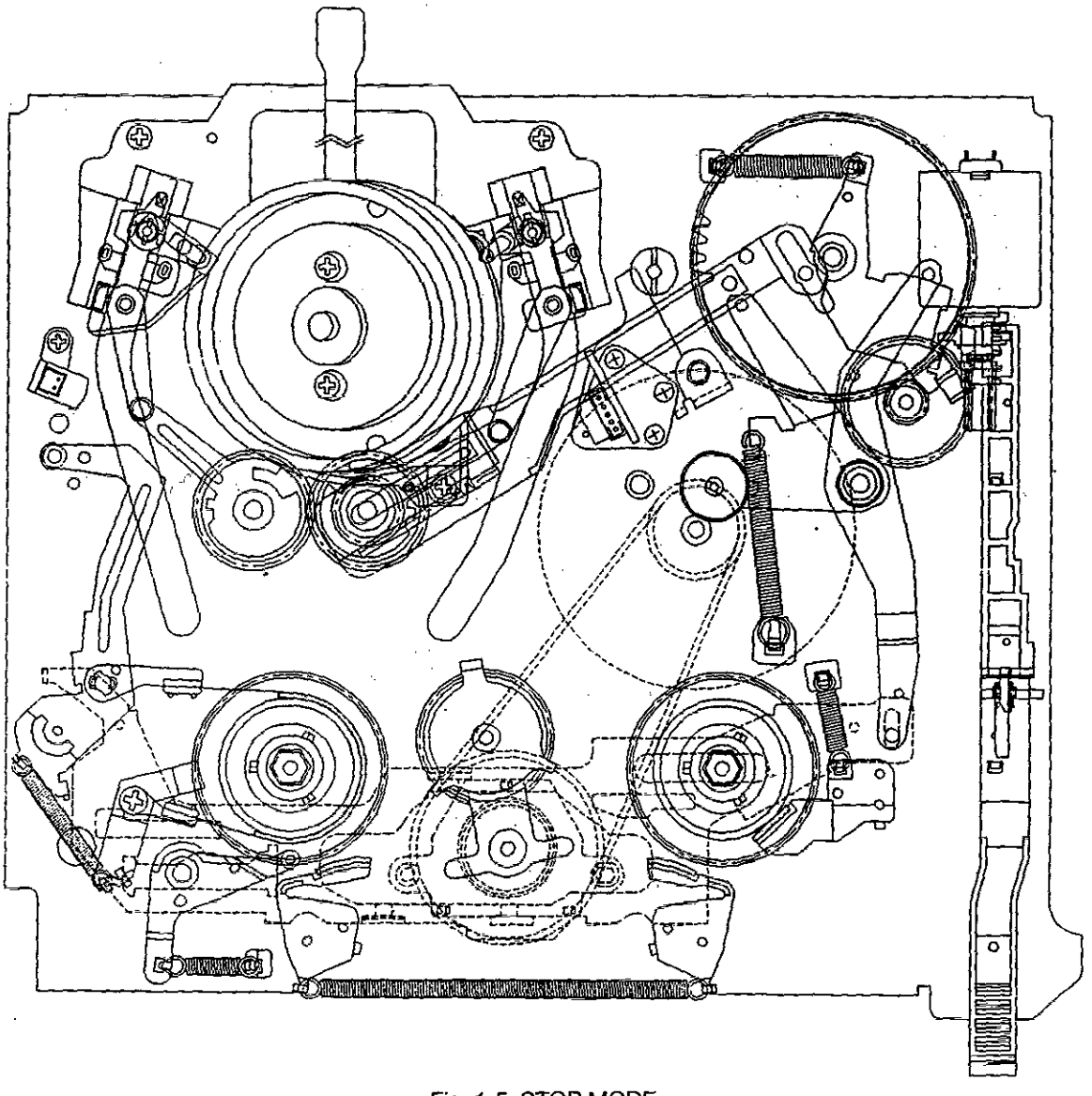


Fig. 1-5. STOP MODE

6) PLAY/RECORDING MODE

A. In this mode, the cassette tape is transported to the T-Reel Table at the constant speed.

B. Mechanical Arrangement
   a. The Tension Pole is on its predetermined position.
   b. The Band Brake is applied to the S-Reel Table to execute the TENSION SERVO.
   c. The Pinch Roller is applied to the Capstan Shaft to transport the tape at the constant speed.
   d. The S & T-Main Brake are released from the S & T-Reel Table.
   e. The S-Sub Brake is released from the S-Reel Table.
   f. The T-Sub Brake is applied to the T-Reel Table.

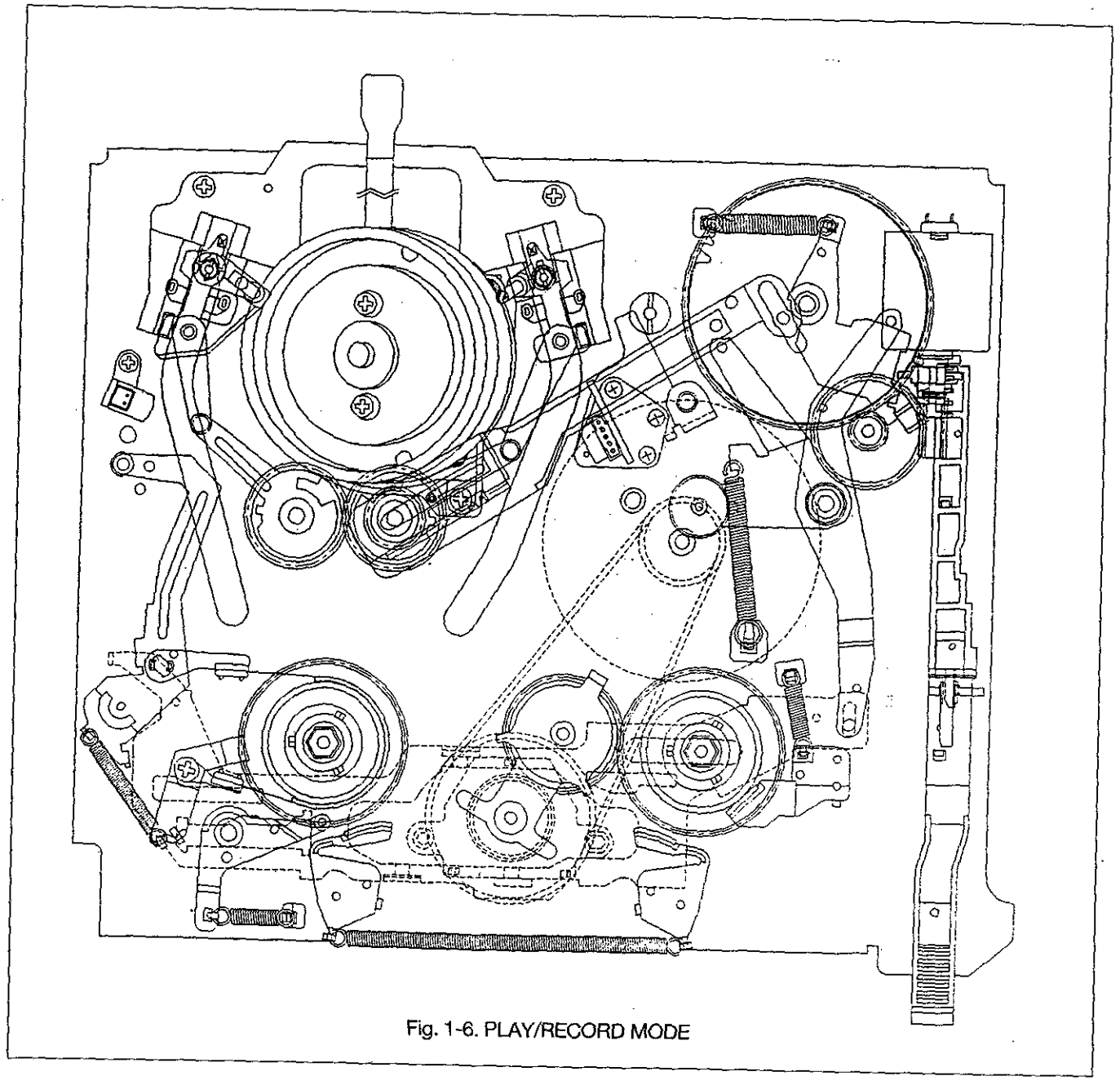


Fig. 1-6. PLAY/RECORD MODE

7) SLOW/STILL MODE

A. This is the operation which makes the transporting system temperarity stopped (so called "STILL") and the slowly executed (so called "SLOW").

B. Mechanical Arrangement
All the Mechanical system is the same as that of PLAY Mode, except that the capstan Brake is applied to the Capstan Flywheel and S-Sub Brake is applied to the S-Reel Table.

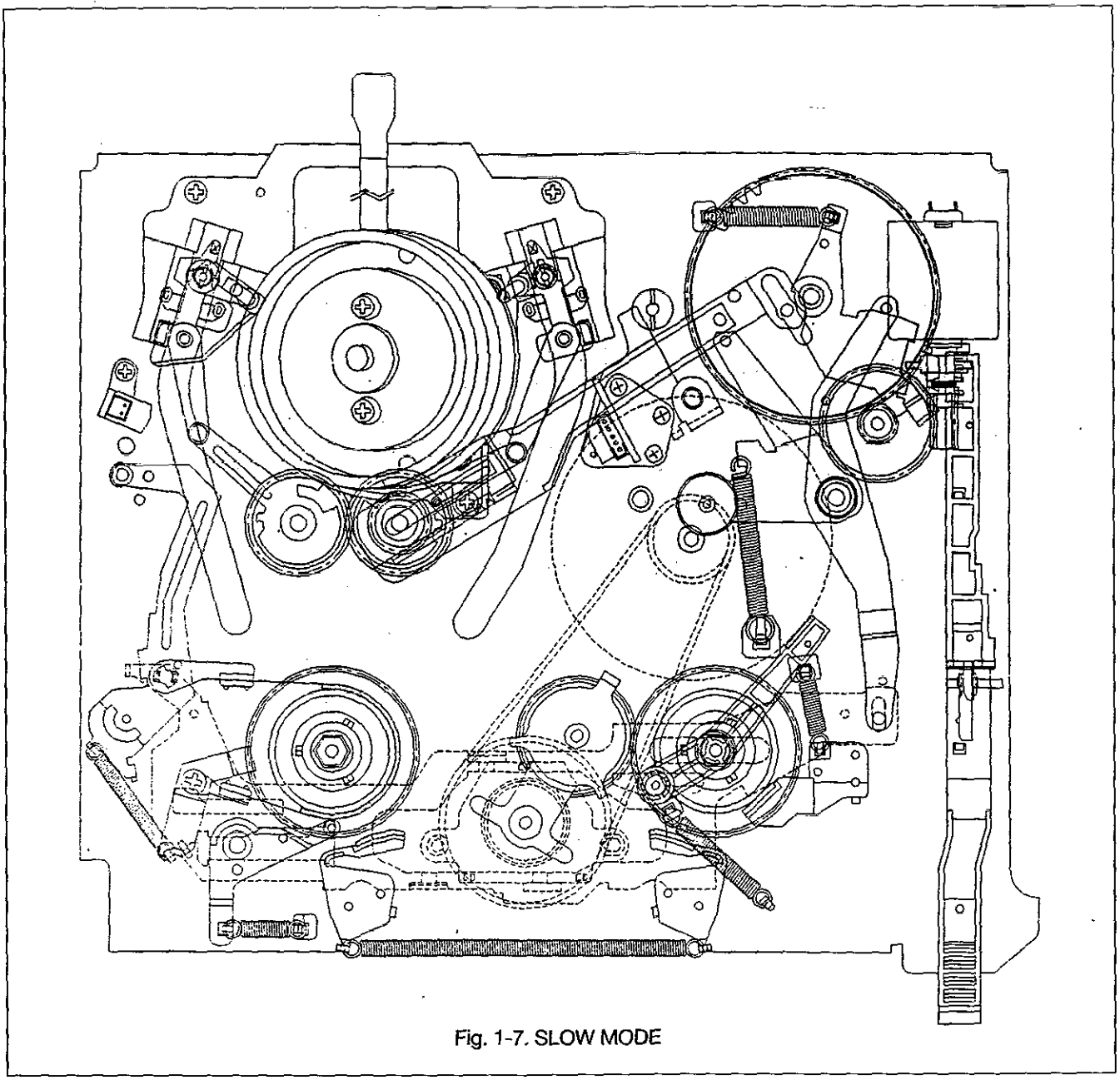


Fig. 1-7. SLOW MODE

8) BRAKE MODE

A. This mode is a mechanical mode which lies in between SLOW MODE and FF/REW MODE. If either STOP/EJECT BUTTON or PLAY BUTTON is pushed in the FF/REW MODE, FF/REW operation is stopped quickly.

B. Mechanical Arrangement
   a. The Pinch Roller is released from the Capstan Shaft.
   b. The Band Brake is released from the S-Reel Table.
   c. The S-Sub Brake is applied to the S-Reel Table.
   d. The T-Sub Brake is applied to the T-Reel Table.
   e. The S & T-Main Brake are applied to the S & T-Reel Table.

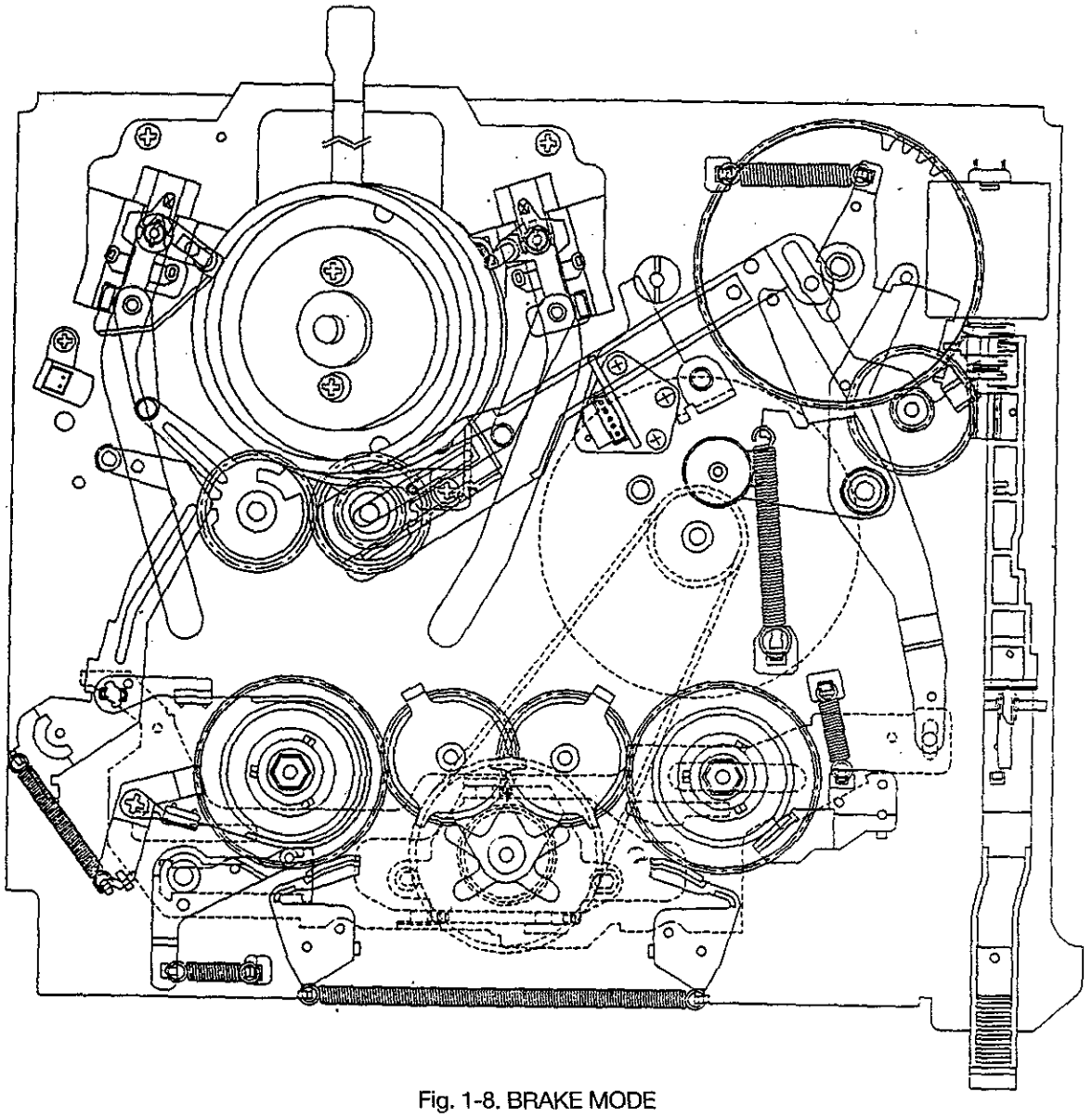


Fig. 1-8. BRAKE MODE

9) 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 Auto Reverse/Forward Search.
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 Pinch Roller is released from the Capstan Shaft.
b. All Brakes are released.

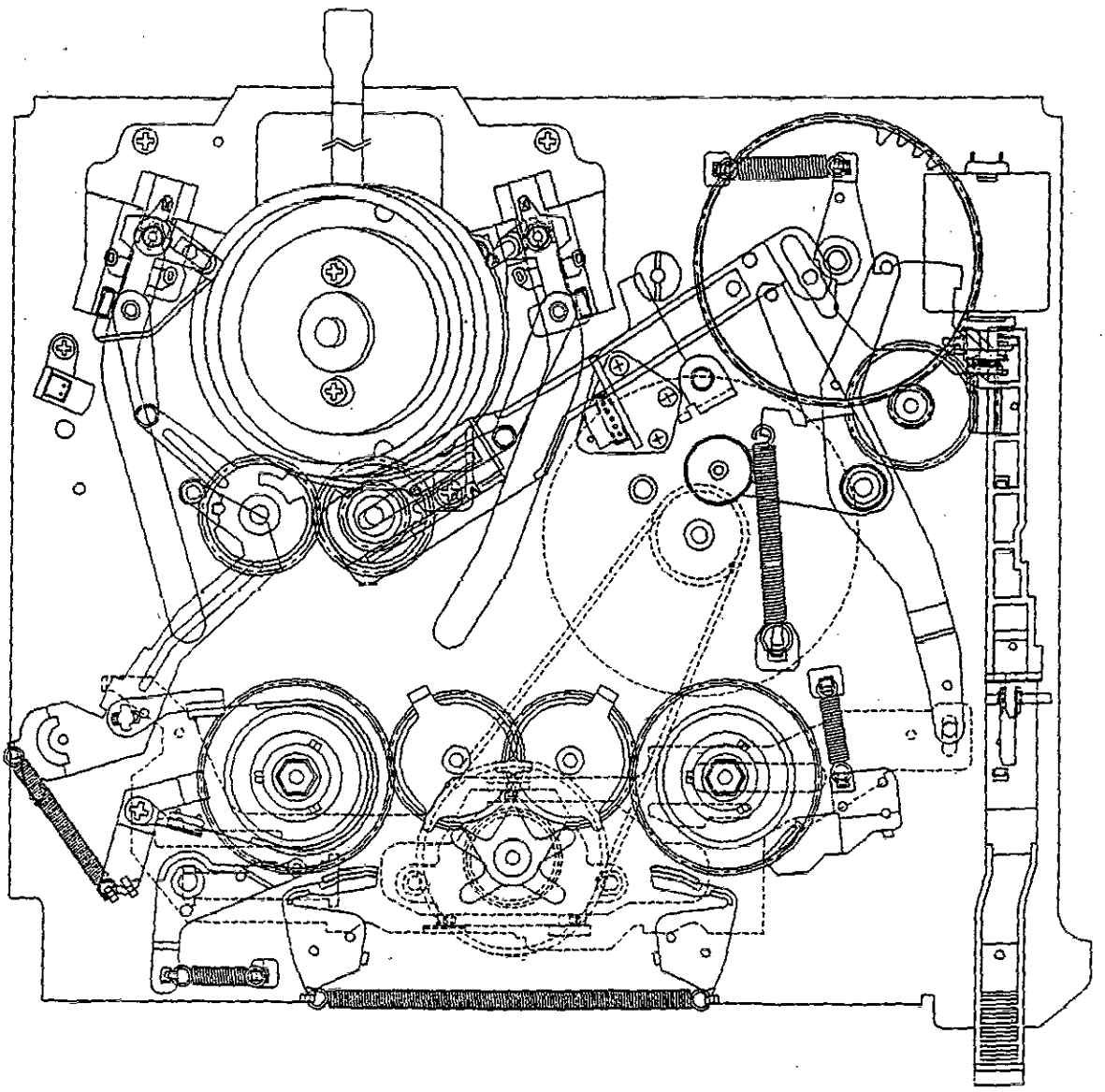
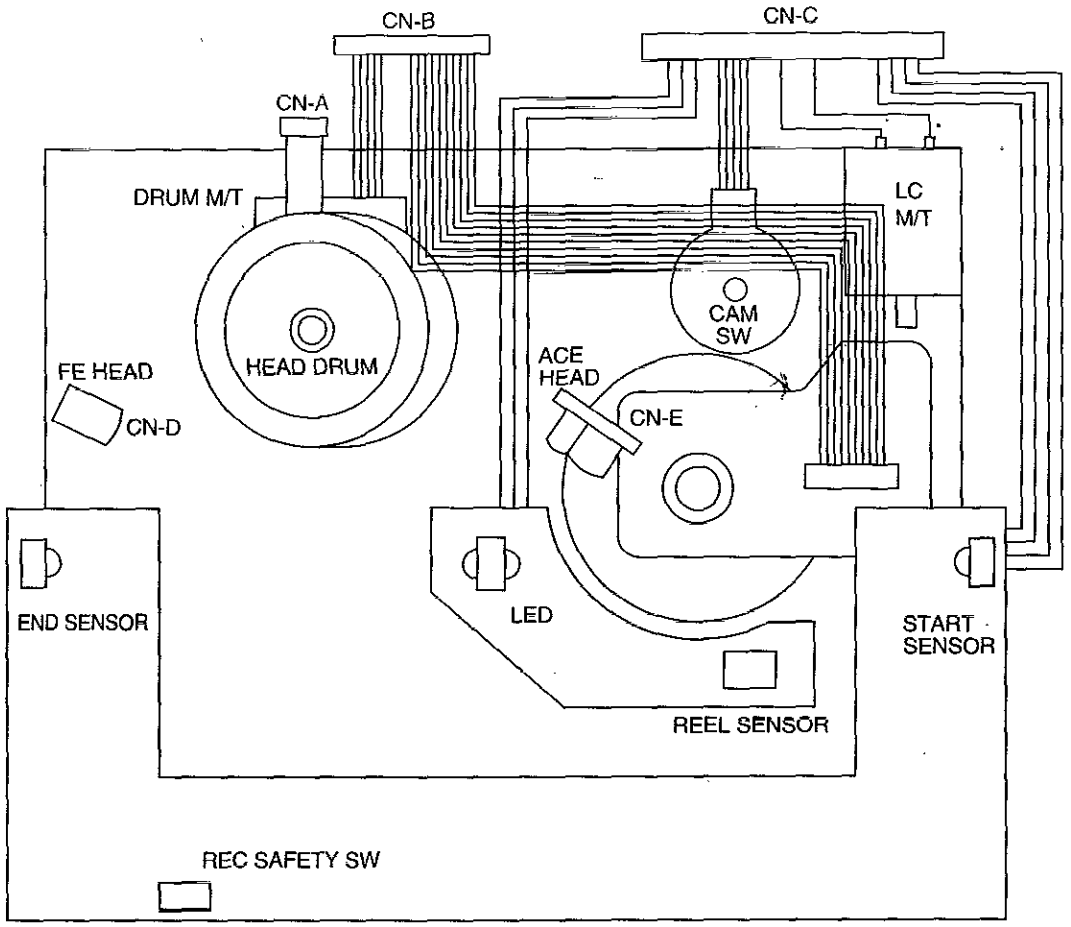


Fig. 1-9. FF/REW MODE

NO	MECHA MODE / ANGLE	EJECT	INITIAL	LOADING/UNLOADING	REVIEW STOP	PLAY SLOW	FF/REW
	CAM SWITCH	0°	75°	190°	207°	239° 256°	324°
1	CAM (1) RELAY LEVER	R23.5 63° 69° R26 179° 185° R23.5 195° 203° R20.9 245° 253° R18.3 268° 300° 304° 321° R14.3 R10.75					
	CAM ANGLE	0°	73.8°	190°	208.1°	240° 258°	326.9°
2	CAM (2) LOADING RACK	R26.2 83° 133° 148° 167° 183° R12.8 R10 R10 R6.7					
3	CAM (3) PINCH LEVER	R13 62.7° H L R23.276 185.7° 180.7° 190.7° 198.7° R23.3 239.7° 226.7° R22 R24.2 260.4° 263.7° R23.3 315.7° R15					L: release H: application
	CAM ANGLE	0°		190.8°	207.5°	239.8° 256.8°	324.5°
4	CAM (4) F/L RACK	61.37° * F/L RACK STROKE : 0~31.46					
5	CONNECT PLATE	63° 69° 179° 185° 195° 203° 245° 253° R18.3 268° 300° 321° 30.4° * CONNECT PLATE STROKE : 0~-3~0~-3~3~4.5~4					
6	S,T-MAIN BRAKE	L H L L H L					L: release H: application
7	S-SUB BRAKE	H L H L					L: release H: application
8	T-SUB BRAKE	H L					L: release H: application
9	CAPSTAN BRAKE	L H L					L: release H: application
10	BAND BRAKE	L H L					L: release H: application
11	REEL DRIVE	S D S					S: SLIP D: DIRECT

1-4. WIRING DIAGRAM



CN-A
(2 HEAD MONO)

1	VR 1
2	COMMON
3	VL 1
4	GND

■ (4 HEAD MONO)

1	VR 2
2	COMMON
3	VL2
4	GND
5	VR1
6	COMMON
7	VL1

CN-B

1	M 12V
2	DRUM CTL
3	DRUM PG
4	M GND
5	DRUM FG
6	ON/OFF 5V
7	F(L)/R(H)
8	CAP FG
9	CTL REF
10	CAP DRIVE
11	I LIMIT
12	M 12V
13	M GND
14	GND

CN-C

1	GND
2	CAM D
3	CAM C
4	CAM B
5	CAM A
6	TAPE START
7	TAPE END
8	REEL PULSE
9	REC SAFETY
10	EVER SAFETY
11	FL/LC (-)
12	FL/LC (+)

CN-D

1	GND
2	FE

CN-E

1	CTL
2	CTL
3	AUDIO
4	AUDIO
5	A ERASE
6	GND

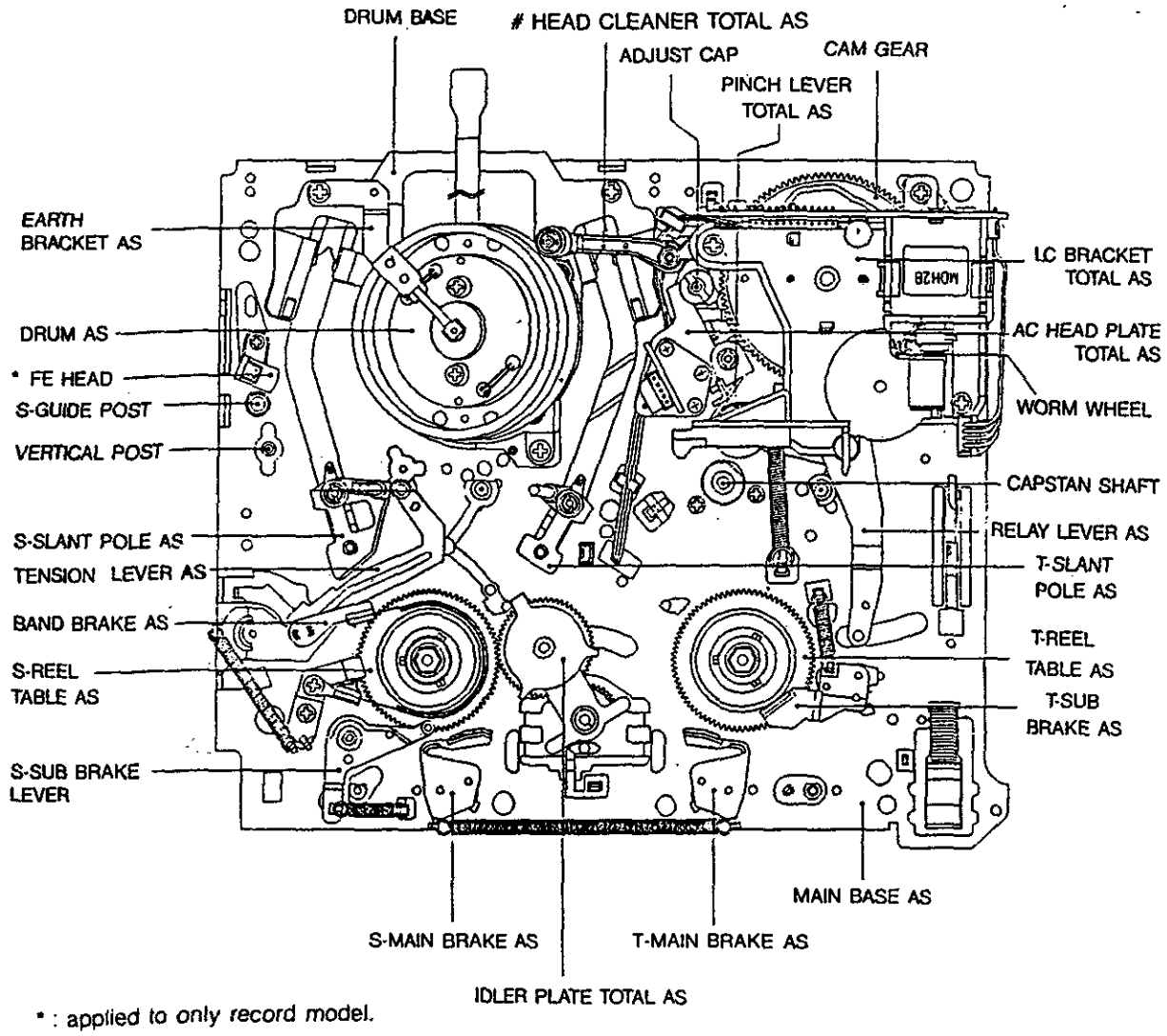
* : applied to only record model.
■ : applied to only 4 head mono model.

2. ARRANGEMENT AND CHECK FOR THE MAJOR PARTS

2-1. PARTS LOCATION

1) PARTS LOCATION OF DECK ASS'Y

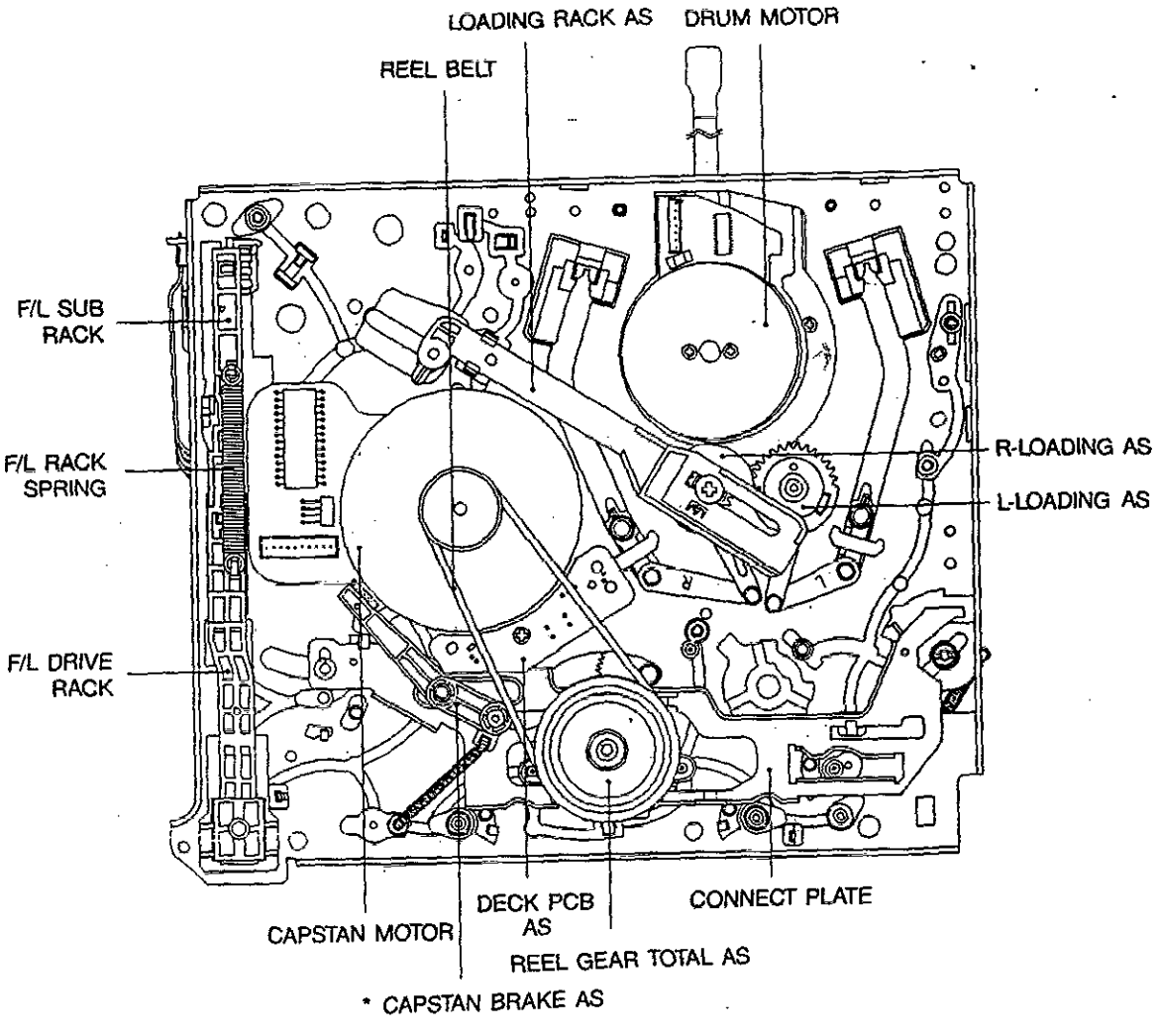
A. TOP VIEW



* : applied to only record model.

#: applied to only option model

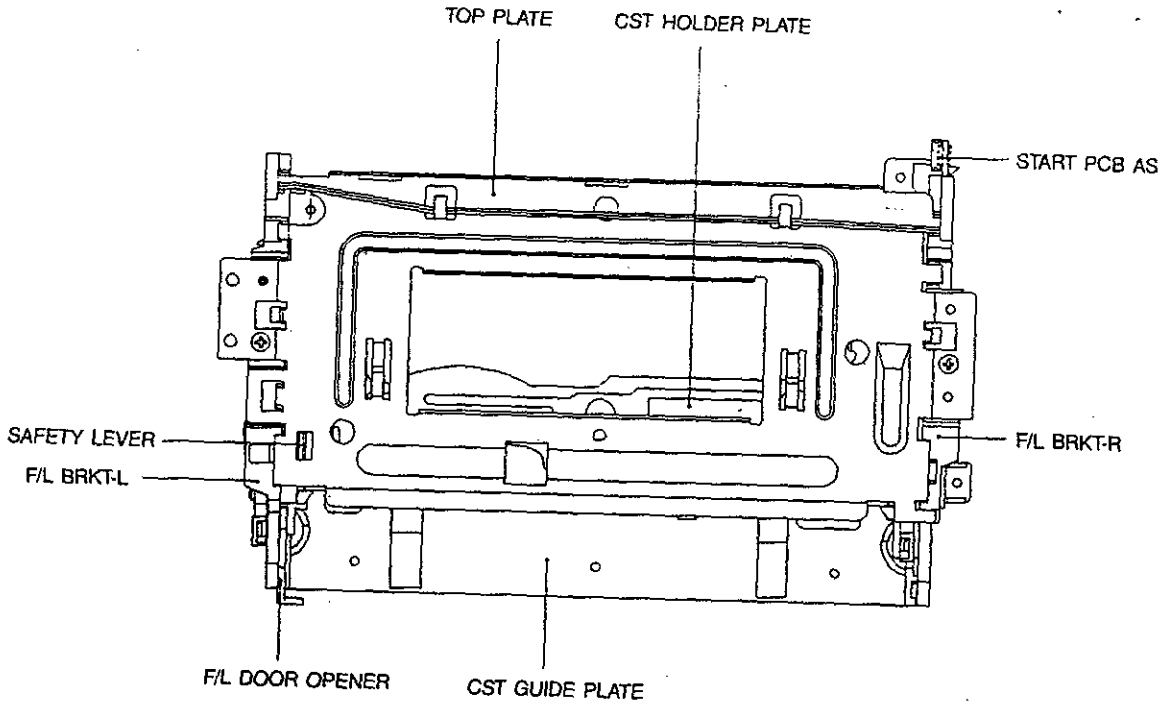
B. BOTTOM VIEW



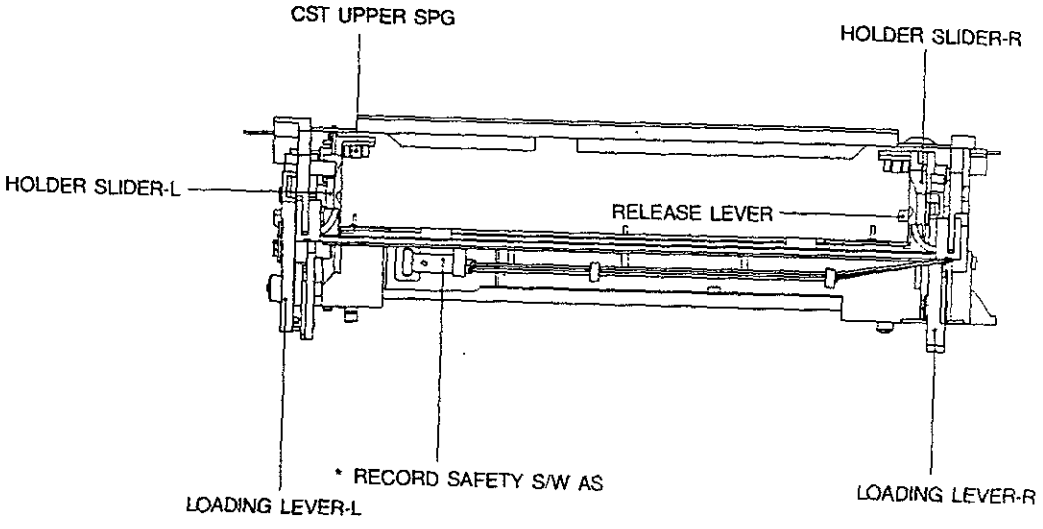
*: applied to only 4 HEAD MONO MODEL

2) PARTS LOCATION OF FRONT LOADING ASS'Y

A. TOP VIEW



B. FRONT VIEW



*: applied to only record model

2-2. PERIODIC MAINTENANCE AND SERVICE SCHEDULE

In order to effectively maintain the excellent performance and fully utilize the features of this machine, and to lengthen the life of mechanism and tapes, we strongly recommand you to perform the periodic maintenance and inspection as described below.

1) Maintenance after repair

After repairing, do the maintenance as described below irrespective of the length of time in use.

A. Cleaning of the Head Drum Ass'y

a. Clean the Drum assembly with a cleaning cloth soaked in liquid cleaner (isopropyl alcohol) by placing lightly against the Drum and slowly revolving the rotating Head Drum Ass'y by hand (Do not rotate it by applying the electric power to the motor for cleaning).

b. Do not move the cleaning cloth in the vertical direction against the head-tip.

B. Cleaning of the tape running section

Clean the tape running parts (tape guide, the surface of drum assembly, capstan, pinch roller, etc.) with a cleaning cloth soaked in the liquid cleaner.

C. Cleaning of driving section

Clean the driving section (the surface of the Reel Table) with the cloth soaked in the liquid alcohol (isopropyl alcohol).

D. Routine inspection

Perform the maintenance and inspection as separately described depending on the period of time in use.

2) Cleaning and Lubrication
A. Cleaning

a. Cleaning of Tape Transporting System.

■ Following parts should be cleaned every 500 hours of use.

- VERTICAL POST
- TENSION POLE
- S-GUIDE POST
- FE HEAD
- S-GUIDE ROLLER
- S-SLANT POLE
- VIDEO HEAD/DRUM ASS'Y
- T-SLANT POLE
- T-GUIDE ROLLER
- AC HEAD/AE HEAD
- T-GUIDE POST
- CAPSTAN SHAFT

■ Since the above parts contact with video tape, they tend to collect dust particles. Therefore if these parts are polluted, they affect the picture directly and result in tape damage.

■ After cleaning with alcohol, allow the parts to dry throughly before using a cassette tape.

b. Cleaning of Drive System

- S-REEL TABLE
- T-REEL TABLE
- S-MAIN BRAKE
- T-MAIN-BRAKE
- T-SUB BRAKE
- CAPSTAN FLYWHEEL/PULLEY
- REEL PULLEY

B. Lubrication

a. Following components should be lubricated with oil every 2000 hours of use.

• S-REEL TABLE POST • T-RELL TABLE POST • IDLER BRKT POST

b. After cleaning the above components with slcohol, lubricate these with one or two drops oil.

3) Service schedule for the major parts

Following parts should receive periodic service according to the recommended intervals.

Part Name	Periodic Service Schedule (Operating Hours)				
	1000	2000	3000	4000	5000
DRUM TOTAL ASS'Y	△	O	△	O	△
CAPSTAN MOTOR		O		O	
L/C BRKT TOTAL ASS'Y		O		O	
REEL BELT		O		O	
IDLER PLATE TOTAL ASS'Y		△		O	
S-REEL TABLE ASS'Y			O		
T-REEL TABLE ASS'Y			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	

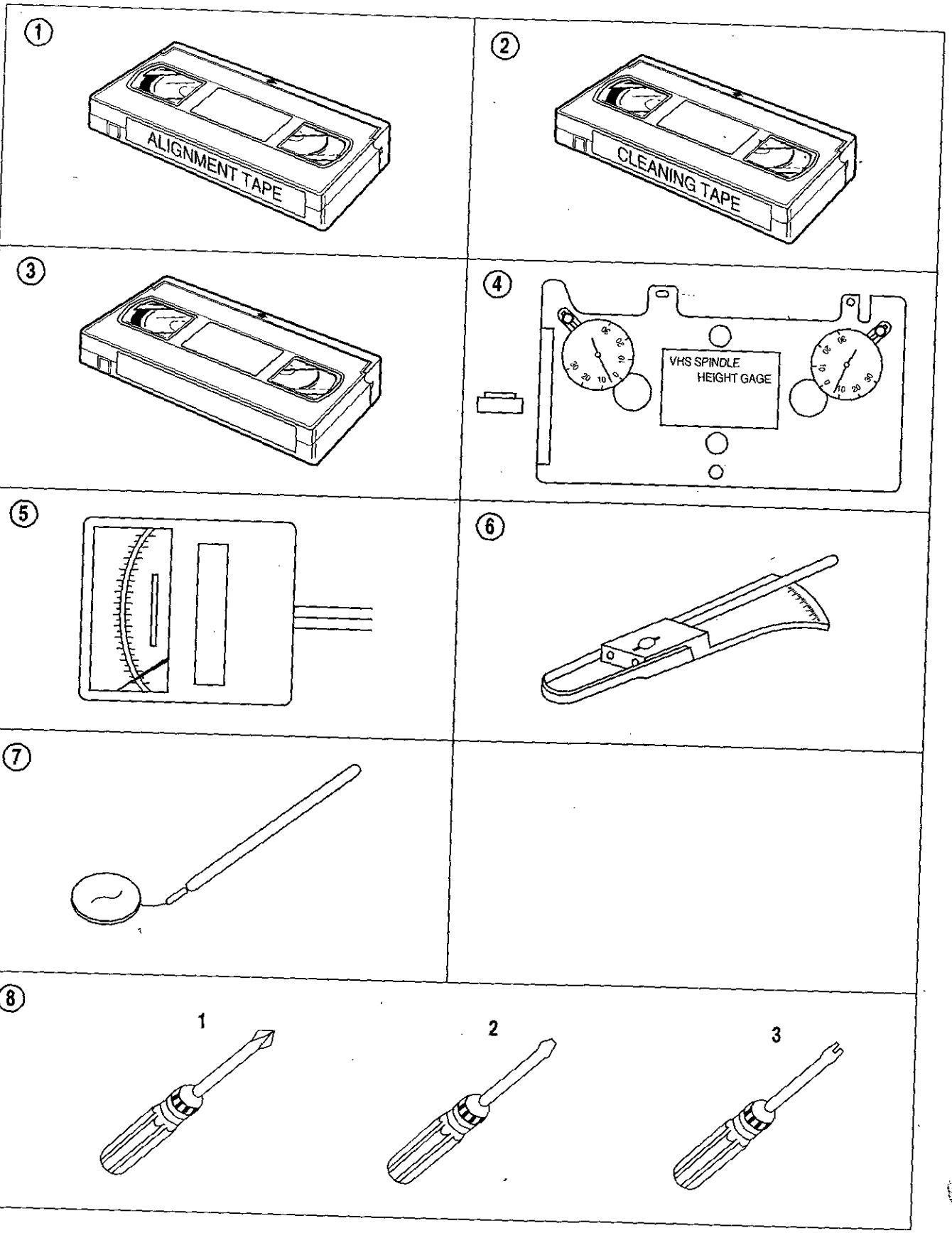
△: Check and replace if necessary
O: Replace

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

2-3. JIGS AND TOOLS

1) LIST OF JIGS AND TOOLS (Refer to next page)

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 TAPE TRANSPORTING SYSTEM
2	CLEANING TAPE (DAEWOO)	DHC-602V	②	CLEANING OF TAPE TRANSPORTING SYSTEM
3	CASSETE TAPE (SANSEIRIKO)	SRK-VHK-404	③	MEASUREMENT OF RELL TORQUE
4	VHS SPINDLE HEIGHT GAUGE (TENTELO)	TSH-V4	④	HEIGHT MEASUREMENT OF REEL TABLE
5	TENTELO METER (TENTELO)	T2-H7-UM	⑤	MEASUREMENT OF BACK TENSION
6	FAN TYPE TENSION METER	ABOVE 2KG	⑥	MEASUREMENT OF PRESSING FORCE FOR THE PINCH ROLLER
7	DENTAL MIRROR		⑦	CHECKING OF TAPE TRANSPORTING SYSTEM
8	+ DRIVER — DRIVER ADJUSTMENT DRIVER		⑧-1 ⑧-2 ⑧-3	ASSEMBLY, DISASSEMBLY AND ADJUSTMENT


①
ALIGNMENT TAPE
②
CLEANING TAPE
③
④
VHS SPINDLE
HEIGHT GAGE
⑤
⑥
⑦
⑧
1
2
3

3. DISASSEMBLY AND REPLACEMENT

CAUTION: When you disassembly the Deck Mechanism, it should be done at the EJECT MODE.

3-1. The Replacement of Front Loading Ass'y (refer to Fig. 3-1)

1) Disassemble the Top Cover and the Front Panel.
2) Remove screw fastening the Main PCB.
3) Remove screw fastening the Top Plate in the Front Loading Ass'y (screw for ground).
4) Remove the Connector Ass'y which is connected to the F/L PCB Ass'y in the Front Loading Ass'y (4p).
5) Remove three screws fastening the Front Loading Ass'y and lift the Front Loading Ass'y.
6) Be careful not to break the F/L Drive Rack when disassembling the Front Loading Ass'y.

NOTE:
1. Disassemble the Front Loading Ass'y as a whole.
2. Reassemble the Front Loading Ass'y in the EJECT MODE and be careful not to break the F/L Drive Rack.
3. The specification screws (TT3 RND 3x6) should be used in the regions indicated by arrow.

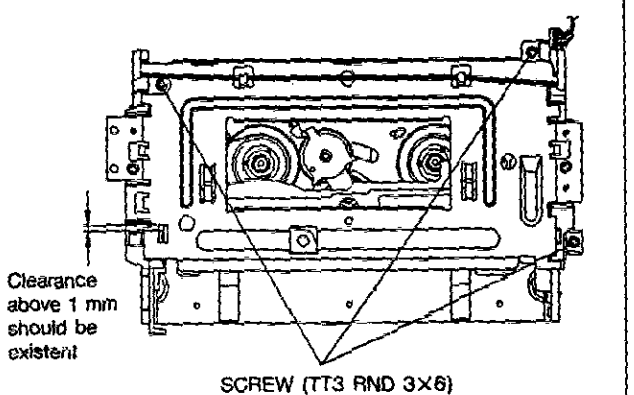


Fig. 3-1

3-2. The Replacement of Drum Ass'y (refer to Fig. 3-2)

1) Disassemble the Connector ② (6P) from the Motor PCB in the Drum Ass'y ①.
2) Remove two screws fastening the Pre-Amp.
3) Disassemble the Flexible PCB ④ from the Pre-Amp.
4) Remove three screws ⑥ fastening the Drum Total Ass'y and lift the Earth Bracket Ass'y ③ together with it.
5) Remove three screws lift the Drum Ass'y ① and disassemble it.
6) Install a new Drum Ass'y
7) Reassemble the above-mentioned parts in the reverse order.
8) On completing the replacement, confirm the performance. If any further performance is required, refer to section 5 and perform the procedures.

NOTE:
1. Work with the extreme care when removing or replacing the Drum Ass'y. Do not touch the Video Head during work.
2. If the quality of the TV picture deteriorates or the black dot is found irregularly on the TV picture, then try to clean the Video Heads. If the quality is not improved, the Video Heads can be regarded as worn out. In this case, replace the Drum Ass'Y.

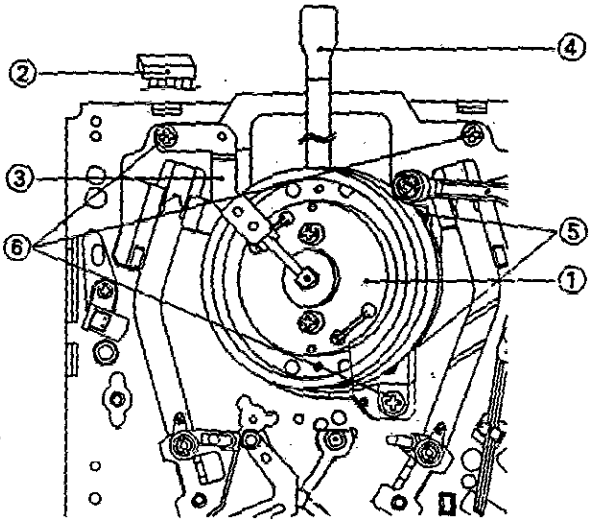


Fig. 3-2

3-3. The Replacement of Drum Motor Ass'y (refer to Fig. 3-3, 3-4)

1) Disassemble the Connector (6P) ② from the Motor PCB ①.
2) Remove two screws ③ and disassemble the Rotor ④.
3) Remove three screws ⑤ and disassemble the Stator ⑥.
4) Install a new Drum Motor Ass'y.
5) Reassemble the above-mentioned parts in the reverse order.
6) If necessary, the Playback Phase should be adjusted (refer to section 5).

NOTE:
1. Clamping torque of screw is 3-4 kg. cm.
2. Make sure the Phase decision holes of Rotor and Preload Boss are matched.

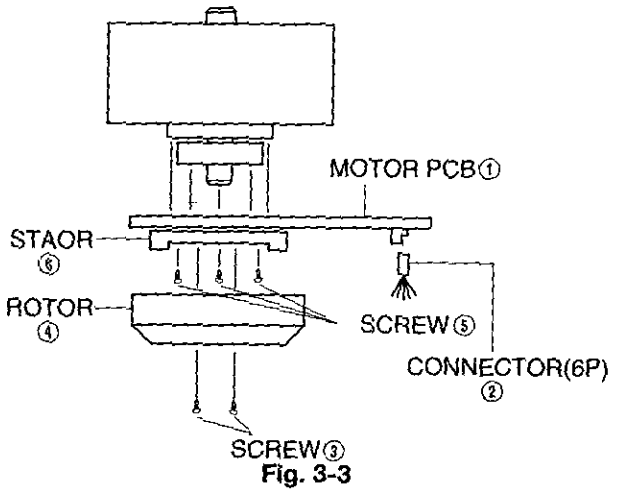


Fig. 3-3

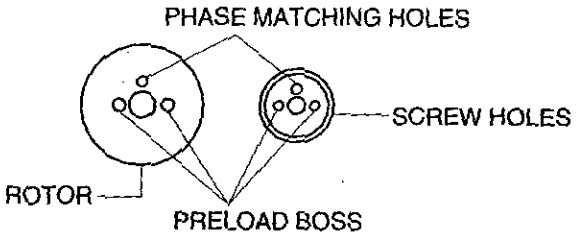


Fig. 3-4 Phase matching between Rotor and Preload Boss

3-4. The Replacement of Reel Gear Total Ass'y (refer to Fig. 3-6)

1) After removing the Reel Belt ①, remove the Pole Washer ②.
2) Install a new Reel Gear Total Ass'y.
3) Reasemble the above-mentioned parts in the reverse order.

NOTE:
When assembling the Reel Gear Total Ass'y, make sure that the Pole Slider (D3.1xD6xT0.13) is in the Idler Bracket Post.

3-5. The Replacement of Pinch Lever Total Ass'y (refer to Fig. 3-6)

1) Disassemble the Connector Ass'y (3P) ② from the L/C Motor PCB ①.
2) Remove three screws ④ and disassemble the L/C Bracket Total Ass'y ③.
3) Disassemble the Worm Wheel ⑤.
4) Remove the Pinch Roller Spring ⑥ from the hook 'A' on the Main Base.
5) After removing the Poly Washer ⑦, disassemble the Pinch Lever Total Ass'y ⑧.
6) Install a new Pinch Lever Total Ass'y.
7) Reassemble the above-mentioned parts in the reverse order.

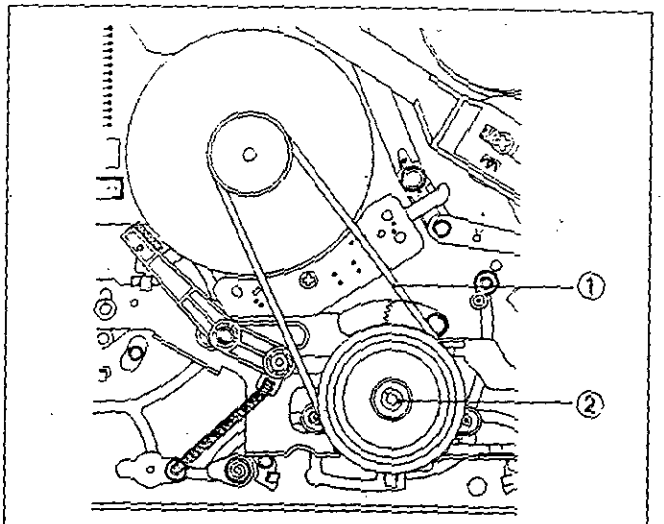


Fig. 3-5

NOTE:
1. Make sure that the upper part of Pinch Lever Ass'y is situated on the required upper cam locus in the Cam Gear (refer to Fig. 4-4).
2. Be careful for the pinch Roller Ass'y not to be oiled or greased.

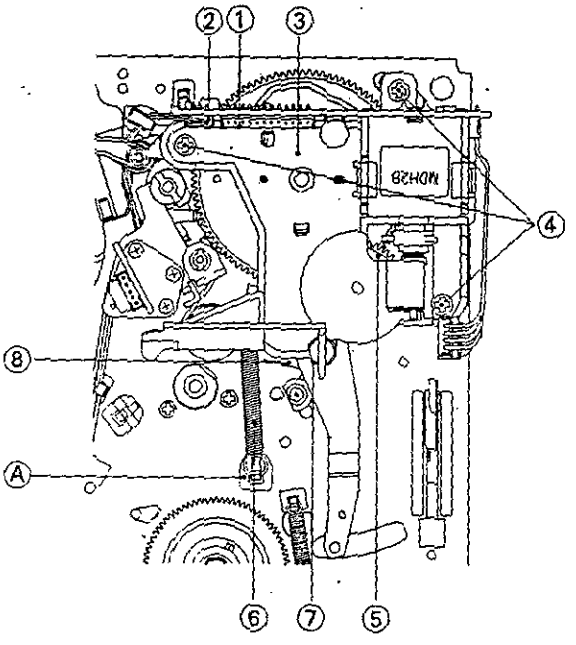


Fig. 3-6

3-6. The Replacement of AC Head Total Ass'y (refer to Fig. 3-7)

1) Referring to section 3-5, disassemble the L/C Bracket Total Ass'y and Pinch Lever Total Ass'y
2) Release the AC Head Nut ① and remove a part of AC Head guide Spring ② from the hook on the Main Base.
3) Disassemble the AC Head Total Ass'y ③.
4) Install a new AC Head Total Ass'y
5) Reassemble the above-mentioned parts in the reverse order.
6) After reassembling, perform the Tape Transporting Adjustment (refer to section 5).

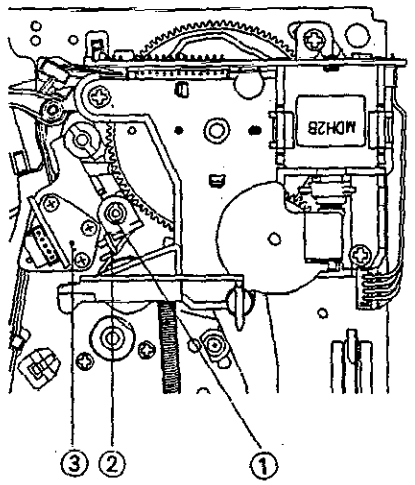


Fig. 3-7

3-7. The Replacement of Capstan Motor (refer to Fig. 3-8)

1) Referring to section 3-5, disassemble the L/C Bracket Total Ass'y and Pinch Lever Total Ass'y
2) Disassemble the Connector Ass'y (10P) from the Capstan Motor PCB.
3) Disassemble the Reel Belt (refer to Fig. 3-5).
4) Remove three screw ① and disassemble the Capstan Motor ②.
5) Reassemble the above-mentioned parts in the reverse order.

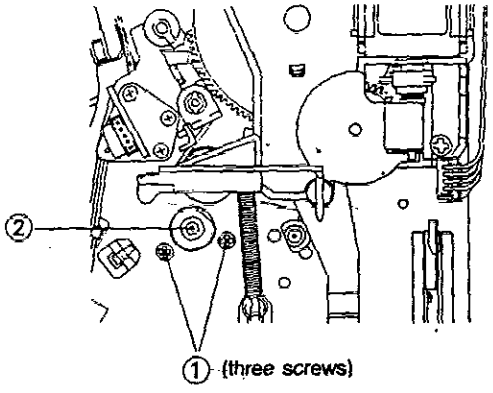


Fig. 3-8

3-8. The Replacement of Pole Base Ass'y (refer to Fig. 3-9)

1) Referring to section 3-3, disassemble the Drum Total Ass'y.
2) Remove the SCREW ② and disassemble the Loading Rack Ass'y ①.
3) Disassemble the L & R-Loading Ass'y ③, ④.
4) After moving the S & T-Slant Pole Ass'y ⑤, ⑥ to the V-Block position, disassemble them.
5) Install a new Pole Base Ass'y.
6) Reassemble the above-mentioned parts in the reverse order.

NOTE:
1. Be careful for the Guide Roller of the Pole Base Ass'y not to be greased.
2. Be careful not to break the hook 'A' on the Main Base when disassembling the Loading Rack Ass'y.

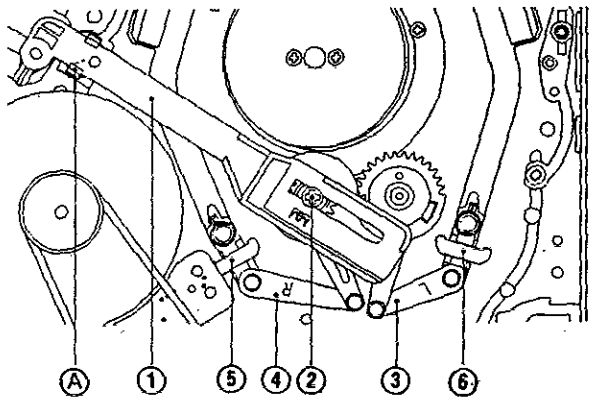


Fig. 3-9

3-9. The Replacement of S-Reel Table Ass'y (refer to Fig. 3-10)

1) Disassemble the S-Sub Brake Spring ②.
2) After rotating the S-Sub Brake Lever ① to CW direction, disassemble it.
3) Disassemble the Tension Lever Spring ③.
4) Remove the screw ⑤ fastening the Band Brake Ass'y ④.
5) When disassembling the S-Reel Table Ass'y ⑥, be careful for the Gear Ass'y not to touch with the Band Brake Ass'y ④.
6) Remove the Pole Slider.
7) After cleaning the Reel Table Post by using the alcohol, lubricate it with on or two drops of oil.
8) After installing a new S-Reel Table Ass'y, perform the height adjustment (refer to section 4-5).
9) Reassemble the above-mentioned parts in the reverse order.

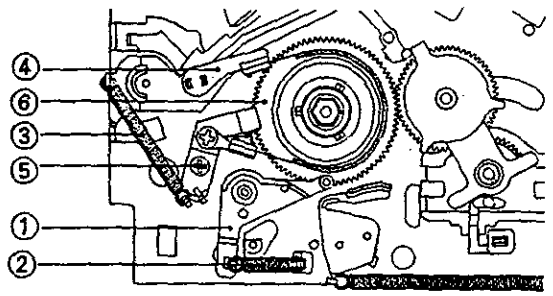


Fig. 3-10

3-10. The Replacement of T-Reel Table Ass'y (refer to Fig. 3-11)

1) Disassemble the T-Sub Brake Spring ①.
2) After rotating the T-Sub Brake Ass'y ② to CCW direction, disassemble it.
3) After disassembling the T-Reel Table Ass'y ③, remove the Poly Slider.
4) After cleaning the Reel Table Post by using the alcohol, lubricate it with one or two drops of oil.
5) After replacing the T-Reel table Ass'y with a new one, perform the height adjustment (refer to section 4-5).
6) Reassemble the above-mentioned parts in the reverse order.

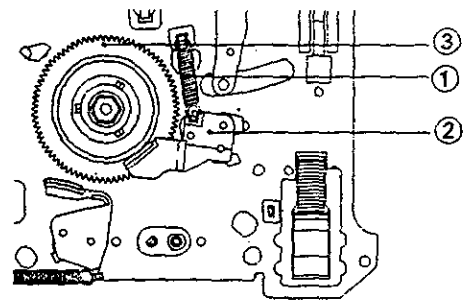


Fig. 3-11

3-11. The Replacement of the F/L Sub Rack (refer to Fig. 3-12)

1) Referring to section 3-5 and 3-7, disassemble the L/C Bracket Total Ass'y, Pinch Lever Total Ass'y and Capstan Motor.
2) Remove the Cam Gear ① and the Worm Wheel ②.
3) Disassemble the F/L Rack Spring ③.
4) Disassemble the F/L Drive Rack ④ and F/L Sub Rack ⑤.
5) Install a new F/L Sub Rack.
6) Reasemble the above-mentioned parts in the reverse order.

NOTE:
Be careful not to break the part 'A' when assembling or disassembling the F/L Sub Rack.

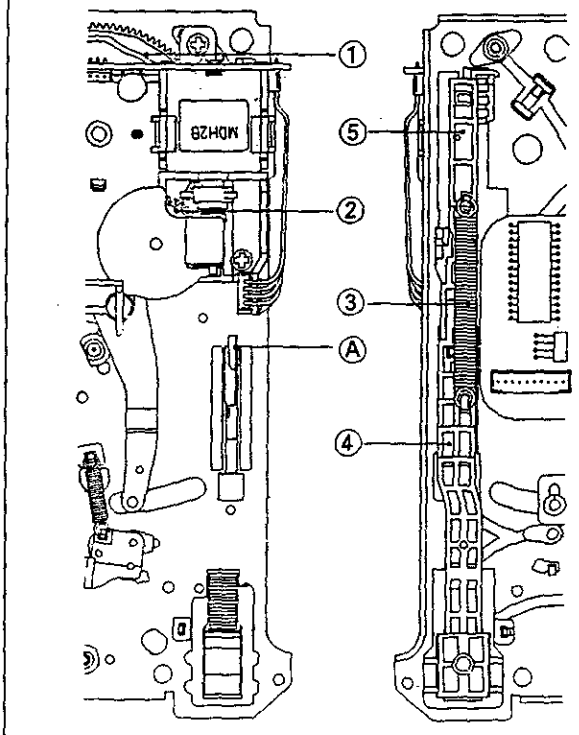
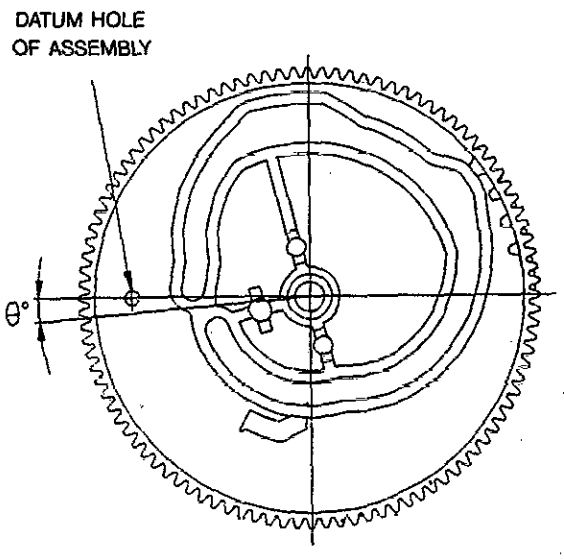


Fig. 3-12

4. MECHANICAL ADJUSTMENT

4-1. CHECK FOR THE MECHANICAL POSITION

Check for the following matters before disassembling, replacement and reassembling.
1) Make sure of the assembly conditions of the Deck Machanism in the EJECT MODE.
2) Make sure of the assembly position among the Cam Gear and several parts before assembling the L/C Bracket Total Ass'y (refer to Fig. 4-1, 2, 3, 4).
3) Make sure of the assembly position between the Loading Rack and the R & L-Loading Ass'y (refer to Fig. 4-5).
4) Make sure of the position of the Cam Switch when assembling the L/C BRKT Total Ass'y (refer to Fig. 4-6).
5) Make sure of the assembly state of the Front Loading Ass'y (refer to Fig. 4-7).
6) Make sure of the other's assembly state (refer to fig. 4-8).



* **Note:** Datum hole of assembly should be located in = 0~5°C

Fig. 4-1 Reference of assembly for the Cam Gear

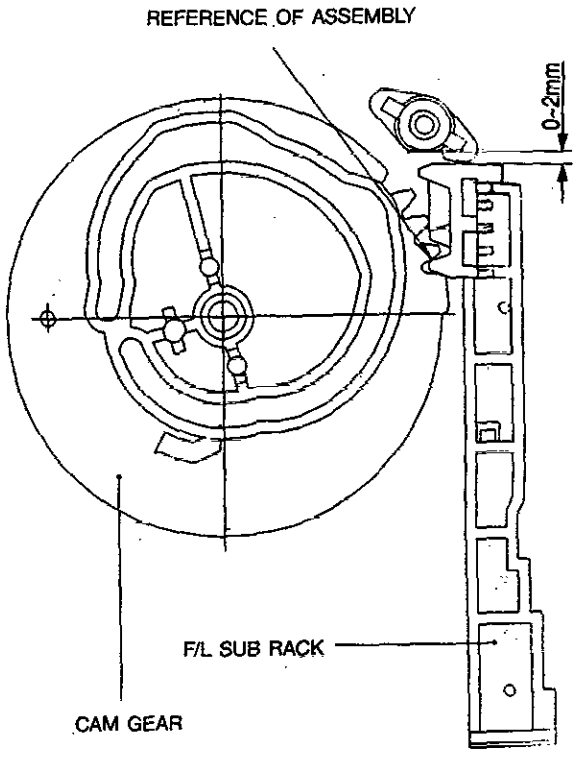


Fig. 4-2 Reference of assembly for the F/L Sub Rack and Cam gear

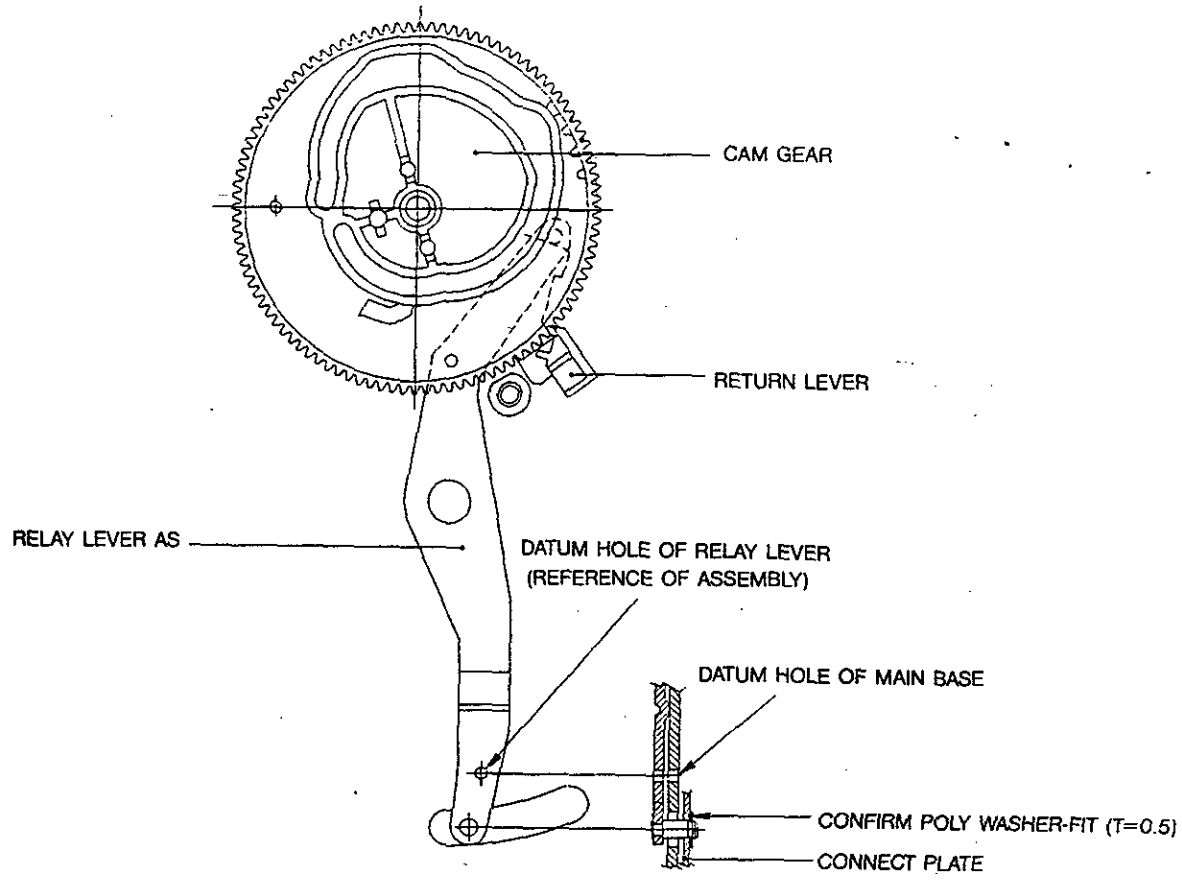


Fig. 4-3 Reference of assembly for the Cam Gear and Relay Lever

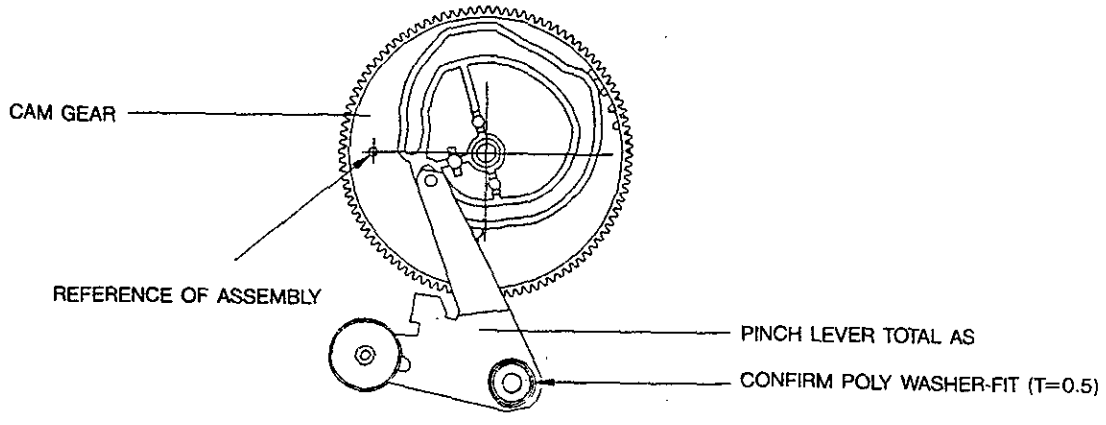


Fig. 4-4 Reference of assembly for the Cam Gear and Pinch Lever

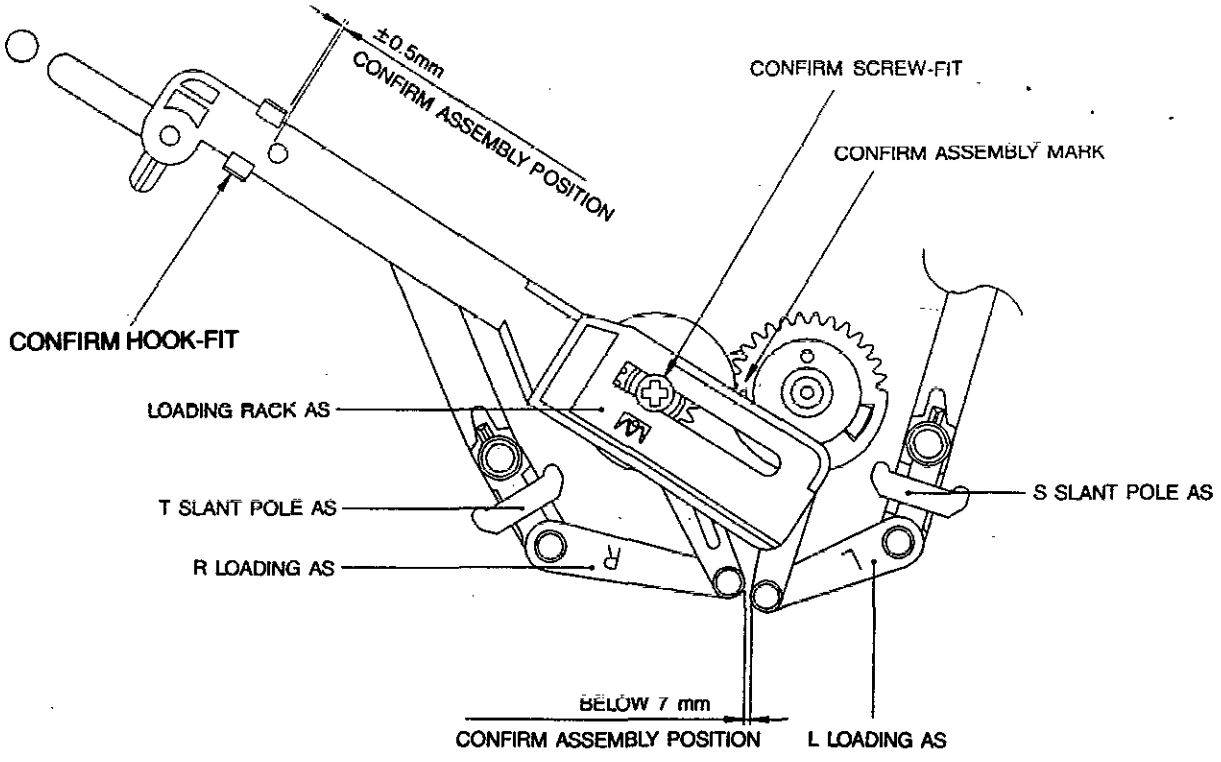


Fig. 4-5 Reference of assembly for the Cam Gear and Relay Lever

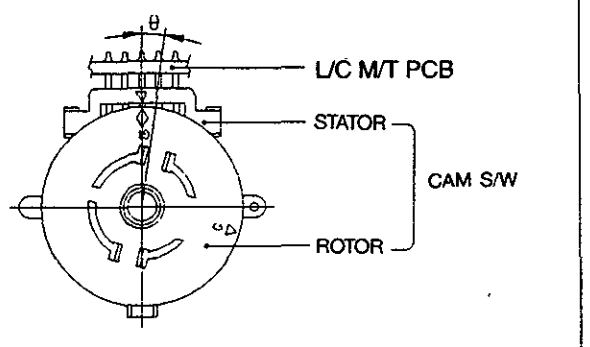


Fig. 4-6 Reference of assembly for the Cam Switch

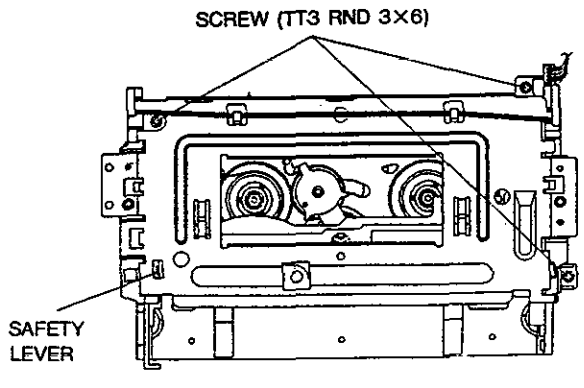


Fig. 4-7 Reference of assembly for the Front Loading AS

* **Note:** 1. The mark (◇) of Rotor should be located in = 0~5°.
2. The above figure is a reference bottom view for the LC Bracket Total AS.

* **Note:** 1. It should be returned to its original state when the safety lever was pushed by hand.
2. On fastening screws, these above 6 mm should not be used (In the case of using non-specification screw, the Capstan PCB will be deformed).

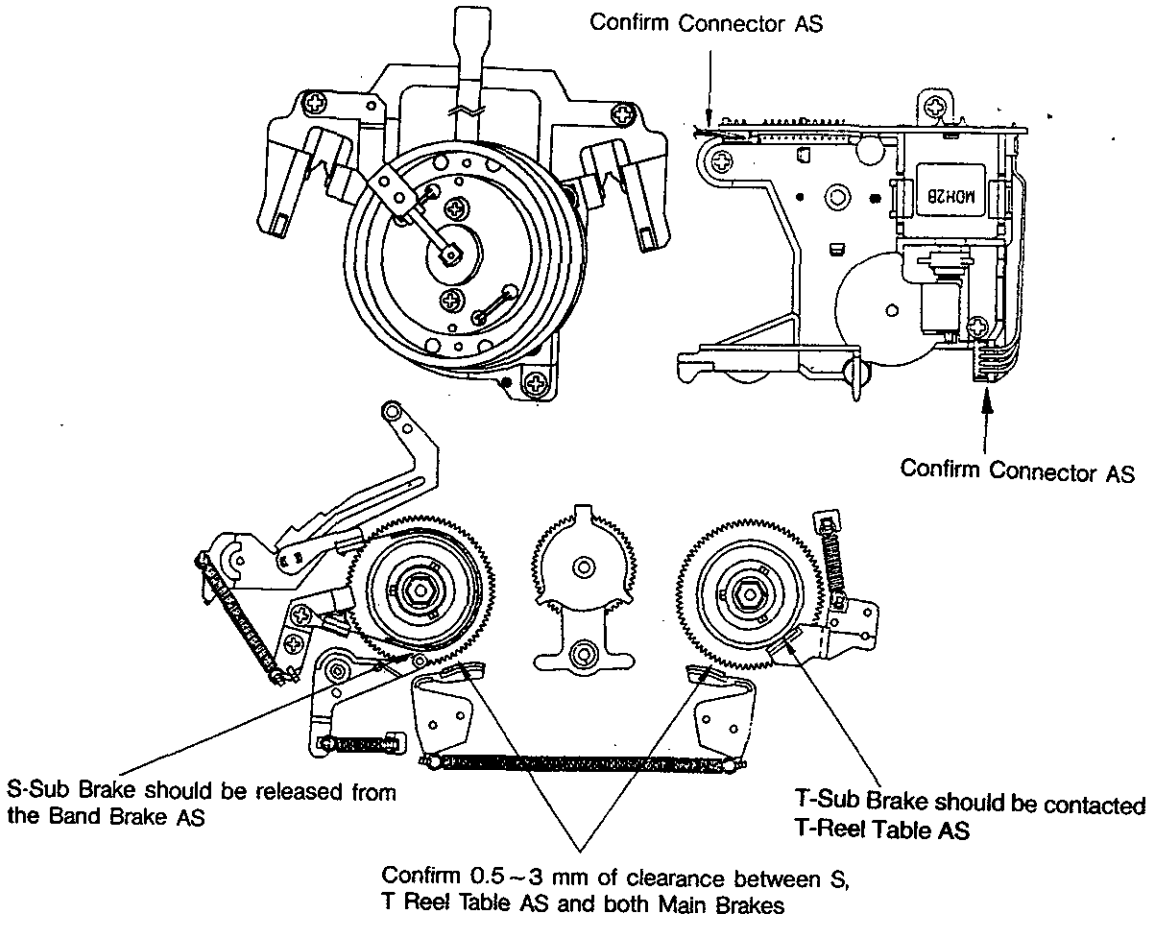


Fig. 4-3 Reference of assembly for the Cam Gear and Relay Lever

4-2. HOW TO SET MECHANICAL MODE

1) On removing the Front Loading Ass'y, Syscon executes the INTIAL MODE and then power off.
2) If the power is on in the INITIAL MODE, it executes the STOP MODE.
3) Push the button you want.
4) On executing the required mode, pull out the power plug if necessary.
5) If the STOP/EJECT button is pushed in the STOP MODE or EJECT MODE, it returns to the INITIAL MODE via the EJECT mode and then power off.
6) Reassemble in Front Loading Ass'y in the only EJECT MODE.

4-3. Measurement of Pressing Force for Pinch Roller

1) In the state of removing the Front Loading Ass'y, pull out the power plug after playing back without cassette.
2) Remove the L/C Bracket Total Ass'y and the Worm Wheel.
3) Pull the push-pull gauge to the direction 'A' indicated by the arrow as shown in Fig. 4-9.
4) Confirm that the scale of push-pull gauge is 1.0±0.2 Kg at the moment of the Pinch Roller Separating from the Capstan Shaft.
5) If it is out of specification, replace the Pinch Roller Spring or the Pinch Lever Total Ass'y.

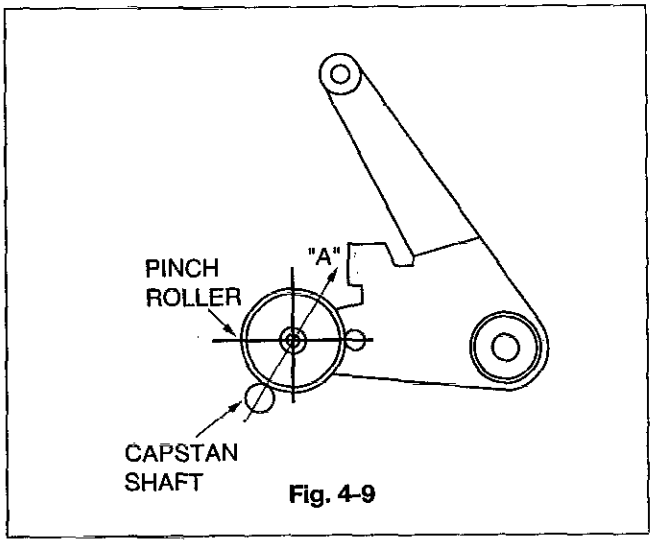


Fig. 4-9

4-4. The Measurement and Adjustment of Back Tension

1) Play back T-120 tape at its center position without F/L Ass'y, and wait until the driving of tape is stabilized (about 10~20 seconds).
2) Set the Tentelometer as shown in Fig. 4-10 and confirm the scale (SPEC: 20~27g).
3) If it is out of specification, change the position of Adjust Cam in order to adjust the tension value.

NOTE:
1. Make sure that the three probes of the Tentelometer are all in good contact with tape.
2. It is recommended to be measured three times because Tentelometer is very sensitive.

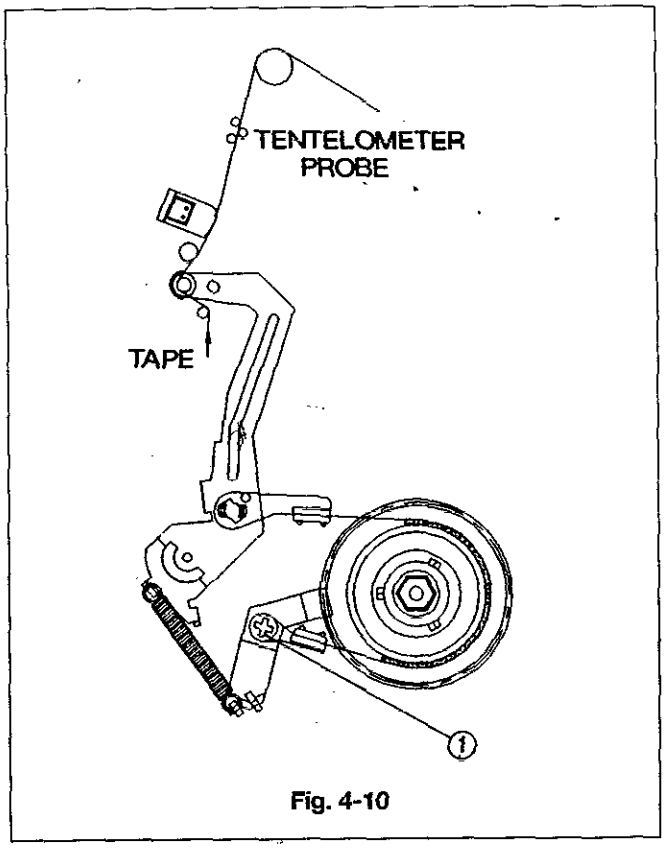


Fig. 4-10

4-5. The Height Adjustment of Reel Table

1) Put the master into the Hole S and the Hole T in the Jig (TSH-V4) and set the Dial Gauge to zero.
2) Set the Jig (TSH-V4) on the Deck Ass'y as shown in Fig. 4-11 and check the height of Reel Table.
(S: 0±0.1 T: [illegible])
3) If it is out of range, it is necessary to adjust the height of Reel Table by adding or subtracting the Poly Slider as shown in Table 4-1.

THICKNESS	PART NUMBER
0.13 mm	97S3903700
0.25 mm	97S3904000
0.5 mm	97S3903600

Table 4-1 Slider for Adjustment

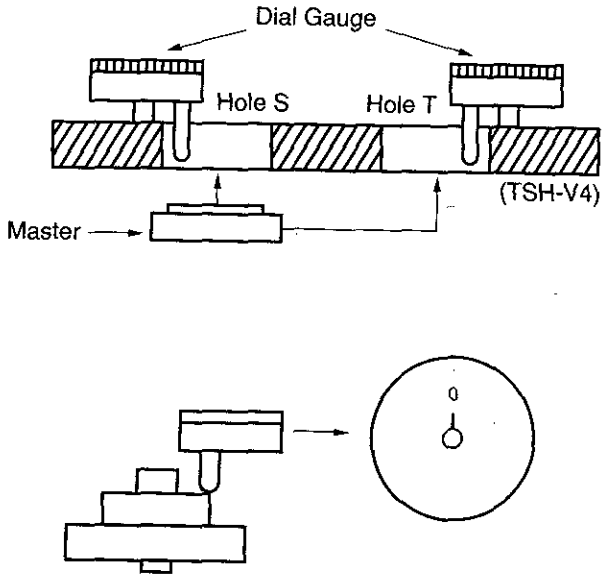


Fig. 4-9

4-6. The Measurement of Reel Torque

1) Play back the Cassette Type Torque Meter.
2) Measure the Take-up Reel Torque after the tape running is stabilized (SPEC: 90~170 g.cm).
3) If it is out of range, replace the Reel Gear Total Ass'y.

5. ADJUSTMENT OF 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 SCHMATIC DIAGRAM OF TAPE TRANSPORTING SYSTEM

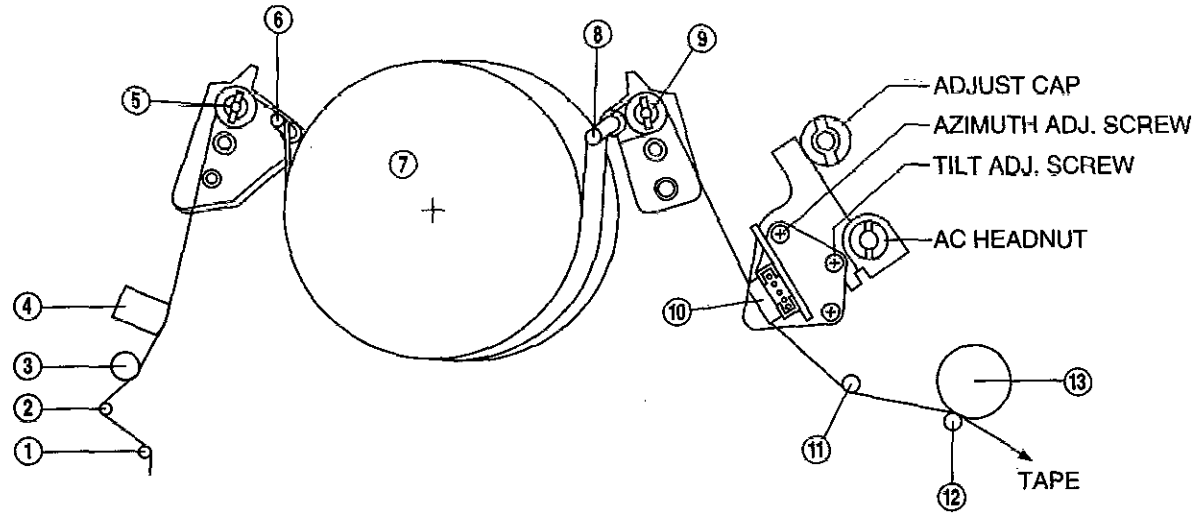
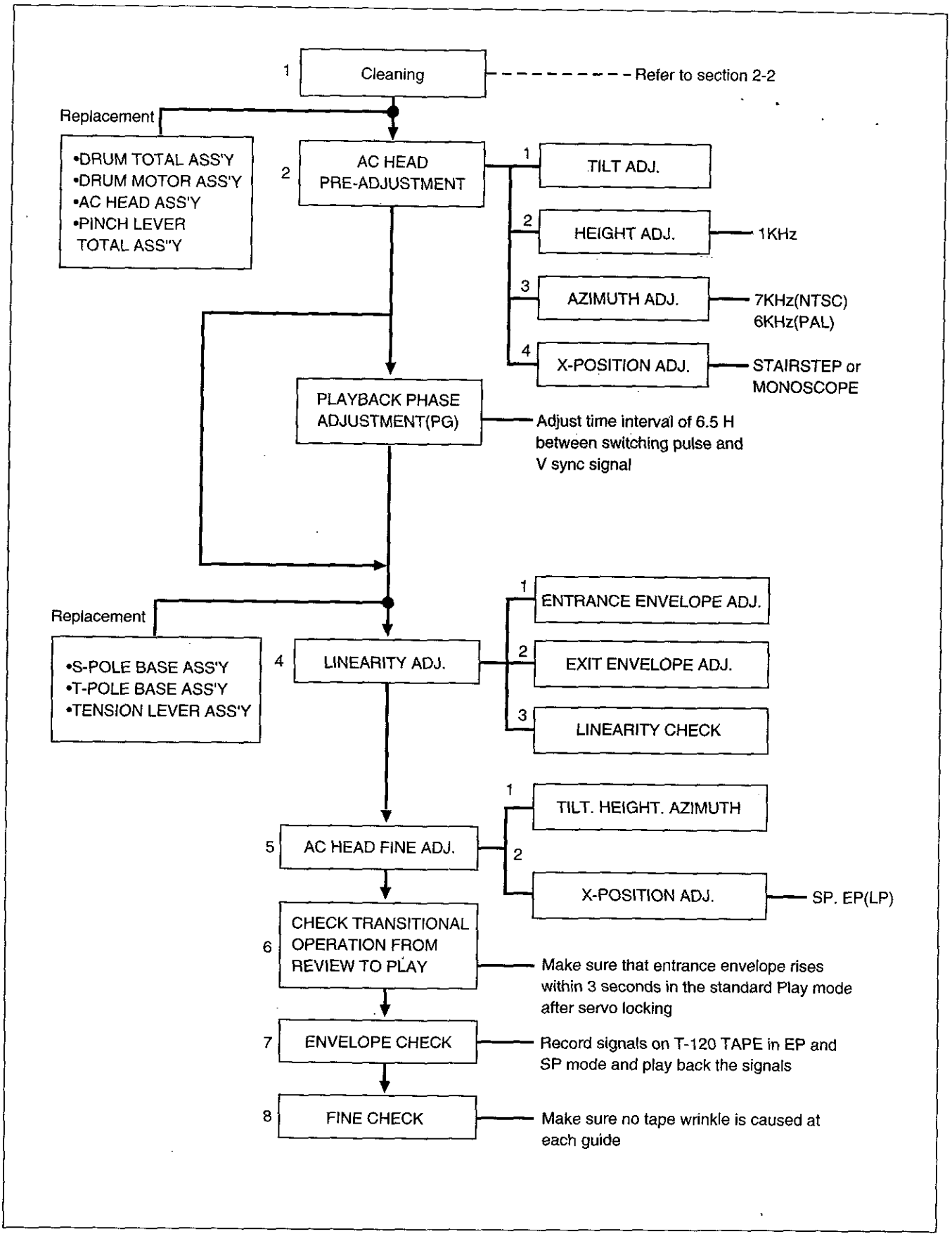


Fig. 4-9

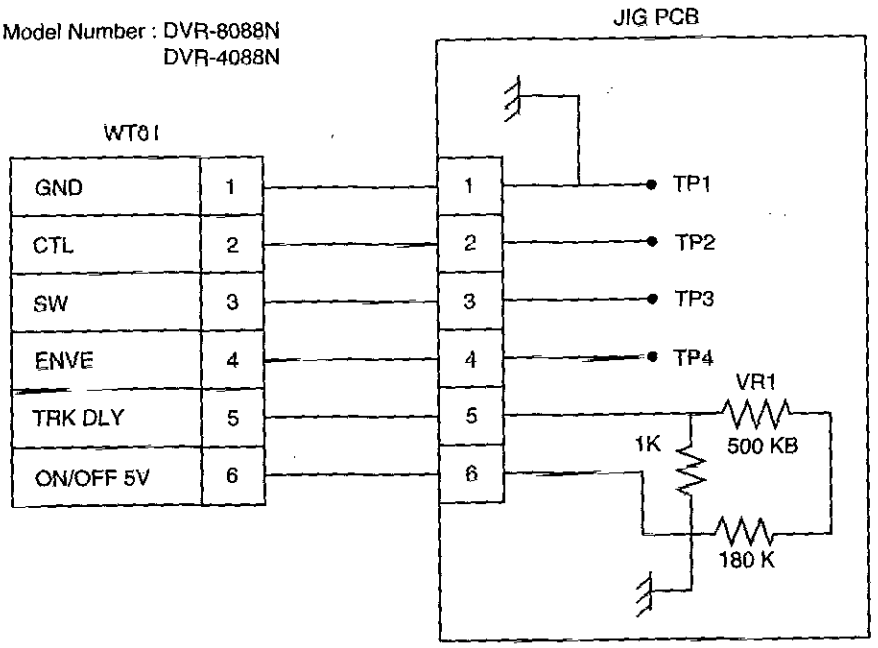
① VERTICAL POST
② TENSION POLE
③ S-GUIDE POST
④ FE HEAD
⑤ S-GUIDE ROLLER
⑥ S-SLANT POLE
⑦ CYLINDER
⑧ T-SLANT POLE
⑨ T-GUIDE ROLLER
⑩ AC HEAD
⑪ T-GUIDE POST
⑫ CAPSTAN SHAFT
⑬ PINCH ROLLER

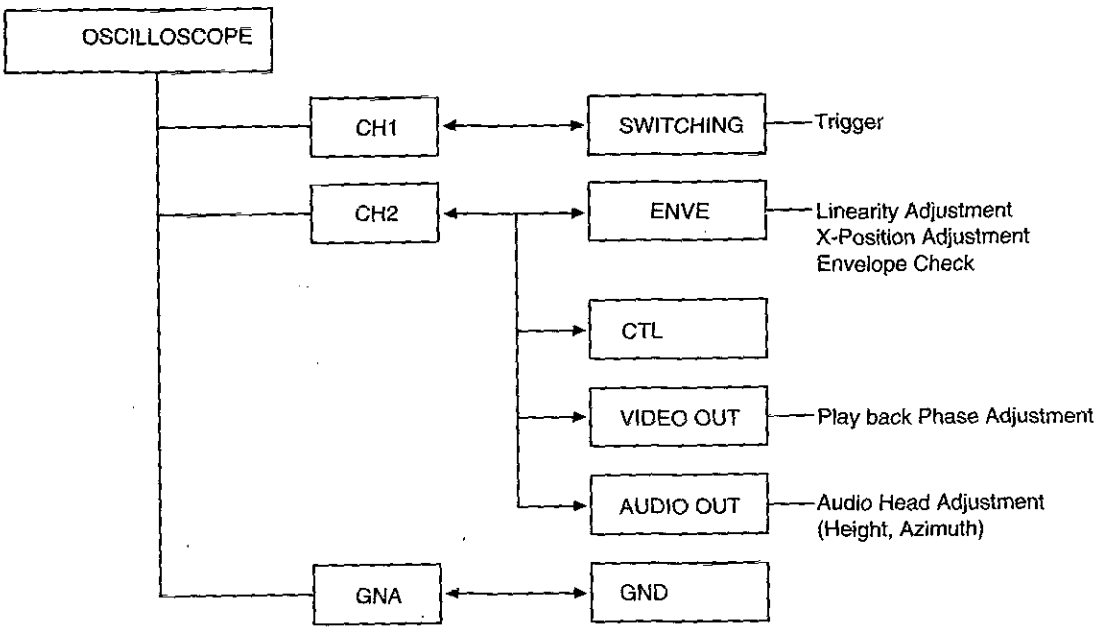
5-2. ADJUSTMENT FLOW FOR THE TAPE TRANSPORTING SYSTEM



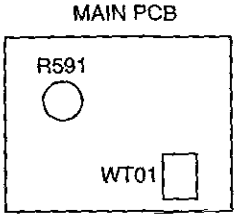
CONNECTION

Model Number : DVR-8088N
DVR-4088N





ADJUSTMENT VR	REMARK
MAIN TRACKING VR PG VR	VR1 (JIG PCB) R591 (MAIN PCB)



5-3. ADJUSTMENT PROCEDURES

1) Pre-adjustment

When the parts as shown in Fig. 5-1 is replaced, the Tape Path may be changed and alignment tape may be damaged. To prevent this, first, playback a T-120 Tape and make sure excessive tape wrinkle does not occur at each tape guide. If tape wrinkle is observed at the S & T-Guide Rollers (⑤, ⑨) in Fig. 5-1, turn the S & T-Guide Rollers for no wrinkle.

2) The Pre-adjustment of AC Head Ass'y

A. Tilt Adjustment

a. Play back a T-120 Tape and observe running condition of the Tape at the upper and lower Flanges of the T-Guide Post Ass'y ⑪ in Fig. 5-1.

b. Adjust the Tilt Adjusting Screw until tape runs stable as shown in Fig. 5-2.

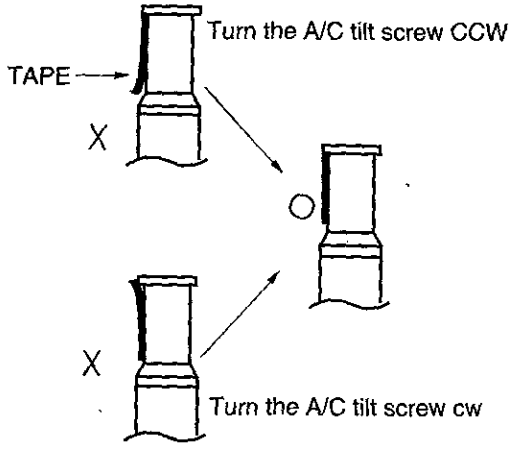


Fig. 5-2 T-Guide Post

B. Audio Azimuth Adjustment

a. Play back the Alignment Tape (SP mode) with audio signal.

• NTSC: 7 KHz • PAL: 6 KHz

b. Observe audio signals on an oscilloscope.

c. Turn the Azimuth Adjusting Screw to obtain maximum audio output.

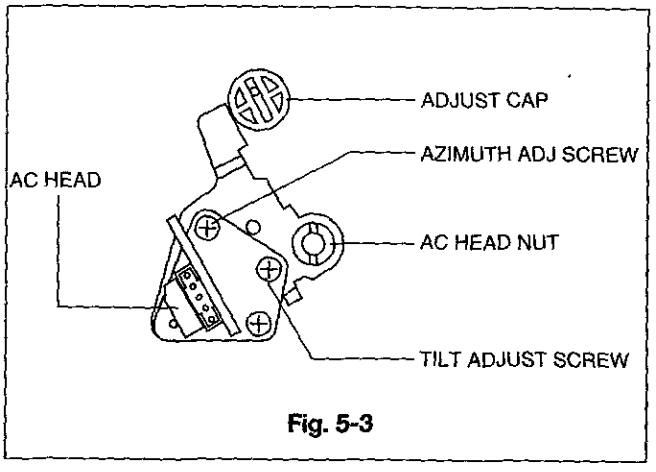


Fig. 5-3

C. The height Adjustment of AC Head

a. Play back the Alignment Tape (SP mode) with 1 KHz audio singal.

b. Turn the AC Head Nut to obtain maximum audio output.

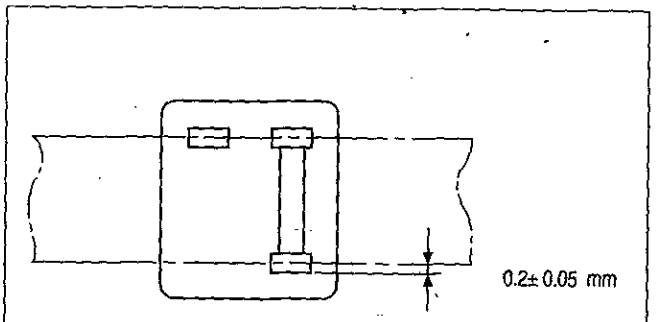


Fig. 5-2 T-Guide Post

D. The X-position Pre-adjustment of AC Head

a. Play back the Alignment Tape with SP stairstep (or monoscope) singal.

b. Adjust the Adjust Cap for maximum envelope output, after Tracking Volume is set at its center, click position.

NOTE:
Before proceeding with this adjustment, remove locking paint applied on the Adjust Cap.

3) Playback Phase Adjustment (PG Adjustment)

A. Play back the Alignment Tape (SP mode).

B. Observe a video signal on an oscilloscope display trigered with the switching pulse.

C. Adjust the PG volume for time interval of 6.5H±0.5H between switching pulse and V sync signal.

NOTE:
In this adjustment, adjust the tracking Volume the best video signal.

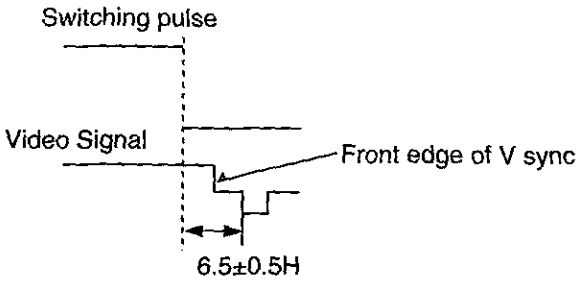
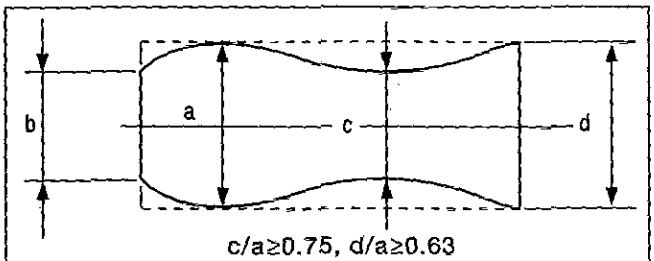


Fig. 5-5 Playback Phase Adjustment

4) Linearity Adjustment

A. Play back the Alignment Tape with SP stairstep (or monoscope) signal.
B. Observe the signal envelope on an oscilloscope display triggerd by the switching pulse.
C. Make sure the envelope waveform (in its maximum) output meets the specifications shown in Fig. 5-6.
   a. Maximum output of envelope.
   b. Minimum output of envelope at the Drum entrance.
   c. Minimum output of envelope at the Drum center.
   d. Maximum output of envelope at the Drum exit in Fig. 5-6.



c/a≥0.75, d/a≥0.63

Fig. 5-6 Envelope Wareform Specification

D. If the section A in Fig. 5-7 does not meet the specification, adjust the S-Guide Roller up or down.
E. If the section B in Fig. 5-7 does not meet the specification, adjust the T-Guide Roller up or down.

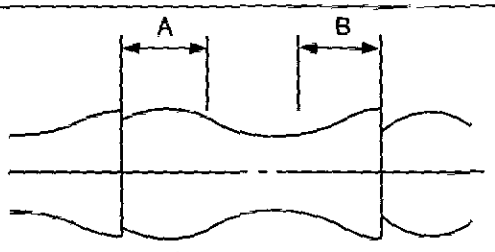


Fig. 5-7 Adjustment Point

F. After completing adjustment, turn the tracking volume and make sure the envelope varies almost flat.
G. If the envelope varies as shown in Fig. 5-8, adjustment of the S-Guide Roller and the T-Guide Roller may be upset. Therefore, perform the adjustment again.

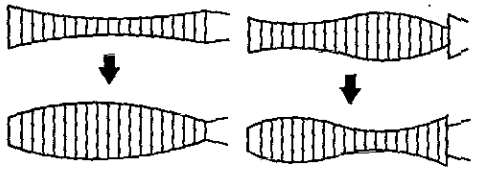


Fig. 5-8 Abnormal Waveform Variation

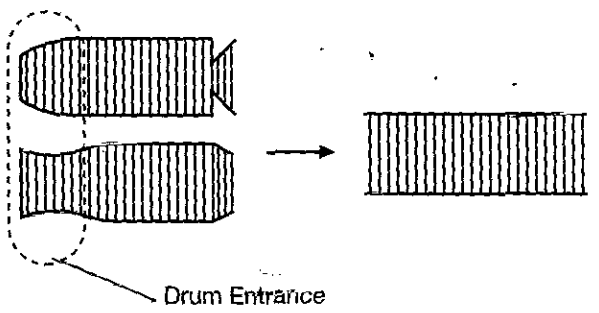


Fig. 5-9 Waveform Adjustment at the Drum Entrance

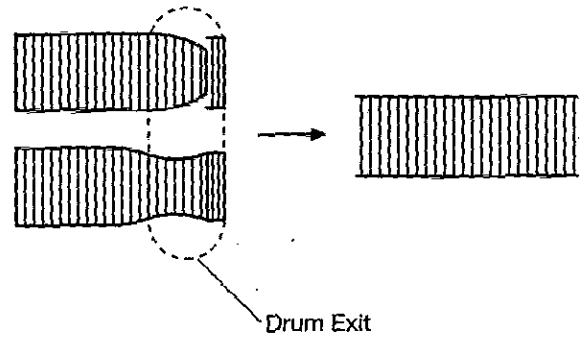


Fig. 5-10 Waveform Adjustment at the Drum Exit

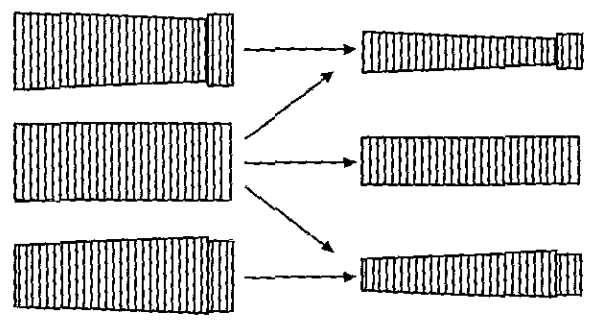


Fig. 5-11 Normal Waveform Variation

5) The fine adjustment of AC head

A. Tilt Adjustment (refer to Fig. 5-2)
   Check the tape wrinkle check at the lower Flange of T-Guide Post Ass'y in Fig. 5-1.
   a. If tape wrinkle is observed at the lower Flange of adjust the Tilt Adjust Screw CCW until the wrinkle disappears.
   b. If a gap observed between the lower Flange of ⓘ and the lower edge of tape, adjust the Tilt Adjusting Screw CW until the tape travels along the lower Flange.

B. Azimuth Adjustment (refer to section 5-3-2)

C. The X Position Adjustment for Interchangeability (refer to Fig. 5-3)
   a. Play back the Alignment Tape (SP mode) with stairstep (or monoscope) signal.
   b. Place the Tracking Volume at its center click.
   c. Trigger an oscilloscope with switching pulse and observe the envelope waveform of Ch 2.
   d. Turn the Adjust Cap CCW or CW within taper section and fix the Adjust Cap at the position where the envelope reaches a peak level.
   e. Play back the Alignment Tape (EP or LP mode) with stairstep (or monoscope) signal.
   f. Make sure the envelope is maximum at the center click position of Tracking Volume. If maximum envelope is not observed, perform the envelope adjustment to obtain maximum envelope output again.
   g. Play back the Alignment Tape with stairstep (or monoscope) signal and make sure audio output is maximum.
      • NTSC: 7 KHz • PAL: 6 KHz

6) Check for transitional operation from Review to Playback.

A. Playback the Alignment Tape (SP mode) in the REVIEW MODE and observe the envelope with an oscilloscope.

B. Switch the REVIEW MODE to the PLAY MODE. Make sure the state within 3 seconds as shown in Fig. 5-12. If it does not rise within 3 seconds after servo locking adjust as follows.
   a. Play back the Alignment Tape which has the stairstep (or monoscope) signal, looking Envelope Waveform, make sure that S & T-Guide Roller's height is adjusted correctly.
   b. Change operation mode from REVIEW MODE to PLAY MODE again and then make sure that the entrance envelope rises within 3 seconds after servo locking.
   c. If not, perform the adjustment according to the section 5-3-4.

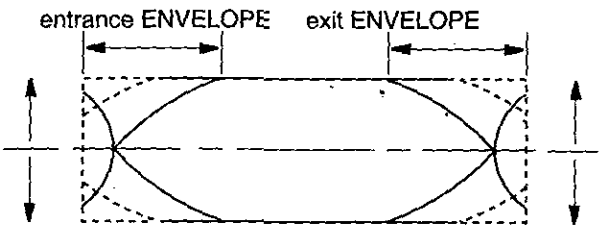


Fig. 5-12

7) Envelope Check

A. Record video signal (color bar or monoscope on T-120 Tape) and make sure the playback envelope output meets the specification as shown in Fig. 5-12.

B. In playing the same Video Deck used for the recording using the T-120, the envelope should meet the specification as shown in fig. 5-13.

C. If the performance does not meet both specification, replace the Drum Total Ass'y.

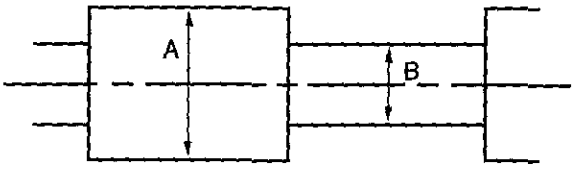


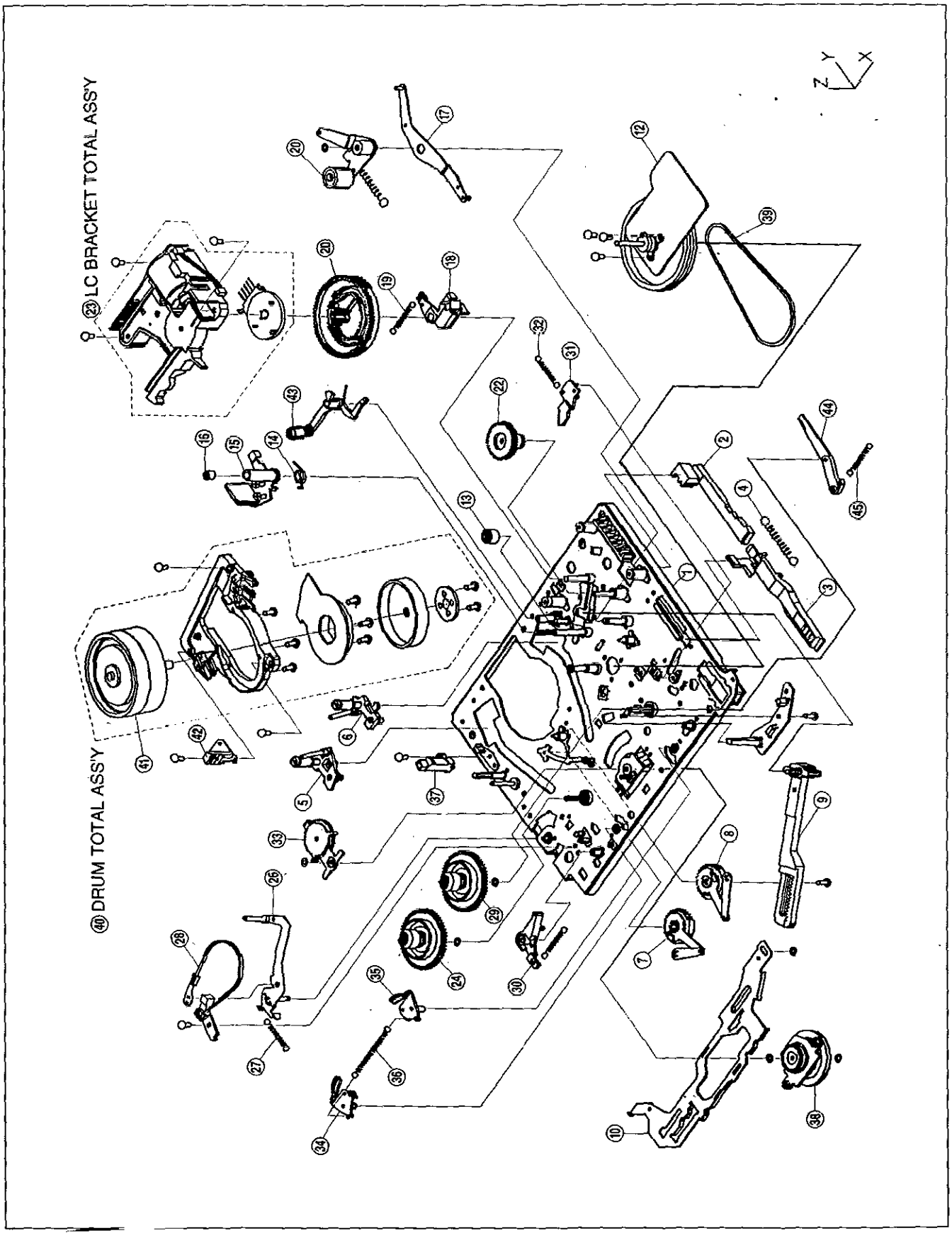
Fig. 5-13 Envelope output and output level difference

8) Final Check

Make sure no Tape wrinkle is caused at each guide.

6. EXPLODED VIEW AND PARTS LIST

6-1. EXPLODED VIEW OF DECK ASS'Y

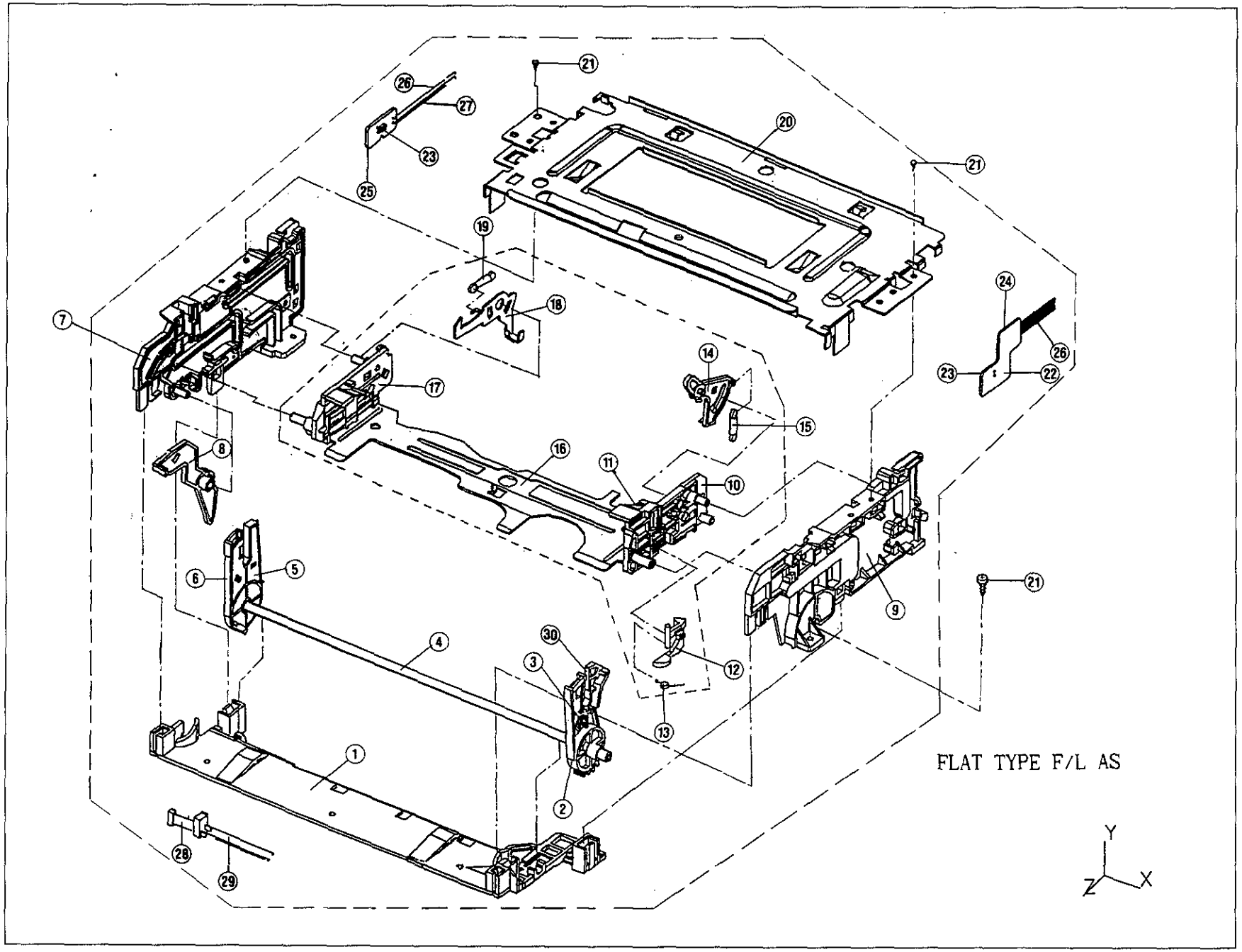


6-2. PARTS LIST OF DECK ASS'Y

NO	STOCK NO.	PART NAME	Q'TY	REMARKS
1	97SB379530	MAIN BASE AS	1 EA	
2	97S2714800	F/L SUB RACK	1 EA	
3	97S2714700	F/L DRIVE RACK	1 EA	
4	97S3035000	F/L RACK SPG	1 EA	
5	97SB387200	S SLANT POLE AS	1 EA	
6	97SB387100	T SLANT POLE AS	1 EA	
7	97SB379800	L LOADING AS	1 EA	
8	97SB379700	R LOADING AS	1 EA	
9	97SB381600	LOADING RACK AS	1 EA	
10	97S0945810	CONNECT PLATE	1 EA	
11	97SB382800	DEC PCB AS	1 EA	
12	97S8103700	CAPSTAN MOTOR	1 EA	
13	97S0427710	CAP ADJUST	1 EA	
14	97S3031300	AC HEAD GUIDE SPG	1 EA	
15	97SB381000	AC HEAD PLATE TOTAL AS	1 EA	RECORD MODEL
	97SB387100	AC HEAD PLATE TOTAL AS	1 EA	PLAY ONLY MODEL
16	97S4001500	AC HEAD UNIT	1 EA	
17	97SB381700	RELAY LEVER AS	1 EA	
18	97S2623500	RETURN LEVER	1 EA	
19	97S3031700	RETURN SPG	1 EA	
20	97S2714900	CAM GEAR	1 EA	
21	97SB381800	PINCH LEVER TOTAL AS	1 EA	
22	97S2906810	WORM WHEEL	1 EA	
23	97SB389700	LC BRACKET TOTAL AS	1 EA	
24	97SB382000	S REEL TABLE AS	1 EA	
25	97SB382100	T REEL TABLE AS	1 EA	
26	97SB379600	TENSION LEVER AS	1 EA	
27	97S3031200	TENSION SPG	1 EA	
28	97SB382900	BAND BRAKE AS	1 EA	
29	97S3037600	S SUB BRAKE SPG	1 EA	
30	97S2626300	S SUB BRAKE LEVER	1 EA	
31	97SB390210	T SUB BRAKE AS	1 EA	
32	97S3032810	T SUB BRAKE SPG	1 EA	
33	97SB382300	IDLER PLATE TOTAL AS	1 EA	
34	97SB382500	S MAIN BRAKE AS	1 EA	
35	97SB382600	T MAIN BRAKE AS	1 EA	
36	97S3032600	MAIN BRAKE SPG	1 EA	
37	97S8012900	FE HEAD	1 EA	RECORD MODEL

NO	STOCK NO.	PART NAME	Q'TY	REMARKS
38	97SB382410	REEL GEAR TOTAL AS	1 EA	
39	97S5502300	REEL BELT	1 EA	
40	97SA298500	DRUM TOTAL AS	1 EA	NTSC 2 HEAD (SP/EP)
	97SA293700	DRUM TOTAL AS	1 EA	NTSC 4 HEAD (MONO)
	97SA244400	DRUM TOTAL AS	1 EA	PAL 2 HEAD (SP ONLY)
	97SA244600	DRUM TOTAL AS	1 EA	PAL 2 HEAD (SLP)
	97SA244500	DRUM TOTAL AS	1 EA	PAL 4 HEAD (MONO)
41	97SB391300	DRUM AS	1 EA	NTSC 2 HEAD (SP/EP)
	97SB390310	DRUM AS	1 EA	NTSC 4 HEAD (MONO)
	97SA300100	DRUM AS	1 EA	PAL 2 HEAD (SP ONLY)
	97SA300300	DRUM AS	1 EA	PAL 2 HEAD (SLP)
	97SA300200	DRUM AS	1 EA	PAL 4 HEAD (MONO)
42	97SB381100	EARTH BRACKET AS	1 EA	
43	97SB385000	HEAD CLEANER TOTAL AS	1 EA	
44	97SB386700	CAPSTAN BRAKE AS	1 EA	4 HEAD MODEL
45	97S3036100	CAPSTAN BRAKE SPG	1 EA	4 HEAD MODEL

6-3. EXPLODED VIEW OF FRONT LOADING ASS'Y



6-4. PARTS LIST OF FRONT LOADING ASS'Y

NO	STOCK NO.	PART NAME	Q'TY	DESCRIPTION	REMARKS
1	97S0938100	CST GUIDE PLATE	1 EA	ABS	
2	97S2624900	LOADING LEVER-R	1 EA	DURACON M90-02	
3	97S3030500	LEVER-R SPG	1 EA	SWPB	
4	97S3606800	LOADING SHAFT	1 EA	SUM 32 MFZN	
5	97S2622100	LOADING LEVER-L	1 EA	DURANEX 3300	
6	97S3030600	LEVER-L SPG	1 EA	SWPB	
7	97S2430600	FL BRKT-L	1 EA	ABS GLASS 10%	
8	97S2622500	F/L DOOR OPENER	1 EA	DURANEX 3300	
9	97S2433600	F/L BRKT-R	1 EA	ABS GLASS 10%	
10	97S5201700	HOLDER SLIDER-R	1 EA	DURACON M90-02	
11	97S3030100	CST UPPER SPG	2 EA	SUS304CSP	
12	97S2622400	RELEASE LEVER	1 EA	DURACON M90-02	
13	97S3030700	RELEASE SPG	1 EA	SUS304WPB	
14	97S2622600	PRE OPENER	1 EA	DURANCON M90-02	
15	97S3030900	OPENER SPG	1 EA	SUS304WPB	
16	97S0935800	CST HOLDER PLATE	1 EA	SECC T1.2	
17	97S5201600	HOLDER SLIDER-L	1 EA	DURACON M90-02	
18	97S2622310	SAFETY LEVER	1 EA	SECC T1.0	
19	97S3030800	SAFETY SPG	1 EA	SUS304WPB	
20	97S0935700	TOP PLATE	1 EA	SECC T1.0	
21	7121300811	TAPPING SCREW	2 EA		
22	97P6538202	START PCB	1 EA	BAKELITE	
23	TPT304R2--	PHOTO TR	2 EA	PT304R2	
24	97P8805803	CONN WAFER ANGLE	1 EA		
25	97P6538203	END PCB	1 EA	BAKELITE	
26	WP-9RD3213	LEAD WIRE	1 EA		
27	WP-9WH3213	LEAD WIRE	1 EA		
28	5SD0101052	RECORD SAFETY S/W	1 EA		RECORD MODEL
29	WP-9YW3113	LEAD WIRE	2 EA		RECORD MODEL
30	97S3538900	LEVER-R POST	1 EA	SUM32	

6-5. MAIN SPARE PARTS LIST OF DECK ASS'Y

NO	PART NAME	PART S/N	DESCRIPTION	Q'TY	REMARKS
1	CONNECT PLATE	97S0945810	SECC T1.0	1 EA	
2	F/L SUB RACK	97S2714800	DURANEX 3300	3 EA	
3	F/L DRIVE RACK	97S2714700	DURANEX 3300	3 EA	
4	F/L RACK SPG	97S3035000	SWPB	1 EA	
5	S SLANT POLE AS	97SB387200	G-MECHA	1 EA	
6	T SLANT POLE AS	97SB387100	G-MECHA	1 EA	
7	L LOADING AS	97SB379800	G-MECHA	1 EA	
8	R LOADING AS	97SB379700	G-MECHA	1 EA	
9	LOADING RACK AS	97SB381600	G-MECHA	1 EA	
10	DECK PCB AS	97SB382800	G-MECHA	3 EA	
11	ADJUST CAP	97S0427710	ZAMAK 3	1 EA	
12	CAPSTAN MOTOR	97S8103700	F2QKB47	3 EA	
13	AC HEAD PLATE TOTAL AS	97SB381000	G-MECHA	3 EA	RECORD MODEL
	AC HEAD PLATE TOTAL AS	97SB387100	G-MECHA	3 EA	PLAY ONLY MODEL
14	RELAY LEVER AS	97SB381700	G-MECHA	1 EA	
15	RETURN LEVER	97S2623500	DURACON M90	1 EA	
16	RETURN SPG	97S3031700	SUS3042WPB	1 EA	
17	CAM GEAR	97S2714900	TR-10D	1 EA	
18	PINCH LEVER TOTAL AS	97SB381800	G-MECHA	3 EA	
19	WORM WHEEL	97S2906810	DURACON M90	1 EA	
20	LC BRAKET TOTAL AS	97SB389700	G-MECHA	3 EA	
21	IDLER PLATE TOTAL AS	97SB382300	G-MECHA	3 EA	
22	S REEL TABLE AS	97SB382000	G-MECHA	3 EA	
23	T REEL TABLE AS	97SB382100	G-MECHA	3 EA	
24	TENSION LEVER AS	97SB379600	G-MECHA	1 EA	
25	BAND BRAKE AS	97SB382900	G-MECHA	1 EA	
26	TENSION SPG	97S3031200	SUS304WPB	1 EA	
27	S SUB BRAKE LEVER	97S2626300	DURACON M90	1 EA	
28	S SUB BRAKE SPG	97S3037600	SUS304WPB	1 EA	
29	T SUB BRALE AS	97SB390210	G-MECHA	3 EA	
30	T SUB BRAKE SPG	97S3032810	SUS304WPB	1 EA	
31	S MAIN BRAKE AS	97SB382500	G-MECHA	3 EA	
32	T MAIN BRAKE AS	97SB382600	G-MECHA	3 EA	
33	MAIN BRAKE SPG	97S3032600	SUS3042WPB	1 EA	
34	FE HEAD	97S8012900	HVFMF0016AK	3 EA	RECORD MODEL
35	REEL GEAR TOTAL AS	97SB382410	G-MECHA	1 EA	
36	CONNECTOR AS	97P8806203	MAIN-DECK (MOTOR) 14P-6/9P	3 EA	

NO	PART NAME	PART S/N	DESCRIPTION	Q'TY	REMARKS
37	DRUM TOTAL AS	97SA295800	G-MECHA	3 EA	NTSC 2 HEAD (SP/EP)
	DRUM TOTAL AS	97SA293700	G-MECHA	3 EA	NTSC 4 HEAD (MONO)
38	HEAD CLEAR TOTAL AS	97SB385000	G-MECHA	3 EA	
39	FLAT TYPE F/L AS	97SB125930	G-MECHA	3 EA	RECORD MODEL
	FLAT TYPE F/L AS	97SB177640	G-MECHA	3 EA	PLAY ONLY MODEL
40	POLY WASHER	97S3117300	D3.6xD8xT0.5	5 EA	
41	POLY WASHER	97S3108200	D2.6xD6xT0.5	5 EA	
42	POLY SLIDER	97S3903600	D3.1XD6XT0.5	5 EA	
43	TAPPING SCREW	7121300611	T2S PAN 3x6 MFZN	5 EA	
44	TAPTITE SCREW	7278260611	TT3 WAS 2.6x6 MFZN	10 EA	
45	TAPPING SCREW	7124301211	T2S RND 3x12 MFZN	EA	
46	TAPTITE SCREW	7274300611	TT3 RND 3x6 MFZN	5 EA	DECK-F/LOADING
47	TAPTITE SCREW	7278300511	TT3 WAS 3x5 MFZN	5 EA	
48	TAPTITE SCREW	7274261011	TT3 RND 2.6x10 MFNZ	5 EA	
49	TAPTITE SCREW	7274301011	TT3 RND 3x10 MFZN	5 EA	
50	TAPTITE SCREW	7274301211	TT3 RND 3x12 MFZN	5 EA	
51	MACHINE SCREW	7008260511	WAS 2.6x5 MFZN	3 EA	
52	CAPSTAN BRAKE AS	97SB386700	G-MECHA	3 EA	4 HEAD MODEL
53	CAPSTAN BRAKE SPG	97S3036100	SUS 304 WPB	1 EA	4 HEAD MODEL

TEAC

ADDENDUM
SERVICE MANUAL

MV-4850 \ 3450
TELEVIDEO

Addendum to MV-4850/3450 Service Manual.

This is a Technical Service Guide Only for the Video Mechanism.

Effective: November, 1996 **MV4850ADDEN**

TEAC

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Effective: November, 1996

MV4850ADDEN

CONTENTS

1. MECHANICAL DESCRIPTION

1-1. CHARACTERISTIC OF G-MECHA MECHANISM

1) G-Mecha follows the VHS STANDARDS and corresponds to the NTSC/PAL TV.
2) G-Mecha has three motors (Drum Motor, Capstan Motor and L/C Motor).
3) G-Mecha uses L/C Motor to drive Front Loading.
4) G-Mecha realizes its mode by the 4-bit mode signal which is executed by the Mode Switch driven by a L/C Motor.
5) G-Mecha is a slim type DECK with 81.5 mm height.
6) G-Mecha has reduced the consuming time of the mode converting, especially picture appearing time on TV by so-called, "The Full Loading System" which keeps the type always wrapped around the Drum.

1-2. MODE DESCRIPTION

1) EJECT MODE

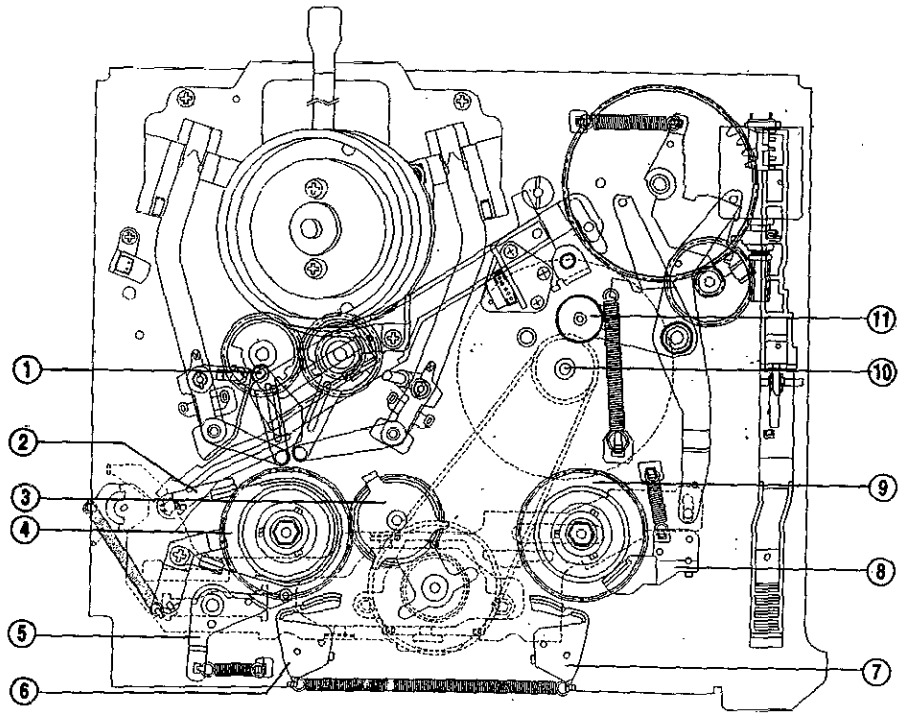
A. In this mode, the Cassette In/Out operation is performed by the CW/CCW rotation of the L/C Motor to which the Front Loading driving parts are directly related.

CASSETTE IN : If the Cassette is completely inserted into the predetermined postion of the Deck, the state of the Start Sensor is changed from OFF to ON and at the same time the Cassette In is detected. And instantly the Cassette loading is performed and the Mode proceeds to the Stop Mode.

CASSETTE OUT : In this state, the Cassette Holder is located at the entrance of the Front Pannel, the Start Sensor is ON 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 are released from the S & T-Reel Table.
c. The S-Sub Brake is released to the S-Reel Table.
d. The T-Sub Brake is applied to the T-Reel Table.
e. The Idler Gear is applied to the S-Reel Table.



① TENSION POLE
② BAND BRAKE
③ IDLER GEAR
④ S-REEL TABLE
⑤ S-SUB BRAKE
⑥ S-MAIN BRAKE
⑦ T-MAIN BRAKE
⑧ T-SUB BRAKE
⑨ T-REEL TABLE
⑩ CAPSTAN SHAFT
⑪ PINCH ROLLER

Fig. 1-1. EJECT MODE

2) INITIAL MODE

A. INITIAL MODE is performed between EJECT MODE and LOADING MODE. Also this is used as the reference mode determining whether or not Cassette Down has finished completely when Cassette In is performed and whether or not the unloading has finished when the state proceeds from STOP MODE to EJECT MODE.

B. Mechanical Arrangement
   a. The S & T-Main Brake are released from the S & T-Reel Table.
   b. The Band Brake is released from the S-Reel Table.
   c. The S-Sub Brake is applied to the S-Reel Table.
   d. The T-Sub Brake is applied to the T-Reel Table.
   e. The Idler Gear is applied to the S-Reel Table.

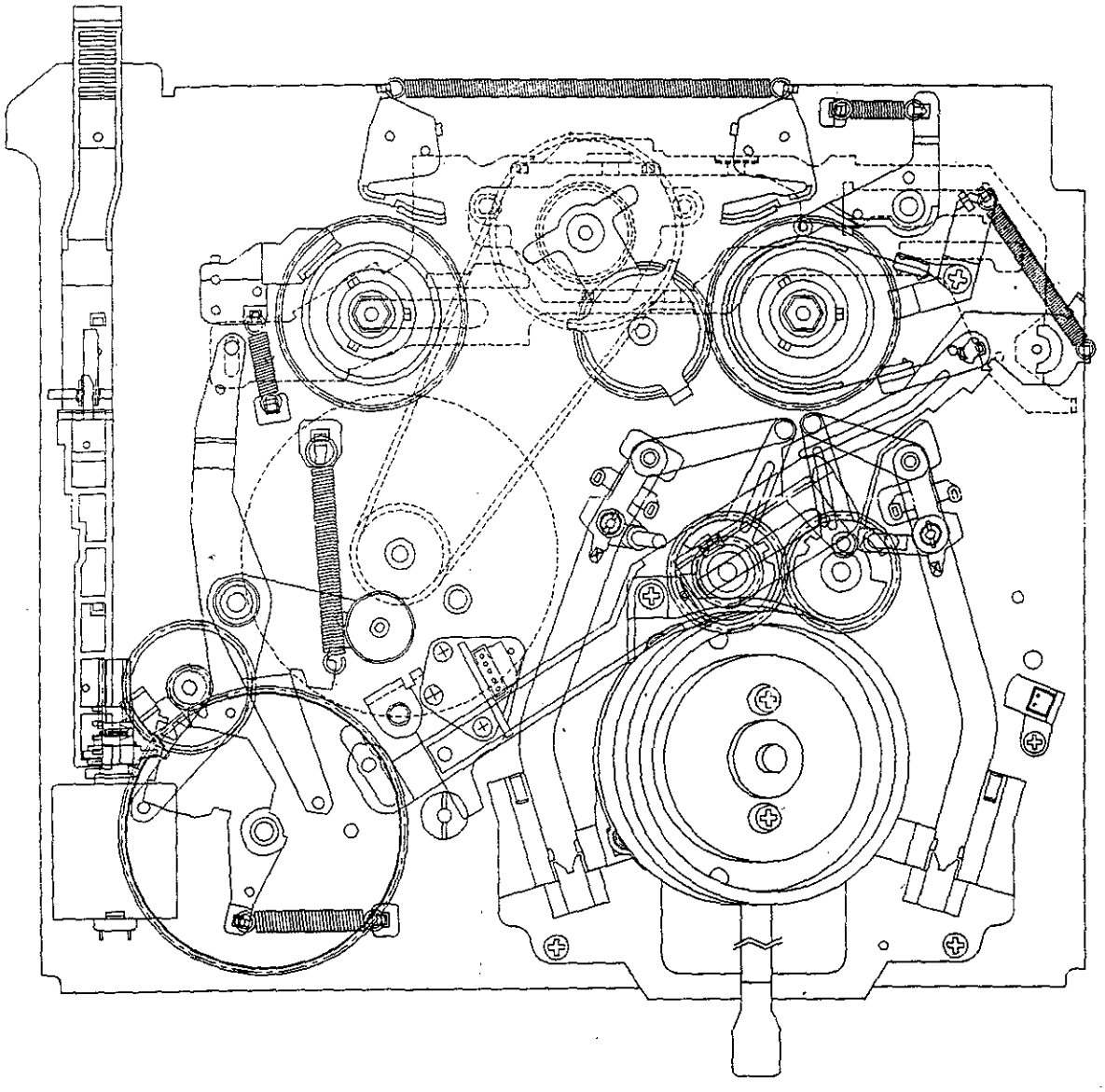


Fig. 1-2. INITIAL MODE

3) LOADING MODE

A. LOADING MODE is performed between *INITIAL MODE* and STOP MODE. Also this mode is used as the reference mode which checks for the loading and unloading of the Pole Base.

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 T-Sub Brake is applied to the T-Reel Table.
   e. The Idler Gear is located near the T-Reel Table.

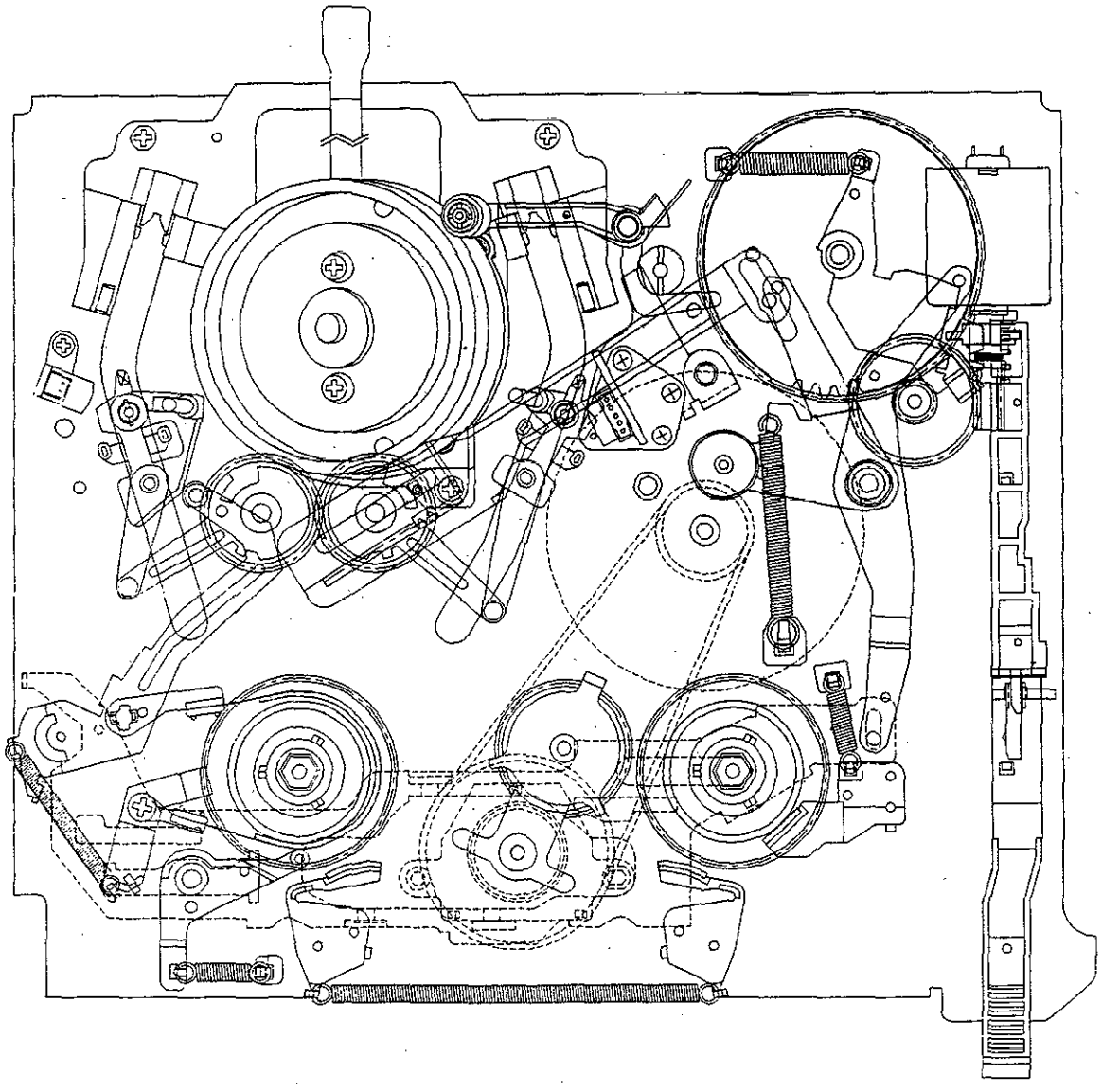


Fig. 1-3. LOADING MODE

4) REVIEW MODE

A. The Review Search operation is performed in this mode. This mode is obtained by pushing the REVIEW BUTTON in the PLAY MODE. The L/C Motor rotates 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 Motor starts to rotate CCW.

B. Mechanical Arrangement
   a. The S & T Pole Base are fully loaded to the V-Block of the Drum Base.
   b. The Band Brake is released from the S-Reel Table.
   c. The S & T-Main Brake are released from the S & T-Reel Table.
   d. The S-Sub Brake is applied to the S-Reel Table
   e. The T-Sub Brake is applied to the T-Reel Table.
   f. The Idler Gear is applied to the S-Reel Table.
   g. The Pinch Roller is applied to the Capstan Shaft to transport the tape reversely.

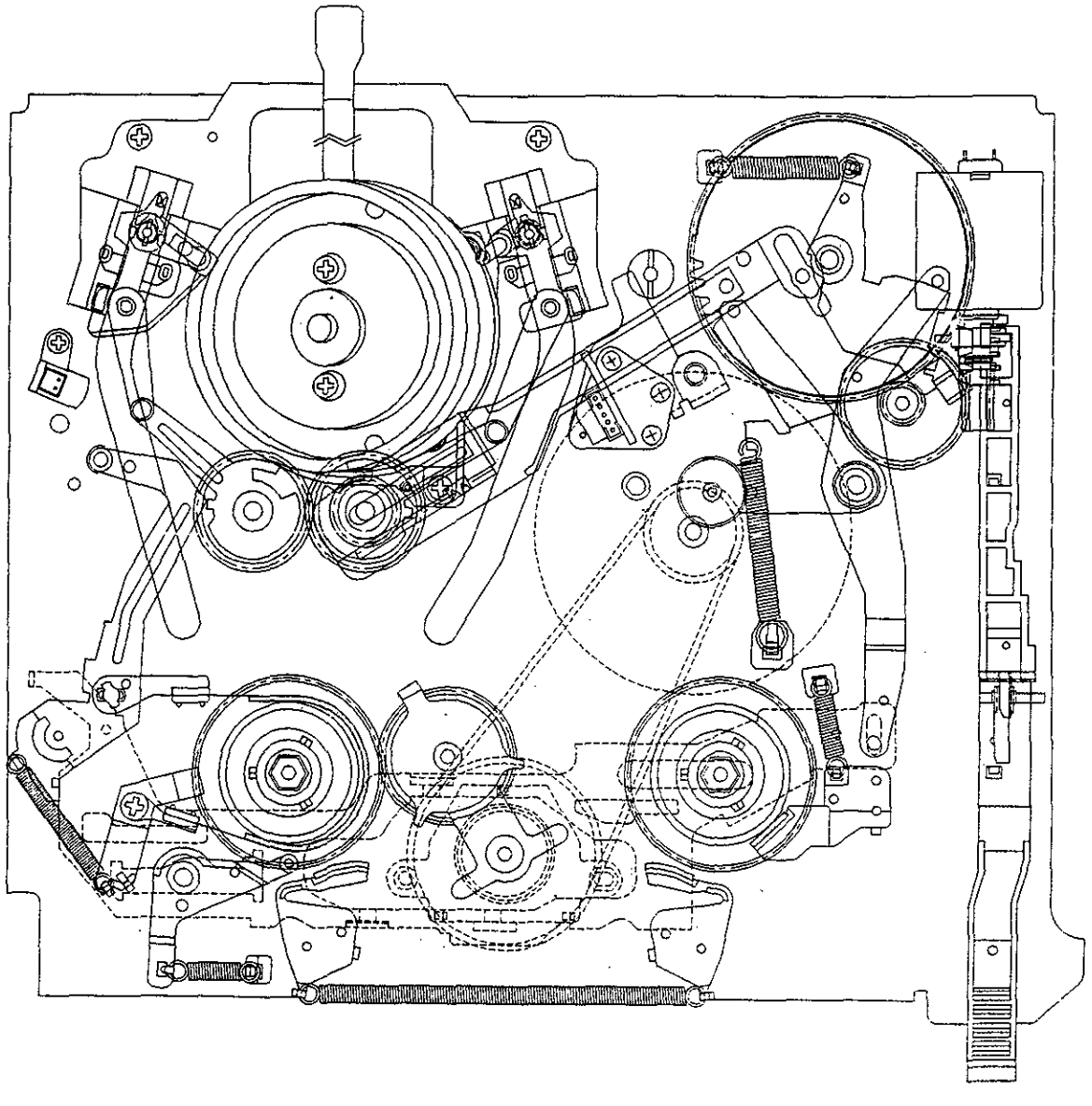


Fig. 1-4. REVIEW MODE

5) STOP MODE

A. This STOP MODE is completely performed by means of the loading operation from the INITIAL MODE.
The cassette tape is wrapped around the Drum to perform the other mode operation quickly (Remind that the Fully Loading System realizes the Quck Response and Quick Start Function).

B. Mechanical Arrangement
a. The Tension Pole is on its predetermined position.
b. The Pinch Roller is waiting to contact to the Capstan Shaft.
c. The Band Brake is applied to the S-Reel Table.
d. The S & T-Main Brake are released from S & T-Reel Table.
e. The S-Sub Brake is released from the S-Reel Table.
f. The T-Sub Brake is applied to the T-Reel Table.
g. The Idler Gear is located near the S-Reel Table.

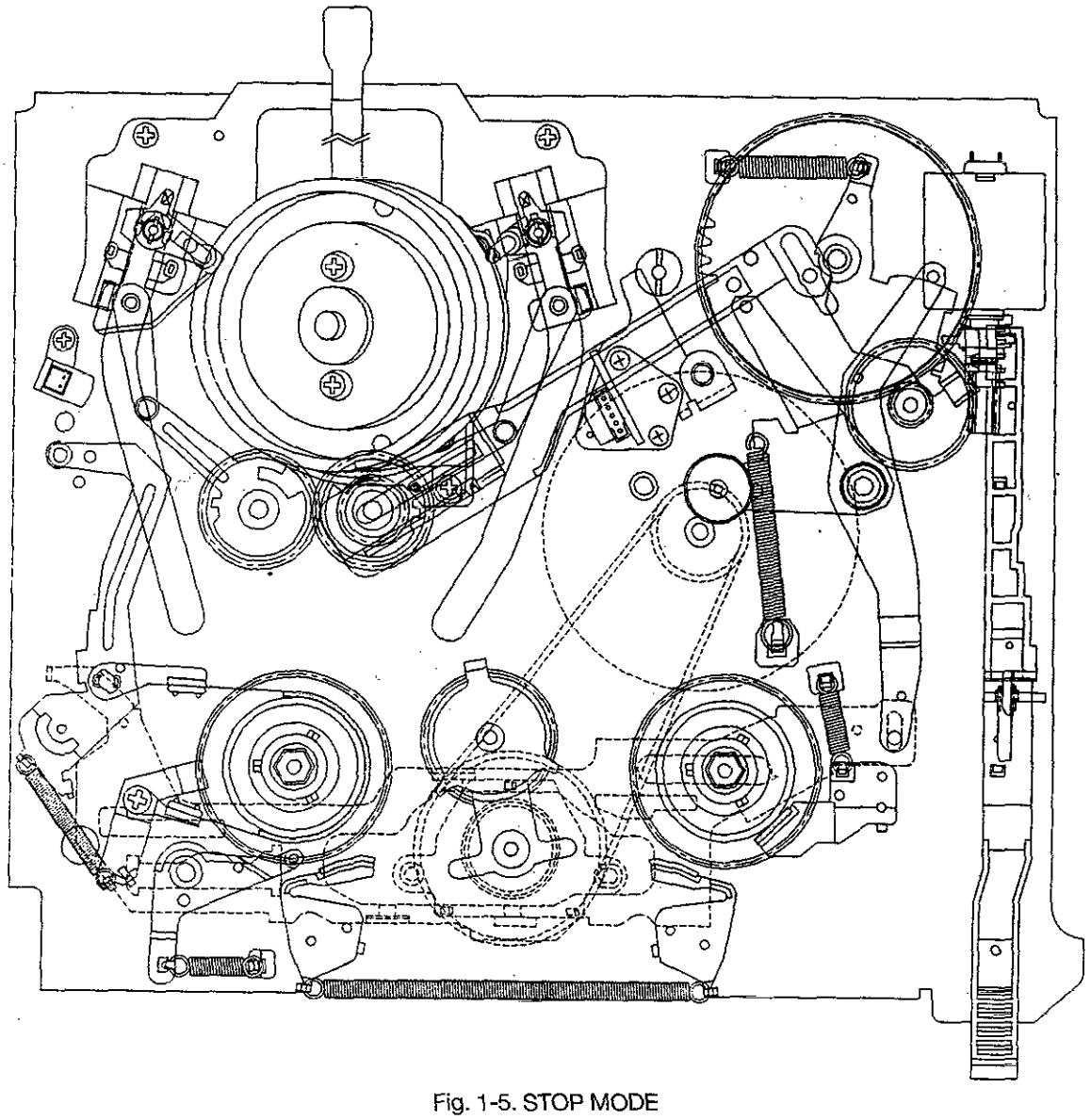


Fig. 1-5. STOP MODE

6) PLAY/RECORDING MODE

A. In this mode, the cassette tape is transported to the T-Reel Table at the constant speed.

B. *Mechanical Arrangement*
   a. The Tension Pole is on its predetermined position.
   b. The Band Brake is applied to the S-Reel Table to execute the TENSION SERVO.
   c. The Pinch Roller is applied to the Capstan Shaft to transport the tape at the constant speed.
   d. The S & T-Main Brake are released from the S & T-Reel Table.
   e. The S-Sub Brake is released from the S-Reel Table.
   f. The T-Sub Brake is applied to the T-Reel Table.

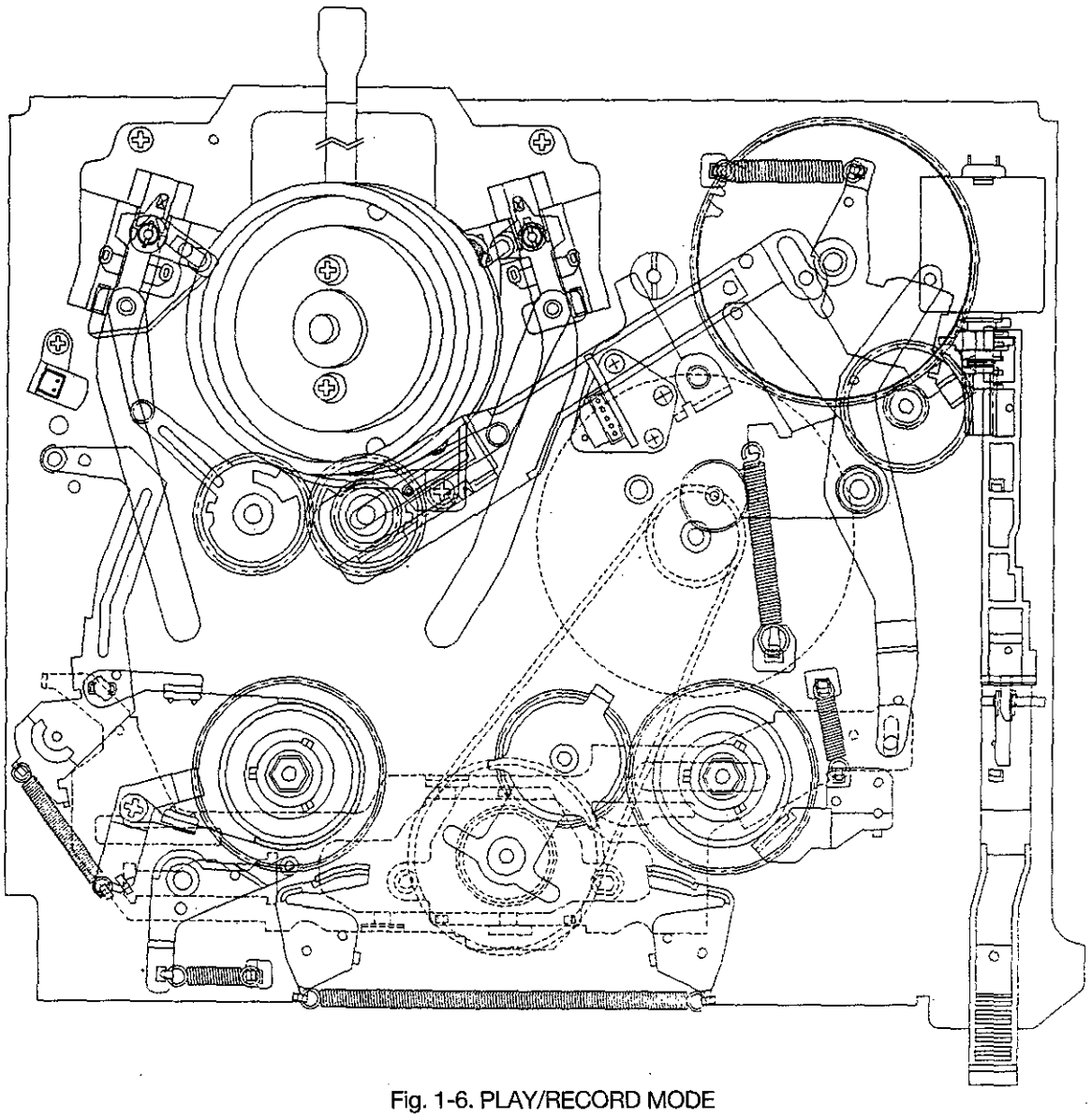


Fig. 1-6. PLAY/RECORD MODE

7) SLOW/STILL MODE

A. This is the operation which makes the transporting system temperarity stopped (so called "STILL") and the slowly executed (so called "SLOW").

B. Mechanical Arrangement
All the Mechanical system is the same as that of PLAY Mode, except that the capstan Brake is applied to the Capstan Flywheel and S-Sub Brake is applied to the S-Reel Table.

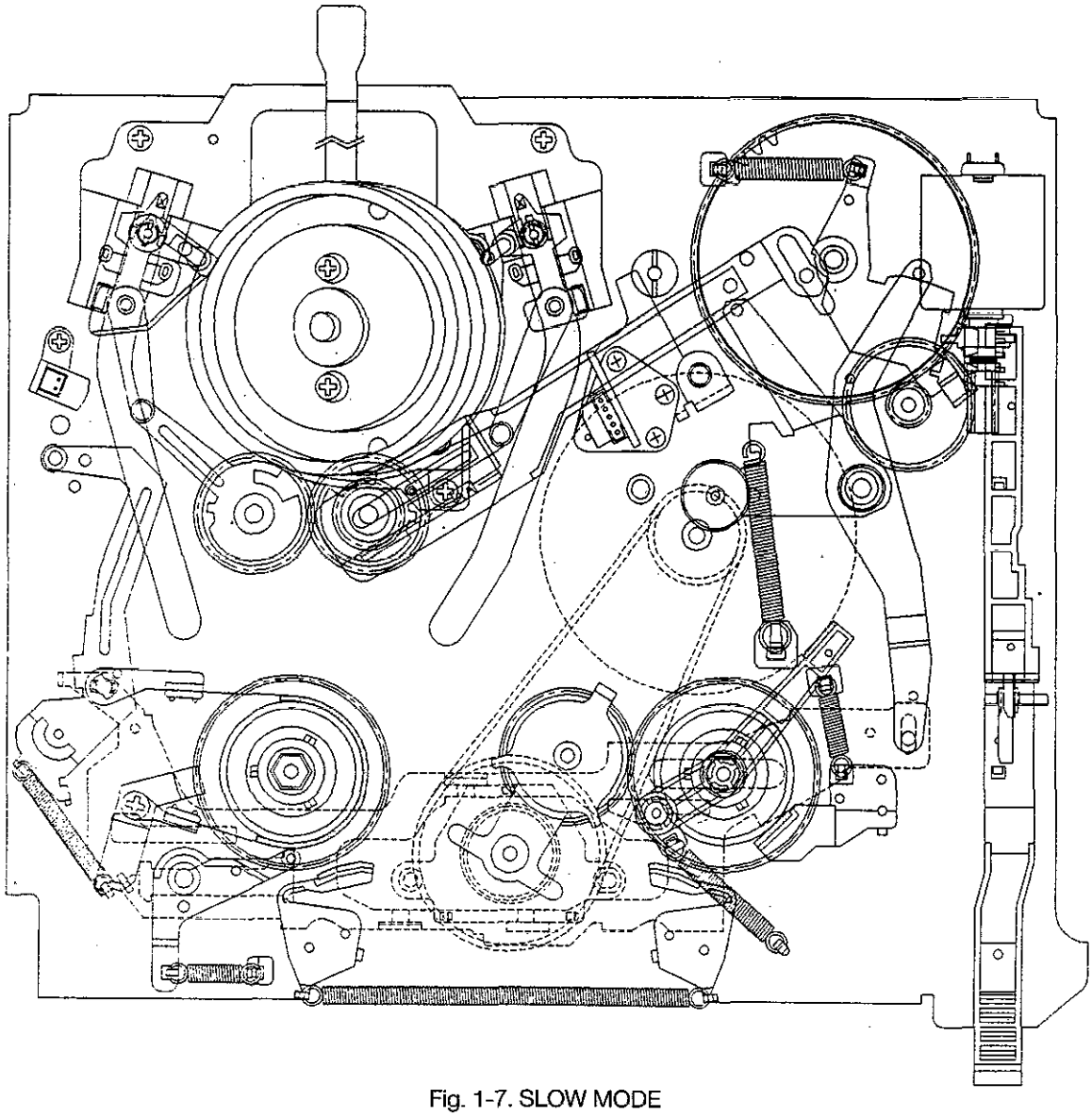


Fig. 1-7. SLOW MODE

8) BRAKE MODE

A. This mode is a mechanical mode which lies in between SLOW MODE and FF/REW MODE. If either STOP/EJECT BUTTON or PLAY BUTTON is pushed in the FF/REW MODE, FF/REW operation is stopped quickly.

B. Mechanical Arrangement
   a. The Pinch Roller is released from the Capstan Shaft.
   b. The Band Brake is released from the S-Reel Table.
   c. The S-Sub Brake is applied to the S-Reel Table.
   d. The T-Sub Brake is applied to the T-Reel Table.
   e. The S & T-Main Brake are applied to the S & T-Reel Table.

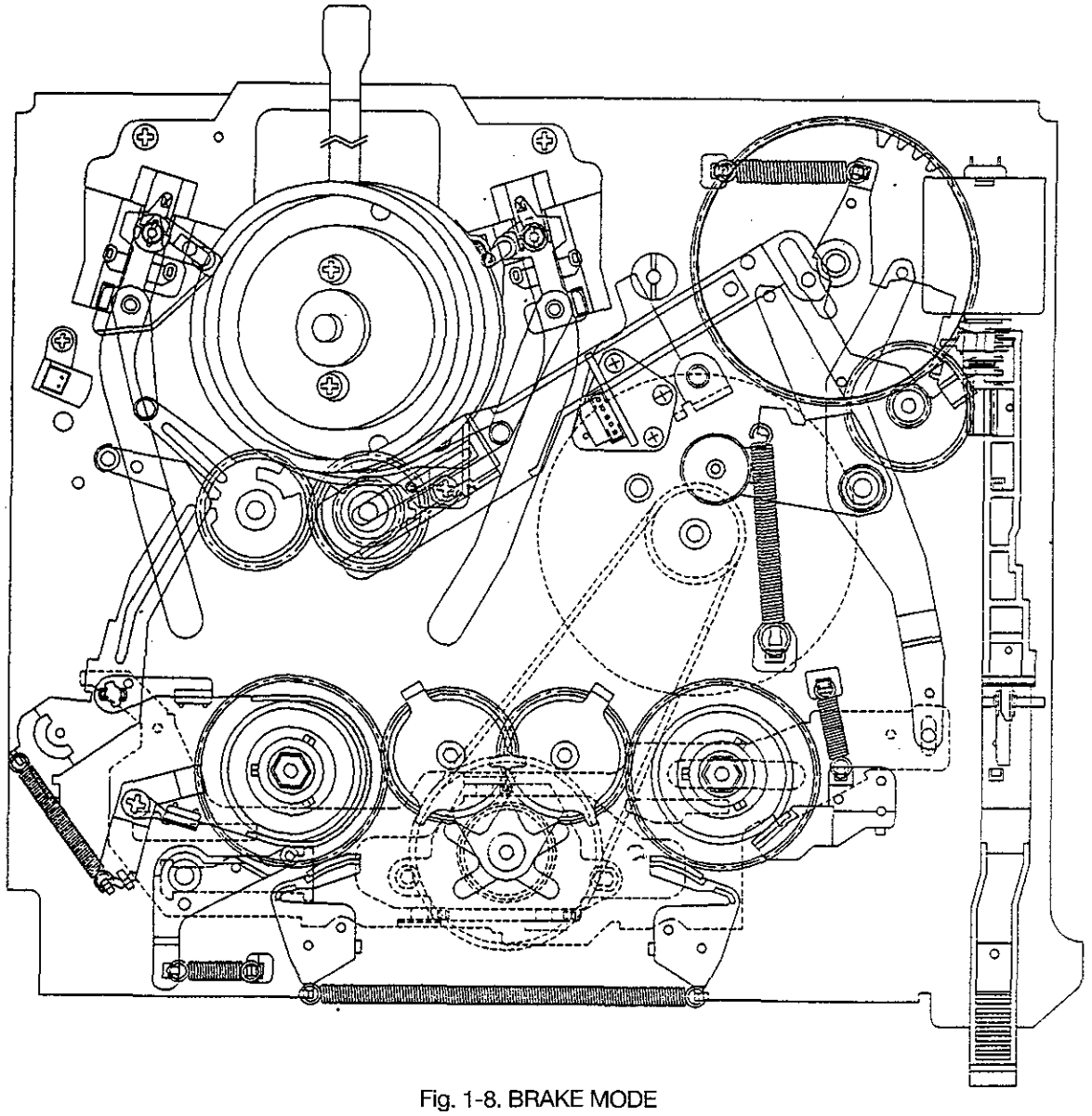


Fig. 1-8. BRAKE MODE

9) 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 Auto Reverse/Forward Search.
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 Pinch Roller is released from the Capstan Shaft.
b. All Brakes are released.

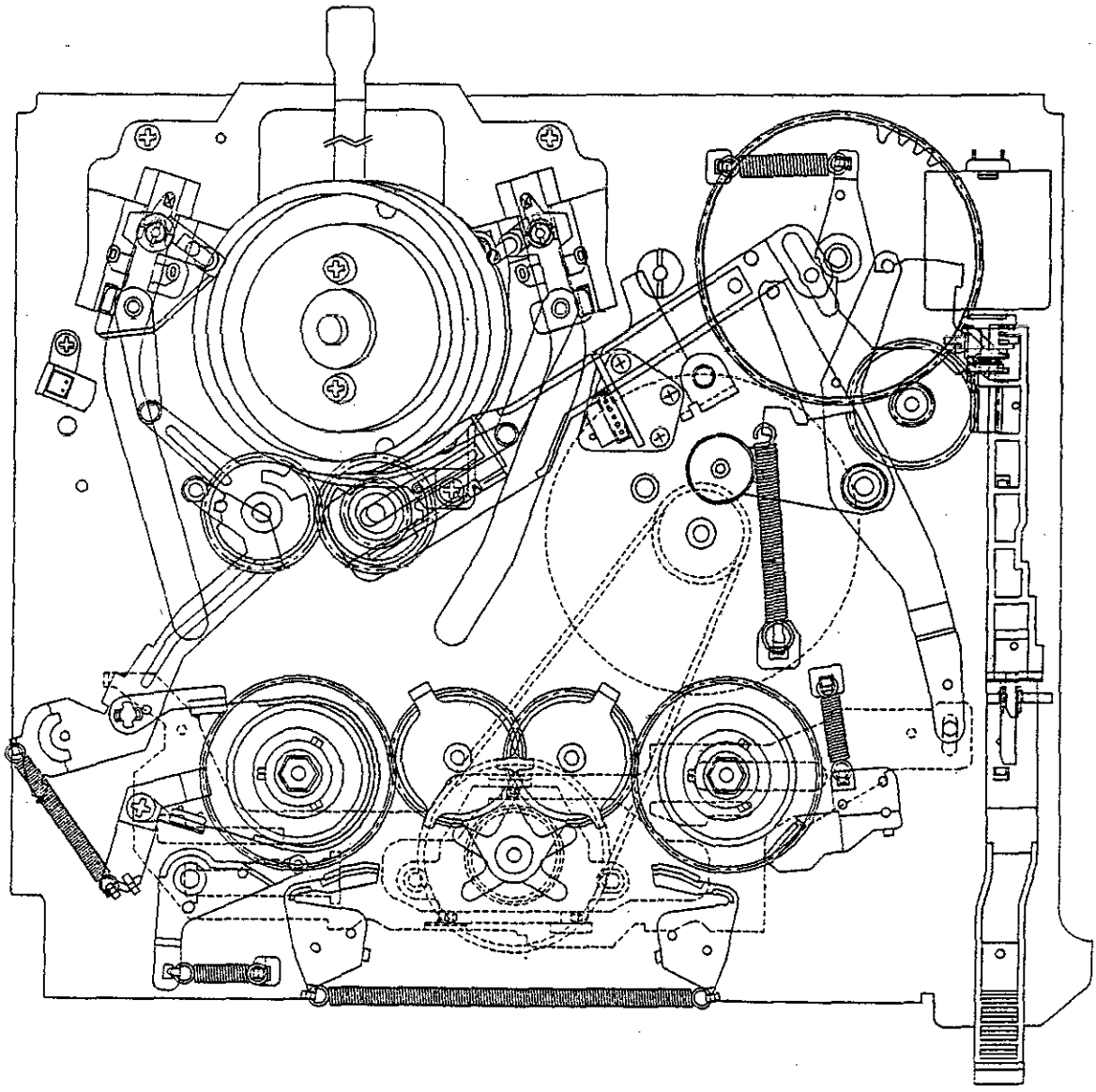
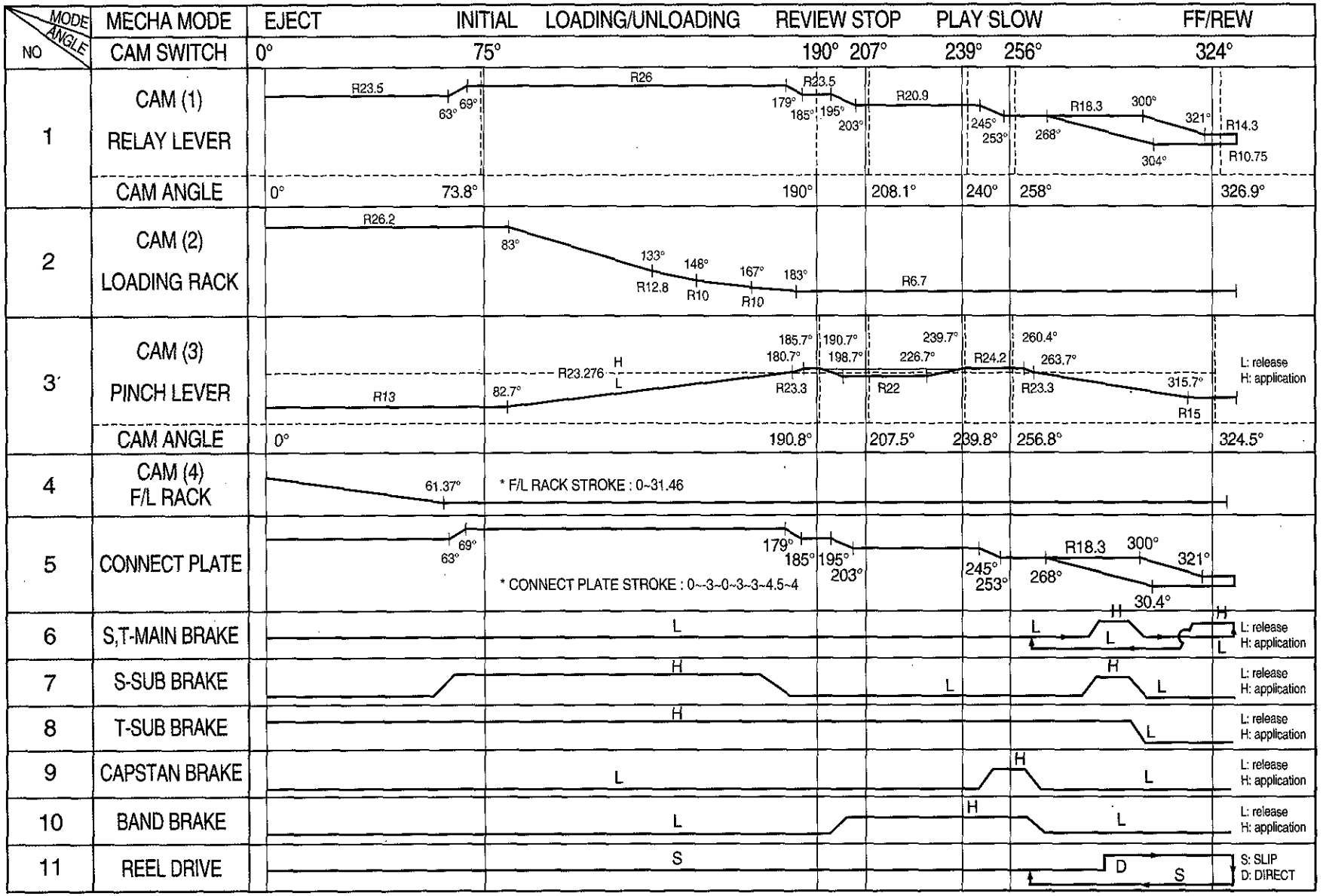
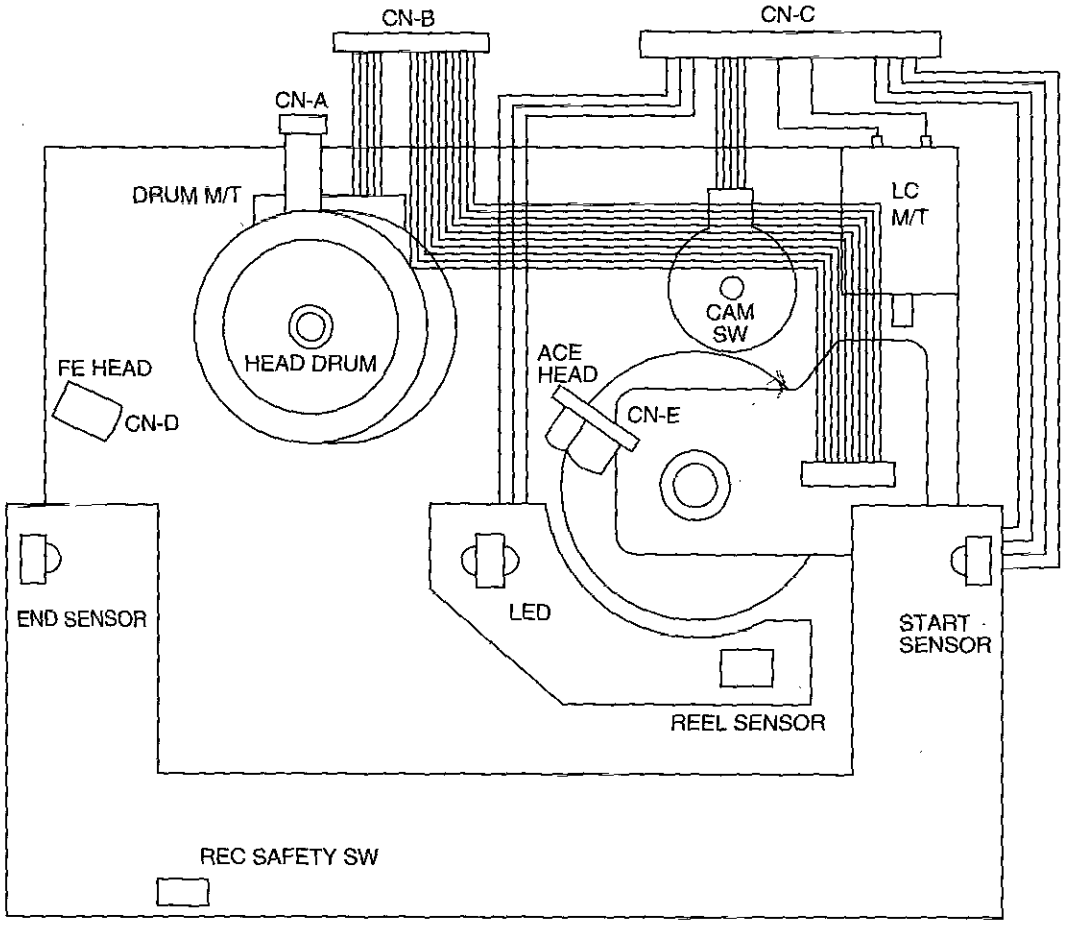


Fig. 1-9. FF/REW MODE


MODE
ANGLE
NO
MECHA MODE
EJECT
INITIAL
LOADING/UNLOADING
REVIEW STOP
PLAY SLOW
FF/REW
CAM SWITCH
0°
75°
190°
207°
239°
256°
324°
1
CAM (1)
RELAY LEVER
R23.5
63°
69°
R26
179°
185°
R23.5
195°
203°
R20.9
245°
253°
R18.3
268°
300°
304°
321°
R14.3
R10.75
CAM ANGLE
0°
73.8°
190°
208.1°
240°
258°
326.9°
2
CAM (2)
LOADING RACK
R26.2
83°
133°
R12.8
148°
R10
167°
R10
183°
R6.7
3
CAM (3)
PINCH LEVER
R13
82.7°
H
L
R23.276
180.7°
185.7°
R23.3
190.7°
198.7°
226.7°
239.7°
R22
R24.2
260.4°
R23.3
263.7°
315.7°
R15
L: release
H: application
CAM ANGLE
0°
190.8°
207.5°
239.8°
256.8°
324.5°
4
CAM (4)
F/L RACK
61.37°
* F/L RACK STROKE : 0~31.46
5
CONNECT PLATE
63°
69°
179°
185°
195°
203°
* CONNECT PLATE STROKE : 0~-3~0~3~3~4.5~4
245°
253°
R18.3
268°
300°
321°
30.4°
6
S,T-MAIN BRAKE
7
S-SUB BRAKE
8
T-SUB BRAKE
9
CAPSTAN BRAKE
10
BAND BRAKE
11
REEL DRIVE
S
D
S
S: SLIP
D: DIRECT

1-4. WIRING DIAGRAM



CN-A
(2 HEAD MONO)

1	VR 1
2	COMMON
3	VL 1
4	GND

■ (4 HEAD MONO)

1	VR 2
2	COMMON
3	VL2
4	GND
5	VR1
6	COMMON
7	VL1

CN-B

1	M 12V
2	DRUM CTL
3	DRUM PG
4	M GND
5	DRUM FG
6	ON/OFF 5V
7	F(L)/R(H)
8	CAP FG
9	CTL REF
10	CAP DRIVE
11	I LIMIT
12	M 12V
13	M GND
14	GND

CN-C

1	GND
2	CAM D
3	CAM C
4	CAM B
5	CAM A
6	TAPE START
7	TAPE END
8	REEL PULSE
9	REC SAFETY
10	EVER SAFETY
11	FL/LC (-)
12	FL/LC (+)

CN-D

1	GND
2	FE

CN-E

1	CTL
2	CTL
3	AUDIO
4	AUDIO
5	A ERASE
6	GND

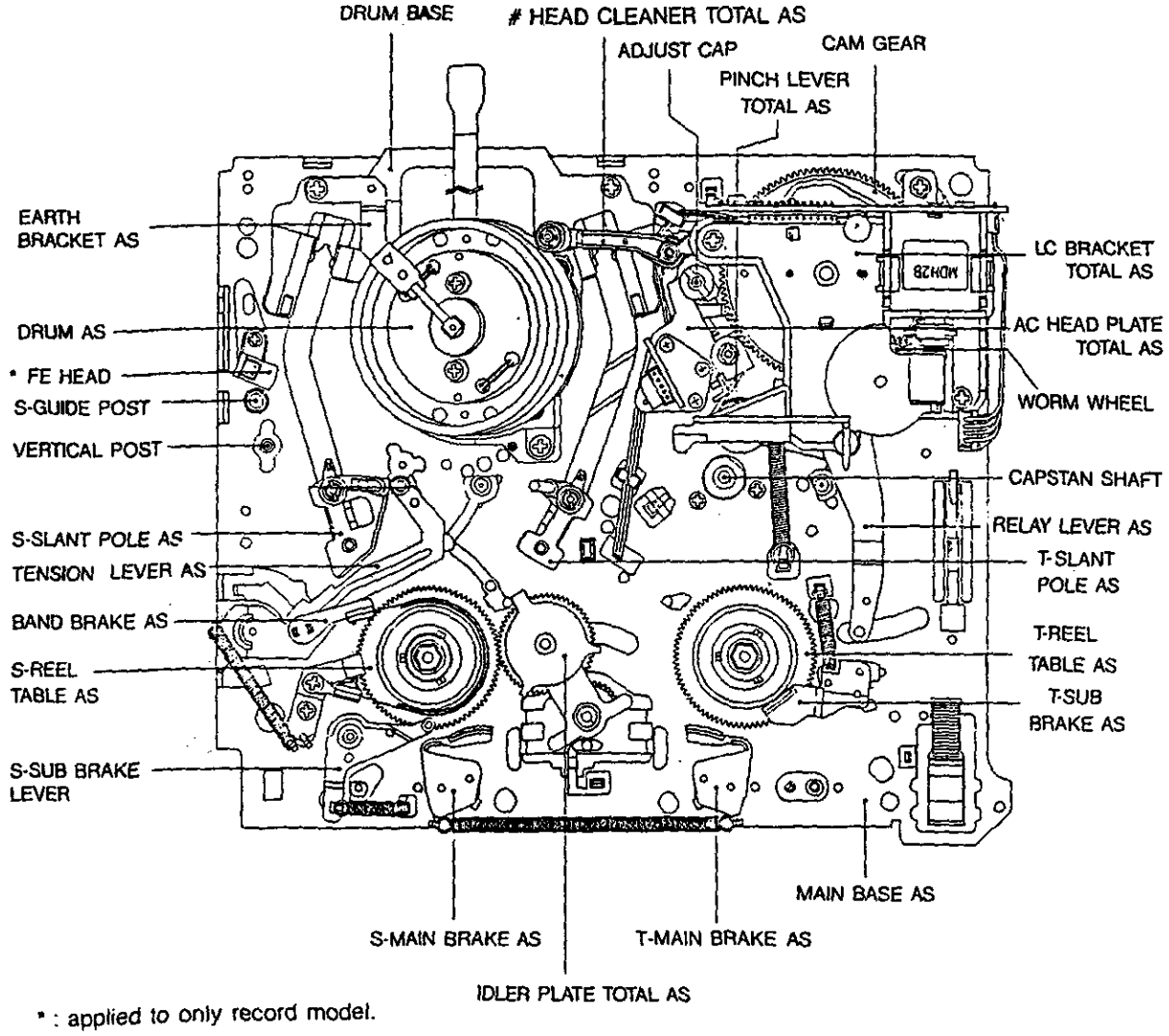
* : applied to only record model.
■ : applied to only 4 head mono model.

2. ARRANGEMENT AND CHECK FOR THE MAJOR PARTS

2-1. PARTS LOCATION

1) PARTS LOCATION OF DECK ASS'Y

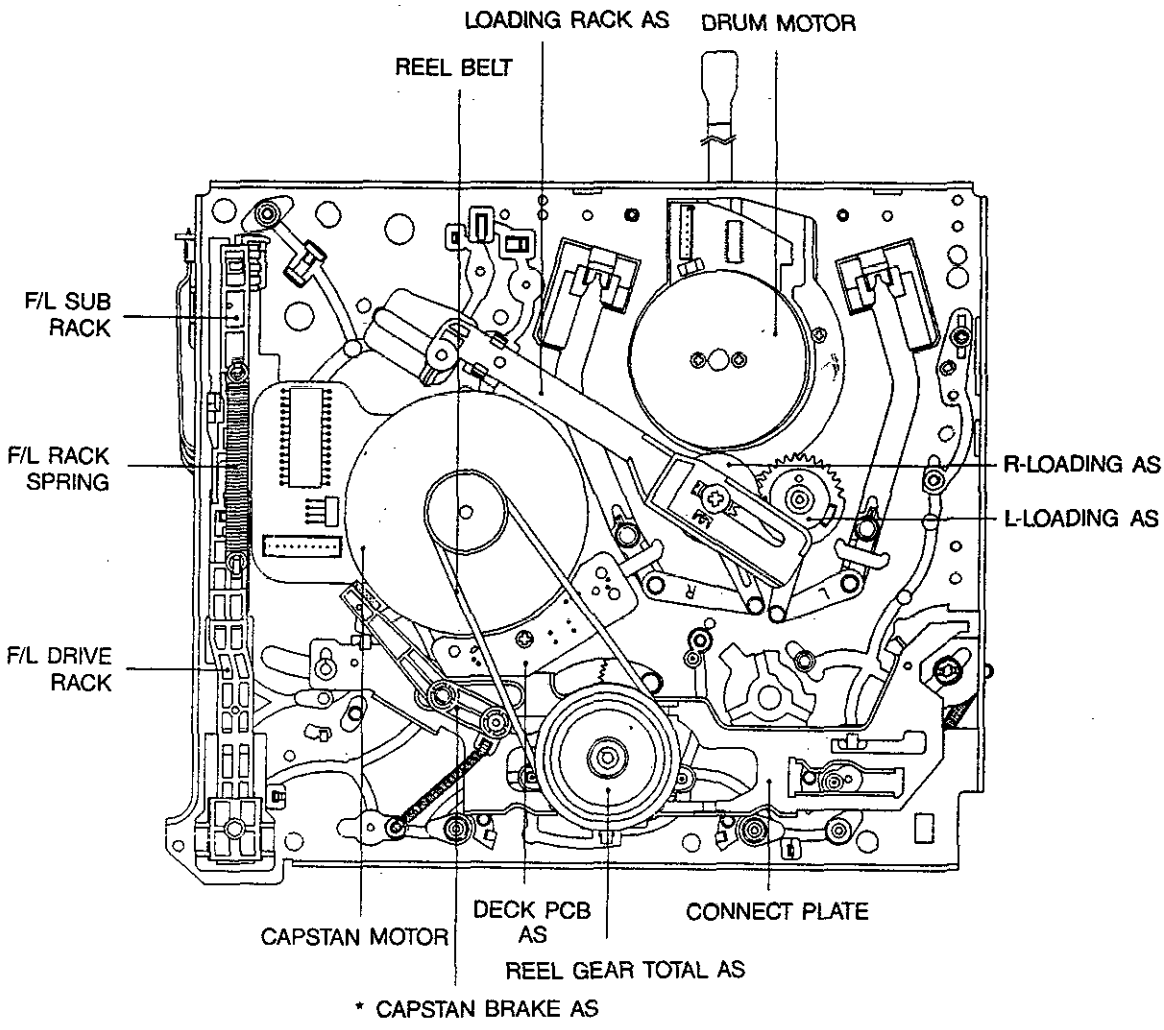
A. TOP VIEW



* : applied to only record model.

#: applied to only option model

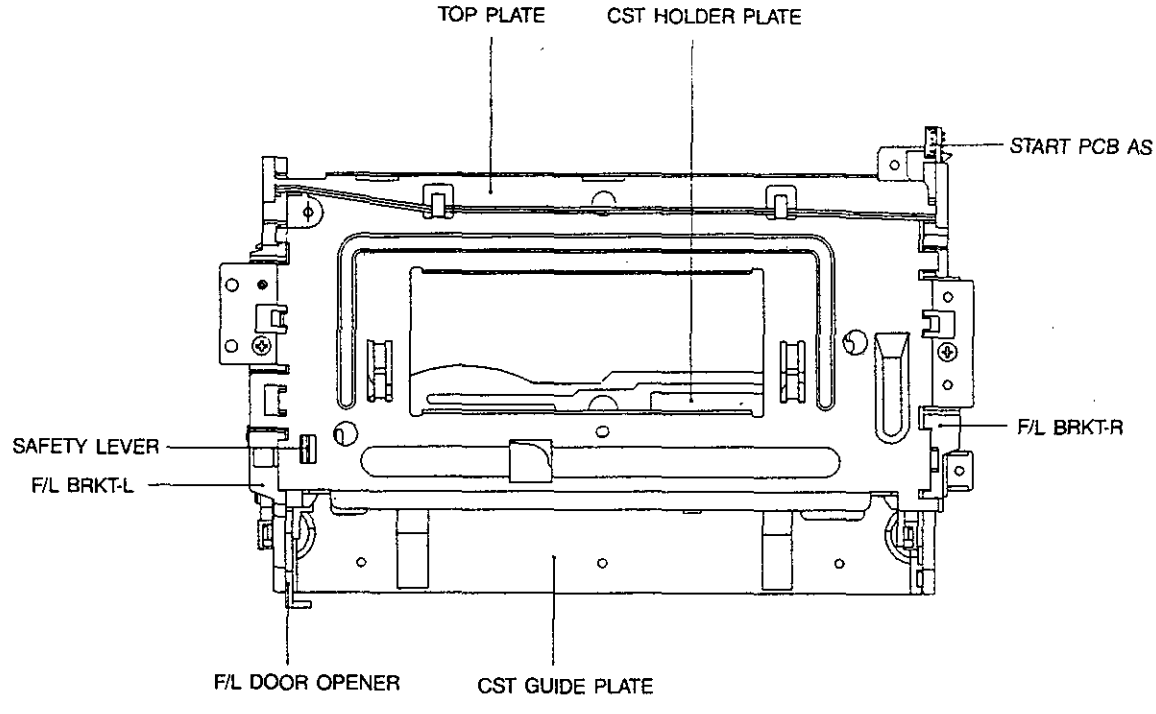
B. BOTTOM VIEW



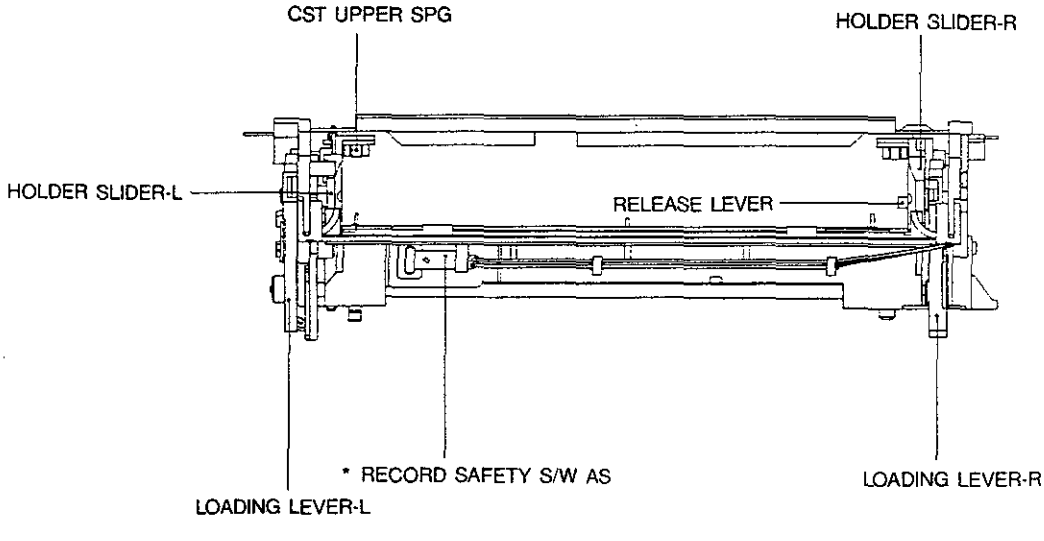
*: applied to only 4 HEAD MONO MODEL

2) PARTS LOCATION OF FRONT LOADING ASS'Y

A. TOP VIEW



B. FRONT VIEW



*: applied to only record model

2-2. PERIODIC MAINTENANCE AND SERVICE SCHEDULE

In order to effectively maintain the excellent performance and fully utilize the features of this machine, and to lengthen the life of mechanism and tapes, we strongly recommand you to perform the periodic maintenance and inspection as described below.

1) Maintenance after repair

After repairing, do the maintenance as described below irrespective of the length of time in use.

A. Cleaning of the Head Drum Ass'y

a. Clean the Drum assembly with a cleaning cloth soaked in liquid cleaner (isopropyl alcohol) by placing lightly against the Drum and slowly revolving the rotating Head Drum Ass'y by hand (Do not rotate it by applying the electric power to the motor for cleaning).

b. Do not move the cleaning cloth in the vertical direction against the head-tip.

B. Cleaning of the tape running section

Clean the tape running parts (tape guide, the surface of drum assembly, capstan, pinch roller, etc.) with a cleaning cloth soaked in the liquid cleaner.

C. Cleaning of driving section

Clean the driving section (the surface of the Reel Table) with the cloth soaked in the liquid alcohol (isopropyl alcohol).

D. Routine inspection

Perform the maintenance and inspection as separately described depending on the period of time in use.

2) Cleaning and Lubrication
A. Cleaning

a. Cleaning of Tape Transporting System.

■ Following parts should be cleaned every 500 hours of use.

- VERTICAL POST
- TENSION POLE
- S-GUIDE POST
- FE HEAD
- S-GUIDE ROLLER
- S-SLANT POLE
- VIDEO HEAD/DRUM ASS'Y
- T-SLANT POLE
- T-GUIDE ROLLER
- AC HEAD/AE HEAD
- T-GUIDE POST
- CAPSTAN SHAFT

■ Since the above parts contact with video tape, they tend to collect dust particles. Therefore if these parts are polluted, they affect the picture directly and result in tape damage.

■ After cleaning with alcohol, allow the parts to dry throughly before using a cassette tape.

b. Cleaning of Drive System

- S-REEL TABLE
- T-REEL TABLE
- S-MAIN BRAKE
- T-MAIN-BRAKE
- T-SUB BRAKE
- CAPSTAN FLYWHEEL/PULLEY
- REEL PULLEY

B. Lubrication

a. Following components should be lubricated with oil every 2000 hours of use.

- S-REEL TABLE POST
- T-RELL TABLE POST
- IDLER BRKT POST

b. After cleaning the above components with slcohol, lubricate these with one or two drops oil.

3) Service schedule for the major parts

Following parts should receive periodic service according to the recommended intervals.

Part Name	Periodic Service Schedule (Operating Hours)				
	1000	2000	3000	4000	5000
DRUM TOTAL ASS'Y	△	O	△	O	△
CAPSTAN MOTOR		O		O	
L/C BRKT TOTAL ASS'Y		O		O	
REEL BELT		O		O	
IDLER PLATE TOTAL ASS'Y		△		O	
S-REEL TABLE ASS'Y			O		
T-REEL TABLE ASS'Y			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

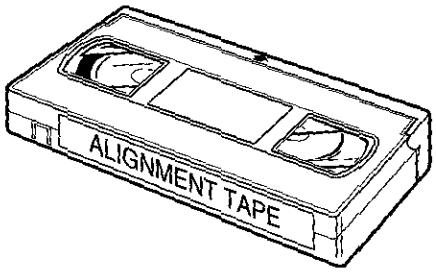
Note: Even though the unit is not used frequently, cleaning, lubrication and replacement of the belt should be undertaken every 2 years.

2-3. JIGS AND TOOLS

1) LIST OF JIGS AND TOOLS (Refer to next page)

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 TAPE TRANSPORTING SYSTEM
2	CLEANING TAPE (DAEWOO)	DHC-602V	②	CLEANING OF TAPE TRANSPORTING SYSTEM
3	CASSETE TAPE (SANSEIRIKO)	SRK-VHK-404	③	MEASUREMENT OF RELL TORQUE
4	VHS SPINDLE HEIGHT GAUGE (TENTELO)	TSH-V4	④	HEIGHT MEASUREMENT OF REEL TABLE
5	TENTELO METER (TENTELO)	T2-H7-UM	⑤	MEASUREMENT OF BACK TENSION
6	FAN TYPE TENSION METER	ABOVE 2KG	⑥	MEASUREMENT OF PRESSING FORCE FOR THE PINCH ROLLER
7	DENTAL MIRROR		⑦	CHECKING OF TAPE TRANSPORTING SYSTEM
8	+ DRIVER — DRIVER ADJUSTMENT DRIVER		⑧-1 ⑧-2 ⑧-3	ASSEMBLY, DISASSEMBLY AND ADJUSTMENT

①



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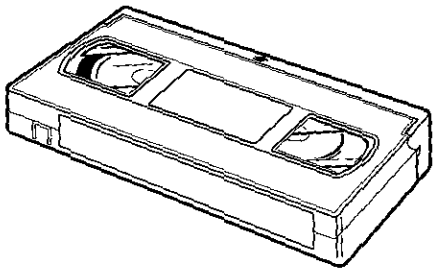
③



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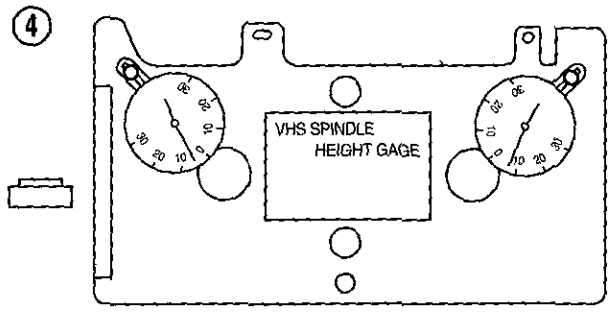

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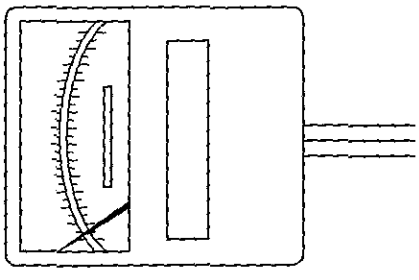

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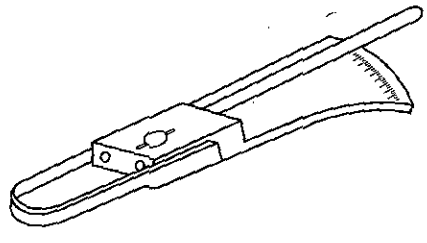

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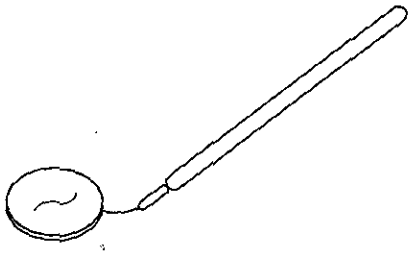

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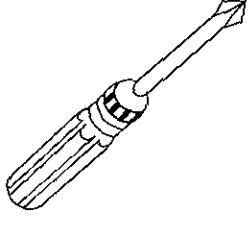

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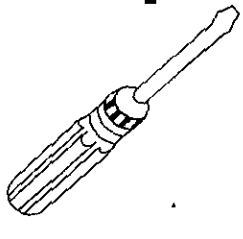

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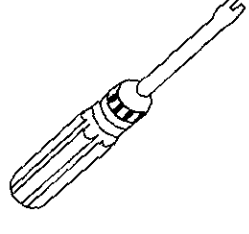


3. DISASSEMBLY AND REPLACEMENT

CAUTION: When you disassembly the Deck Mechanism, it should be done at the EJECT MODE.

3-1. The Replacement of Front Loading Ass'y (refer to Fig. 3-1)

1) Disassemble the Top Cover and the Front Panel.
2) Remove screw fastening the Main PCB.
3) Remove screw fastening the Top Plate in the Front Loading Ass'y (screw for ground).
4) Remove the Connector Ass'y which is connected to the F/L PCB Ass'y in the Front Loading Ass'y (4p).
5) Remove three screws fastening the Front Loading Ass'y and lift the Front Loading Ass'y.
6) Be careful not to break the F/L Drive Rack when disassembling the Front Loading Ass'y.

NOTE:
1. Disassemble the Front Loading Ass'y as a whole.
2. Reassemble the Front Loading Ass'y in the EJECT MODE and be careful not to break the F/L Drive Rack.
3. The specification screws (TT3 RND 3x6) should be used in the regions indicated by arrow.

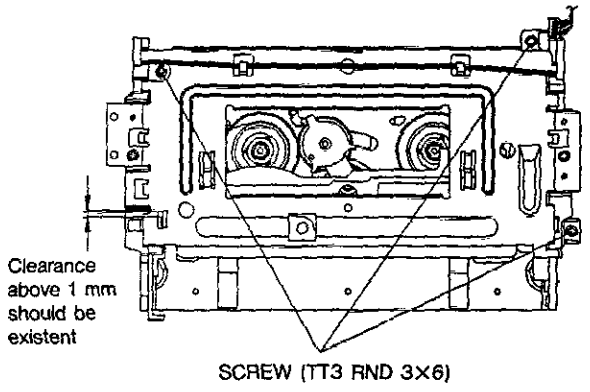


Fig. 3-1

3-2. The Replacement of Drum Ass'y (refer to Fig. 3-2)

1) Disasemble the Connector ② (6P) from the Motor PCB in the Drum Ass'y ①.
2) Remove two screws fastening the Pre-Amp.
3) Disassemble the Flexible PCB ④ from the Pre-Amp.
4) Remove three screws ⑥ fastening the Drum Total Ass'y and lift the Earth Bracket Ass'y ③ together with it.
5) Remove three screws lift the Drum Ass'y ① and disassemble it.
6) Install a new Drum Ass'y
7) Reassemble the above-mentioned parts in the reverse order.
8) On completing the replacement, confirm the performance. If any further performance is required, refer to section 5 and perform the procedures.

NOTE:
1. Work with the extreme care when removing or replacing the Drum Ass'y. Do not touch the Video Head during work.
2. If the quality of the TV picture deteriorates or the black dot is found irregularly on the TV picture, then try to clean the Video Heads. If the quality is not improved, the Video Heads can be regarded as worn out. In this case, replace the Drum Ass'Y.

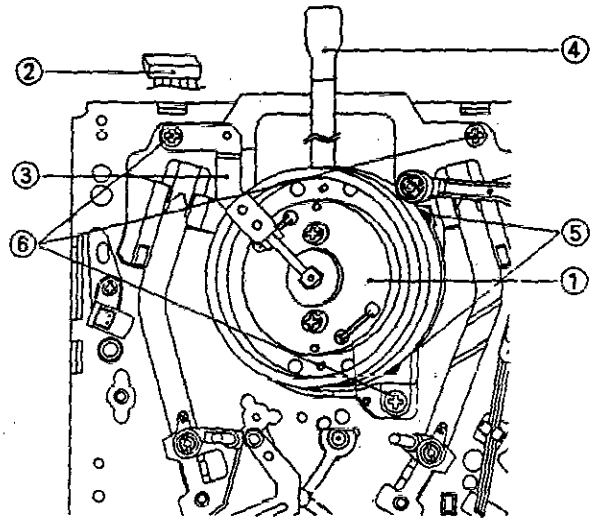


Fig. 3-2

3-3. The Replacement of Drum Motor Ass'y (refer to Fig. 3-3, 3-4)

1) Disassemble the Connector (6P) ② from the Motor PCB ①.
2) Remove two screws ③ and disassemble the Rotor ④.
3) Remove three screws ⑤ and disassemble the Stator ⑥.
4) Install a new Drum Motor Ass'y.
5) Reassemble the above-mentioned parts in the reverse order.
6) If necessary, the Playback Phase should be adjusted (refer to section 5).

NOTE:
1. Clamping torque of screw is 3~4 kg. cm.
2. Make sure the Phase decision holes of Rotor and Preload Boss are matched.

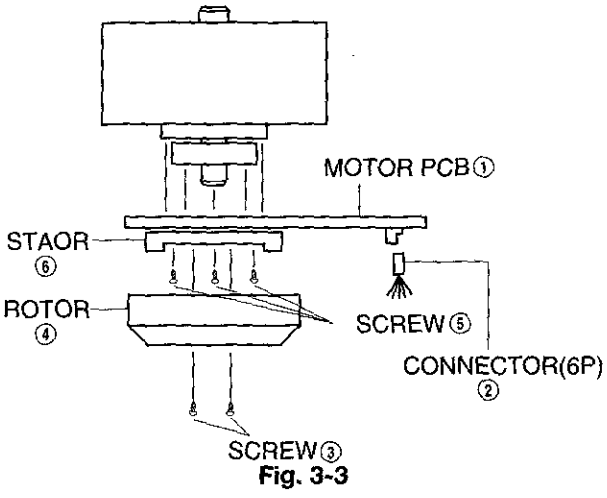


Fig. 3-3

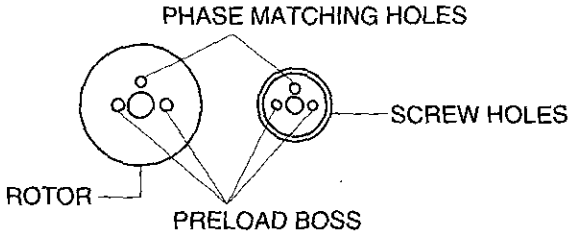


Fig. 3-4 Phase matching between Rotor and Preload Boss

3-4. The Replacement of Reel Gear Total Ass'y (refer to Fig. 3-6)

1) After removing the Reel Belt ①, remove the Pole Washer ②.
2) Install a new Reel Gear Total Ass'y.
3) Reasemble the above-mentioned parts in the reverse order.

NOTE:
When assembling the Reel Gear Total Ass'y, make sure that the Pole Slider (D3.1xD6xT0.13) is in the Idler Bracket Post.

3-5. The Replacement of Pinch Lever Total Ass'y (refer to Fig. 3-6)

1) Disassemble the Connector Ass'y (3P) ② from the L/C Motor PCB ①.
2) Remove three screws ④ and disassemble the L/C Bracket Total Ass'y ③.
3) Disassemble the Worm Wheel ⑤.
4) Remove the Pinch Roller Spring ⑥ from the hook 'A' on the Main Base.
5) After removing the Poly Washer ⑦, disassemble the Pinch Lever Total Ass'y ⑧.
6) Install a new Pinch Lever Total Ass'y.
7) Reassemble the above-mentioned parts in the reverse order.

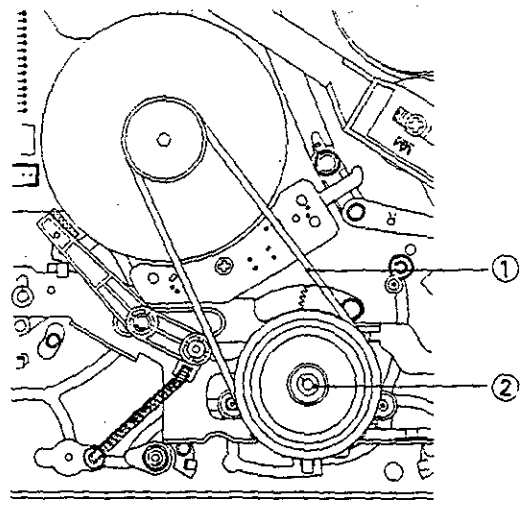


Fig. 3-5

NOTE:
1. Make sure that the upper part of Pinch Lever Ass'y is situated on the required upper cam locus in the Cam Gear (refer to Fig. 4-4).
2. Be careful for the pinch Roller Ass'y not to be oiled or greased.

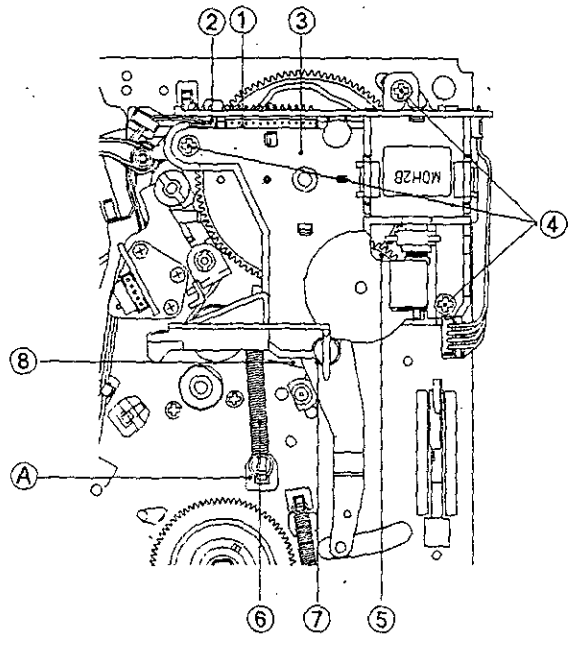


Fig. 3-6

3-6. The Replacement of AC Head Total Ass'y (refer to Fig. 3-7)

1) Referring to section 3-5, disassemble the L/C Bracket Total Ass'y and Pinch Lever Total Ass'y
2) Release the AC Head Nut ① and remove a part of AC Head guide Spring ② from the hook on the Main Base.
3) Disassemble the AC Head Total Ass'y ③.
4) Install a new AC Head Total Ass'y
5) Reassemble the above-mentioned parts in the reverse order.
6) After reassembling, perform the Tape Transporting Adjustment (refer to section 5).

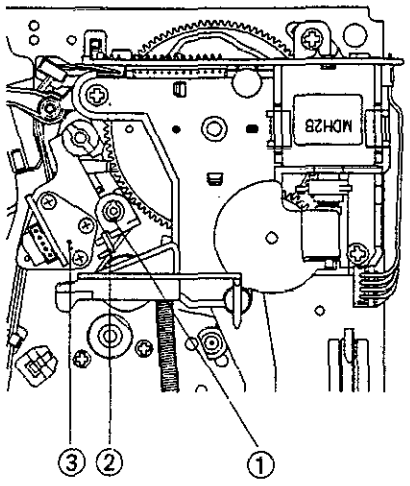


Fig. 3-7

3-7. The Replacement of Capstan Motor (refer to Fig. 3-8)

1) Referring to section 3-5, disassemble the L/C Bracket Total Ass'y and Pinch Lever Total Ass'y
2) Disassemble the Connector Ass'y (10P) from the Capstan Motor PCB.
3) Disassemble the Reel Belt (refer to Fig. 3-5).
4) Remove three screw ① and disassemble the Capstan Motor ②.
5) Reassemble the above-mentioned parts in the reverse order.

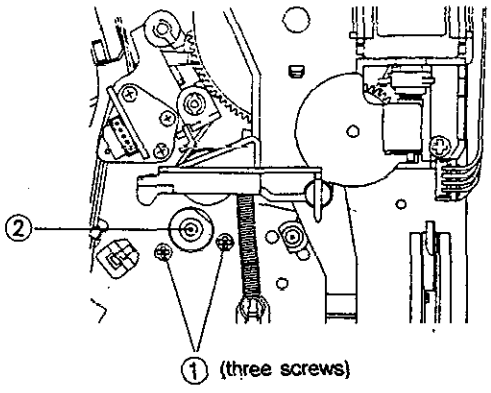


Fig. 3-8

3-8. The Replacement of Pole Base Ass'y (refer to Fig. 3-9)

1) Referring to section 3-3, disassemble the Drum Total Ass'y.
2) Remove the SCREW ② and disassemble the Loading Rack Ass'y ①.
3) Disassemble the L & R-Loading Ass'y ③, ④.
4) After moving the S & T-Slant Pole Ass'y ⑤, ⑥ to the V-Block position, disassemble them.
5) Install a new Pole Base Ass'y.
6) Reassemble the above-mentioned parts in the reverse order.

NOTE:
1. Be careful for the Guide Roller of the Pole Base Ass'y not to be greased.
2. Be careful not to break the hook 'A' on the Main Base when disassembling the Loading Rack Ass'y.

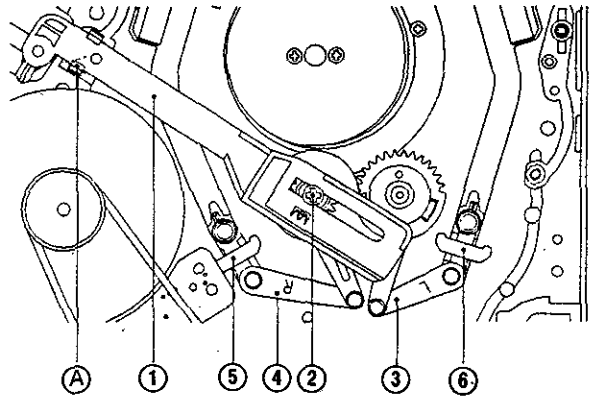


Fig. 3-9

3-9. The Replacement of S-Reel Table Ass'y (refer to Fig. 3-10)

1) Disassemble the S-Sub Brake Spring ②.
2) After rotating the S-Sub Brake Lever ① to CW direction, disassemble it.
3) Disassemble the Tension Lever Spring ③.
4) Remove the screw ⑤ fastening the Band Brake Ass'y ④.
5) When disassembling the S-Reel Table Ass'y ⑥, be careful for the Gear Ass'y not to touch with the Band Brake Ass'y ④.
6) Remove the Pole Slider.
7) After cleaning the Reel Table Post by using the alcohol, lubricate it with on or two drops of oil.
8) After installing a new S-Reel Table Ass'y, perform the height adjustment (refer to section 4-5).
9) Reassemble the above-mentioned parts in the reverse order.

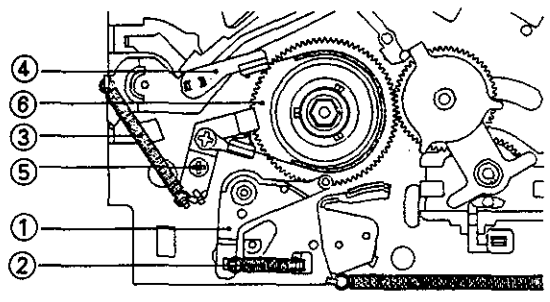


Fig. 3-10

3-10. The Replacement of T-Reel Table Ass'y (refer to Fig. 3-11)

1) Disassemble the T-Sub Brake Spring ①.
2) After rotating the T-Sub Brake Ass'y ② to CCW direction, disassemble it.
3) After disassembling the T-Reel Table Ass'y ③, remove the Poly Slider.
4) After cleaning the Reel Table Post by using the alcohol, lubricate it with one or two drops of oil.
5) After replacing the T-Reel table Ass'y with a new one, perform the height adjustment (refer to section 4-5).
6) Reassemble the above-mentioned parts in the reverse order.

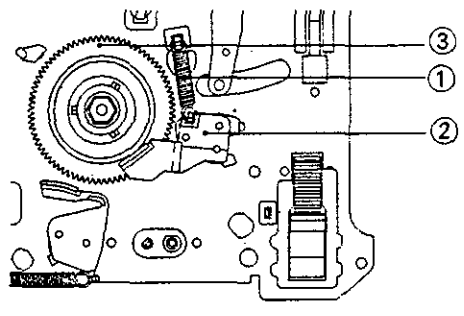


Fig. 3-11

3-11. The Replacement of the F/L Sub Rack (refer to Fig. 3-12)

1) Referring to section 3-5 and 3-7, disassemble the L/C Bracket Total Ass'y, Pinch Lever Total Ass'y and Capstan Motor.
2) Remove the Cam Gear ① and the Worm Wheel ②.
3) Disassemble the F/L Rack Spring ③.
4) Disassemble the F/L Drive Rack ④ and F/L Sub Rack ⑤.
5) Install a new F/L Sub Rack.
6) Reasemble the above-mentioned parts in the reverse order.

NOTE:
Be careful not to break the part 'A' when assembling or disassembling the F/L Sub Rack.

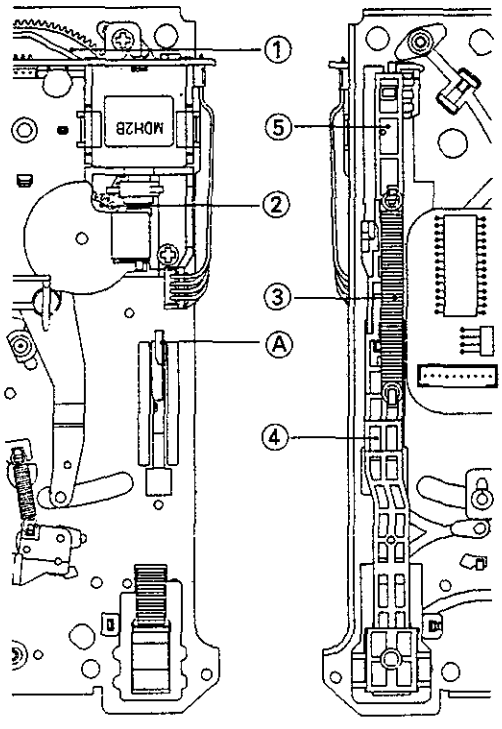
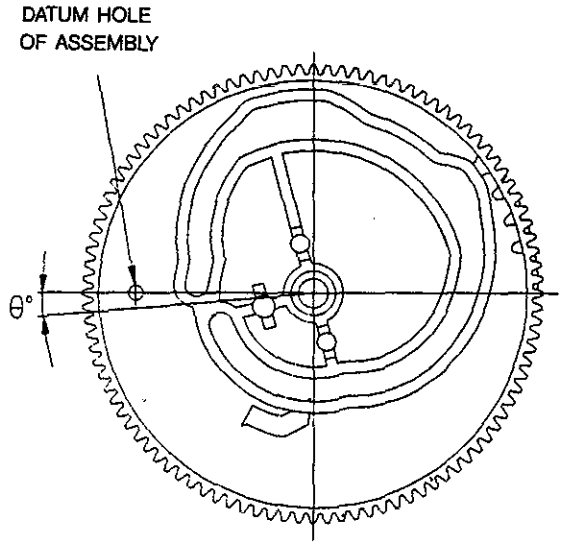


Fig. 3-12

4. MECHANICAL ADJUSTMENT

4-1. CHECK FOR THE MECHANICAL POSITION

Check for the following matters before disassembling, replacement and reassembling.
1) Make sure of the assembly conditions of the Deck Machanism in the EJECT MODE.
2) Make sure of the assembly position among the Cam Gear and several parts before assembling the L/C Bracket Total Ass'y (refer to Fig. 4-1, 2, 3, 4).
3) Make sure of the assembly position between the Loading Rack and the R & L-Loading Ass'y (refer to Fig. 4-5).
4) Make sure of the position of the Cam Switch when assembling the L/C BRKT Total Ass'y (refer to Fig. 4-6).
5) Make sure of the assembly state of the Front Loading Ass'y (refer to Fig. 4-7).
6) Make sure of the other's assembly state (refer to fig. 4-8).



* **Note:** Datum hole of assembly should be located in = 0~5°C

Fig. 4-1 Reference of assembly for the Cam Gear

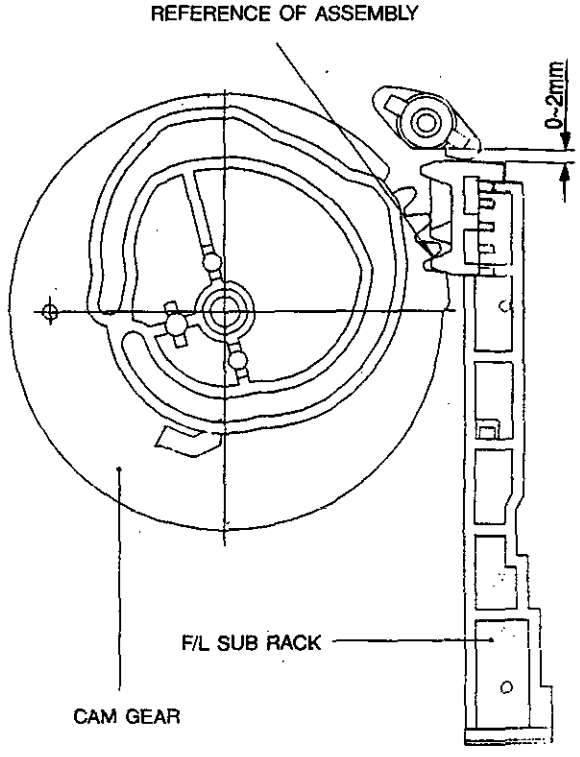


Fig. 4-2 Reference of assembly for the F/L Sub Rack and Cam gear

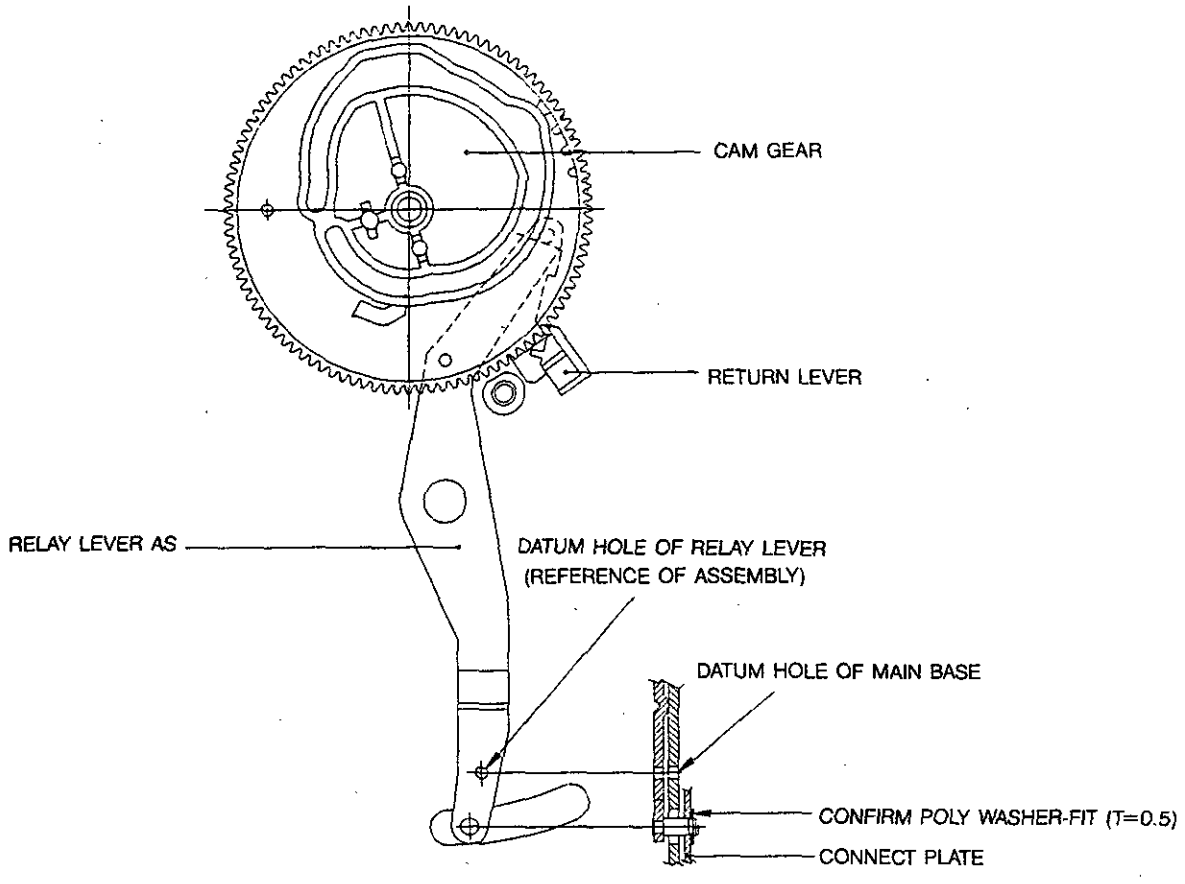


Fig. 4-3 Reference of assembly for the Cam Gear and Relay Lever

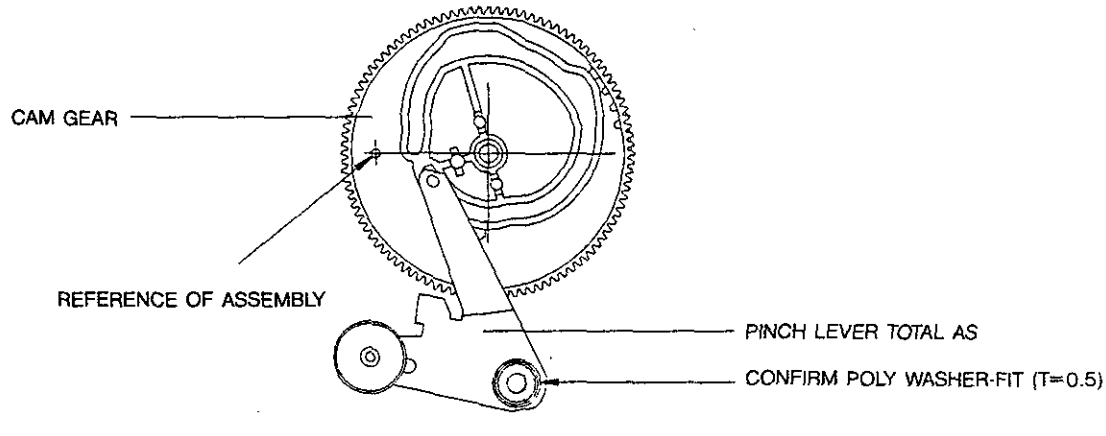


Fig. 4-4 Reference of assembly for the Cam Gear and Pinch Lever

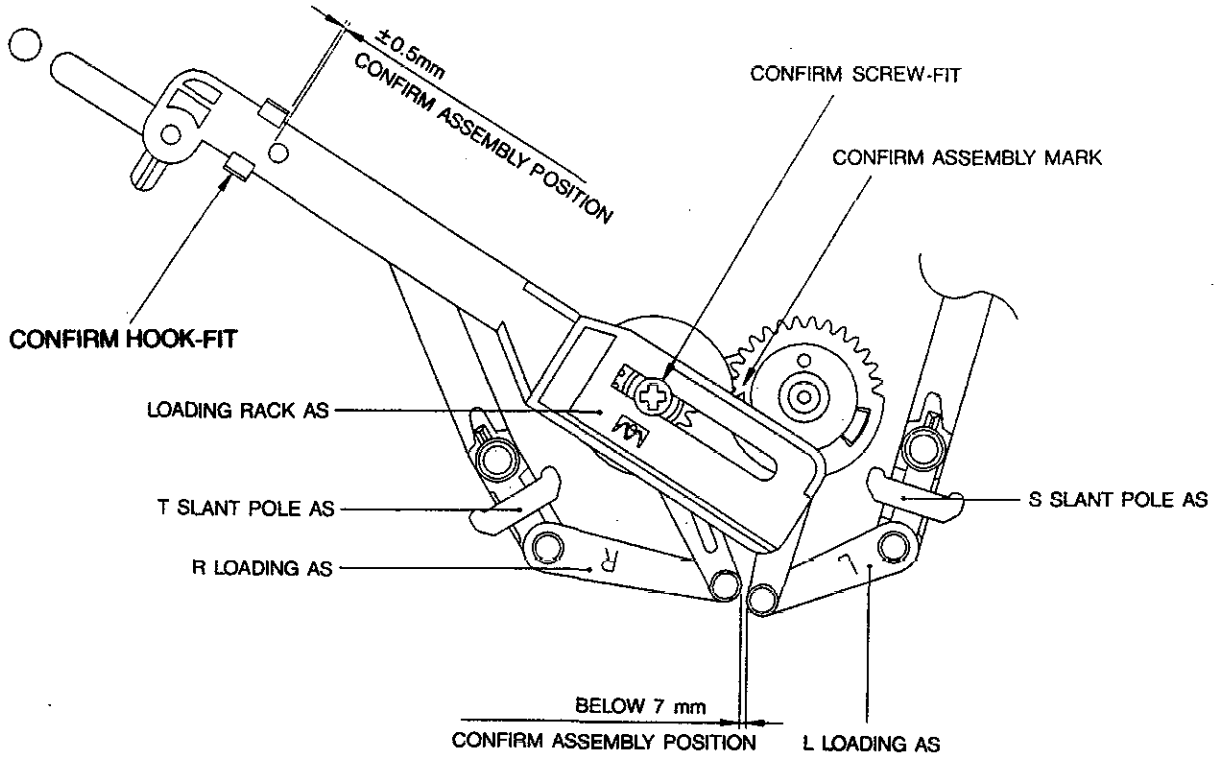


Fig. 4-5 Reference of assembly for the Cam Gear and Relay Lever

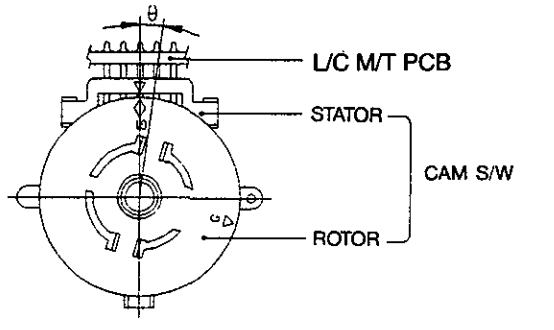


Fig. 4-6 Reference of assembly for the Cam Switch

* **Note:** 1. The mark (◇) of Rotor should be located in = 0~5°.
2. The above figure is a reference bottom view for the LC Bracket Total AS.

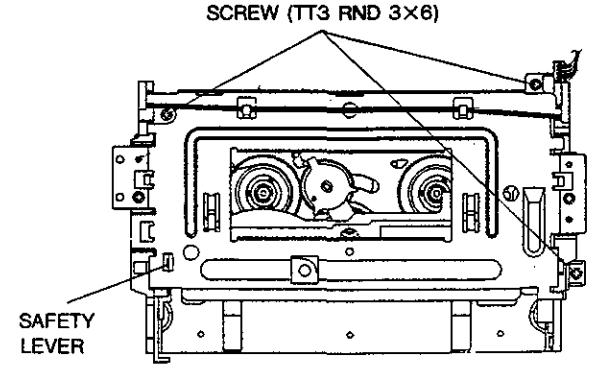


Fig. 4-7 Reference of assembly for the Front Loading AS

* **Note:** 1. It should be returned to its original state when the safety lever was pushed by hand.
2. On fastening screws, these above 6 mm should not be used (In the case of using non-specification screw, the Capstan PCB will be deformed).

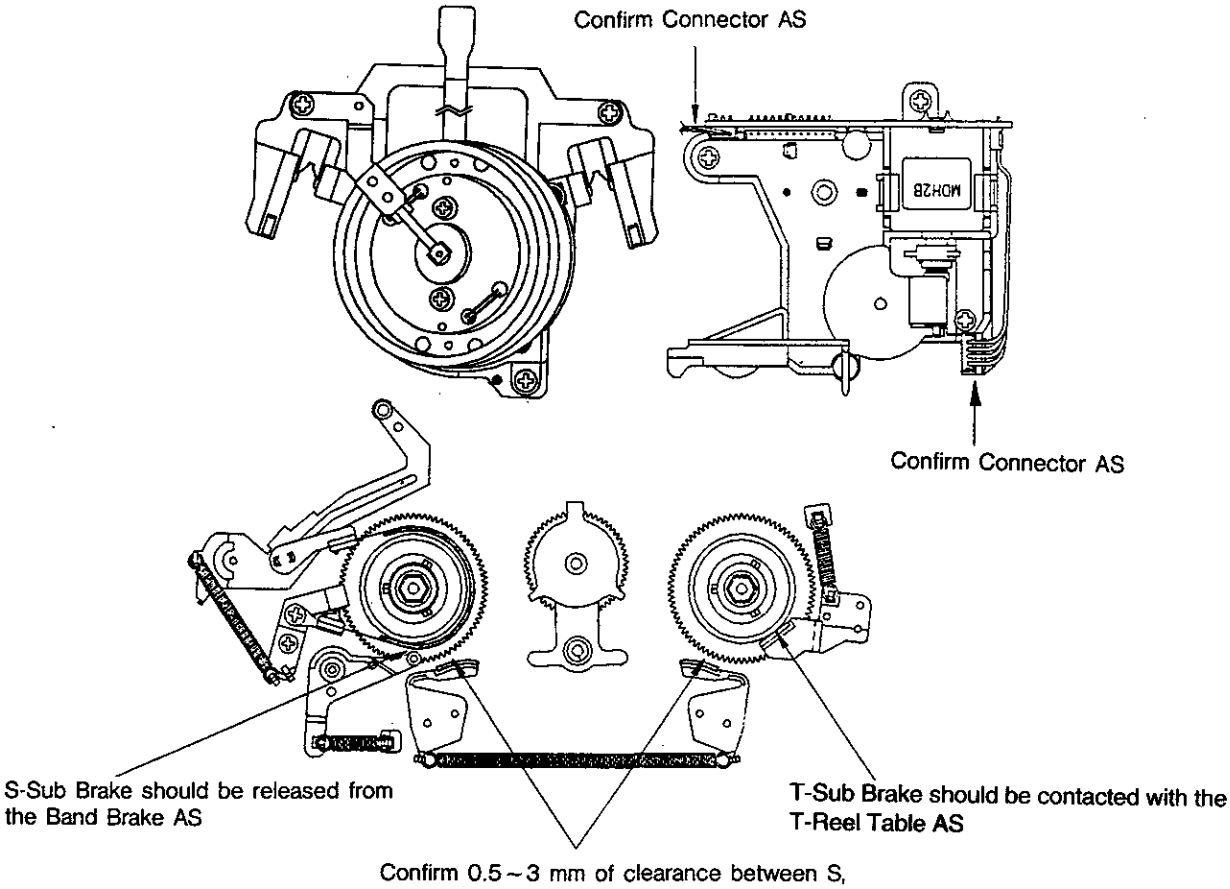


Fig. 4-3 Reference of assembly for the Cam Gear and Relay Lever

4-2. HOW TO SET MECHANICAL MODE

1) On removing the Front Loading Ass'y, Syscon executes the INTIAL MODE and then power off.
2) If the power is on in the INITIAL MODE, it executes the STOP MODE.
3) Push the button you want.
4) On executing the required mode, pull out the power plug if necessary.
5) If the STOP/EJECT button is pushed in the STOP MODE or EJECT MODE, it returns to the INITIAL MODE via the EJECT mode and then power off.
6) Reassemble in Front Loading Ass'y in the only EJECT MODE.

4-3. Measurement of Pressing Force for Pinch Roller

1) In the state of removing the Front Loading Ass'y, pull out the power plug after playing back without cassette.
2) Remove the L/C Bracket Total Ass'y and the Worm Wheel.
3) Pull the push-pull gauge to the direction 'A' indicated by the arrow as shown in Fig. 4-9.
4) Confirm that the scale of push-pull gauge is 1.0±0.2 Kg at the moment of the Pinch Roller Separating from the Capstan Shaft.
5) If it is out of specification, replace the Pinch Roller Spring or the Pinch Lever Total Ass'y.

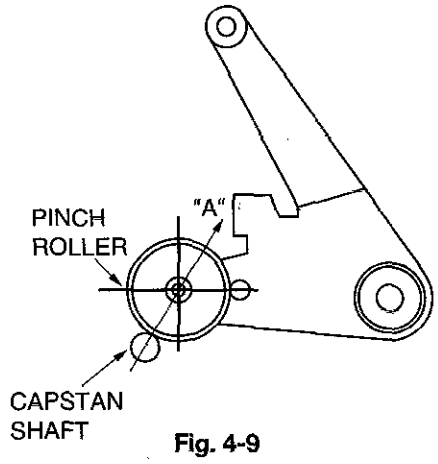


Fig. 4-9

4-4. The Measurement and Adjustment of Back Tension

1) Play back T-120 tape at its center position without F/L Ass'y, and wait until the driving of tape is stabilized (about 10~20 seconds).
2) Set the Tentelometer as shown in Fig. 4-10 and confirm the scale (SPEC: 20~27g).
3) If it is out of specification, change the position of Adjust Cam in order to adjust the tension value.

NOTE:

1. Make sure that the three probes of the Tentelometer are all in good contact with tape.
2. It is recommended to be measured three times because Tentelometer is very sensitive.

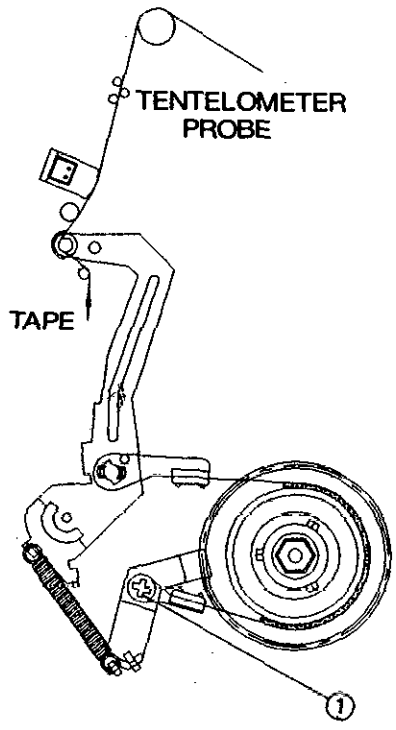


Fig. 4-10

4-5. The Height Adjustment of Reel Table

1) Put the master into the Hole S and the Hole T in the Jig (TSH-V4) and set the Dial Gauge to zero.
2) Set the Jig (TSH-V4) on the Deck Ass'y as shown in Fig. 4-11 and check the height of Reel Table.
   (S: 0±0.1 T: $^{+0.05}_{-0.20}$)
3) If it is out of range, it is necessary to adjust the height of Reel Table by adding or subtracting the Poly Slider as shown in Table 4-1.

THICKNESS	PART NUMBER
0.13 mm	97S3903700
0.25 mm	97S3904000
0.5 mm	97S3903600

Table 4-1 Slider for Adjustment

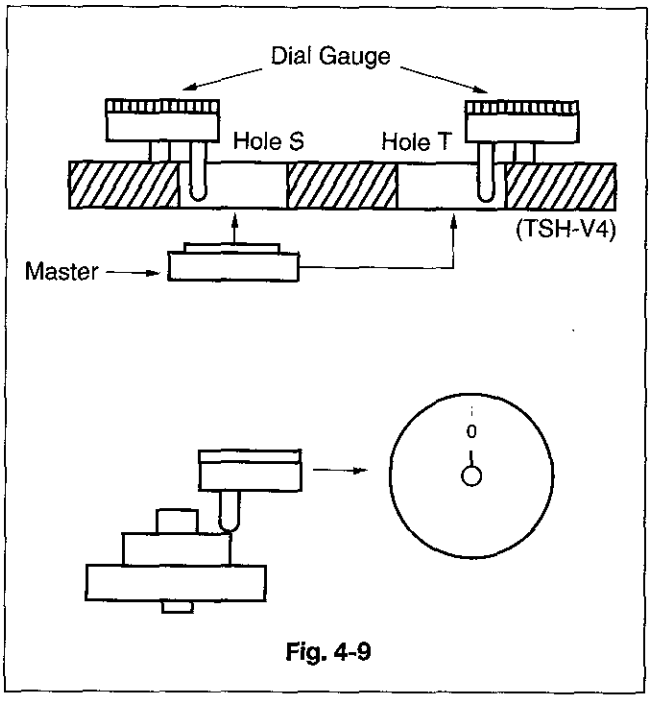


Fig. 4-9

4-6. The Measurement of Reel Torque

1) Play back the Cassette Type Torque Meter.
2) Measure the Take-up Reel Torque after the tape running is stabilized (SPEC: 90~170 g.cm).
3) If it is out of range, replace the Reel Gear Total Ass'y.

5. ADJUSTMENT OF 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 SCHMATIC DIAGRAM OF TAPE TRANSPORTING SYSTEM

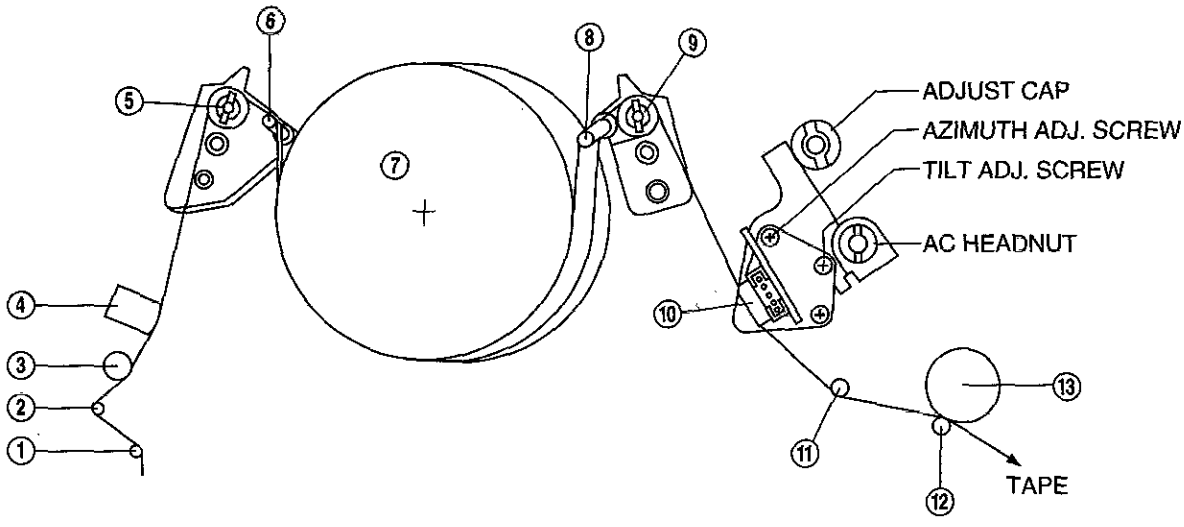
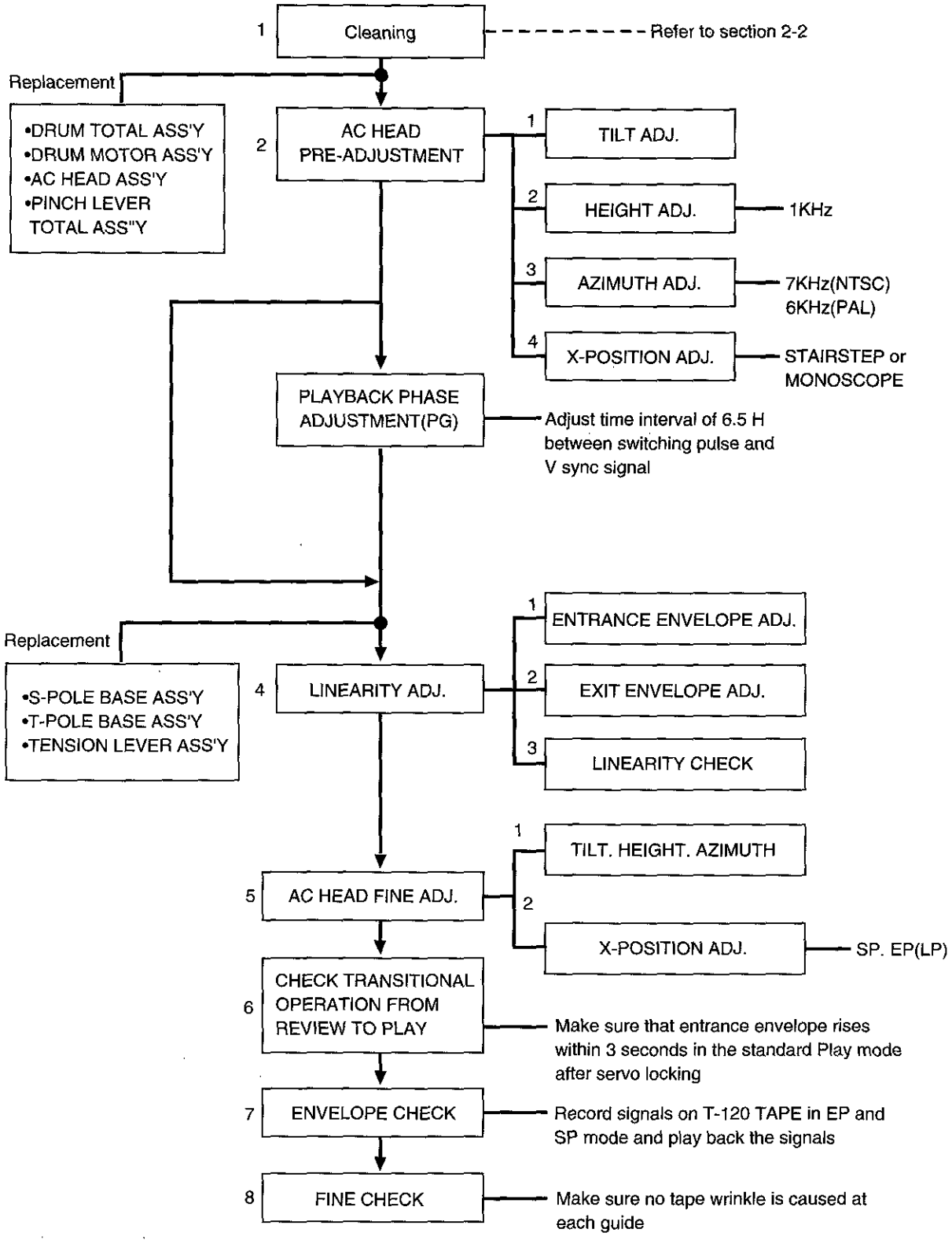


Fig. 4-9

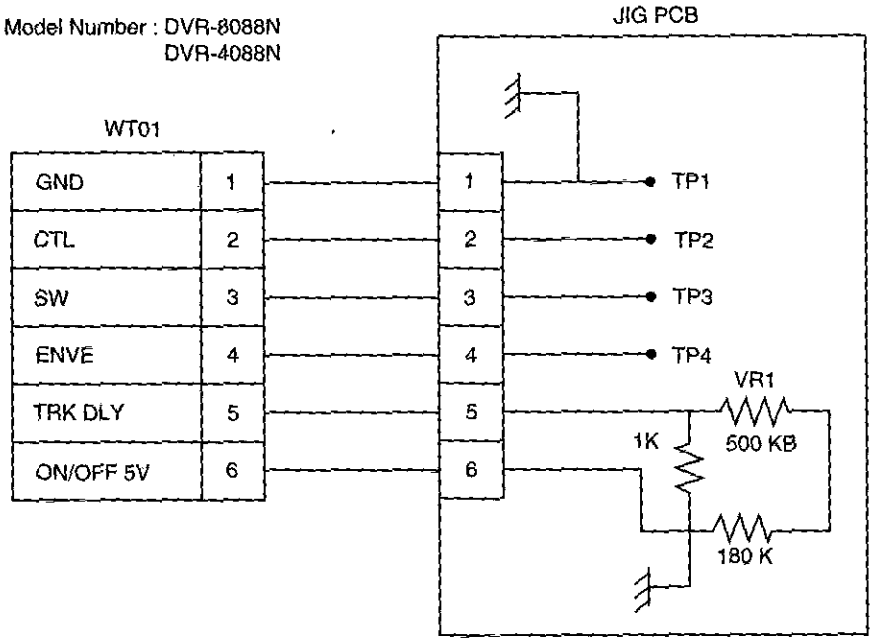
① VERTICAL POST
② TENSION POLE
③ S-GUIDE POST
④ FE HEAD
⑤ S-GUIDE ROLLER
⑥ S-SLANT POLE
⑦ CYLINDER
⑧ T-SLANT POLE
⑨ T-GUIDE ROLLER
⑩ AC HEAD
⑪ T-GUIDE POST
⑫ CAPSTAN SHAFT
⑬ PINCH ROLLER

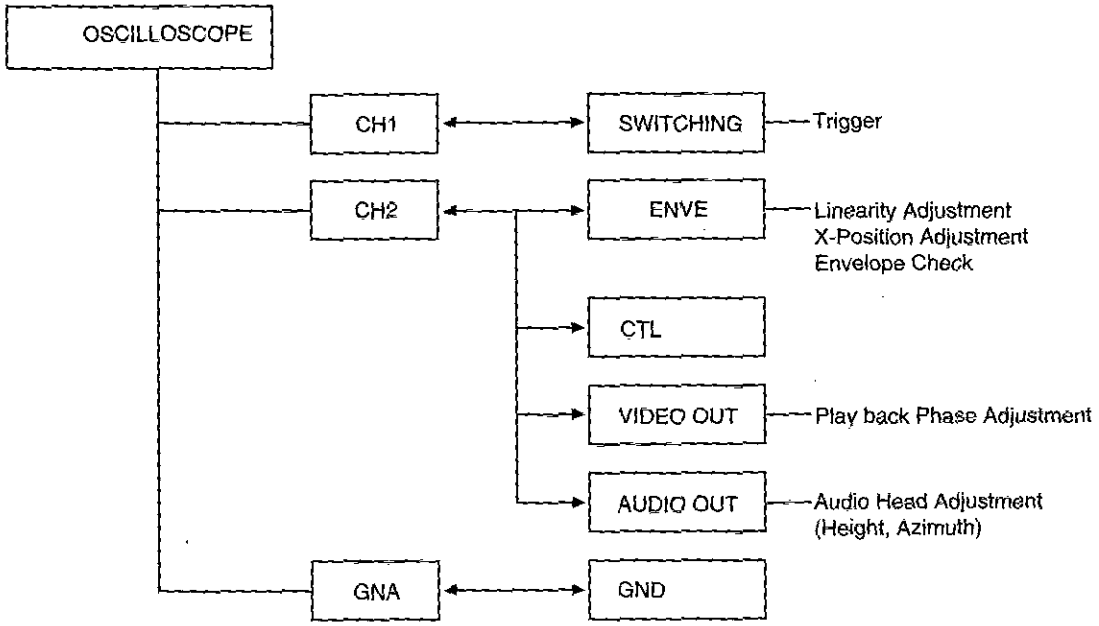
5-2. ADJUSTMENT FLOW FOR THE TAPE TRANSPORTING SYSTEM



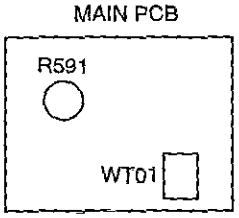
CONNECTION

Model Number : DVR-8088N
DVR-4088N





ADJUSTMENT VR	REMARK
MAIN TRACKING VR	VR1 (JIG PCB)
PG VR	R591 (MAIN PCB)



5-3. ADJUSTMENT PROCEDURES

1) Pre-adjustment

When the parts as shown in Fig. 5-1 is replaced, the Tape Path may be changed and alignment tape may be damaged. To prevent this, first, playback a T-120 Tape and make sure excessive tape wrinkle does not occur at each tape guide. If tape wrinkle is observed at the S & T-Guide Rollers (⑤, ⑨) in Fig. 5-1, turn the S & T-Guide Rollers for no wrinkle.

2) The Pre-adjustment of AC Head Ass'y

A. Tilt Adjustment

a. Play back a T-120 Tape and observe running condition of the Tape at the upper and lower Flanges of the T-Guide Post Ass'y ⑪ in Fig. 5-1.

b. Adjust the Tilt Adjusting Screw until tape runs stable as shown in Fig. 5-2.

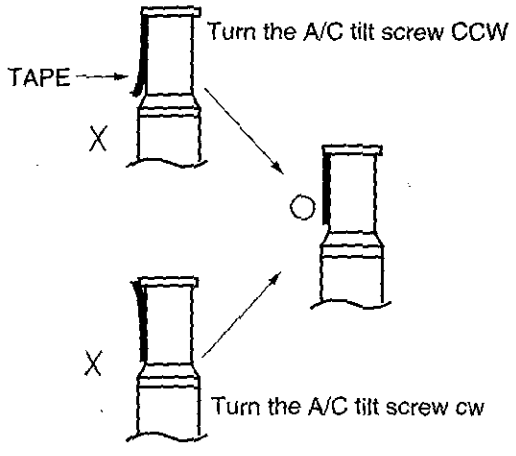


Fig. 5-2 T-Guide Post

B. Audio Azimuth Adjustment

a. Play back the Alignment Tape (SP mode) with audio signal.

• NTSC: 7 KHz • PAL: 6 KHz

b. Observe audio signals on an oscilloscope.

c. Turn the Azimuth Adjusting Screw to obtain maximum audio output.

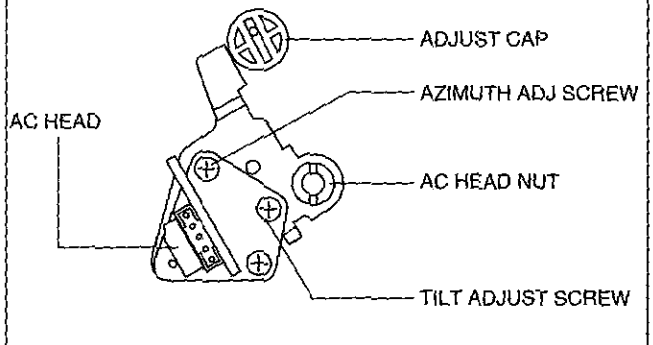


Fig. 5-3

C. The height Adjustment of AC Head

a. Play back the Alignment Tape (SP mode) with 1 KHz audio singal.

b. Turn the AC Head Nut to obtain maximum audio output.

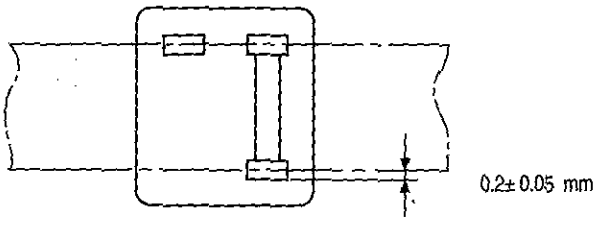


Fig. 5-2 T-Guide Post

D. The X-position Pre-adjustment of AC Head

a. Play back the Alignment Tape with SP stairstep (or monoscope) singal.

b. Adjust the Adjust Cap for maximum envelope output, after Tracking Volume is set at its center, click position.

NOTE:
Before proceeding with this adjustment, remove locking paint applied on the Adjust Cap.

3) Playback Phase Adjustment (PG Adjustment)

A. Play back the Alignment Tape (SP mode).

B. Observe a video signal on an oscilloscope display trigered with the switching pulse.

C. Adjust the PG volume for time interval of 6.5H±0.5H between switching pulse and V sync signal.

NOTE:
In this adjustment, adjust the tracking Volume the best video signal.

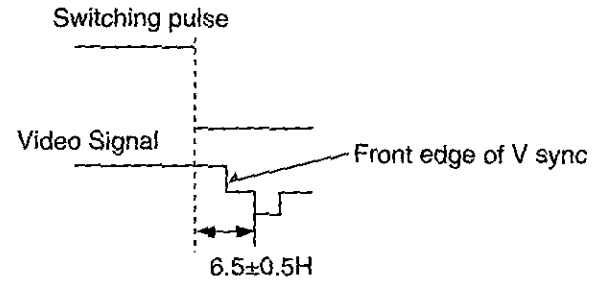
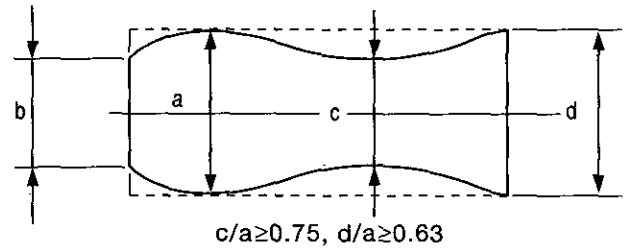


Fig. 5-5 Playback Phase Adjustment

4) Linearity Adjustment

A. Play back the Alignment Tape with SP stairstep (or monoscope) signal.
B. Observe the signal envelope on an oscilloscope display triggerd by the switching pulse.
C. Make sure the envelope waveform (in its maximum) output meets the specifications shown in Fig. 5-6.
   a. Maximum output of envelope.
   b. Minimum output of envelope at the Drum entrance.
   c. Minimum output of envelope at the Drum center.
   d. Maximum output of envelope at the Drum exit in Fig. 5-6.



c/a≥0.75, d/a≥0.63

Fig. 5-6 Envelope Wareform Specification

D. If the section A in Fig. 5-7 does not meet the specification, adjust the S-Guide Roller up or down.
E. If the section B in Fig. 5-7 does not meet the specification, adjust the T-Guide Roller up or down.

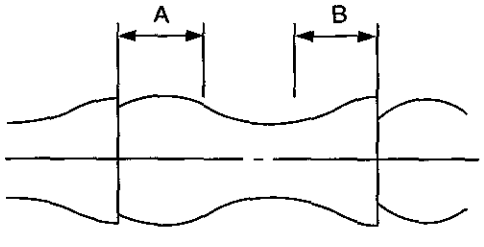


Fig. 5-7 Adjustment Point

F. After completing adjustment, turn the tracking volume and make sure the envelope varies almost flat.
G. If the envelope varies as shown in Fig. 5-8, adjustment of the S-Guide Roller and the T-Guide Roller may be upset. Therefore, perform the adjustment again.

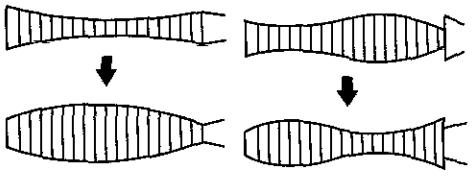


Fig. 5-8 Abnormal Waveform Variation

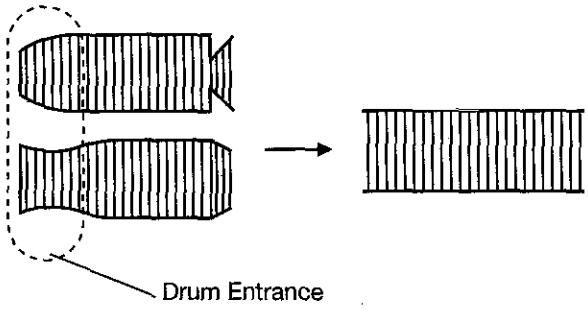


Fig. 5-9 Waveform Adjustment at the Drum Entrance

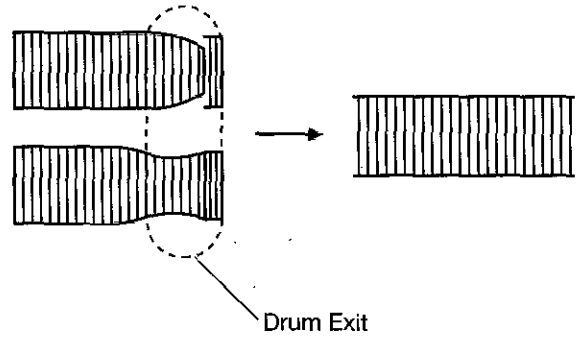


Fig. 5-10 Waveform Adjustment at the Drum Exit

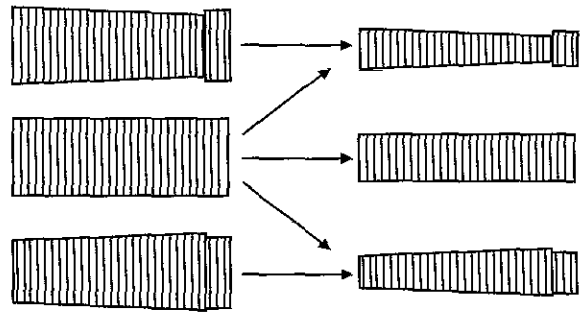


Fig. 5-11 Normal Waveform Variation

5) The fine adjustment of AC head

A. Tilt Adjustment (refer to Fig. 5-2)
Check the tape wrinkle check at the lower Flange of T-Guide Post Ass'y in Fig. 5-1.
a. If tape wrinkle is observed at the lower Flange of adjust the Tilt Adjust Screw CCW until the wrinkle disappears.
b. If a gap observed between the lower Flange of ⓘ and the lower edge of tape, adjust the Tilt Adjusting Screw CW until the tape travels along the lower Flange.

B. Azimuth Adjustment (refer to section 5-3-2)

C. The X Position Adjustment for Interchangeability (refer to Fig. 5-3)
a. Play back the Alignment Tape (SP mode) with stairstep (or monoscope) signal.
b. Place the Tracking Volume at its center click.
c. Trigger an oscilloscope with switching pulse and observe the envelope waveform of Ch 2.
d. Turn the Adjust Cap CCW or CW within taper section and fix the Adjust Cap at the position where the envelope reaches a peak level.
e. Play back the Alignment Tape (EP or LP mode) with stairstep (or monoscope) signal.
f. Make sure the envelope is maximum at the center click position of Tracking Volume. If maximum envelope is not observed, perform the envelope adjustment to obtain maximum envelope output again.
g. Play back the Alignment Tape with stairstep (or monoscope) signal and make sure audio output is maximum.
• NTSC: 7 KHz • PAL: 6 KHz

6) Check for transitional operation from Review to Playback.

A. Playback the Alignment Tape (SP mode) in the REVIEW MODE and observe the envelope with an oscilloscope.

B. Switch the REVIEW MODE to the PLAY MODE. Make sure the state within 3 seconds as shown in Fig. 5-12. If it does not rise within 3 seconds after servo locking adjust as follows.
a. Play back the Alignment Tape which has the stairstep (or monoscope) signal, looking Envelope Waveform, make sure that S & T-Guide Roller's height is adjusted correctly.
b. Change operation mode from REVIEW MODE to PLAY MODE again and then make sure that the entrance envelope rises within 3 seconds after servo locking.
c. If not, perform the adjustment according to the section 5-3-4.

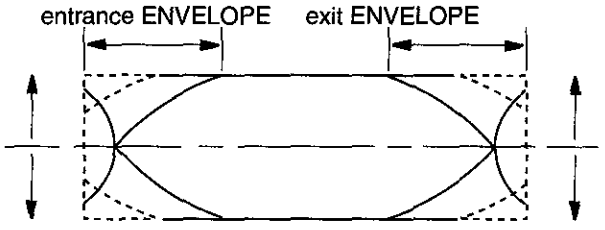


Fig. 5-12

7) Envelope Check

A. Record video signal (color bar or monoscope on T-120 Tape) and make sure the playback envelope output meets the specification as shown in Fig. 5-12.

B. In playing the same Video Deck used for the recording using the T-120, the envelope should meet the specification as shown in fig. 5-13.

C. If the performance does not meet both specification, replace the Drum Total Ass'y.

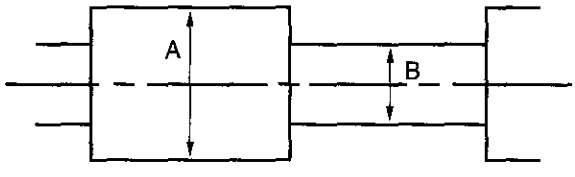


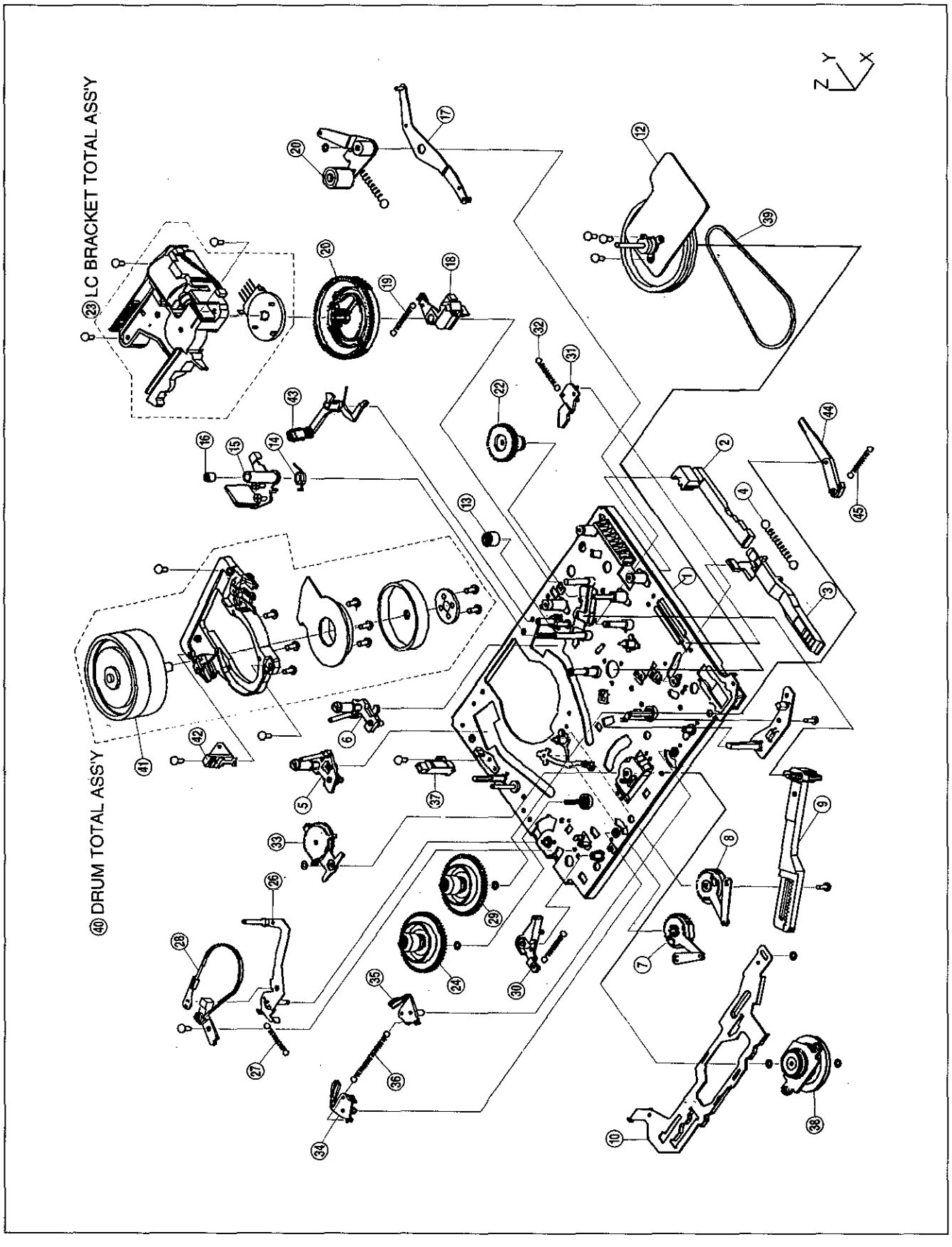
Fig. 5-13 Envelope output and output level difference

8) Final Check

Make sure no Tape wrinkle is caused at each guide.

6. EXPLODED VIEW AND PARTS LIST

6-1. EXPLODED VIEW OF DECK ASS'Y

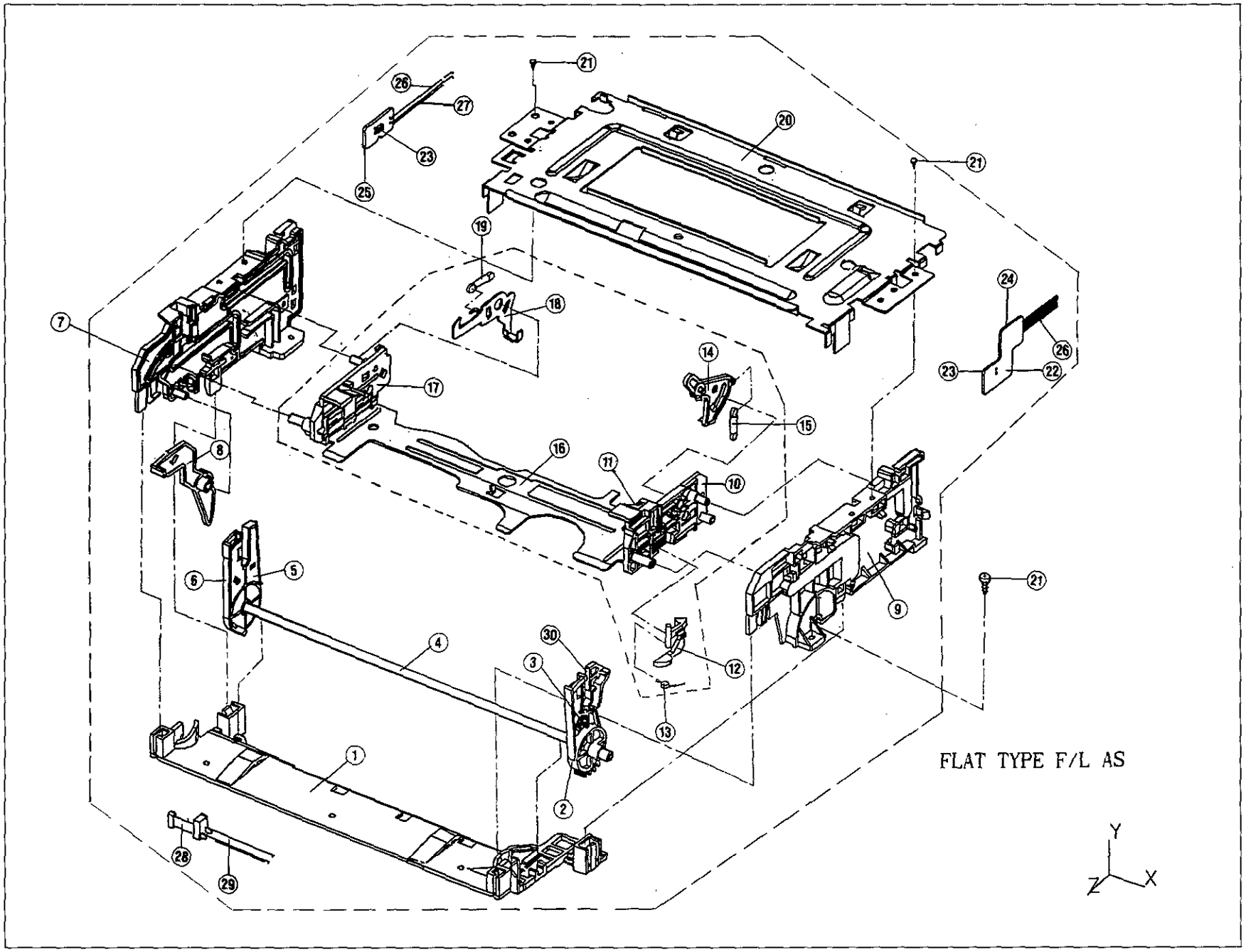


6-2. PARTS LIST OF DECK ASS'Y

NO	STOCK NO.	PART NAME	Q'TY	REMARKS
1	97SB379530	MAIN BASE AS	1 EA	
2	97S2714800	F/L SUB RACK	1 EA	
3	97S2714700	F/L DRIVE RACK	1 EA	
4	97S3035000	F/L RACK SPG	1 EA	
5	97SB387200	S SLANT POLE AS	1 EA	
6	97SB387100	T SLANT POLE AS	1 EA	
7	97SB379800	L LOADING AS	1 EA	
8	97SB379700	R LOADING AS	1 EA	
9	97SB381600	LOADING RACK AS	1 EA	
10	97S0945810	CONNECT PLATE	1 EA	
11	97SB382800	DEC PCB AS	1 EA	
12	97S8103700	CAPSTAN MOTOR	1 EA	
13	97S0427710	CAP ADJUST	1 EA	
14	97S3031300	AC HEAD GUIDE SPG	1 EA	
15	97SB381000	AC HEAD PLATE TOTAL AS	1 EA	RECORD MODEL
	97SB387100	AC HEAD PLATE TOTAL AS	1 EA	PLAY ONLY MODEL
16	97S4001500	AC HEAD UNIT	1 EA	
17	97SB381700	RELAY LEVER AS	1 EA	
18	97S2623500	RETURN LEVER	1 EA	
19	97S3031700	RETURN SPG	1 EA	
20	97S2714900	CAM GEAR	1 EA	
21	97SB381800	PINCH LEVER TOTAL AS	1 EA	
22	97S2906810	WORM WHEEL	1 EA	
23	97SB389700	LC BRACKET TOTAL AS	1 EA	
24	97SB382000	S REEL TABLE AS	1 EA	
25	97SB382100	T REEL TABLE AS	1 EA	
26	97SB379600	TENSION LEVER AS	1 EA	
27	97S3031200	TENSION SPG	1 EA	
28	97SB382900	BAND BRAKE AS	1 EA	
29	97S3037600	S SUB BRAKE SPG	1 EA	
30	97S2626300	S SUB BRAKE LEVER	1 EA	
31	97SB390210	T SUB BRAKE AS	1 EA	
32	97S3032810	T SUB BRAKE SPG	1 EA	
33	97SB382300	IDLER PLATE TOTAL AS	1 EA	
34	97SB382500	S MAIN BRAKE AS	1 EA	
35	97SB382600	T MAIN BRAKE AS	1 EA	
36	97S3032600	MAIN BRAKE SPG	1 EA	
37	97S8012900	FE HEAD	1 EA	RECORD MODEL

NO	STOCK NO.	PART NAME	Q'TY	REMARKS
38	97SB382410	REEL GEAR TOTAL AS	1 EA	
39	97S5502300	REEL BELT	1 EA	
40	97SA298500	DRUM TOTAL AS	1 EA	NTSC 2 HEAD (SP/EP)
	97SA293700	DRUM TOTAL AS	1 EA	NTSC 4 HEAD (MONO)
	97SA244400	DRUM TOTAL AS	1 EA	PAL 2 HEAD (SP ONLY)
	97SA244600	DRUM TOTAL AS	1 EA	PAL 2 HEAD (SLP)
	97SA244500	DRUM TOTAL AS	1 EA	PAL 4 HEAD (MONO)
41	97SB391300	DRUM AS	1 EA	NTSC 2 HEAD (SP/EP)
	97SB390310	DRUM AS	1 EA	NTSC 4 HEAD (MONO)
	97SA300100	DRUM AS	1 EA	PAL 2 HEAD (SP ONLY)
	97SA300300	DRUM AS	1 EA	PAL 2 HEAD (SLP)
	97SA300200	DRUM AS	1 EA	PAL 4 HEAD (MONO)
42	97SB381100	EARTH BRACKET AS	1 EA	
43	97SB385000	HEAD CLEANER TOTAL AS	1 EA	
44	97SB386700	CAPSTAN BRAKE AS	1 EA	4 HEAD MODEL
45	97S3036100	CAPSTAN BRAKE SPG	1 EA	4 HEAD MODEL

6-3. EXPLODED VIEW OF FRONT LOADING ASS'Y



6-4. PARTS LIST OF FRONT LOADING ASS'Y

NO	STOCK NO.	PART NAME	Q'TY	DESCRIPTION	REMARKS
1	97S0938100	CST GUIDE PLATE	1 EA	ABS	
2	97S2624900	LOADING LEVER-R	1 EA	DURACON M90-02	
3	97S3030500	LEVER-R SPG	1 EA	SWPB	
4	97S3606800	LOADING SHAFT	1 EA	SUM 32 MFZN	
5	97S2622100	LOADING LEVER-L	1 EA	DURANEX 3300	
6	97S3030600	LEVER-L SPG	1 EA	SWPB	
7	97S2430600	FL BRKT-L	1 EA	ABS GLASS 10%	
8	97S2622500	F/L DOOR OPENER	1 EA	DURANEX 3300	
9	97S2433600	F/L BRKT-R	1 EA	ABS GLASS 10%	
10	97S5201700	HOLDER SLIDER-R	1 EA	DURACON M90-02	
11	97S3030100	CST UPPER SPG	2 EA	SUS304CSP	
12	97S2622400	RELEASE LEVER	1 EA	DURACON M90-02	
13	97S3030700	RELEASE SPG	1 EA	SUS304WPB	
14	97S2622600	PRE OPENER	1 EA	DURANCON M90-02	
15	97S3030900	OPENER SPG	1 EA	SUS304WPB	
16	97S0935800	CST HOLDER PLATE	1 EA	SECC T1.2	
17	97S5201600	HOLDER SLIDER-L	1 EA	DURACON M90-02	
18	97S2622310	SAFETY LEVER	1 EA	SECC T1.0	
19	97S3030800	SAFETY SPG	1 EA	SUS304WPB	
20	97S0935700	TOP PLATE	1 EA	SECC T1.0	
21	7121300811	TAPPING SCREW	2 EA		
22	97P6538202	START PCB	1 EA	BAKELITE	
23	TPT304R2--	PHOTO TR	2 EA	PT304R2	
24	97P8805803	CONN WAFER ANGLE	1 EA		
25	97P6538203	END PCB	1 EA	BAKELITE	
26	WP-9RD3213	LEAD WIRE	1 EA		
27	WP-9WH3213	LEAD WIRE	1 EA		
28	5SD0101052	RECORD SAFETY S/W	1 EA		RECORD MODEL
29	WP-9YW3113	LEAD WIRE	2 EA		RECORD MODEL
30	97S3538900	LEVER-R POST	1 EA	SUM32	

6-5. MAIN SPARE PARTS LIST OF DECK ASS'Y

NO	PART NAME	PART S/N	DESCRIPTION	Q'TY	REMARKS
1	CONNECT PLATE	97S0945810	SECC T1.0	1 EA	
2	F/L SUB RACK	97S2714800	DURANEX 3300	3 EA	
3	F/L DRIVE RACK	97S2714700	DURANEX 3300	3 EA	
4	F/L RACK SPG	97S3035000	SWPB	1 EA	
5	S SLANT POLE AS	97SB387200	G-MECHA	1 EA	
6	T SLANT POLE AS	97SB387100	G-MECHA	1 EA	
7	L LOADING AS	97SB379800	G-MECHA	1 EA	
8	R LOADING AS	97SB379700	G-MECHA	1 EA	
9	LOADING RACK AS	97SB381600	G-MECHA	1 EA	
10	DECK PCB AS	97SB382800	G-MECHA	3 EA	
11	ADJUST CAP	97S0427710	ZAMAK 3	1 EA	
12	CAPSTAN MOTOR	97S8103700	F2QKB47	3 EA	
13	AC HEAD PLATE TOTAL AS	97SB381000	G-MECHA	3 EA	RECORD MODEL
	AC HEAD PLATE TOTAL AS	97SB387100	G-MECHA	3 EA	PLAY ONLY MODEL
14	RELAY LEVER AS	97SB381700	G-MECHA	1 EA	
15	RETURN LEVER	97S2623500	DURACON M90	1 EA	
16	RETURN SPG	97S3031700	SUS3042WPB	1 EA	
17	CAM GEAR	97S2714900	TR-10D	1 EA	
18	PINCH LEVER TOTAL AS	97SB381800	G-MECHA	3 EA	
19	WORM WHEEL	97S2906810	DURACON M90	1 EA	
20	LC BRAKET TOTAL AS	97SB389700	G-MECHA	3 EA	
21	IDLER PLATE TOTAL AS	97SB382300	G-MECHA	3 EA	
22	S REEL TABLE AS	97SB382000	G-MECHA	3 EA	
23	T REEL TABLE AS	97SB382100	G-MECHA	3 EA	
24	TENSION LEVER AS	97SB379600	G-MECHA	1 EA	
25	BAND BRAKE AS	97SB382900	G-MECHA	1 EA	
26	TENSION SPG	97S3031200	SUS304WPB	1 EA	
27	S SUB BRAKE LEVER	97S2626300	DURACON M90	1 EA	
28	S SUB BRAKE SPG	97S3037600	SUS304WPB	1 EA	
29	T SUB BRALE AS	97SB390210	G-MECHA	3 EA	
30	T SUB BRAKE SPG	97S3032810	SUS304WPB	1 EA	
31	S MAIN BRAKE AS	97SB382500	G-MECHA	3 EA	
32	T MAIN BRAKE AS	97SB382600	G-MECHA	3 EA	
33	MAIN BRAKE SPG	97S3032600	SUS3042WPB	1 EA	
34	FE HEAD	97S8012900	HVFMF0016AK	3 EA	RECORD MODEL
35	REEL GEAR TOTAL AS	97SB382410	G-MECHA	1 EA	
36	CONNECTOR AS	97P8806203	MAIN-DECK (MOTOR) 14P-6/9P	3 EA	

NO	PART NAME	PART S/N	DESCRIPTION	Q'TY	REMARKS
37	DRUM TOTAL AS	97SA295800	G-MECHA	3 EA	NTSC 2 HEAD (SP/EP)
	DRUM TOTAL AS	97SA293700	G-MECHA	3 EA	NTSC 4 HEAD (MONO)
38	HEAD CLEAR TOTAL AS	97SB385000	G-MECHA	3 EA	
39	FLAT TYPE F/L AS	97SB125930	G-MECHA	3 EA	RECORD MODEL
	FLAT TYPE F/L AS	97SB177640	G-MECHA	3 EA	PLAY ONLY MODEL
40	POLY WASHER	97S3117300	D3.6xD8xT0.5	5 EA	
41	POLY WASHER	97S3108200	D2.6xD6xT0.5	5 EA	
42	POLY SLIDER	97S3903600	D3.1XD6XT0.5	5 EA	
43	TAPPING SCREW	7121300611	T2S PAN 3x6 MFZN	5 EA	
44	TAPTITE SCREW	7278260611	TT3 WAS 2.6x6 MFZN	10 EA	
45	TAPPING SCREW	7124301211	T2S RND 3x12 MFZN	EA	
46	TAPTITE SCREW	7274300611	TT3 RND 3x6 MFZN	5 EA	DECK-F/LOADING
47	TAPTITE SCREW	7278300511	TT3 WAS 3x5 MFZN	5 EA	
48	TAPTITE SCREW	7274261011	TT3 RND 2.6x10 MFNZ	5 EA	
49	TAPTITE SCREW	7274301011	TT3 RND 3x10 MFZN	5 EA	
50	TAPTITE SCREW	7274301211	TT3 RND 3x12 MFZN	5 EA	
51	MACHINE SCREW	7008260511	WAS 2.6x5 MFZN	3 EA	
52	CAPSTAN BRAKE AS	97SB386700	G-MECHA	3 EA	4 HEAD MODEL
53	CAPSTAN BRAKE SPG	97S3036100	SUS 304 WPB	1 EA	4 HEAD MODEL