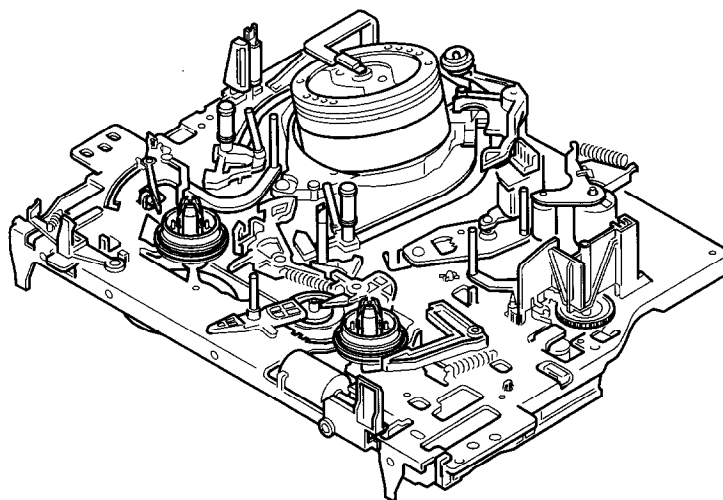
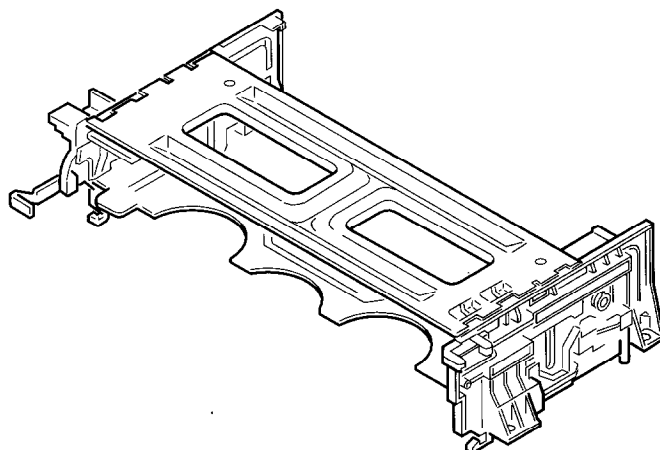


VHS MECHANICAL ADJUSTMENT MANUAL VI

S MECHANISM

VHS

Please use with the service manual.



VHS TAPE TRANSPORT MECHANISM DECK



SONY®

ADJUSTMENTS REQUIRED THE FOLLOWING PARTS REPLACEMENT

PARTS	ADJUSTMENTS										
	4-1-1 TENSION REGULATOR POSITION/TENSION ADJUSTMENT	4-1-2 CHECKING THE TENSION AND TORQUE	4-1-3 X-VALUE ADJUSTMENT	4-1-4 HEIGHT ADJUSTMENT OF GUIDE ROLLERS NO. 3 AND NO. 6	4-1-5 ACE HEAD HEIGHT AND AZIMUTH ADJUSTMENT	4-1-6 X-VALUE FINE ADJUSTMENT	4-1-7 HEIGHT ADJUSTMENT OF GUIDE ROLLER NO. 8	4-1-8 CHECKING THE LINEARITY AND FLUCTUATION OF THE RF OUTPUT			
3-25 REEL (S) TABLE	O	Δ	X	Δ	X	X	X	X			
3-25 TGT ASSEMBLY	O	X	X	Δ	X	X	X	X			
3-6 FEH ASSEMBLY	X	X	X	Δ	X	X	X	X			
3-23 DRUM BASE	X	X	O	O	O	O	O	O			
3-2 DRUM ASSEMBLY	X	X	O	O	O	O	O	O			
3-24 SHUTTLE (S) AND SHUTTLE (T) BLOCK ASSEMBLIES	X	X	O	O	O	O	O	X			
3-5 ACE HEAD BLOCK	X	X	O	Δ	O	O	Δ	X			
3-4 CAPSTAN MOTOR	X	X	X	Δ	O	O	O	X			
3-3 PINCHI PRESS BLOCK ASSY	X	X	X	X	O	O	O	X			
3-3 TGB ASSEMBLY	X	X	X	X	X	X	O	X			
3-10 REEL (T) TABLE	X	X	X	X	X	X	Δ	X			
3-19 PULLEY GEAR ASSEMBLY	X	O	X	X	X	X	X	X			
3-11 PENDULUM ARM ASSEMBLY	X	O	X	X	X	X	X	X			

O: ADJUST

Δ: CHECK

X: NOT REQUIRED

1. PREPARATION FOR MECHANISM CHECKS, ADJUSTMENTS AND REPLACEMENT

For removal of the cabinet, printed wiring boards and others, please refer to the service manual "DISASSEMBLY".

1-1. LOADING AND THREADING PROCEDURE WHEN THE POWER TURNS OFF

1-1-1. LOADING AND THREADING PROCEDURE WITH HANDS

- 1) Turn cam motor in the arrow **A** direction until loading and threading are end.

1-1-2. LOADING AND THREADING PROCEDURE WITH REGULATED DC POWER SUPPLY

- 1) Applying approx. +9V (300mA) to cam motor with regulated DC power supply makes it loading and threading.

Note : When loading and threading without cassette, claws are caught in four positions as following figure (in the order ①-②-③-④).
So release them with hands.

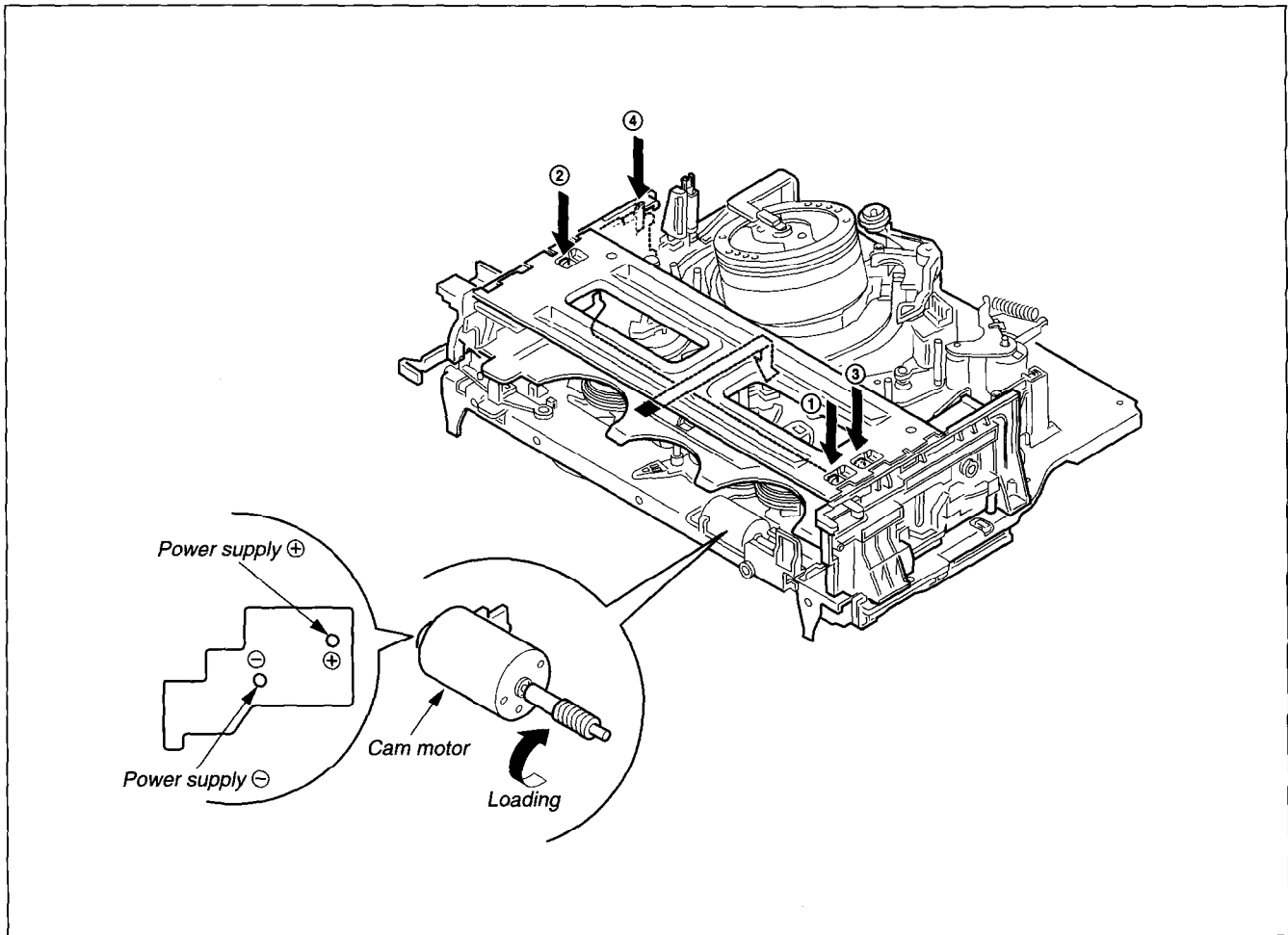


Fig. 1-1

1-2. UNLOADING AND UNTHREADING PROCEDURE WHEN THE POWER TURNS OFF

1-2-1. UNLOADING AND UNTHREADING PROCEDURE WITH HANDS

- 1) Turn cam motor in the arrow **B** direction until unthreading is end.
- 2) Turn capstan motor in the arrow **C** direction to take up tape in cassette.
- 3) Turn cam motor in the arrow **B** direction until unloading is end.

1-2-2. UNLOADING AND UNTHREADING PROCEDURE WITH REGULATED DC POWER SUPPLY

- 1) Apply approx. +5V (300mA) to contrary polarities of cam motor.
- 2) Unthreading operation begins, tape guides return to their initial positions (Unthreading operation is end but tape remains), then stop cam motor by turning power off.

Note : When unloading begins and cassette lid is closed, turn cam motor in the arrow **A** direction to open tape guard.

- 3) Turn capstan motor in the arrow **C** direction to take up tape in cassette.

Note : Take care that tape is not caught at pinch roller.

- 4) Check that tape is no loosened completely, and apply approx. +5V (300mA) to contrary polarities of cam motor with regulated DC power supply.

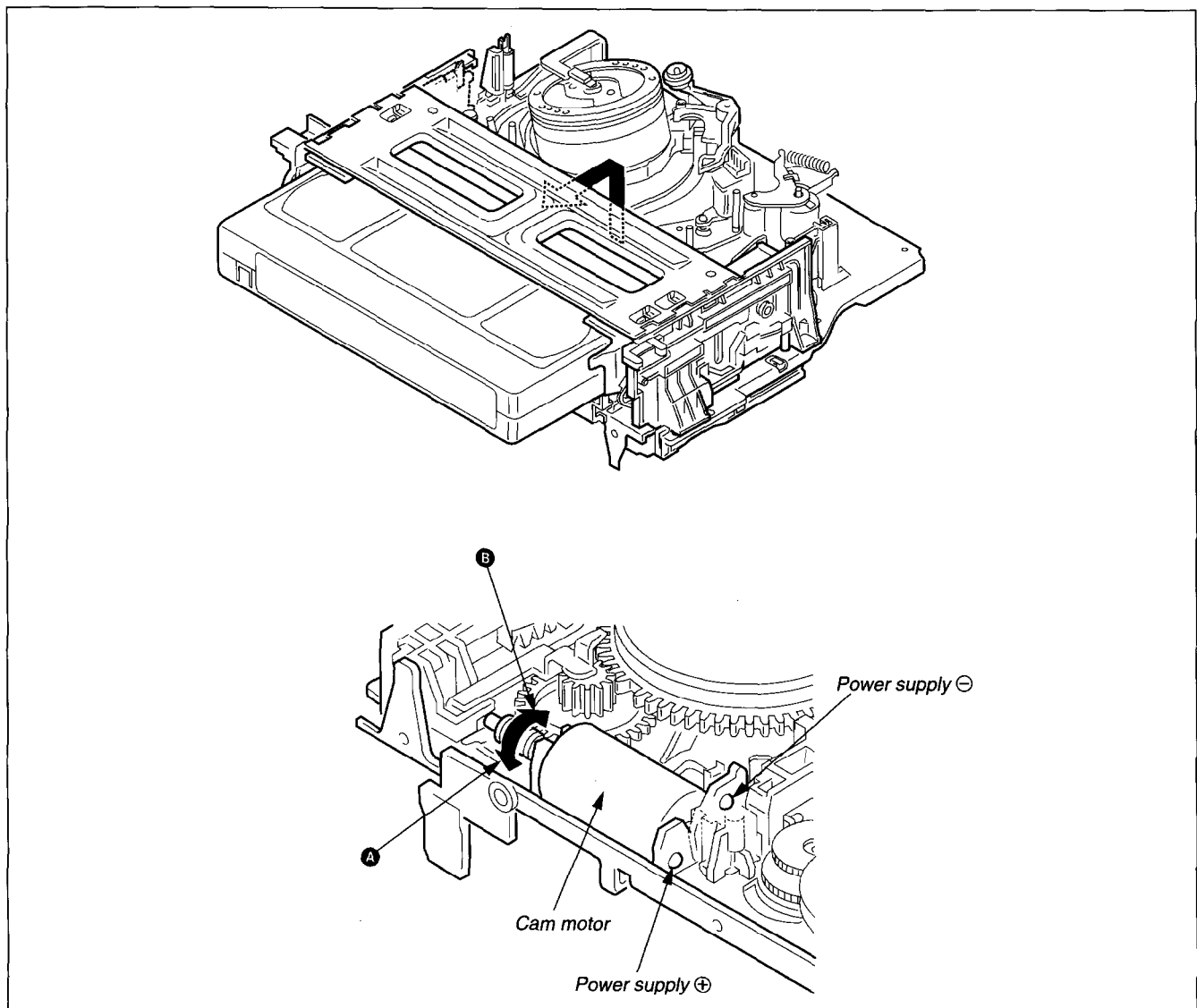


Fig. 1-2

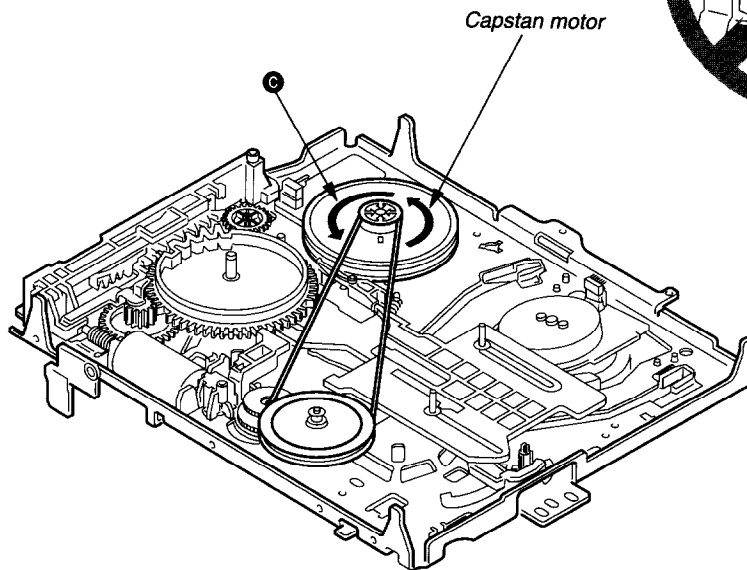
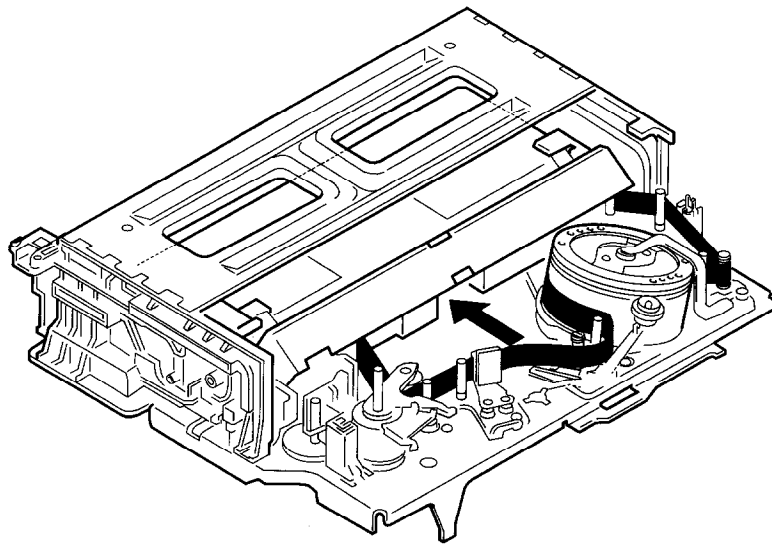


Fig. 1-3

1-3. HOW TO COMPLETE THREADING WITHOUT CASSETTE COMPARTMENT

Note 1 : Put the FL block assembly removed the FL top plate on the bottom not to put dust or grease the top sensor and the end sensor luminous plates or not to scratch them.

- 1) Pull out AC plug from wall outlet.
- 2) Shade near the end and top sensors with a black masking tape or the like.
- 3) Connect AC plug to wall outlet.

Note 2 : In this condition, some modes can not be set.

To make loading in this condition, set the video cassette tape without REC proof claw, pull the REC proof lever once and release it.

On loading without video cassette tape, it is necessary to deceive the microcomputer by turning the reel (T) table with hand.

Fast forward and rewind are not available.

Note 3 : After above mentioned operation, be sure to return the mode in the following order.

- 4) Pull out AC plug from wall outlet to reset the system control microcomputer.
- 5) Remove the tape near the end and top sensors.

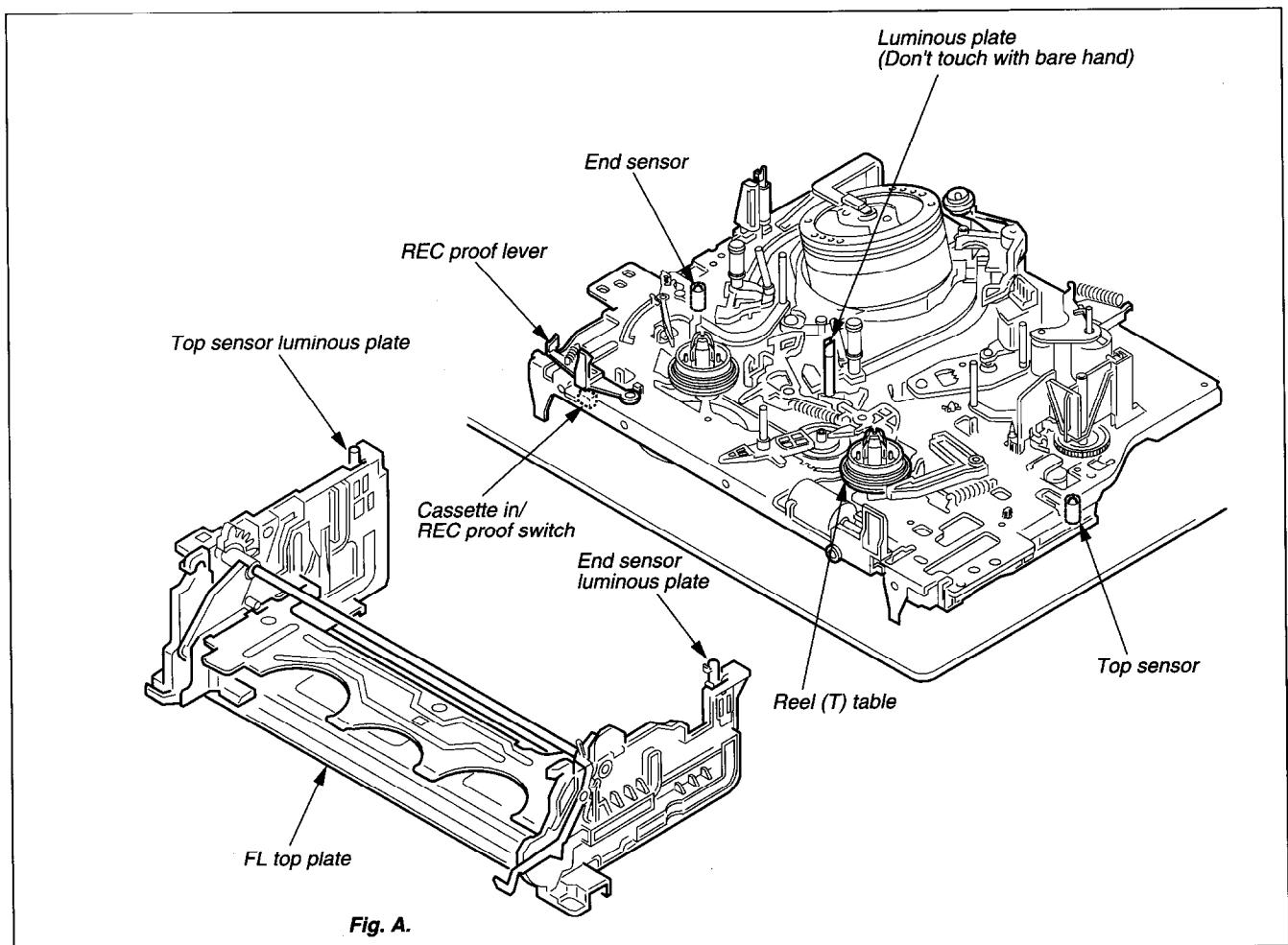


Fig. 1-4

2. PERIODIC CHECK AND REPLACEMENT

In order to obtain the best performance from this unit and make full use of its capabilities, and to extend the life of the unit and tapes, it is recommended that the following periodic checks and maintenance be performed.

* The following must be done after every repair regardless of how many hours the user has operated the machine.

2-1. CLEANING OF ROTATING HEAD DISK ASSEMBLY

- 1) Press a chamois cloth (Jig Ref. No. J-4) which has been dipped in cleaning fluid (Jig Ref. No. J-3) lightly against the rotating drum assembly, then do the cleaning by slowly rotating the rotating head disk by the hand. (Never try to clean by using the motor to turn it.)
- 2) Never try to clean by moving the chamois cloth at a vertical angle to the head tip. There is a very great danger of damaging the head tip if this is done.

2-2. CLEANING OF THE TAPE MOVEMENT SYSTEM

- 1) Clean the surfaces which the tape contacts during its movement (tape guide, drum assembly surface, capstan, pinch roller, etc.) with a chamois cloth that has been dipped in cleaning fluid.

2-3. CLEANING THE DRIVE SYSTEM

- 1) Clean the driving parts with a cloth that has been dipped in cleaning fluid.

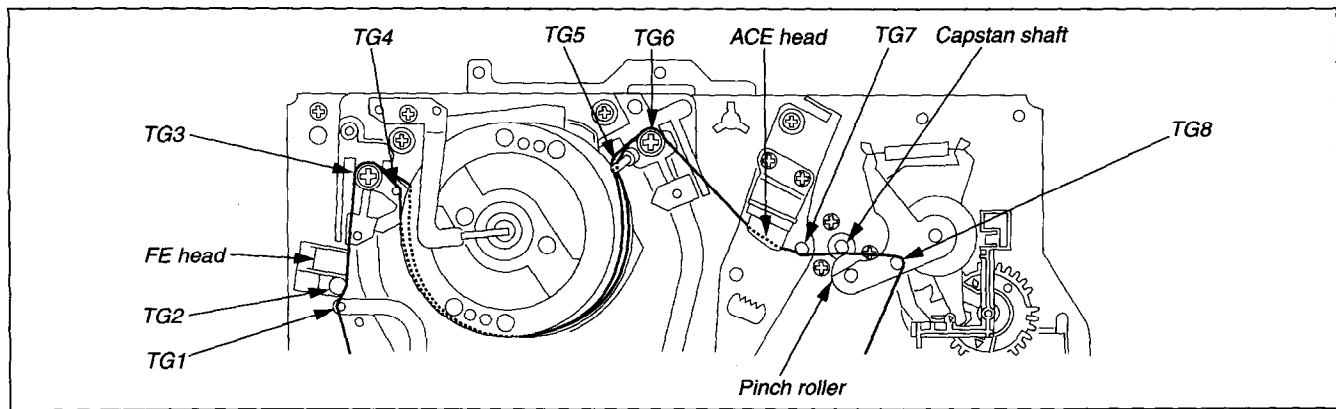


Fig. 2-1 Parts requiring cleaning

2-4. PERIODIC CHECK ITEMS

Perform the maintenance and check listed on the table below, according to users' operating hours.

Operating Hours (H)		500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	Remarks
		Maintenance & Check										
Tape Transportation System	Cleaning of tape transportation system	○	○	○	○	○	○	○	○	○	○	This cleaning must be done whenever a repair is made.
	Cleaning and degaussing of ACE assembly	○	○	○	○	○	○	○	○	○	○	
	Cleaning and degaussing of upper drum assembly	○	○	○	○	○	○	○	○	○	○	
Performance Confirmation	Abnormal sound	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust or replace the section which causes abnormal sound.
	Measurement of FWD back tension	—	☆	—	☆	—	☆	—	☆	—	☆	Confirmation must be made according to 4-1-1. Specified value : Adjust to 5.0504 to 6.5214mN•m (51.5 to 66.5g•cm) (without TC assembly*) or 3.7755 to 5.0994mN•m (38.5 to 52.0g•cm)(with TC assembly*)
	Confirmation of brake system	—	☆	—	☆	—	☆	—	☆	—	☆	Confirmation must be made according to section.
	Confirmation of record and playback functions	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Perform the confirmation whenever repair is made.
	Measurement of forward torque	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust to 4.9033 to 8.8259mN•m (50 to 90 g•cm)

Note : On overhaul

When overhauling the unit, replace parts as indicated in the above table.

○ : Cleaning ☆ : Confirmation

2-5. TOOLS AND FIXTURES REQUIRED FOR SERVICING

Ref. No.	Name	Part No.	Caved Jig No.	Remarks
J-1	Torque Measurement Cassette VHT-103S	J-6090-072-A		For FWD & back tension torque measurement.
	Torque Measurement Cassette VHT-404S	J-6082-012-A		For CUE and REVIEW torque measurement.
J-2	Alignment Tape	KRV-52NE* (NTSC)	8-192-605-41	Tape path, Audio azimuth, X-value adjustments
		KRV-51N2 (NTSC)	8-192-605-32	Electrical adjustments, Operation checks
		KRV-52PL (PAL)	8-192-605-46	Tape path, Audio azimuth, X-value adjustments
		KRV-51P (PAL)	8-192-605-36	Electrical adjustments, Operation checks
J-3	Cleaning fluid	Y-2031-001-0	—	
J-4	Chamois Leather	2-034-697-00	—	
J-5	Dental Mirror (With Handle)	J-6080-029-A	SL-5052	Tape path and tape traveling adjustments or checks.
	Dental Mirror (Mirror)	J-6080-030-1		
J-6	FLOIL SG-646	7-651-000-44		Net. 20g
J-7	Diamond Oil NT-68	7-661-018-18		
J-8	Screw Lock G (1401B)	7-432-114-11		
J-9	X-value adjusting driver	J-6090-073-A		X-value adjustment
J-10	Mode Selector II	J-6082-282-A	—	For S mechanism stand-alone operation
J-11	Connector Conversion Jig	J-6090-052-A	—	For S mechanism stand-alone operation
J-12	S Type Capstan Board	J-6090-075-A	—	For S mechanism stand-alone operation

* Be sure to use KRV-52NE having version number.

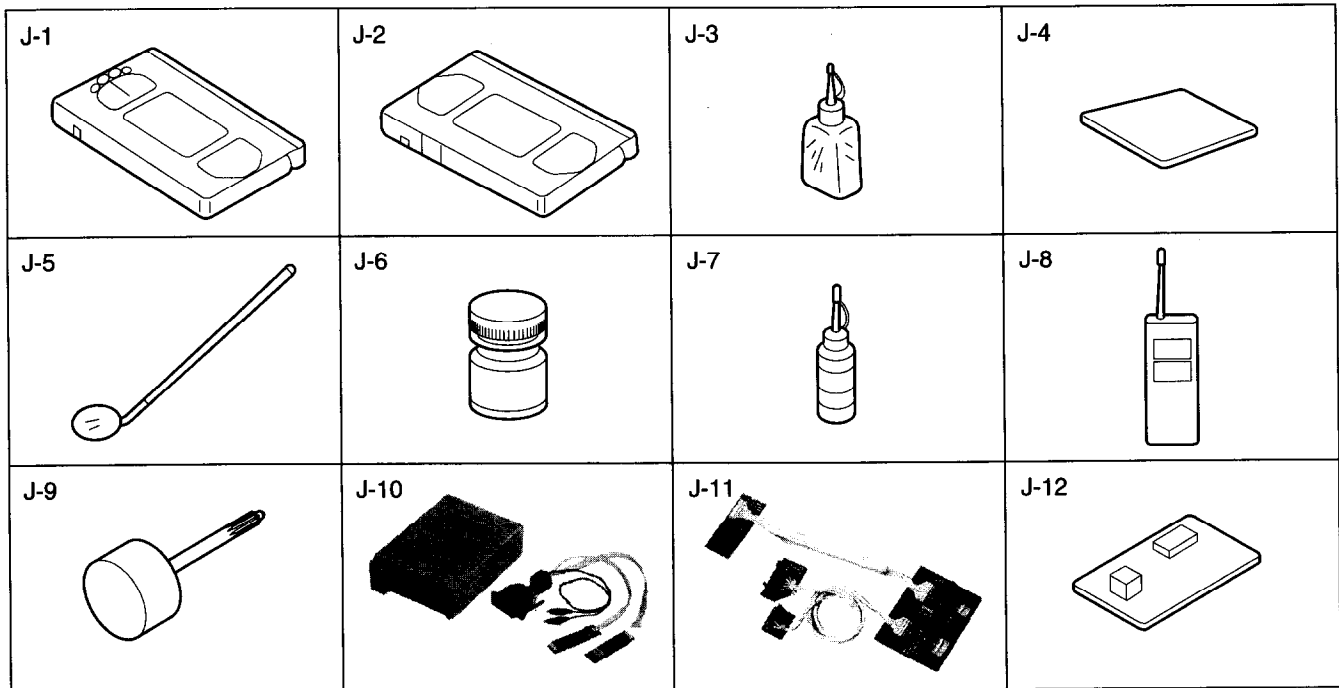


Fig. 2-2

2-6. HOW TO USE THE MODE SELECTOR II FOR ADJUSTING S TYPE MECHANISM ASSEMBLY

2-6-1. OUTLINE

To activate the VHS system S type mechanism assembly using mode selector II (J-6082-282-A), use connector conversion jig (J-6090-052-A) and the S type capstan board (J-6090-075-A). By using the connector conversion jig and the S type capstan board, the following operations are possible.

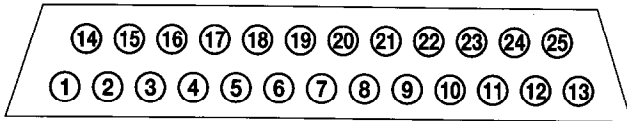
- Loading and unloading action by the loading motor.
- Normal and reverse rotation of the capstan motor.

2-6-2. PREPARATION

- 1) In order to drive the capstan motor, the power +5V and +12V are supplied from the Mode Selector II. Disassemble the D-SUB connector of the Mode Selector cable, then solder the following three places.

Supplied 3-pin cable	D-SUB connector of the Mode Selector II	Voltage
Pin 1 (Red index)	Pin 20	+12V
Pin 2	Pin 25	GND
Pin 3	Pin 24	+5V

- Connector pin number assignment of the D-SUB connector (From the soldering side)



- When connections are made, check that +5V and +12V are available at the 3-pin cable connector.

2) CHECKING THE SOFTWARE VERSION

Turn on the power of the Mode Selector II.

If the reading of the software version on the Mode Selector II is not 1.10 or higher, replace the new ROM (J-6082-314-A).

2-6-3. CONNECTION

1) S TYPE CAPSTAN BOARD ATTACHMENT

Replace the capstan board supplied with the connector conversion jig (J-6090-052-A) with the S type capstan board (J-6090-075-A).

2) CONNECTION BETWEEN THE CONNECTOR CONVERSION JIG AND THE MODE SELECTOR II.

Insert the connectors of the two 6-pin cables (one is white and the other is black) and the 3-pin cable from the Mode Selector II to the corresponding connectors on the connector conversion jig (J-6090-052-A).

3) CONNECTION BETWEEN THE CONNECTOR CONVERSION JIG AND THE S TYPE MECHANISM ASSEMBLY

With the power of the Mode Selector II turned off, insert the following two connectors to the corresponding connectors on the S type mechanism assembly.

- 3-pin connector for the loading motor
- 10-pin connector for the capstan motor

Set the speed control for the minimum setting (fully counterclockwise).

2-6-4. OPERATION

1) OPERATION OF THE LOADING MOTOR ON THE S TYPE MECHANISM ASSEMBLY

- ① Select the H type mechanism assembly setting on the Mode Selector II.

- ② Operating procedures after the mechanism selection

For the operating procedures, see pages 3 to 5 of "8mm Video Mechanical Adjustment Manual IV (TK Mechanism) Supplement-1".

For the loading procedure, see page 4 of "VHS Mechanical Adjustment manual IV (S Mechanism)".

2) OPERATION OF THE CAPSTAN MOTOR ON THE S TYPE MECHANISM ASSEMBLY

- ① By the loading motor operation under the item 1), change the mode setting to the FF/REW mode.

- ② Turn the speed control gradually in clockwise direction, then the capstan motor starts rotating. To turn the capstan motor in desired rotating direction, change the FF/REW setting of the rotating direction switch.

2-6-5. PRECAUTIONS

- Turn the speed control only when necessary. Otherwise, hold the speed control turned at fully counterclockwise direction. If the power of the Mode Selector II is turned on with the speed control turned in clockwise direction, +12V power fails and the power of the Mode Selector II cannot be turned on.
- Although the connector conversion jig (J-6090-052-A) has rubber feet, do not make a short circuit on the bottom surface of the connector conversion jig via peripheral conductive materials.

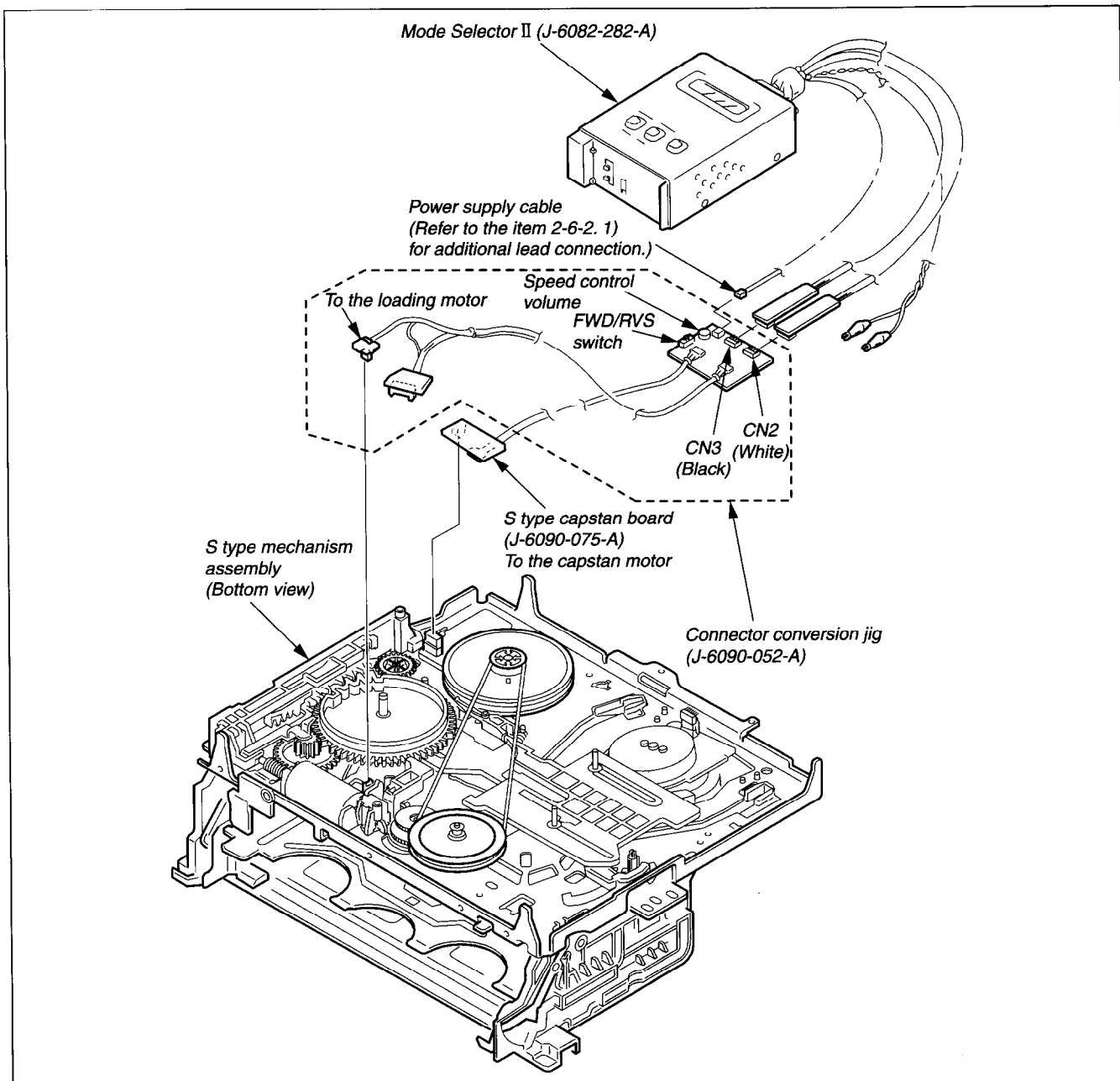


Fig. 2-3

2-6-6. CHECKING THE MECHANISM MODE BY THE MARK CARVED ON THE SLIDER

As shown in the right figure, the mechanism mode can be identified by checking the mark carved on the slider pointed by the loading gear shaft.

Carved mark	Mode
CD	Cassette down
EJ	Eject
UL	Unload end
LE	Load end
RV	Reverse
PR	Pinch release
FP	FWD pause
FW	FWD
ST	Stop
FR	FF/REW

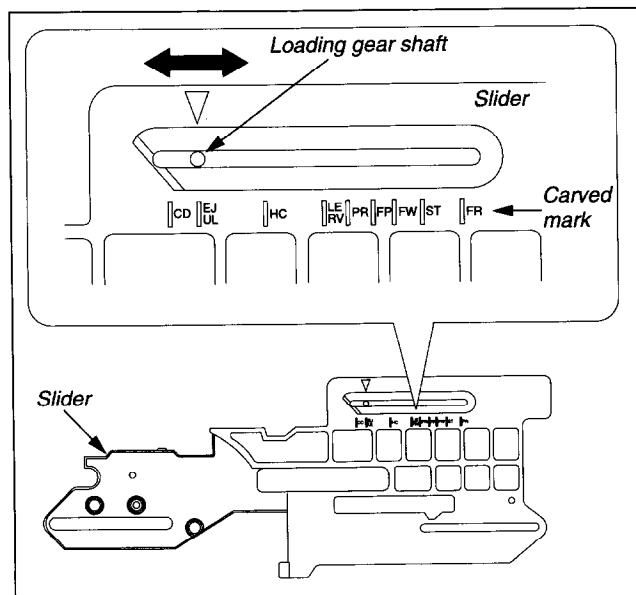


Fig. 2-4

2-7. PHASE ADJUSTMENT ON ATTACHING S TYPE MECHANISM ASSEMBLY

As shown below, adjust the phase between the rotary switch on the MA board and the cam gear.

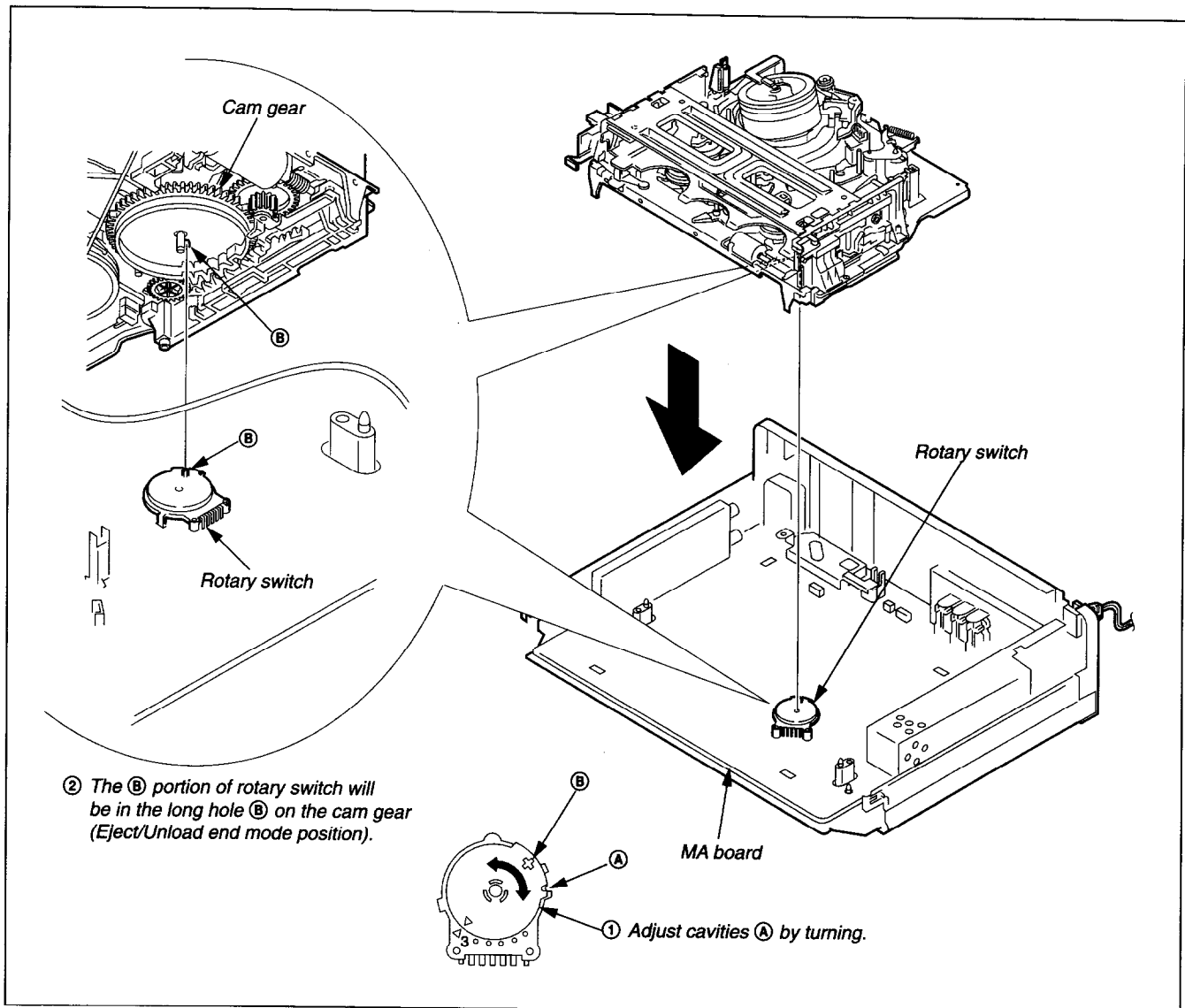


Fig. 2-5

3. MAINLY MECHANICAL PARTS REPLACEMENT

Notes:

For the removal of cabinets, printed circuit boards or the like, please refer to the "DISASSEMBLY" section on the service manual of the respective models.

To assemble the mechanical parts which are disassembled in the following sections, perform the disassembly steps in reverse, unless otherwise specified.

When replacing greased parts, grease them in the same way.

Do not oil, grease or touch with bare hands the surfaces that contacts tape of guides and brake shoes.

Install gears to engage each other.

Basically, disassembling and assembling should be done in the unthreading-end condition.

3-1. FL COMPLETE ASSEMBLY

- 1) Remove screws (BVTP3 × 8) ①.
- 2) Remove FL complete assembly ② in the arrow **A** direction.

Note : Be careful not to damage claws on the bottom and front.

- 3) Remove torsion spring (deck open) ③.
- 4) Remove luminous plate (top sensor) ④ and luminous plate (end sensor) ⑤.

[Note on Mounting]

- When mounting FL complete assembly, first insert claws on the bottom and front not to damage.
- Keep clean top sensor and end sensor luminous plates.

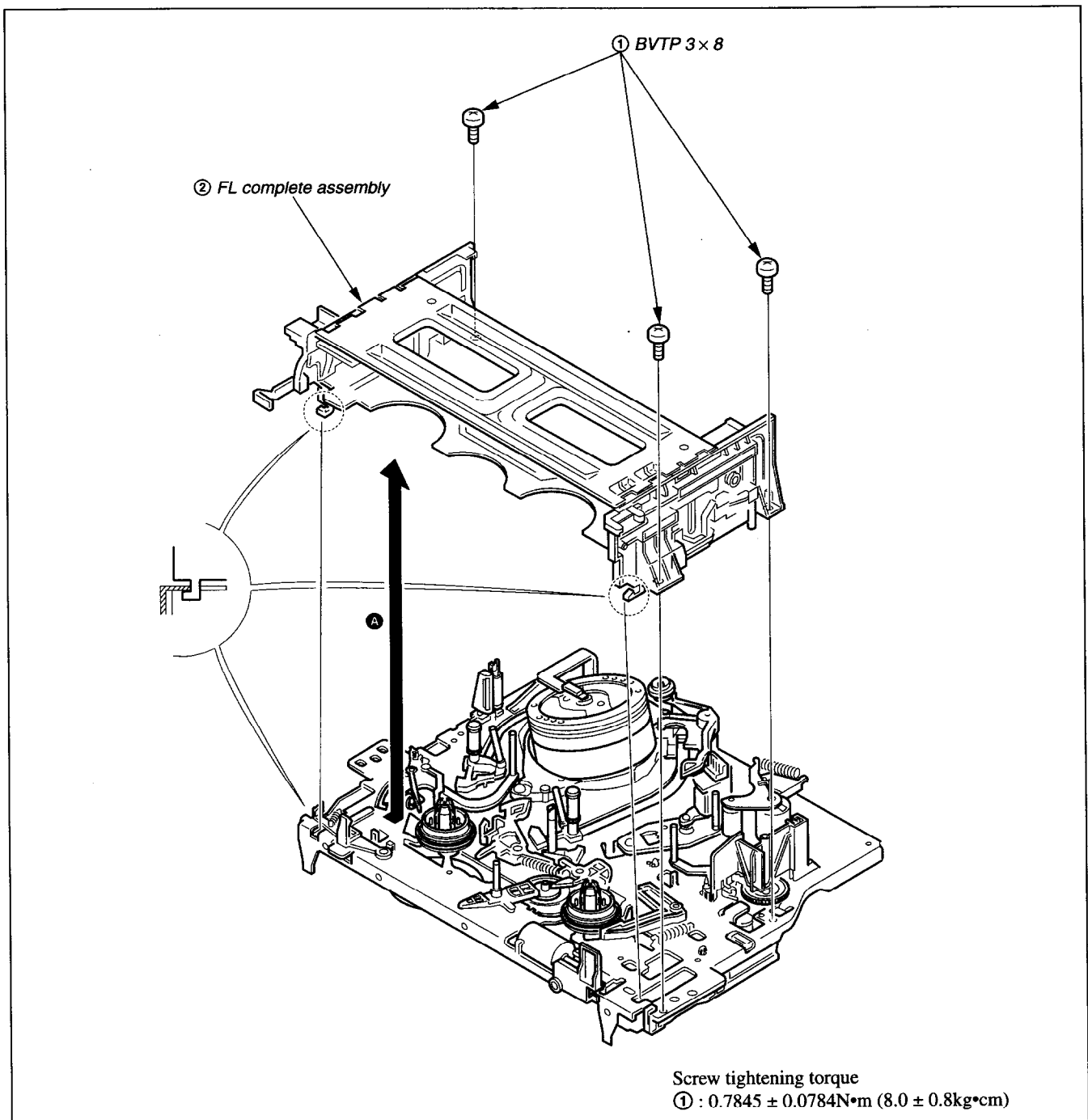


Fig. 3-1

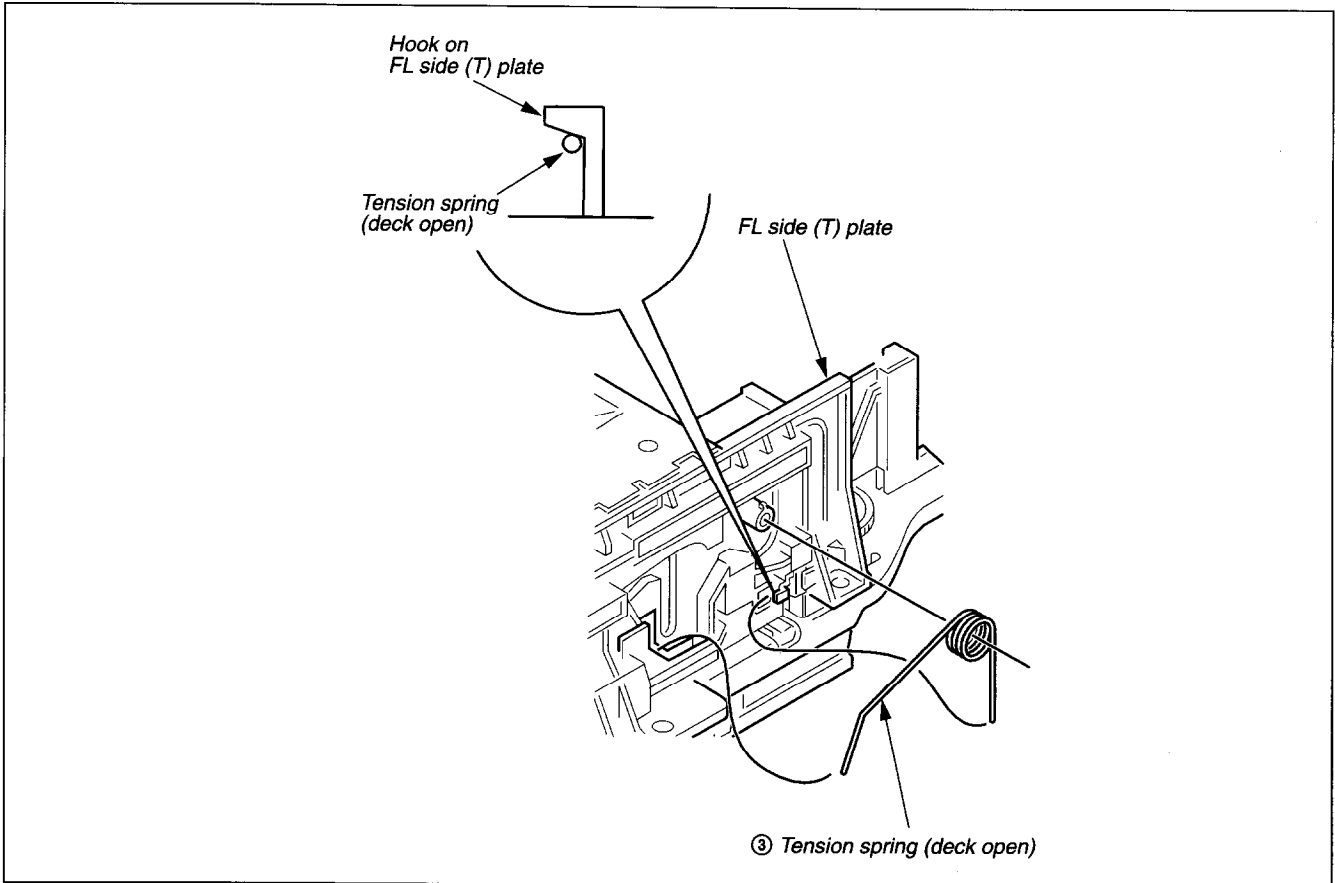


Fig. 3-2

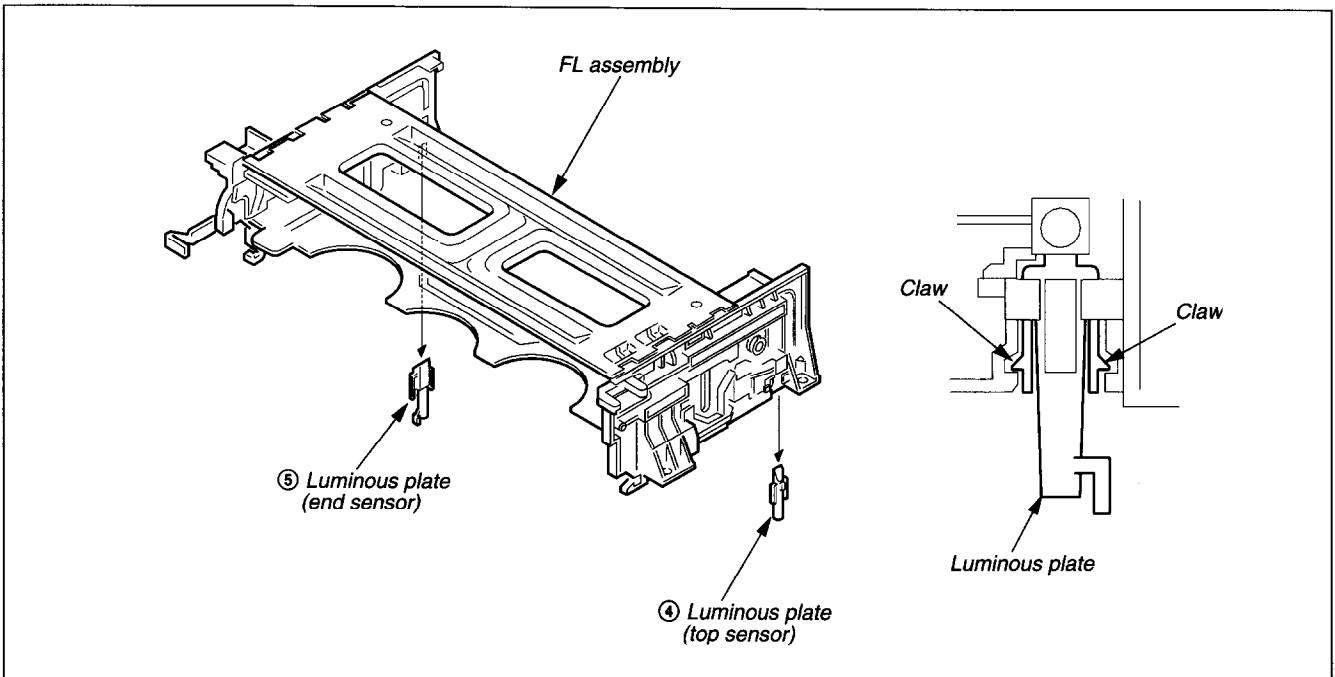


Fig. 3-3

3-2. DRUM ASSEMBLY

- 1) Remove screw (BVTP3 × 8) ①.
- 2) Remove ground shaft assembly ② not to touch its tip with bare hand.
- 3) Remove screws ③ to remove drum assembly ④.

[Notes on Mounting]

- Don't touch head chips and tip of ground shaft assembly with bare hand.
- Keep clean the surface that contacts tape of drum assembly.
- Tighten screw ③ in the order a, b, c.

[Adjusting after Mounting]

- 4-1. Tape path adjustment

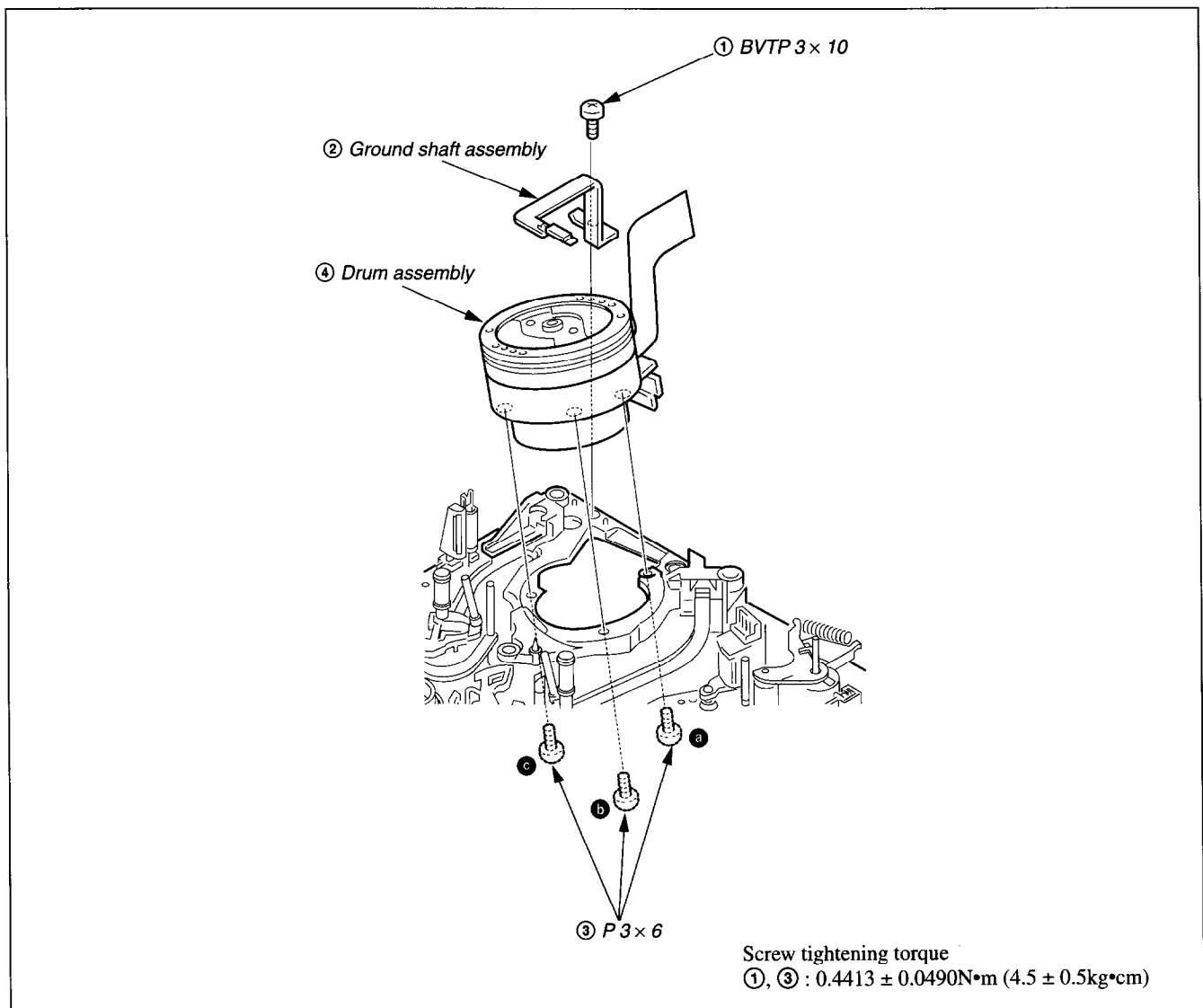


Fig. 3-4

3-3. PINCH PRESS BLOCK ASSEMBLY, TG8 ASSEMBLY AND THEIR PERIPHERY

- 1) Remove pinch press block assembly ① while releasing its tip from the claw of lid opener ②.
- 2) Remove lid opener ② while releasing claw in the arrow A direction from mechanical chassis.
- 3) Remove elevator gear ③.
- 4) Remove TG8 assembly ④, TG8 arm gear ⑤ and TG8 arm driving gear ⑥.
- 5) Then remove pinch pressing gear ⑦.

[Notes on Mounting]

- When attaching pinch pressing gear ⑦ and elevator gear ③, be sure to adjust their phases as shown in Fig. A.
- Apply grease to elevator gear ⑦ and pinch shaft as shown in Fig. B.
- Don't touch surface of pinch roller with bare hand.

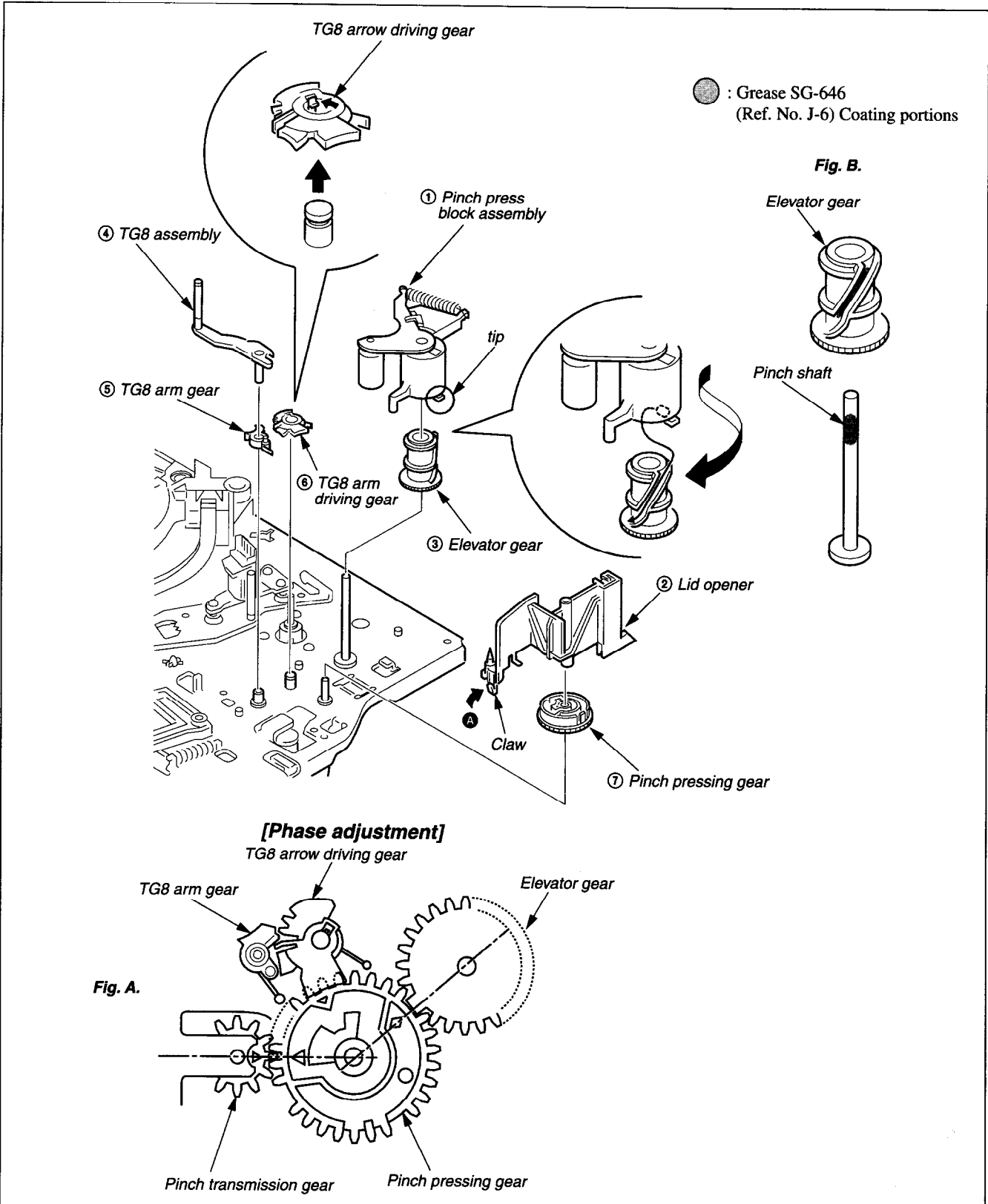


Fig. 3-5
— 16 —

3-4. RUBBER BELT, CAPSTAN MOTOR

- 1) Remove rubber belt ①.
- 2) Remove screws ② to pull out capstan motor ③.

[Notes on Mounting]

- Attach rubber belt not to twist it.
- Don't touch capstan motor with bare hand to keep clean capstan motor.
- Tighten screws ② in the order a, b, c.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

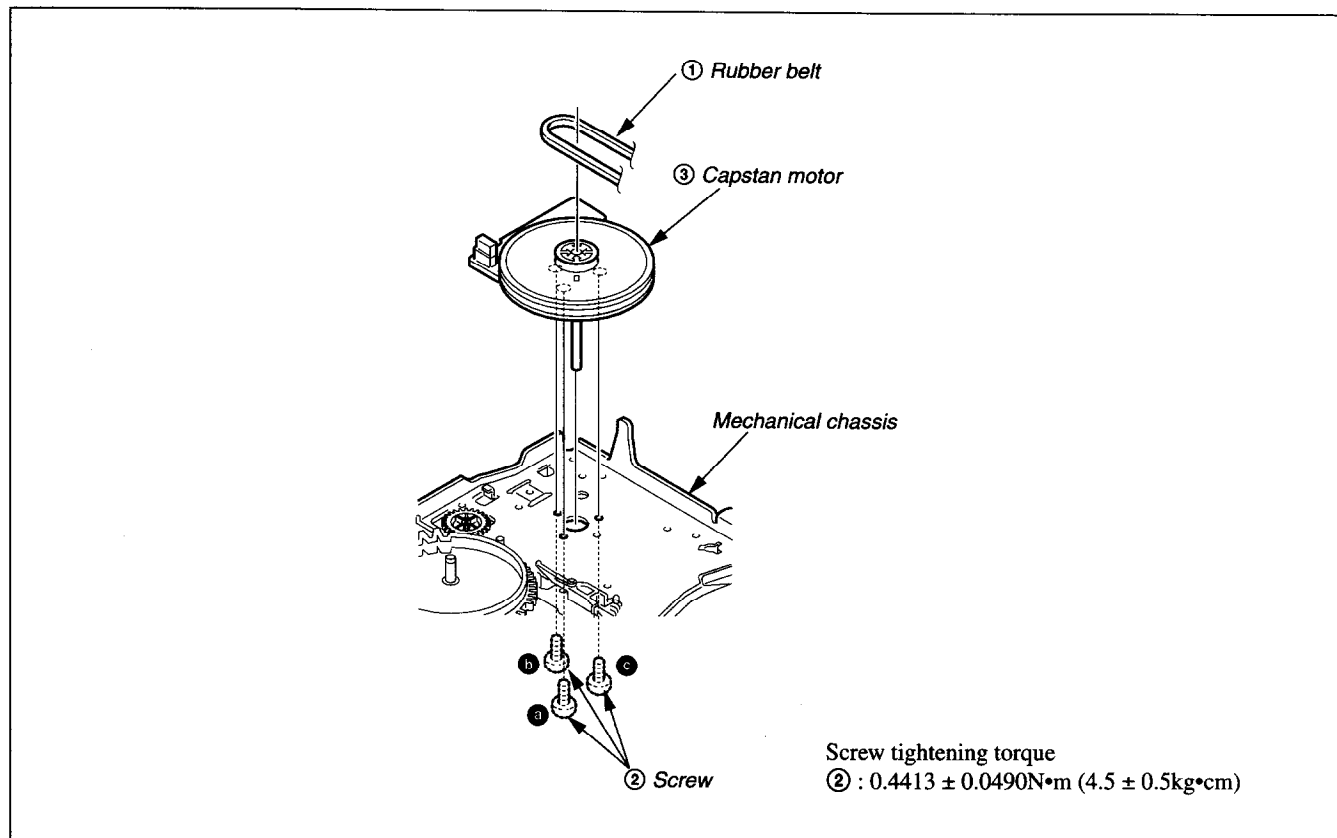


Fig. 3-6

3-5. ACE HEAD BLOCK ASSEMBLY

- 1) Remove screws ① to remove ACE head block assembly ②.

[Notes on Mounting]

- Don't touch capstan motor with bare hand to keep clean capstan motor.
- On tightening screws ①, first, tighten in the order **A**, **B**, next loosen **B** 180 degrees or more and perform adjustments. After adjustments tighten with torque screwdriver (torque; 0.29 ± 0.29 N•m (3.0 ± 0.3 kg•cm)).

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

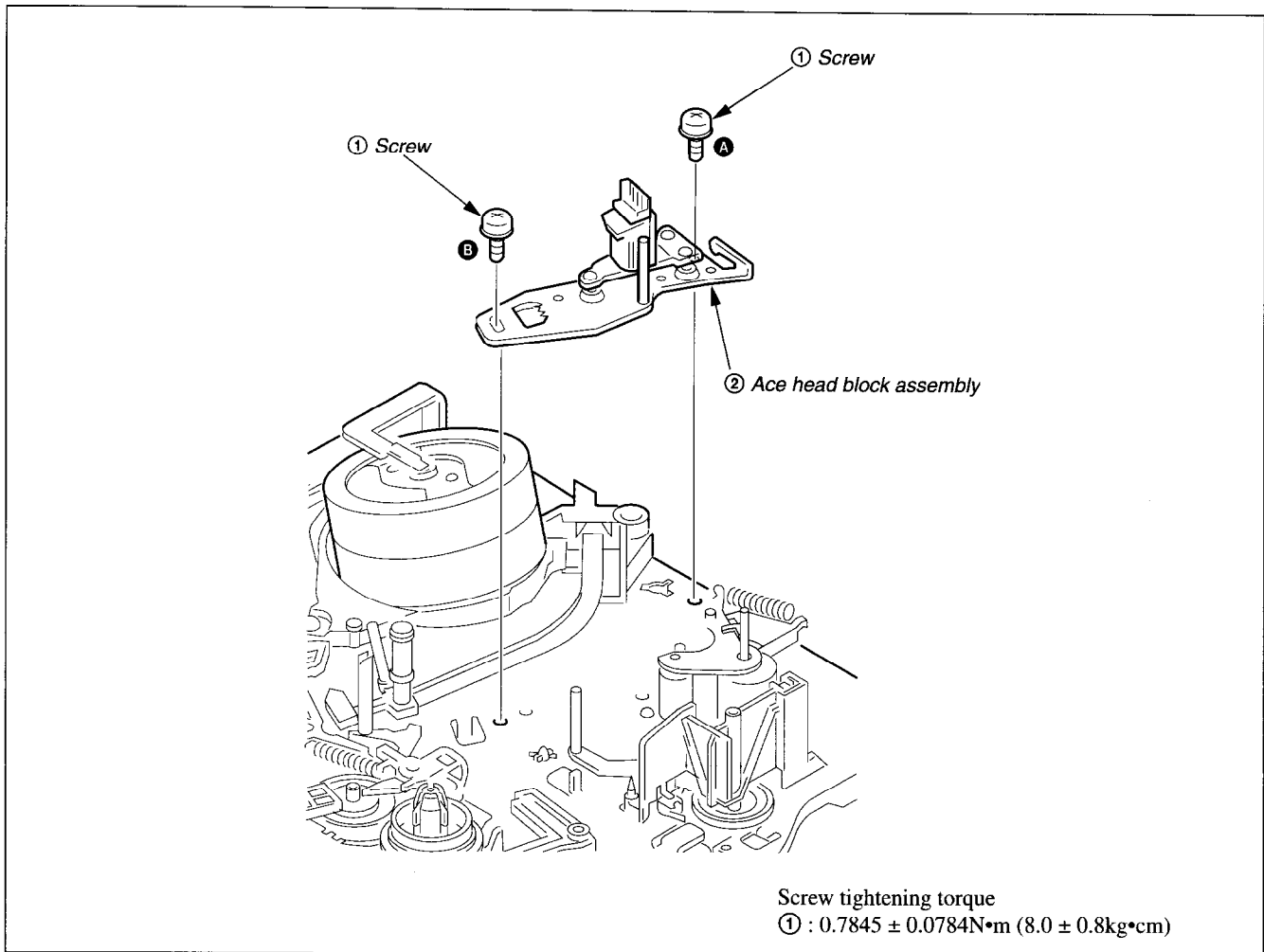


Fig. 3-7

3-6. FEH ASSEMBLY

- 1) While putting the boss out from mechanical chassis, turn FEH assembly ① in the arrow **A** direction and pull out FEH assembly above.
- 2) Slide FE head ② out from FEH holder not to break claw (Recorder only).
- 3) Remove TG2 shaft ③ by pushing with a screwdriver covered with cloth or the like not to scratch the surface.

[Note on Mounting]

- Don't touch FE head and TG2 shaft with bare hand.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

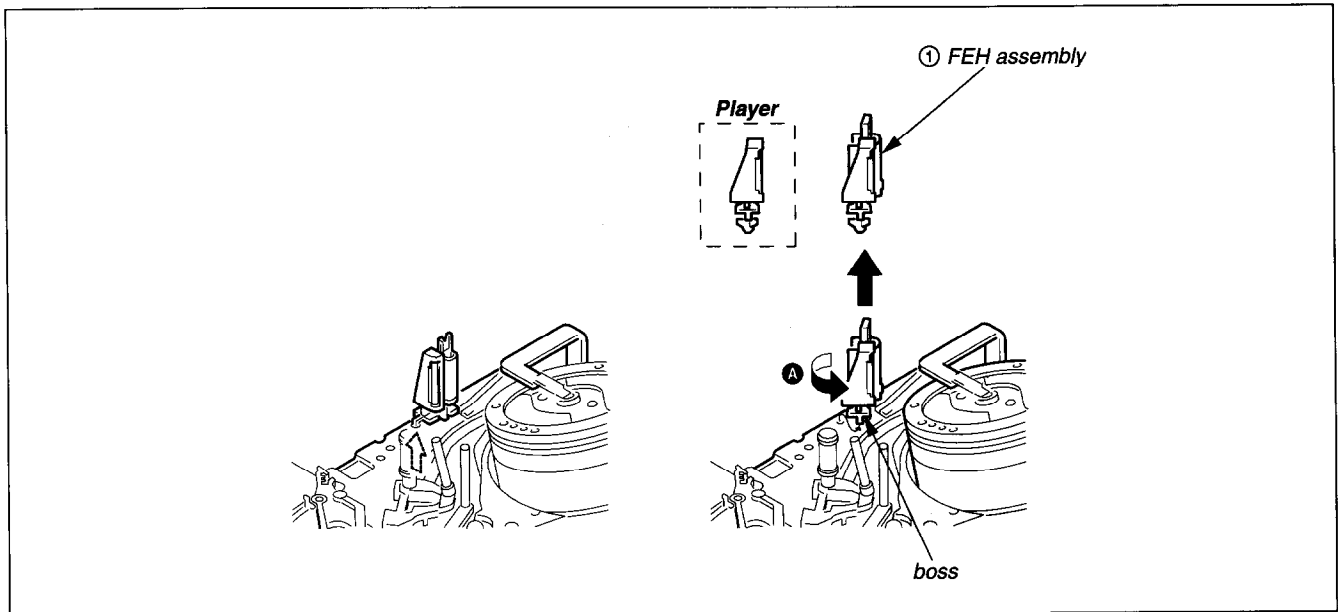


Fig. 3-8

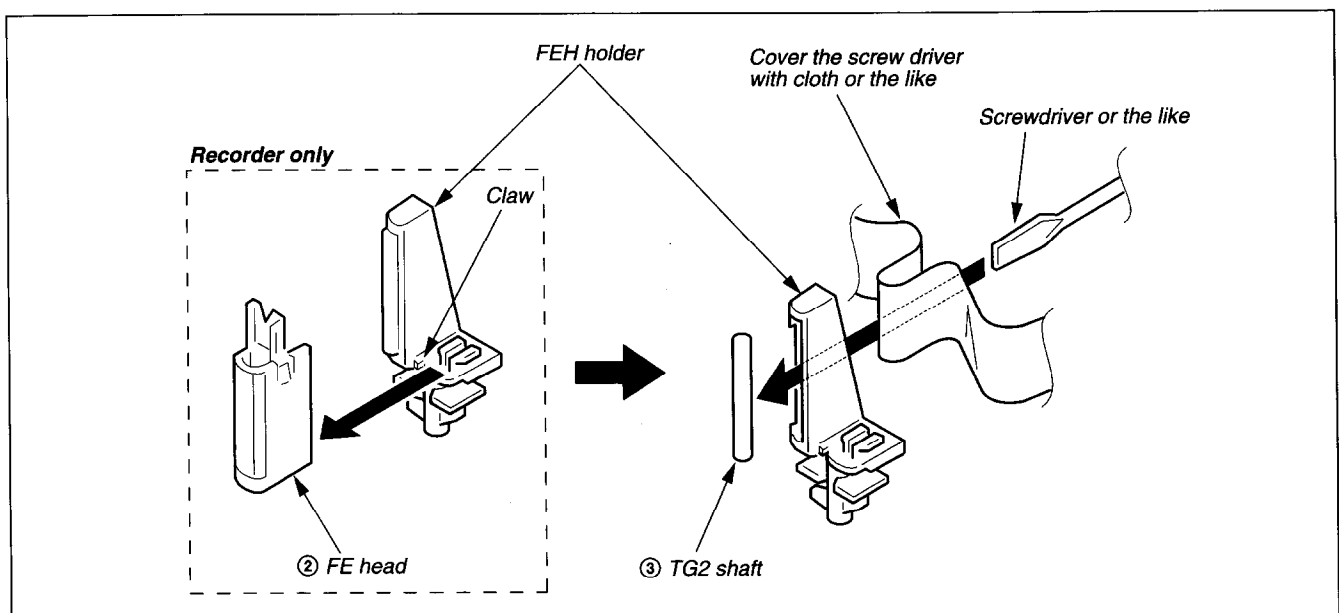


Fig. 3-9

3-7. REC PROOF LEVER

- 1) Remove FL complete assembly. (Refer to 3-1.)
- 2) Remove tension spring (REC proof) ①.
- 3) Remove REC proof lever ② in the arrow ⑤ by pushing claw in the arrow ④ direction.

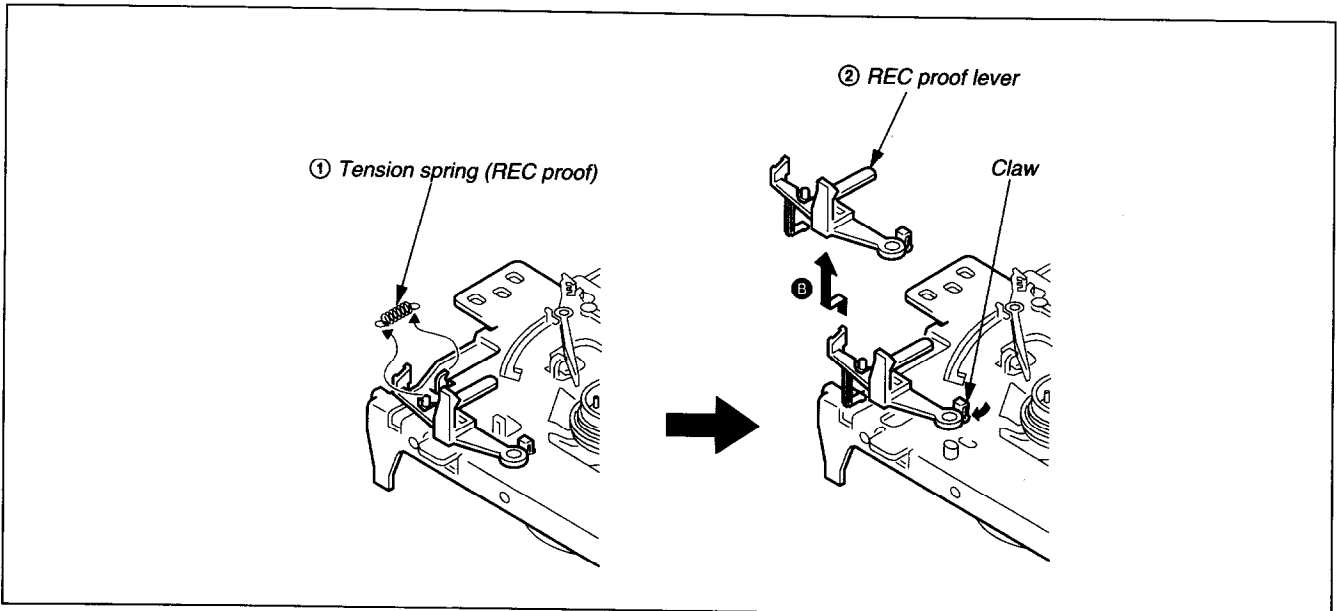


Fig. 3-10

3-8. RVS BRAKE ARM ASSEMBLY

- 1) Remove FL complete assembly. (Refer to 3-1.)
- 2) Remove extension spring (RVS brake) ①.
- 3) Turn RVS brake arm assembly ② in the arrow ④ direction and remove it in the arrow ⑤.

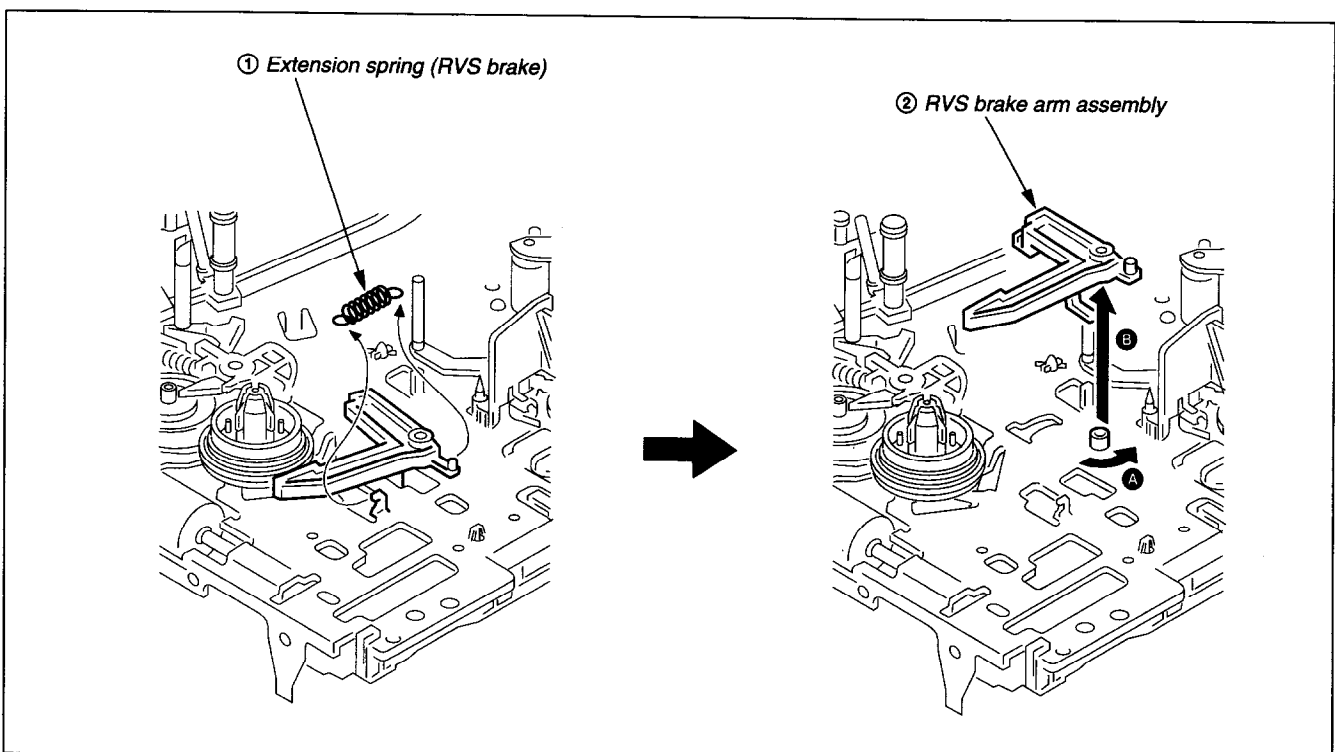


Fig. 3-11

3-9. MAIN (S) AND MAIN (T) BRAKE ASSEMBLIES

- 1) Remove FL complete assembly. (Refer to 3-1.)
- 2) Remove extension spring (main brake) ①.
- 3) Turn main (S) brake assembly ② in the arrow A direction and remove it in the arrow B.
- 4) Turn main (T) brake assembly ③ in the arrow C direction and remove it in the arrow D.

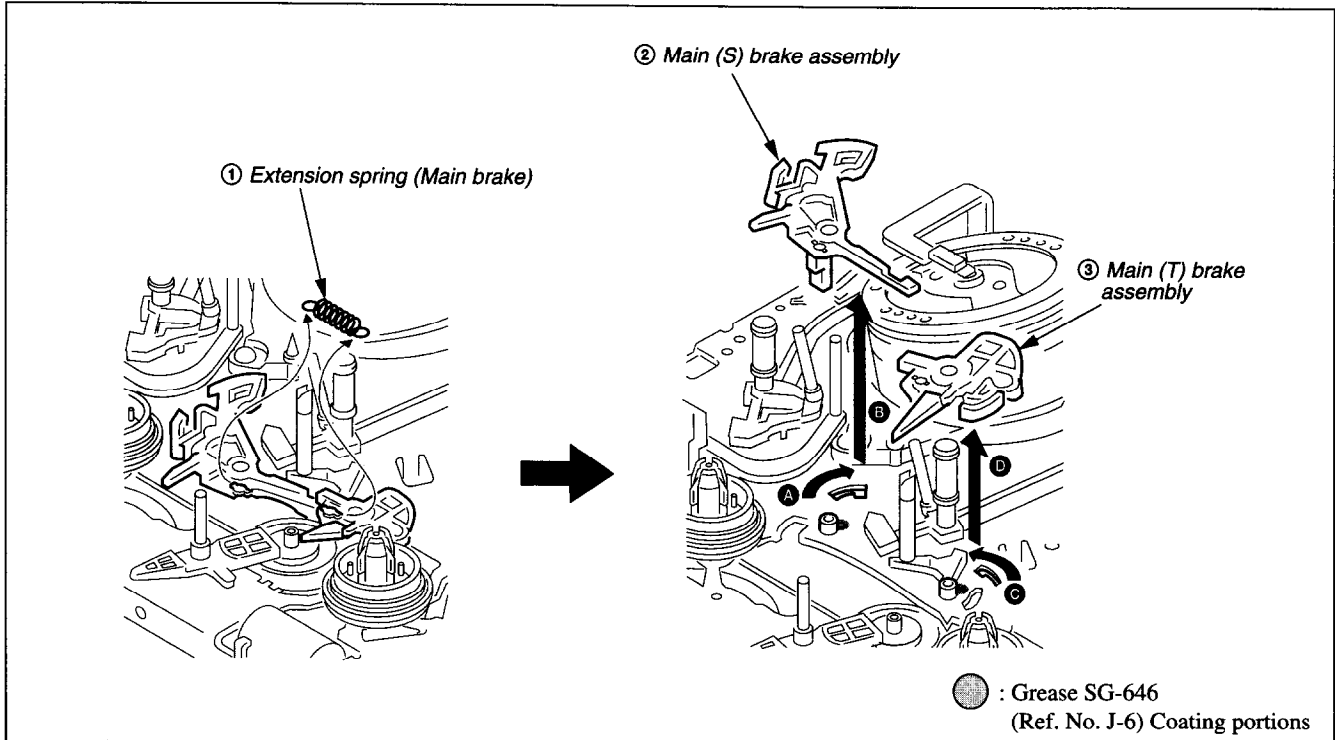


Fig. 3-12

3-10. REEL (T) TABLE (BLACK)

- 1) Remove FL complete assembly. (Refer to 3-1.)
- 2) Remove stopper washer ① to pull reel (T) table ② out.
- 3) Remove thrust washer ③.

[Note on Mounting]

- Before attaching, confirm the oil is applied at the top of reel (T) shaft.

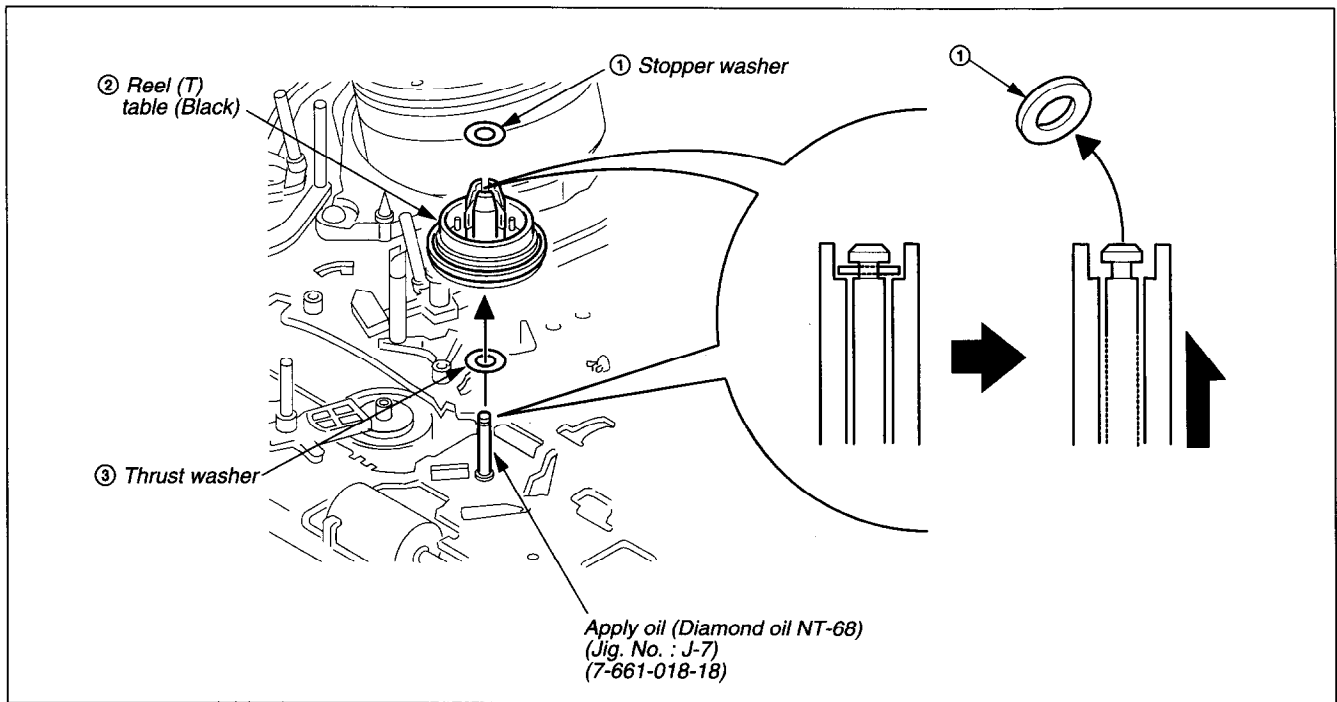


Fig. 3-13

3-11. PENDULUM ARM ASSEMBLY

- 1) Remove FL complete assembly. (Refer to 3-1.)
- 2) Remove main (S) and main (T) brake assemblies. (Refer to 3-9.)
- 3) While releasing claws from the pendulum arm shaft in the arrow A direction, pull out pendulum arm assembly ①.

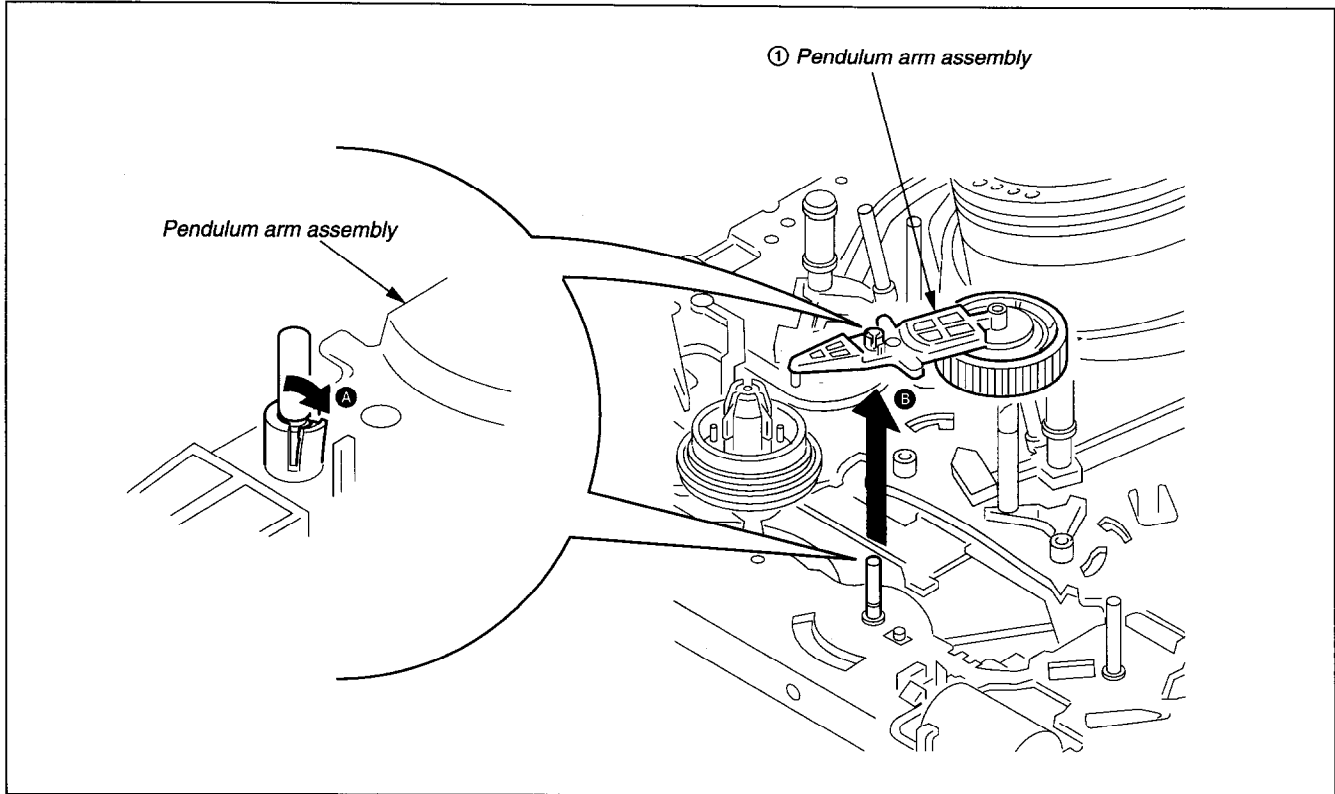


Fig. 3-14

3-12. FL SLIDER BLOCK ASSEMBLY

- 1) Remove FL complete assembly. (Refer to 3-1.)
- 2) Set the mechanism deck upside down.
- 3) Remove a screw (BVTP 3 × 8) ① and then retainer plate ② is getting out of place.
- 4) Slide FL slider block assembly ③ off in the arrow A direction and raise it up.

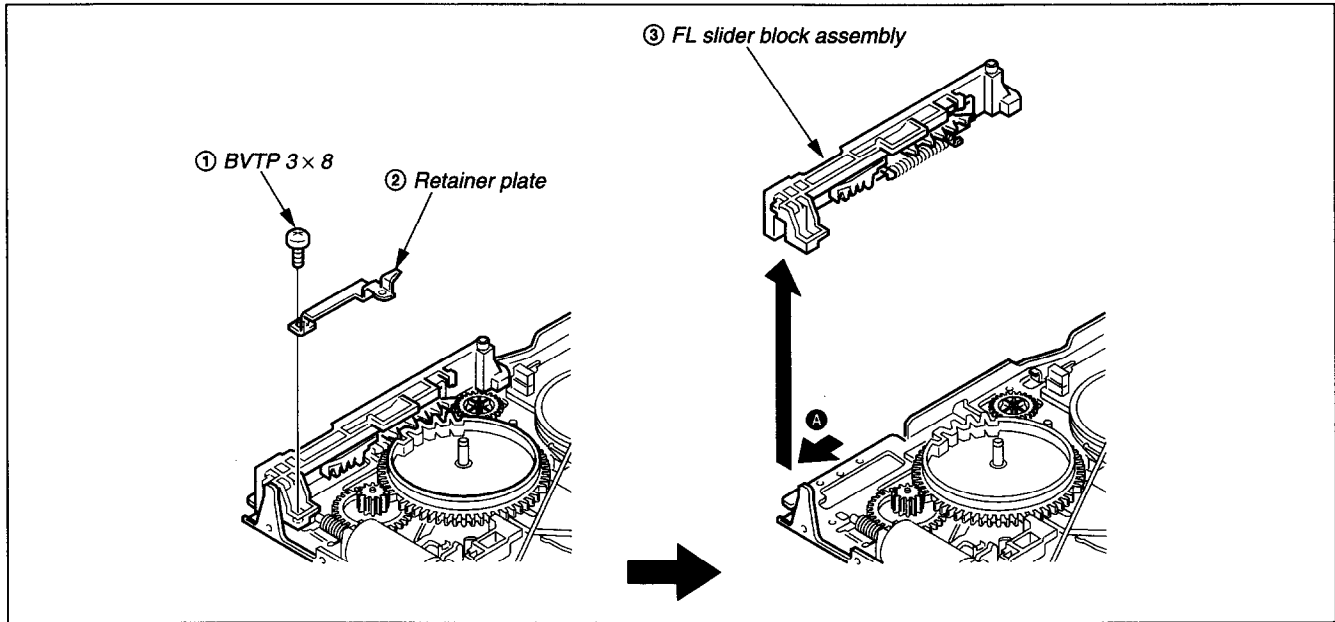


Fig. 3-15

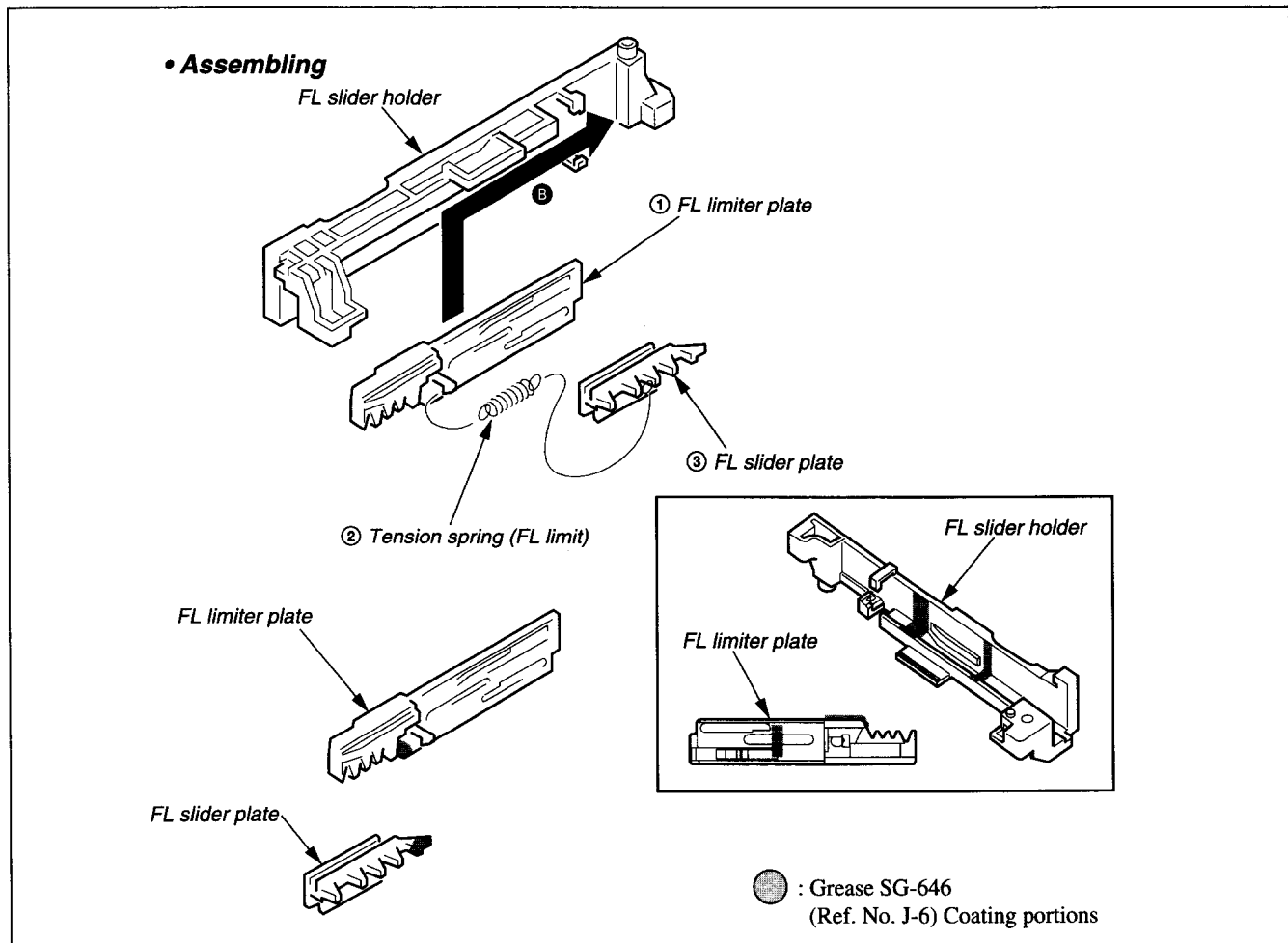


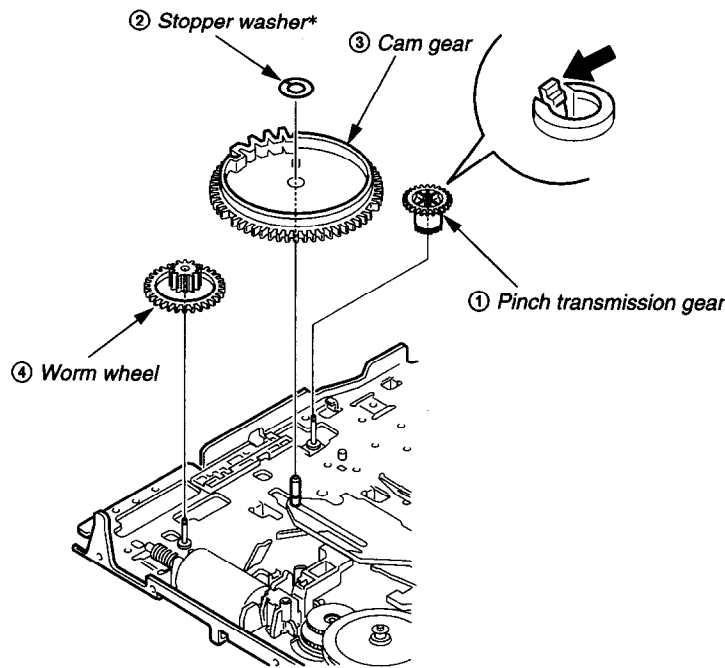
Fig. 3-16

3-13. PINCH TRANSMISSION GEAR, CAM GEAR, WORM WHEEL

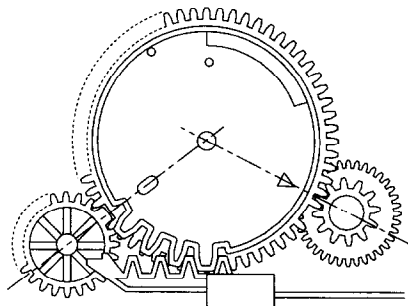
- 1) Remove FL complete assembly. (Refer to 3-1.)
- 2) Remove FL slider block assembly. (Refer to 3-12.)
- 3) Remove pinch transmission gear ① by putting off its claw from shaft.
- 4) Remove stopper washer ②* to pull out cam gear ③.
- 5) Remove worm wheel ④ by putting off its claw from shaft.

[Note on Mounting]

- Before attaching cam gear ③, confirm that the specified locations are coated with grease SG-646 (Ref. No. J-6).
- Adjust the phase of gears each other.

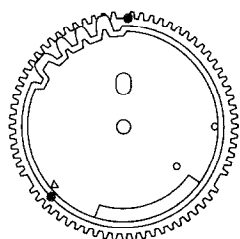


• Phase adjustment

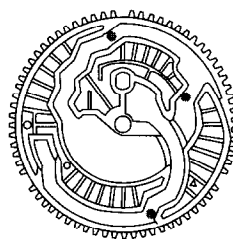


● : Grease SG-646
(Ref. No. J-6) Coating portions

[Top]



[Bottom]



*Once remove stopper washer ②, don't use it again. Replace it with new one.

Fig. 3-17

3-14. CAPSTAN BRAKE ASSEMBLY, CAPSTAN BRAKE SHAFT

- 1) Remove rubber belt. (Refer to 3-4.)
- 2) Remove cap brake spring ①.
- 3) Remove capstan brake assembly ② by putting off claw of capstan brake shaft ③.
- 4) Set the mechanical chassis bottom side down.
- 5) While pushing the boss of capstan brake shaft ③, turn it clockwise to remove it.

[Note on Mounting]

- Don't touch shoe of capstan brake assembly with bare hand.

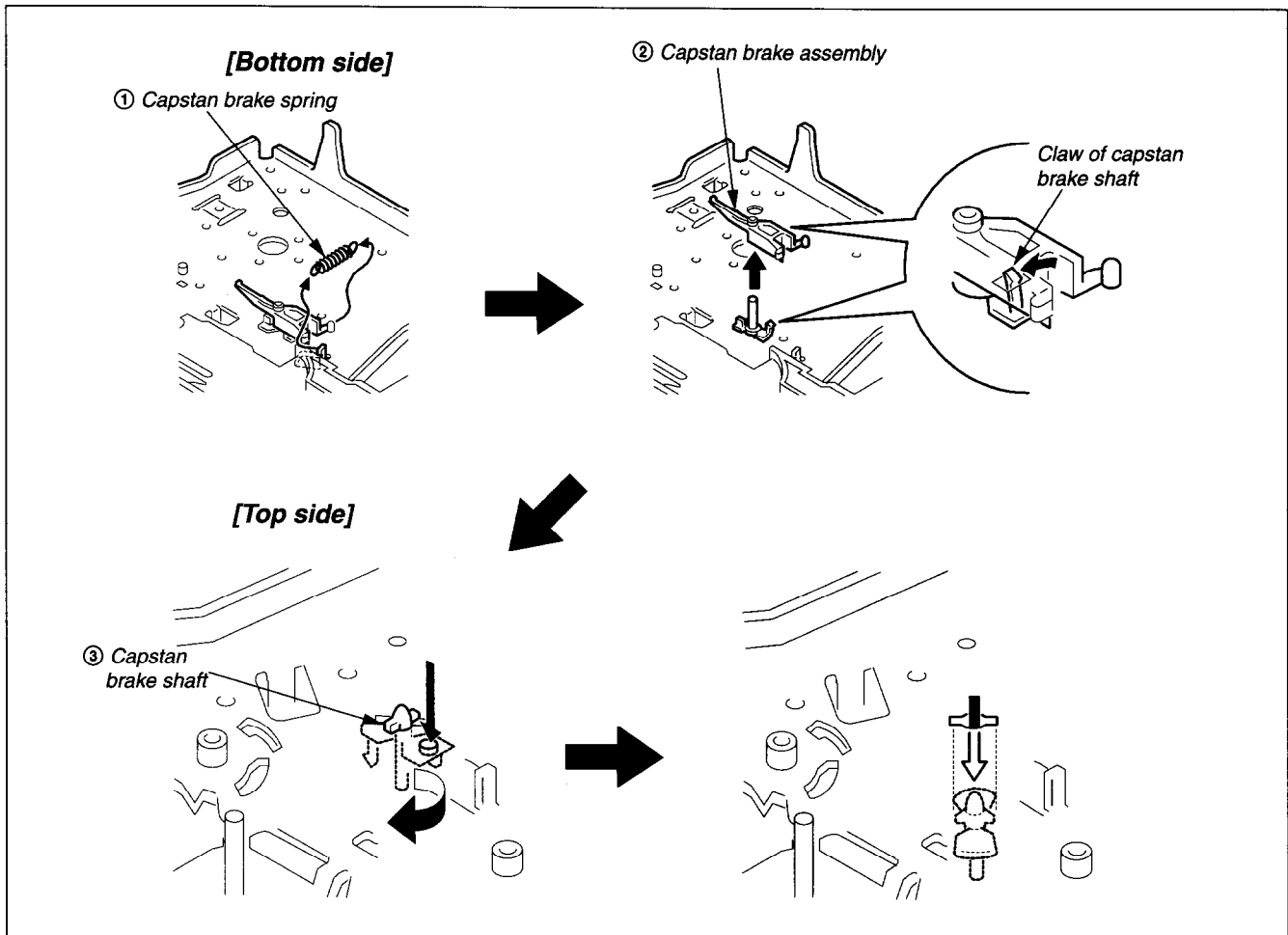


Fig. 3-18

3-15. FL SLIDER GUIDE

- 1) Remove FL complete assembly. (Refer to 3-1.)
- 2) Remove FL slider block assembly. (Refer to 3-12.)
- 3) Remove FL slider guide ① while pushing claws in the arrow **A** direction.

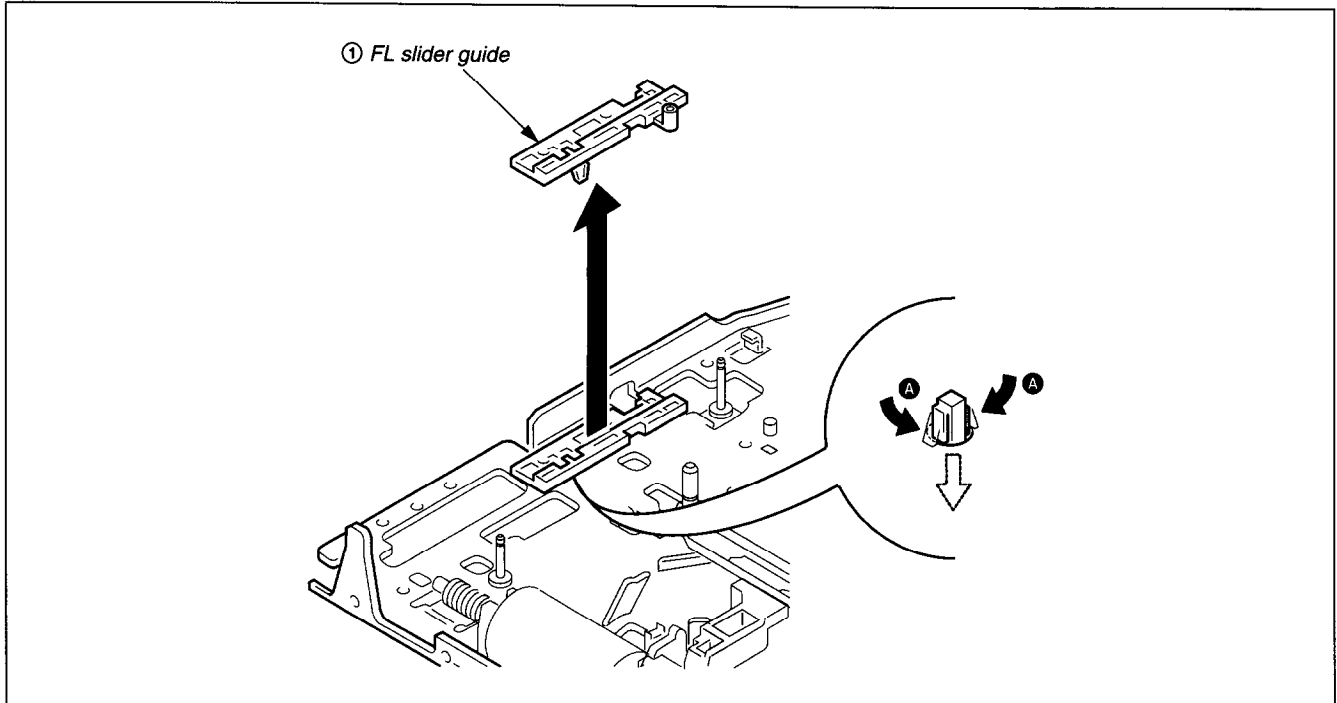


Fig. 3-19

3-16. SLIDER

- 1) Remove FL complete assembly. (Refer to 3-1.)
- 2) Remove rubber belt. (Refer to 3-4.)
- 3) Remove FL slider block assembly. (Refer to 3-12.)
- 4) Remove cam gear. (Refer to 3-13.)
- 5) Remove stopper washers ① and remove slider ② in the arrow direction.

[Note on Mounting]

- Before attaching slider ②, confirm the specified locations are coated with grease SG-646 (Ref. No. J-6).
- When attaching slider ②, adjust "Δ" mark on slider to loading gear (T) shaft as shown in Fig. A.

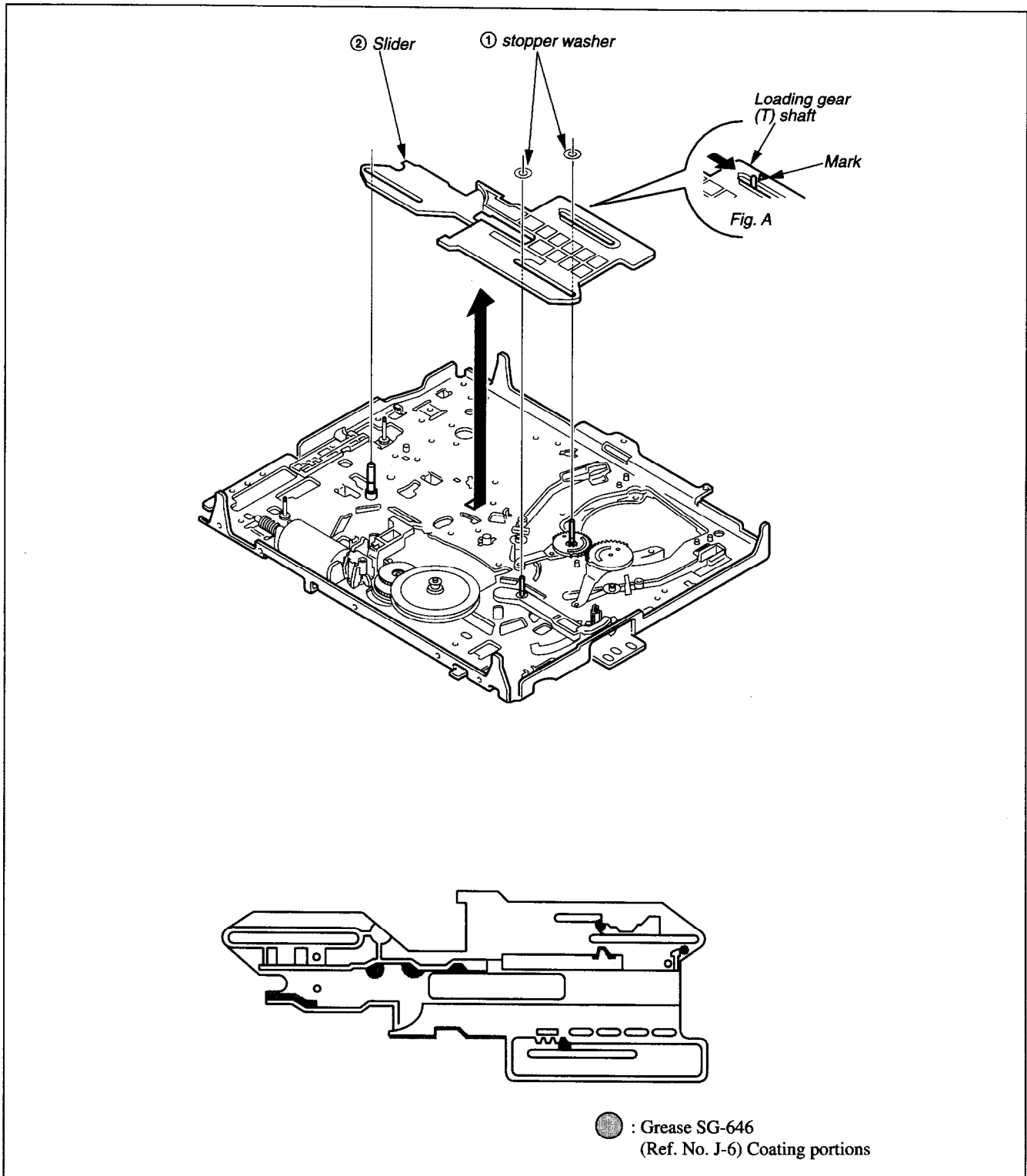


Fig. 3-20

3-17. TG1 DRIVING ARM

- 1) Remove FL complete assembly. (Refer to 3-1.)
- 2) Remove rubber belt. (Refer to 3-4.)
- 3) Remove FL slider block assembly. (Refer to 3-12.)
- 4) Remove cam gear. (Refer to 3-13.)
- 5) Remove slider. (Refer to 3-16.)
- 6) Remove spring (power tension) ① from TG1 driving arm ②.
- 7) Remove TG1 driving arm ② by turning it in the arrow A to B direction.

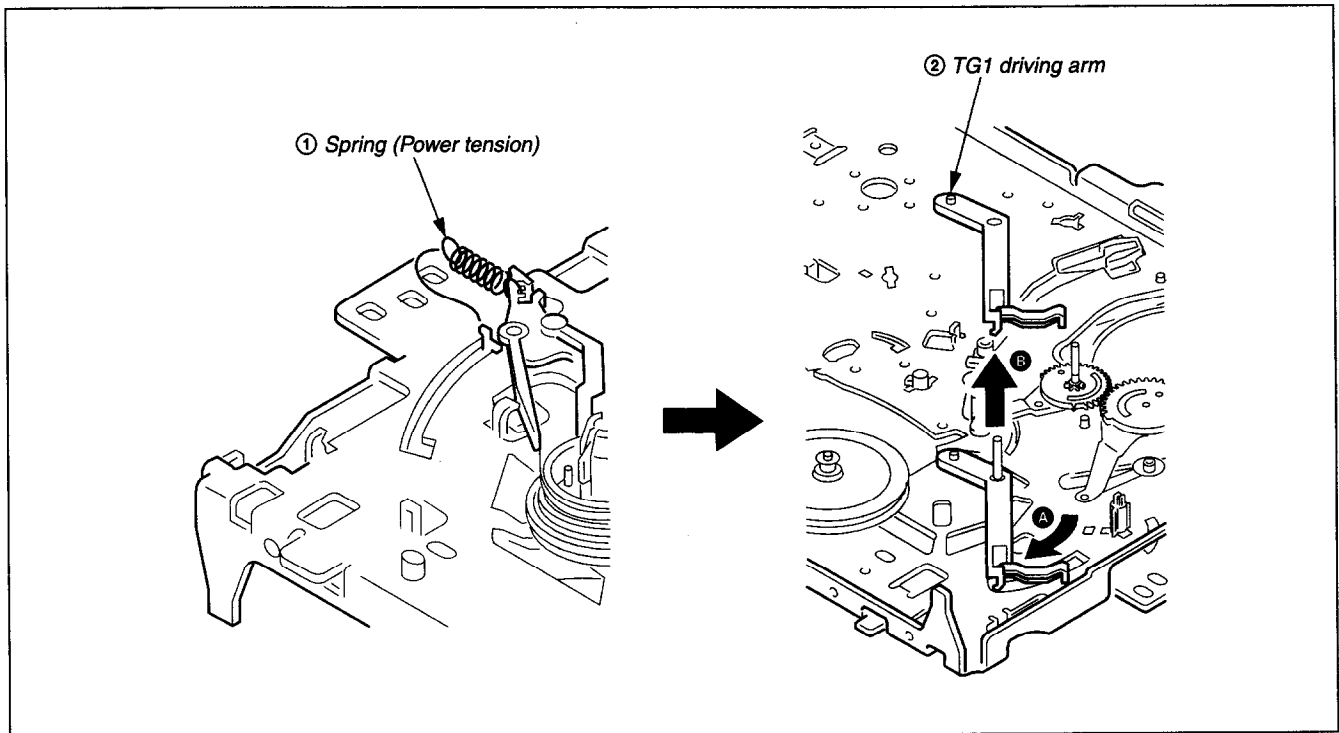


Fig. 3-21

3-18. LOADING (T) AND LOADING (S) GEAR ASSEMBLIES

- 1) Remove FL complete assembly. (Refer to 3-1.)
- 2) Remove rubber belt. (Refer to 3-4.)
- 3) Remove FL slider block assembly. (Refer to 3-12.)
- 4) Remove cam gear. (Refer to 3-13.)
- 5) Remove slider. (Refer to 3-16.)
- 6) Remove loading (T) gear assembly ① and loading (S) gear assembly ② in the arrow direction.

[Note on Mounting]

- When attaching them, be sure to adjust the phase each other.

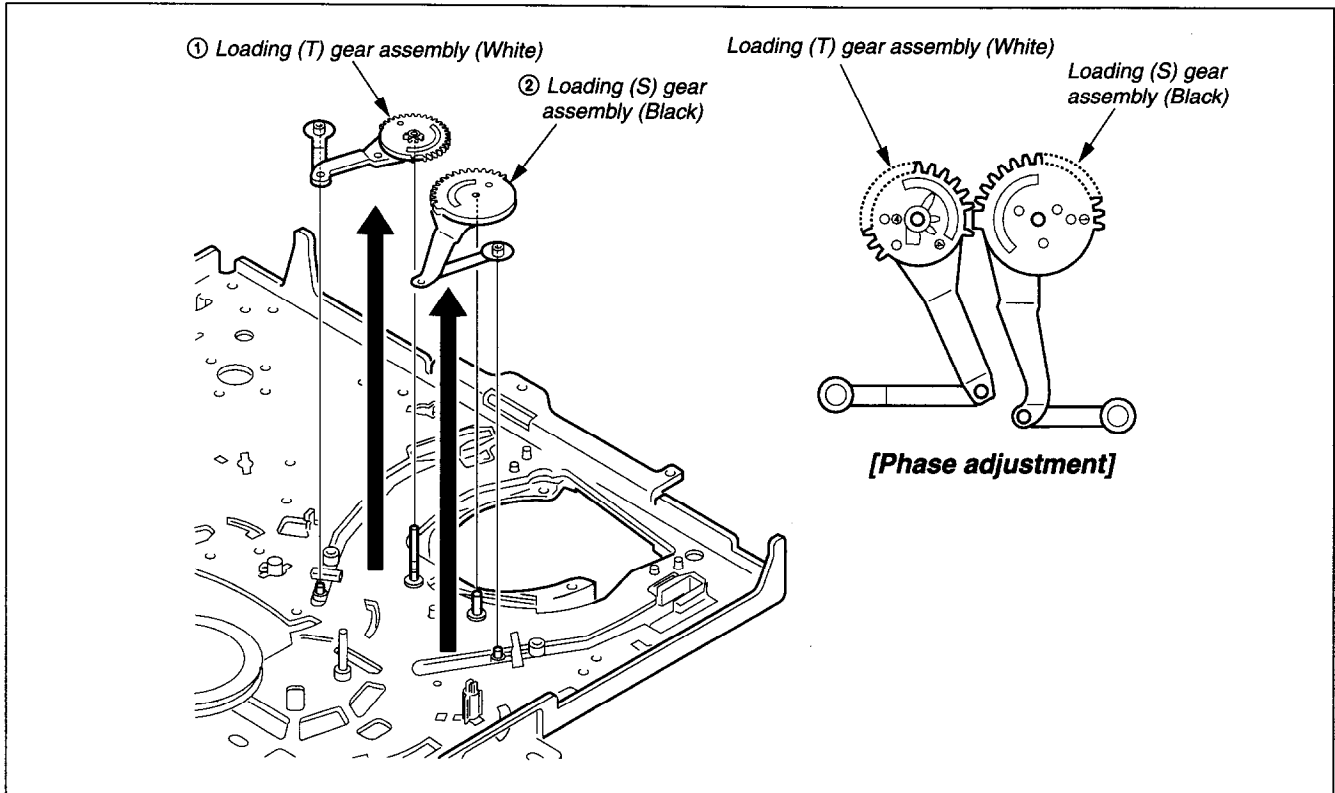


Fig. 3-22

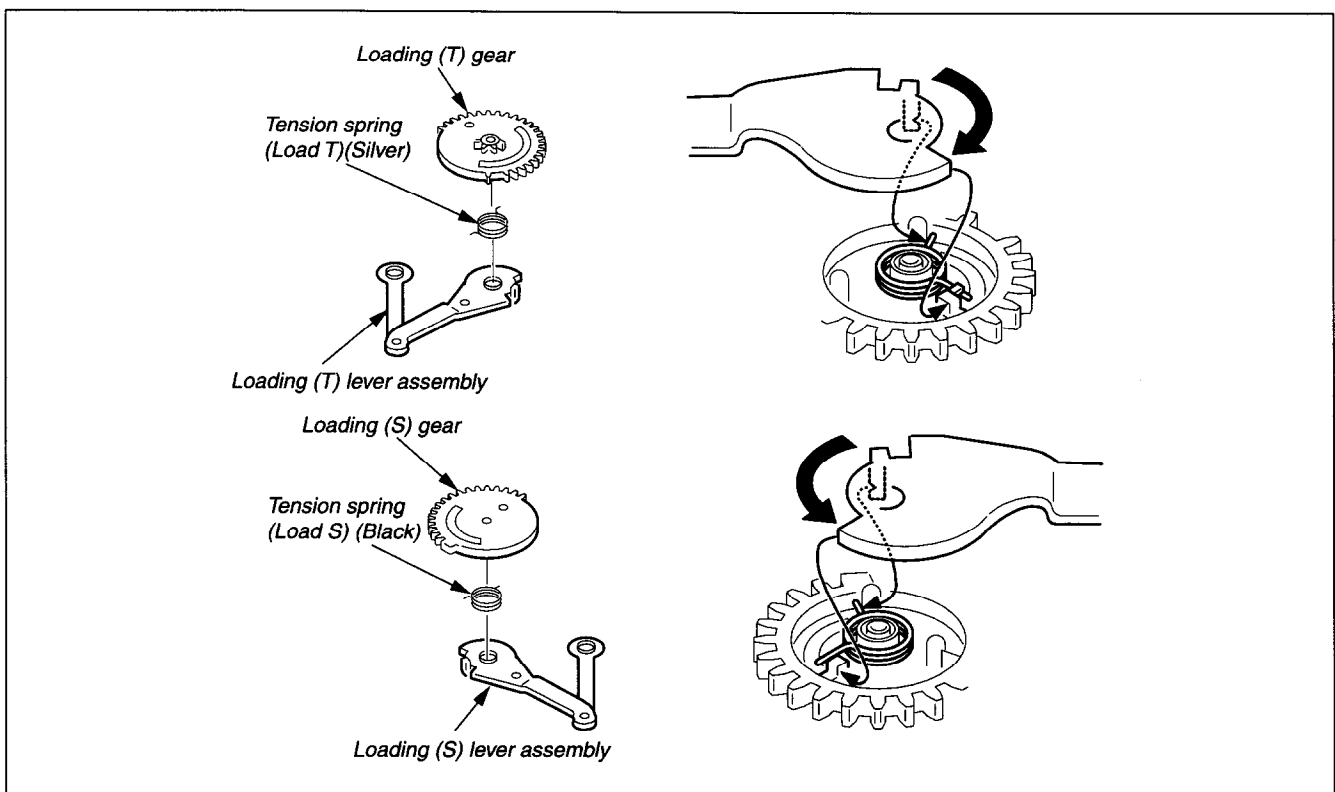


Fig. 3-23

3-19. PULLEY GEAR ASSEMBLY, CLUTCH GEAR

- 1) Remove rubber belt. (Refer to 3-4.)
- 2) Remove stopper washer ①.
- 3) Remove pulley gear assembly ② with clutch gear ③.

[Note on Mounting]

- When attaching them, don't insert strongly.

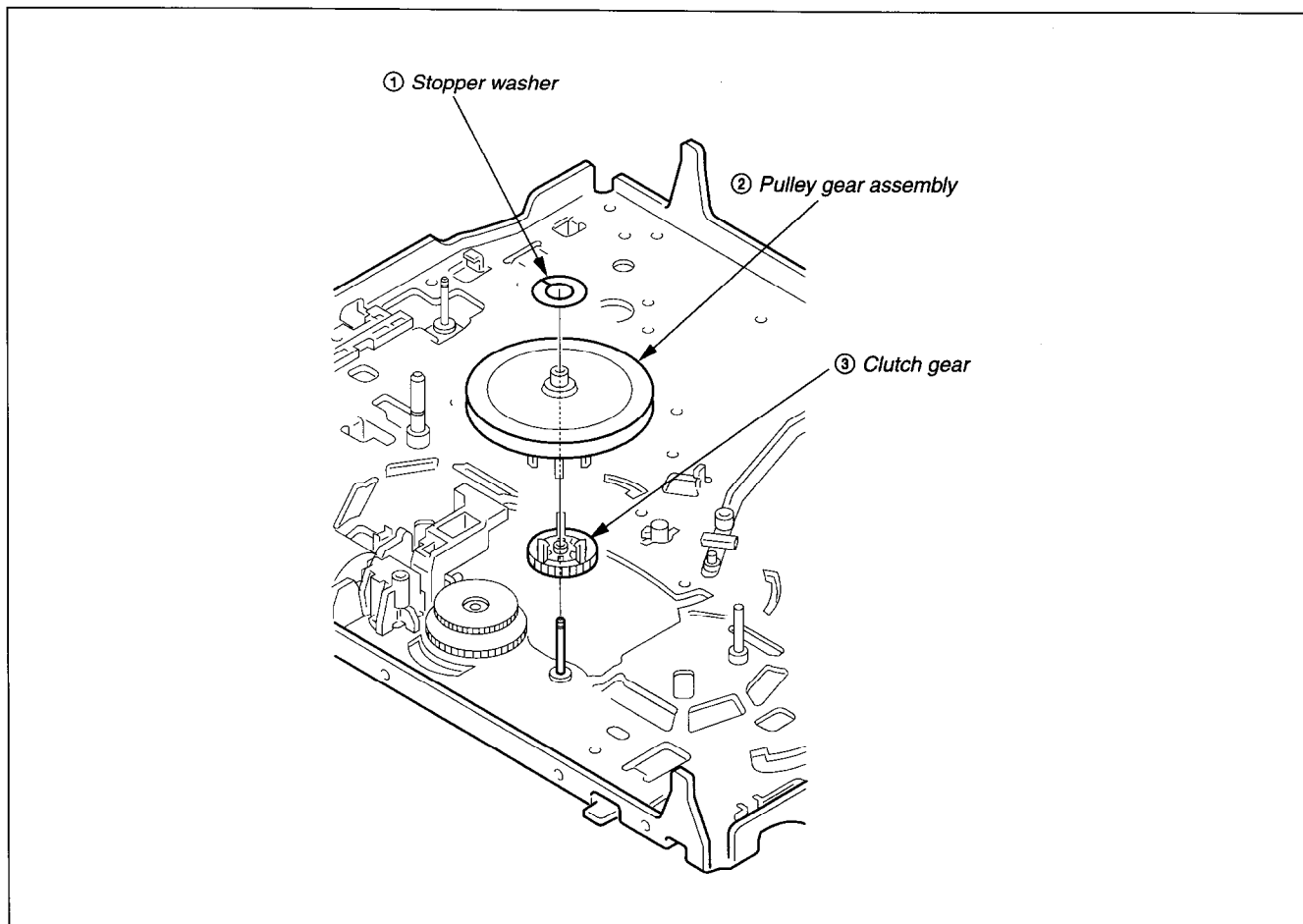


Fig. 3-24

3-20. REEL DIRECT ASSEMBLY

- 1) Remove rubber belt. (Refer to 3-5.)
- 2) Remove pulley gear assembly with clutch gear. (Refer to 3-19.)
- 3) Remove stopper washer ① and reel direct assembly ②.

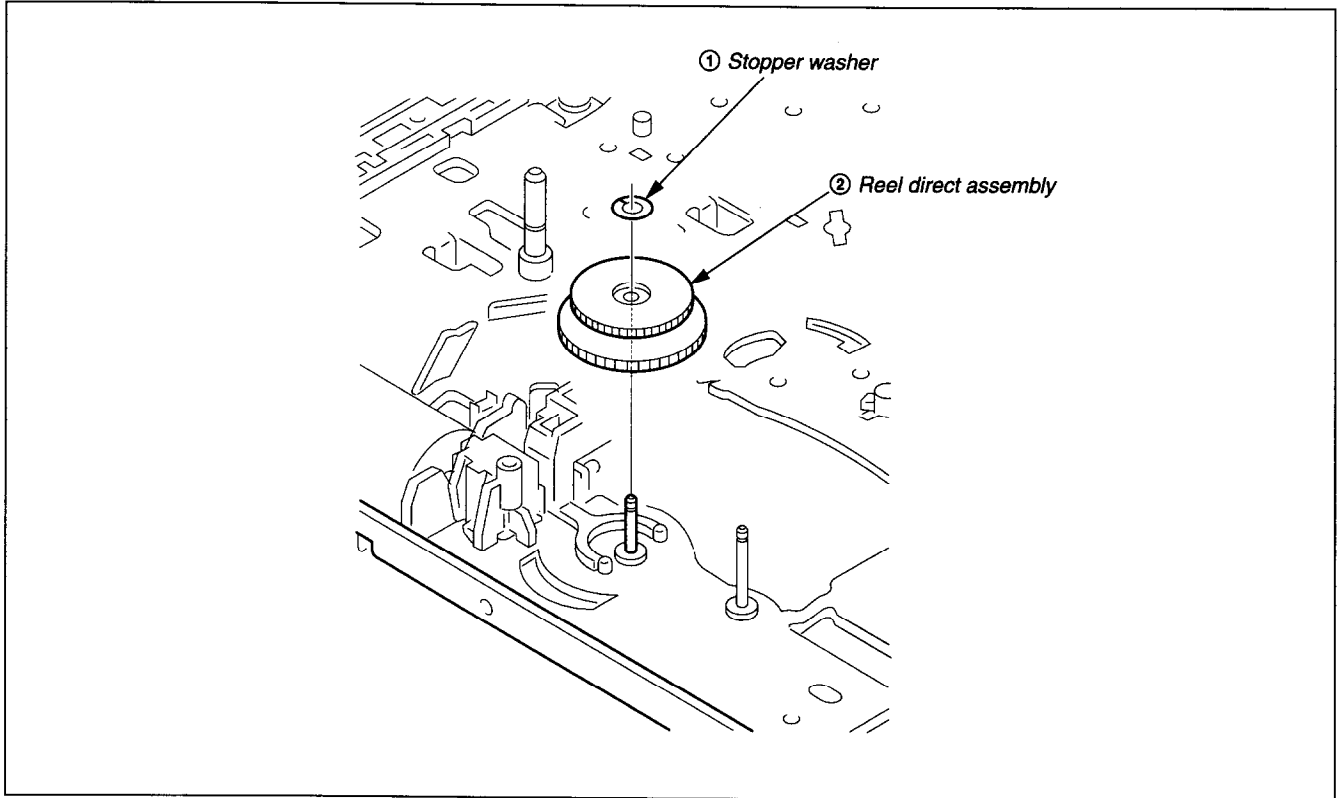


Fig. 3-25

3-21. CASSETTE GUIDE PLATE

- 1) Remove a screw (P 3 × 8) ① and remove cassette guide plate ②.

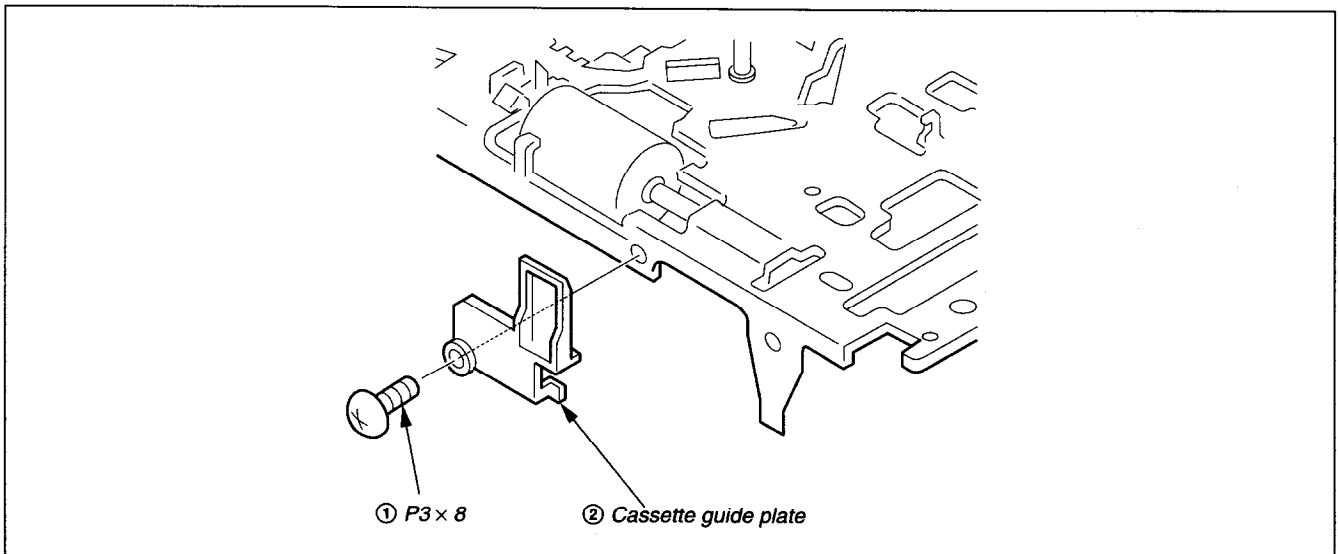


Fig. 3-26

3-23. DRUM BASE, HC ROLLER BLOCK ASSEMBLY

- 1) Remove the drum assembly. (Refer to 3-2.)
- 2) Remove screws BVTP 3 × 8 ①.
- 3) Remove drum base ②.
- 4) Pull out HC roller assembly ③ straight in the arrow A direction.

[Note on Mounting]

- Before attaching drum base ②, confirm the specified locations are coated with grease SG-646 (Ref. No. J-6).
- Tightening screws ① in the order a to b to c.

[Adjustment after Mounting]

- 4-1. Tape path adjustment

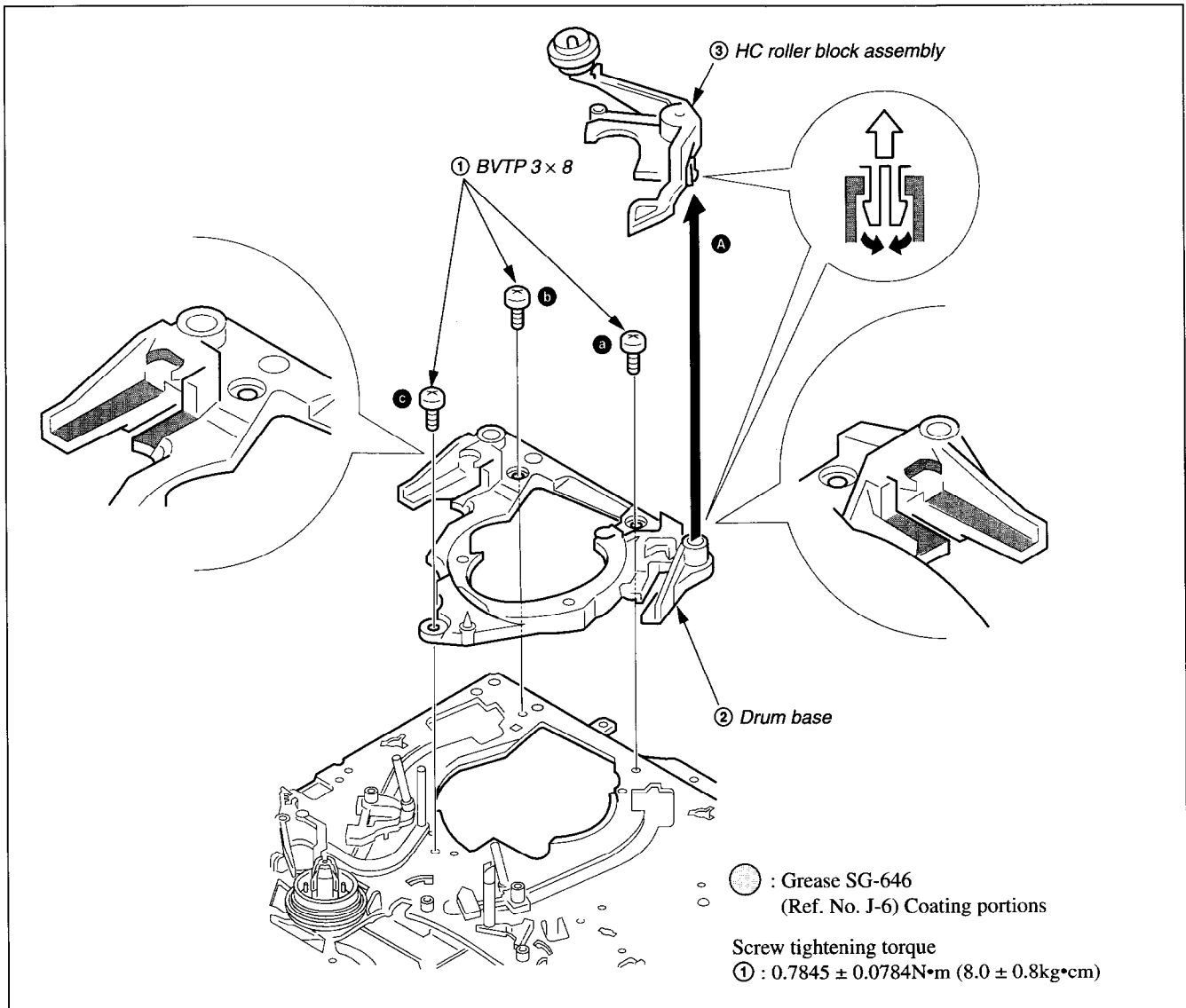


Fig. 3-28

3-24. SHUTTLE (S) AND SHUTTLE (T) BLOCK ASSEMBLIES

1. Guide Roller Assemblies

- 1) Turn them counterclockwise, then they are out of place, also springs.

[Note on Mounting]

Don't touch the surface that contacts tape with bare hand.

[Adjustment after Mounting]

- 4-1. Tape path adjustment

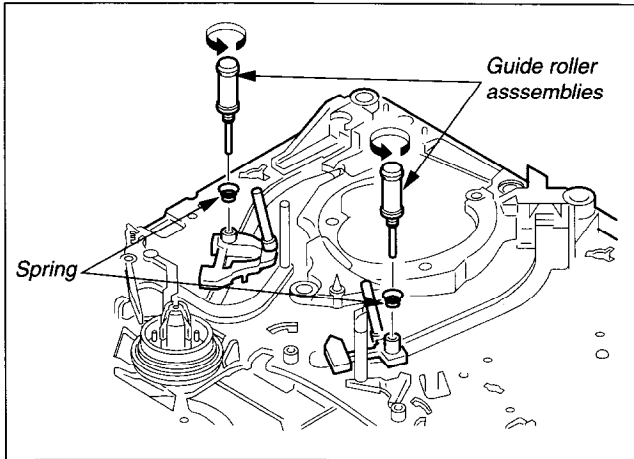


Fig. 3-29

2. Shuttle (S) and Shuttle (T) Assemblies

- 1) Remove FL complete assembly. (Refer to 3-1.)
- 2) Remove the drum assembly. (Refer to 3-2.)
- 3) Remove rubber belt. (Refer to 3-4.)
- 4) Remove FL slider block assembly. (Refer to 3-12.)
- 5) Remove cam gear. (Refer to 3-13.)
- 6) Remove slider. (Refer to 3-16.)
- 7) Remove loading (T) gear assembly and loading (S) gear assembly. (Refer to 3-18.)
- 8) Remove drum base. (Refer to 3-23.)
- 9) Remove shuttle (S) or shuttle (T) assembly by slide them backward.

[Note on Mounting]

Don't touch the surface that contacts tape with bare hand.

[Adjustment after Mounting]

- 4-1. Tape path adjustment

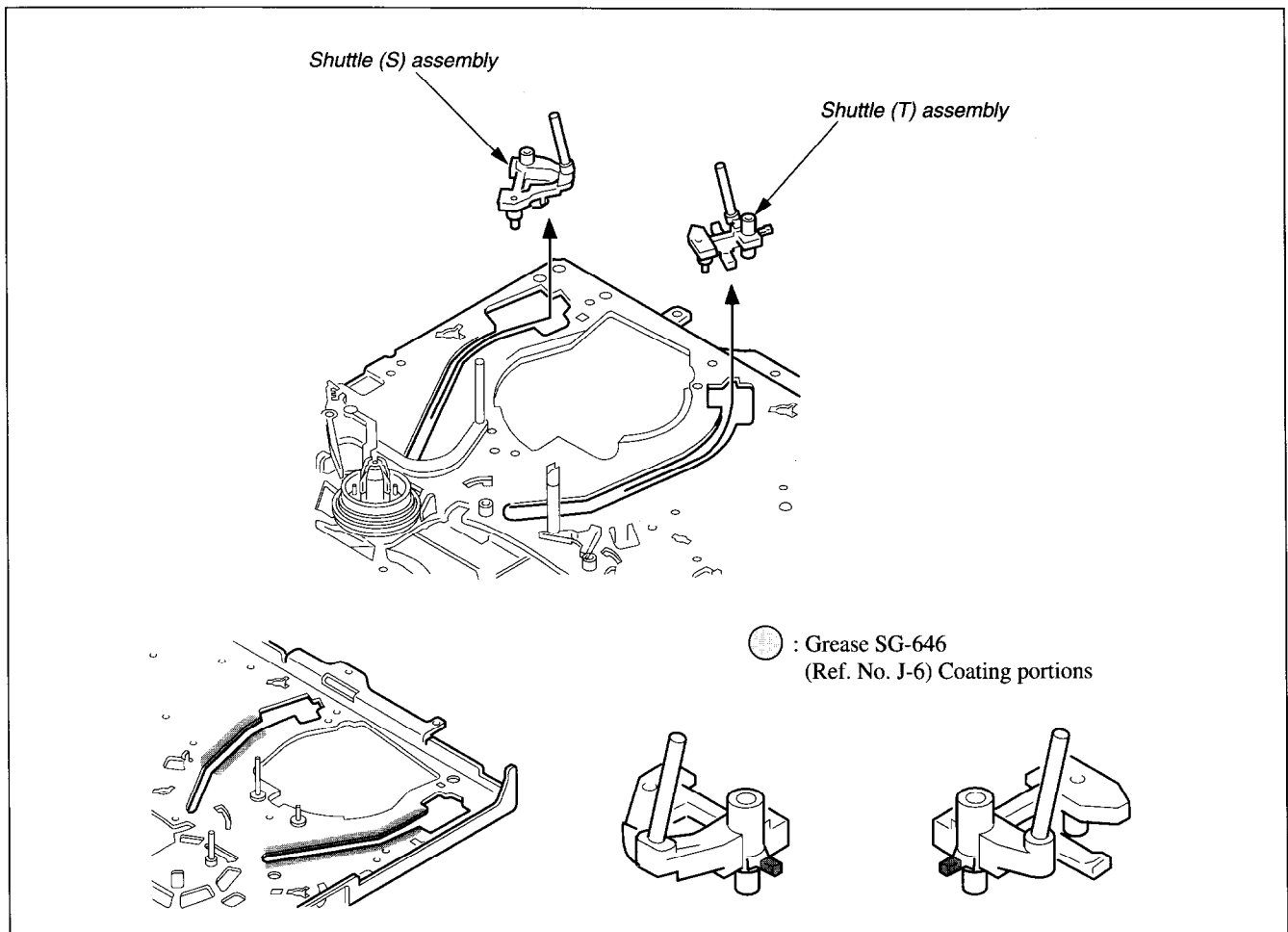


Fig. 3-30

3-25. TG1 ASSEMBLY, REEL (S) TABLE

- 1) Remove FL complete assembly. (Refer to 3-1.)
- 2) Remove spring (power tension) ① from TG1 driving arm.
- 3) While spreading claws on the bottom in the arrows **A** direction, pull TG1 assembly ② out.
- 4) While spreading claws on the top in the arrows **B** direction, pull reel (S) table ③ out.
- 5) Remove thrust washer ④.

[Note on Mounting]

Don't touch the surface that contacts tape and the braking surface of TG1 assembly with bare hand.

[Adjustment after Mounting]

- 4-1. Tape path adjustment

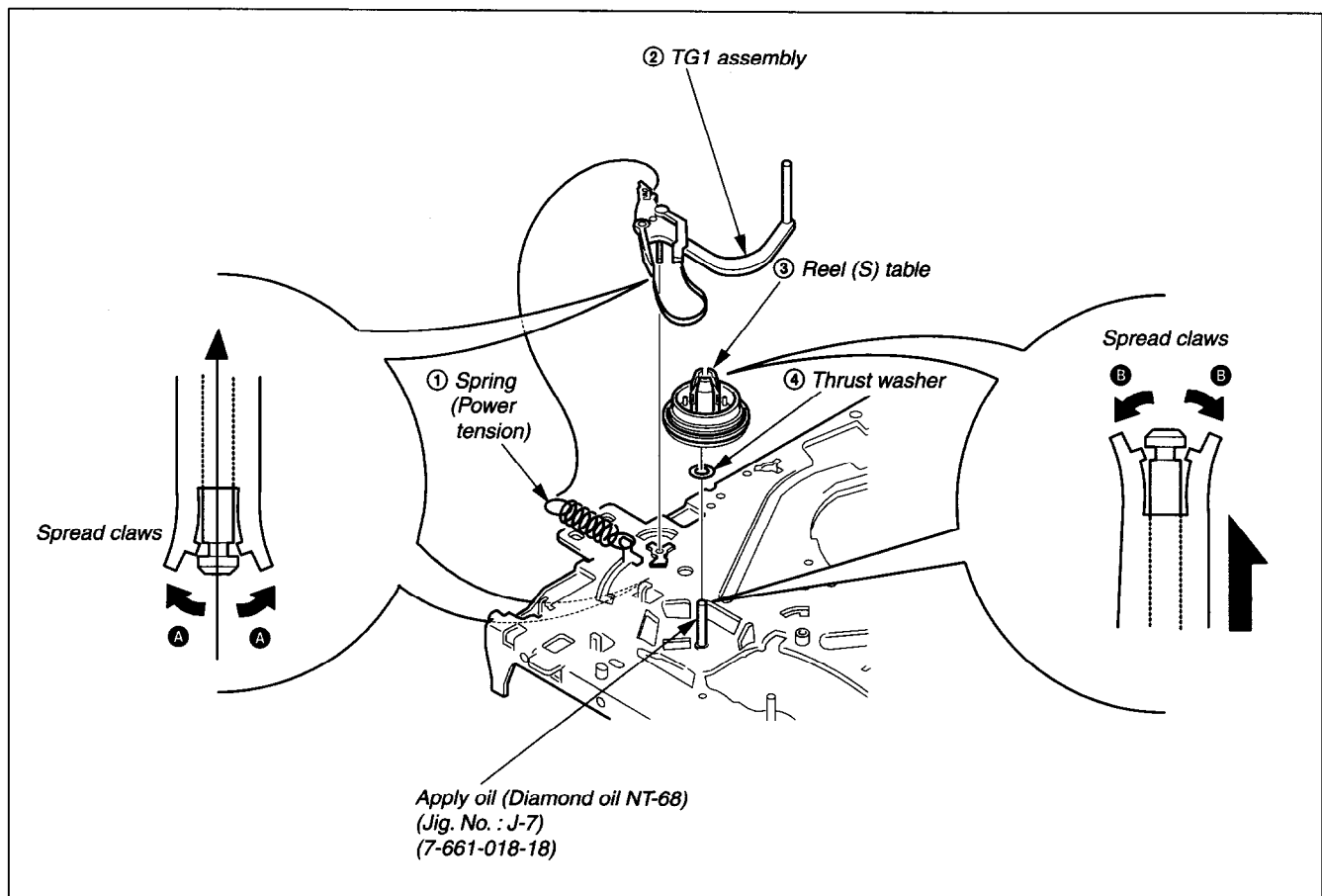


Fig. 3-31

3-26. TG1 FULCRUM BOSS

- 1) Remove FL complete assembly. (Refer to 3-1.)
- 2) Remove TG1 assembly. (Refer to 3-25.)
- 3) Turn TG1 fulcrum boss counterclockwise and pull it out.

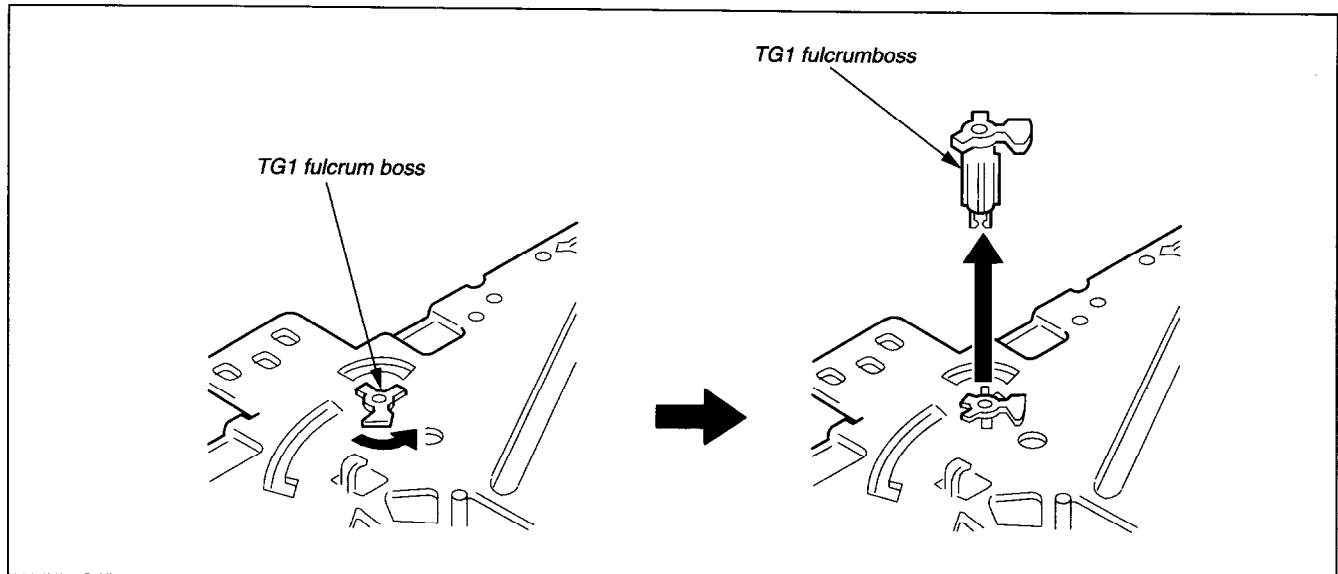


Fig. 3-32

3-27. LUMINOUS PLATE

- 1) Remove main (T) brake assembly. (Refer to 3-9.)
- 2) Turn luminous plate clockwise while raising a portion **A** slightly and pull it out.

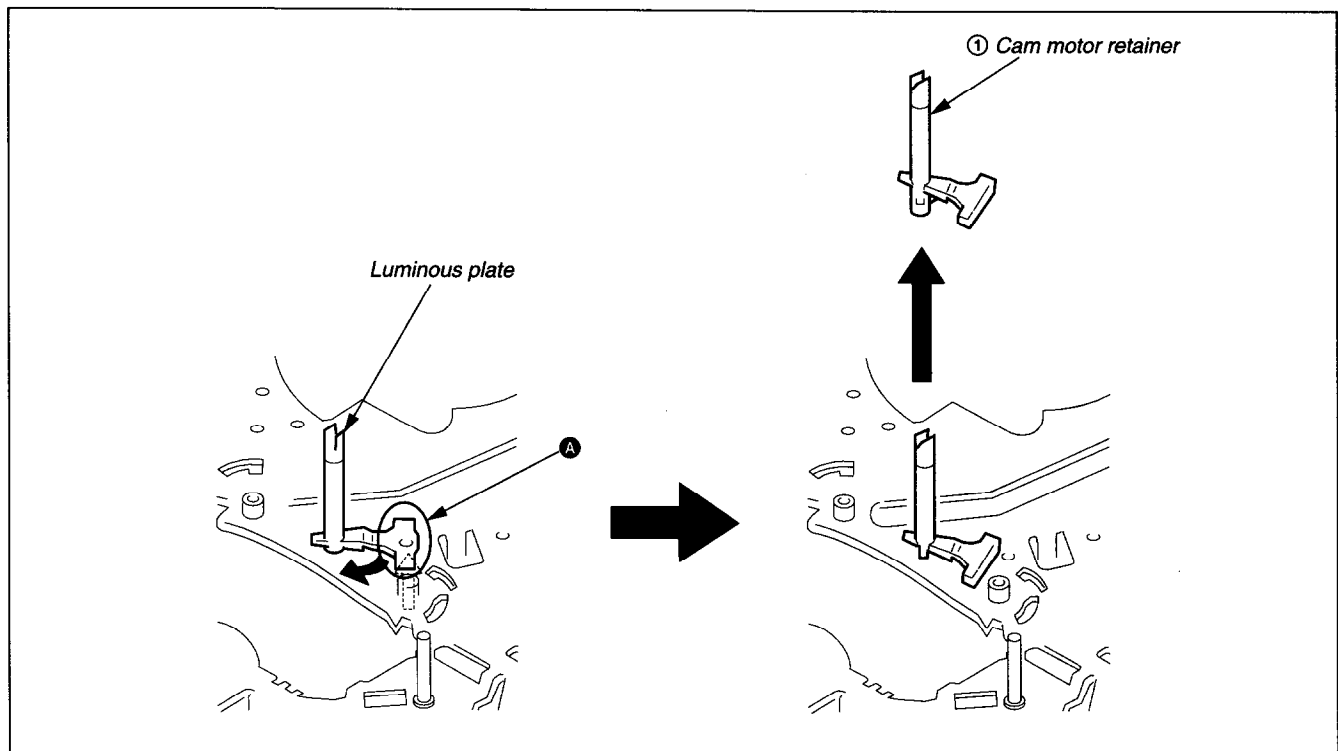


Fig. 3-33

4. ADJUSTMENT

4-1. TAPE PATH ADJUSTMENT

The "Tape path" refers to the route of the tape from the supply reel disk to the take-up reel disc via the video heads.

Each component part of the tape transport system particularly the surface of parts which make direct contact with the tape must always be kept clean, free of dust, oil, scratches and so forth.

The tape path system is factory pre-adjusted, when parts of the tape transport system are replaced, be sure to make the required adjustments as precisely as possible in order to ensure stable tape transport.

4-1-1. TENSION REGULATOR (TG1) POSITION/ TENSION ADJUSTMENT (Fig. 4-1)

Purpose: stabilizes contact of the video head and the tape to maintain the tension of the tape so that it feeds at a constant level.

• Position adjustment

Mode	Threading is completed without a cassette loaded (Playback)
Adjustment locations	Eccentric pin of TG1 band assembly

[Adjustment Method]

- 1) Allow the unit to go through the threading procedure without a cassette loaded.

- 2) Set the unit to play back, then turn the eccentric pin so that the tip of tension arm goes to the left side line carved on the mechanical chassis. (Fig. A)
- 3) After adjustment, go through the loading procedure once more without a cassette loaded, then check the position of the tension arm.

• Tension adjustment

Mode	Playback (SP)
Measuring instrument/tool	Torque cassette VHT-103S (Ref. No. J-1)
Adjustment locations	Position for hooking the tension spring
Specified value	5.05 to 6.52 mN•m (51.5 to 66.5g•cm) (without TC assembly) 3.78 to 5.10 mN•m (38.5 to 52.0g•cm) (with TC assembly)

[Adjustment Method]

- 1) Playback the torque cassette.
- 2) Check that the center value deviation reading on the torque cassette meets with the standards.
- 3) When the reading is higher than the standards : Move the spring toward direction **A**.
When the reading is less than the standards : Move the spring toward direction **B**.

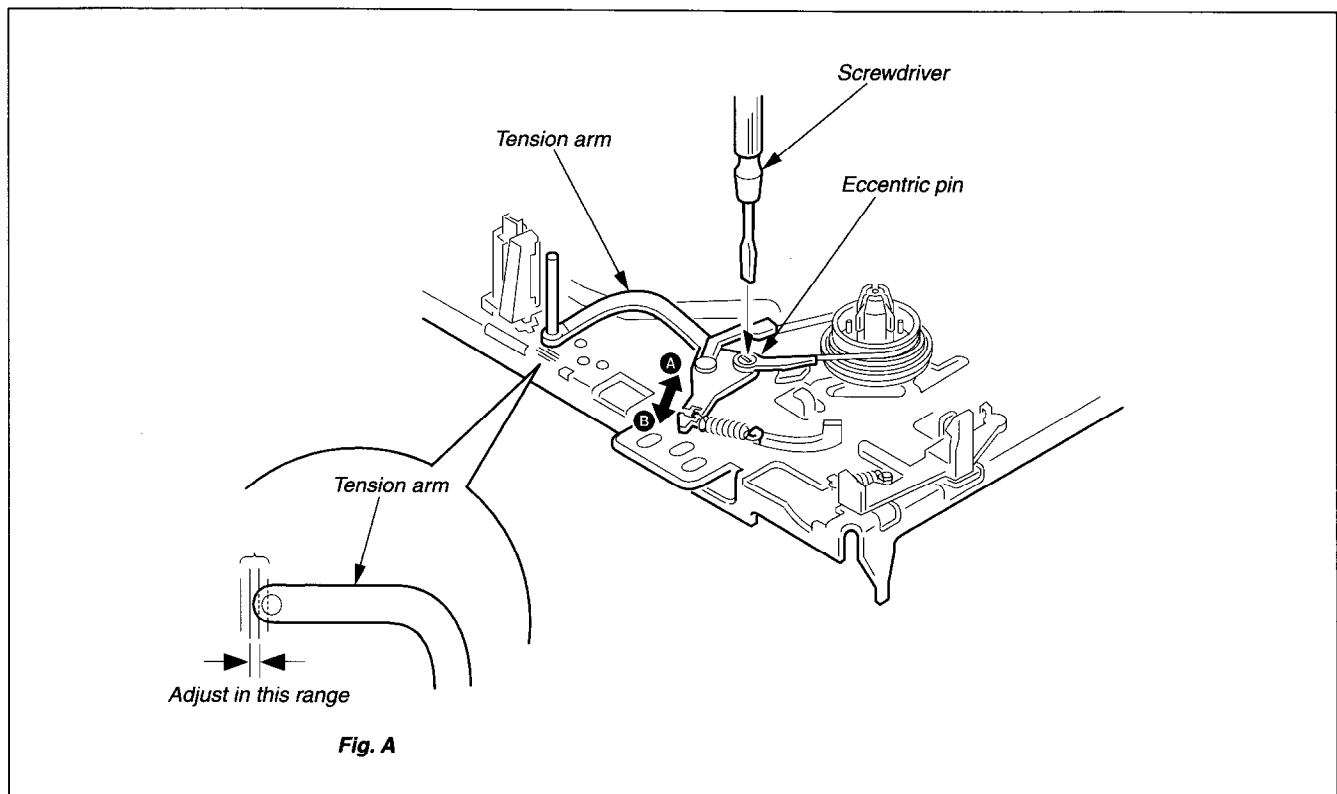


Fig. 4-1

4-1-2. CHECKING THE TENSION AND TORQUE

Purpose : To check that the tension, torque and compression force of the tape take-up section and mobile sections to ensure smooth tape run and achieve standard VTR performance.

If the tape transport is not smooth or problems occur in relation to the tape transport speed, perform the following check.

Mode	Each operation mode
Measuring instrument	Torque cassette VHT-103S, VHT-404S

Item	VTR operation mode	Reel to be measured	Measurement value
Review torque	Review	S reel	12.7 to 19.6 mN•m (130 to 200 g•cm)
Take-up torque	Playback	T reel	4.41 to 10.8 mN•m (45 to 110g•cm)
Back tension torque	Playback	S reel	See section 4-1-1.

4-1-3. X-VALUE ADJUSTMENT (Using the tape having the version No.)

Purpose: To obtain compatibility with other VCRs.

Precaution: Before starting to adjust X-value, set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys, press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking [AUTO/MANUAL] key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

Mode	Playback
Signal	Alignment tape: KRV-52NE (NTSC)/52PL(PAL)
Measuring instrument	Oscilloscope TIME/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH1: Connector PB RF pin for RF PC board check CH2: Connector RF SWP pin for RF PC board check
Adjustment locations	ACE base assembly

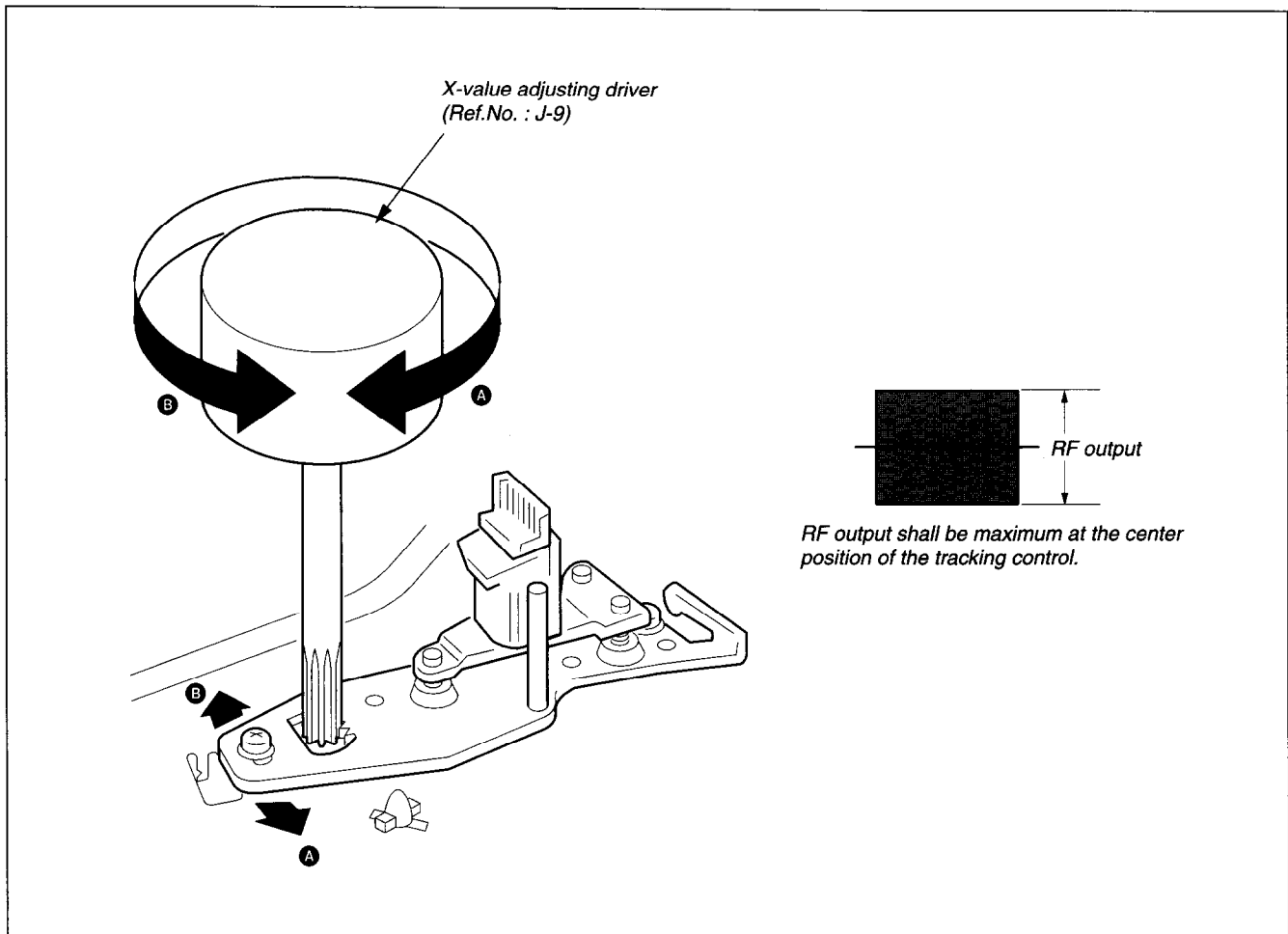


Fig. 4-2

[Adjustment Method]

Set the tracking control at the center position. For the VCRs equipped with standard gap video heads, set the ACE head position with X-value adjusting driver where a maximum RF output is obtained. For the VCRs equipped with wide gap video heads, set the ACE head position with X-value adjusting driver both where a maximum RF output is obtained and where the RF output decreases immediately when the ▼ tracking control key is pressed.

*** TYPE OF DRUM**

DZH-68D	DZH-89A
DZH-71D	DZH-90A
DZH-77A	DZH-91A
DZH-78A	DZH-92A
DZH-78B	

**1. Adjusting X-value
(Using the tape having the version No.)**

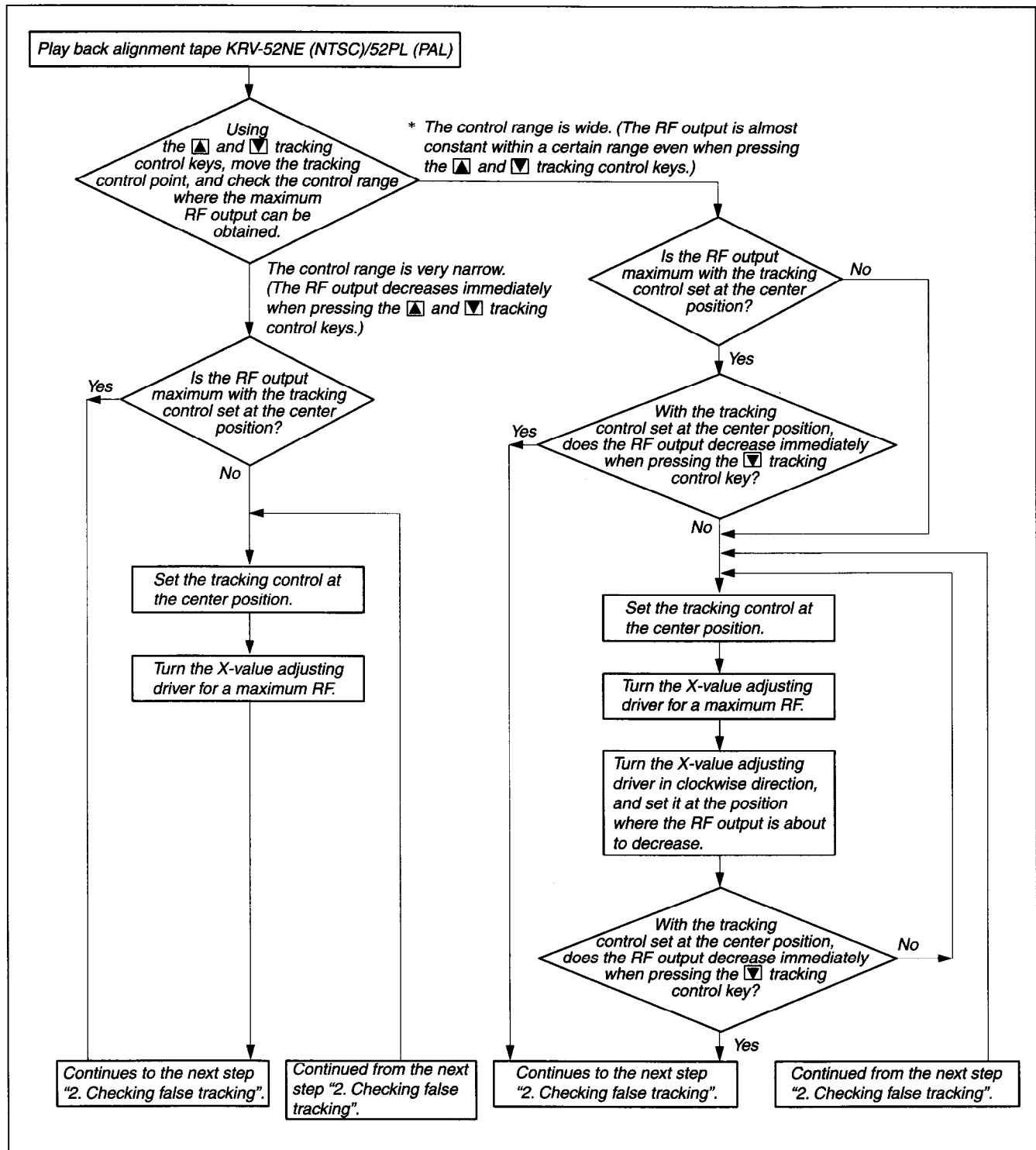


Table. 4-1

2. Checking false tracking
(Using the tape having the version No.)

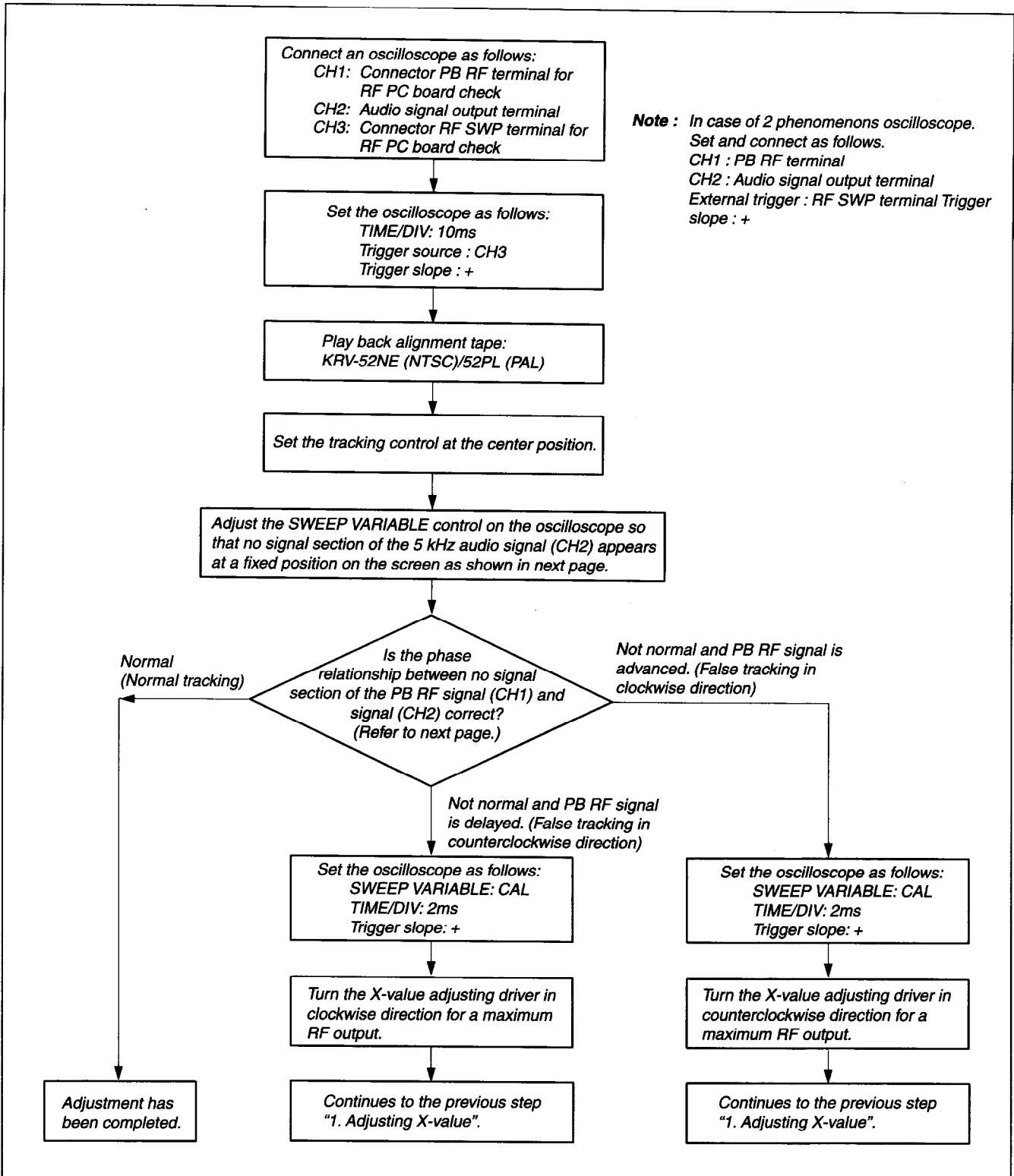


Table. 4-2

Using the tape having the version No.

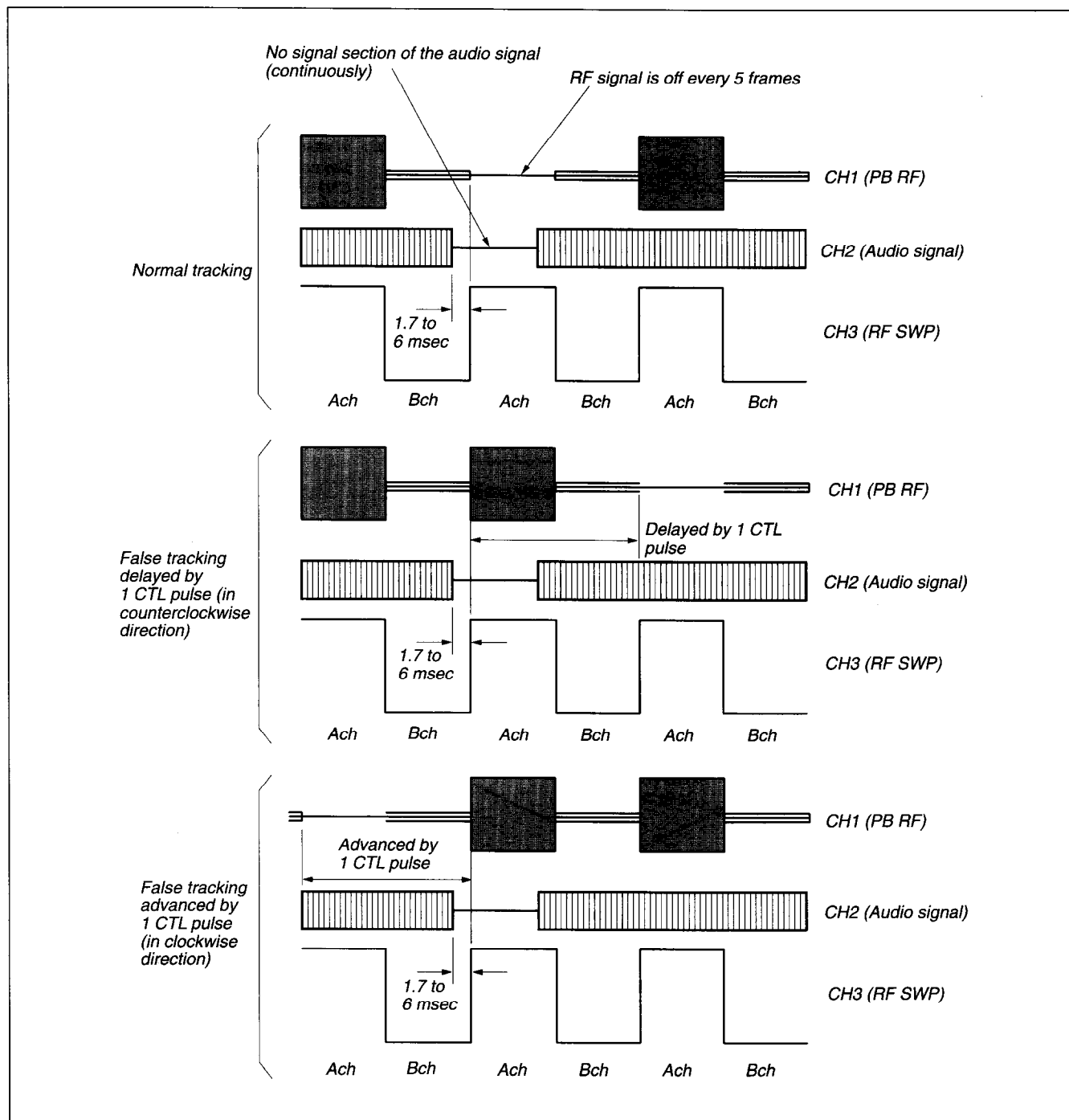


Table. 4-3

[Adjustment Method (*For the VCRs Equipped with Narrow Gap Video Heads)]

Set the tracking control at the center position. Set the ACE head position with X-value adjusting driver both where a maximum RF output is obtained and where the RF output decreases immediately when the ▲ tracking control key is pressed.

* TYPE OF DRUM
DZH-98A

**1. Adjusting X-value
(Using the tape having the version No.)**

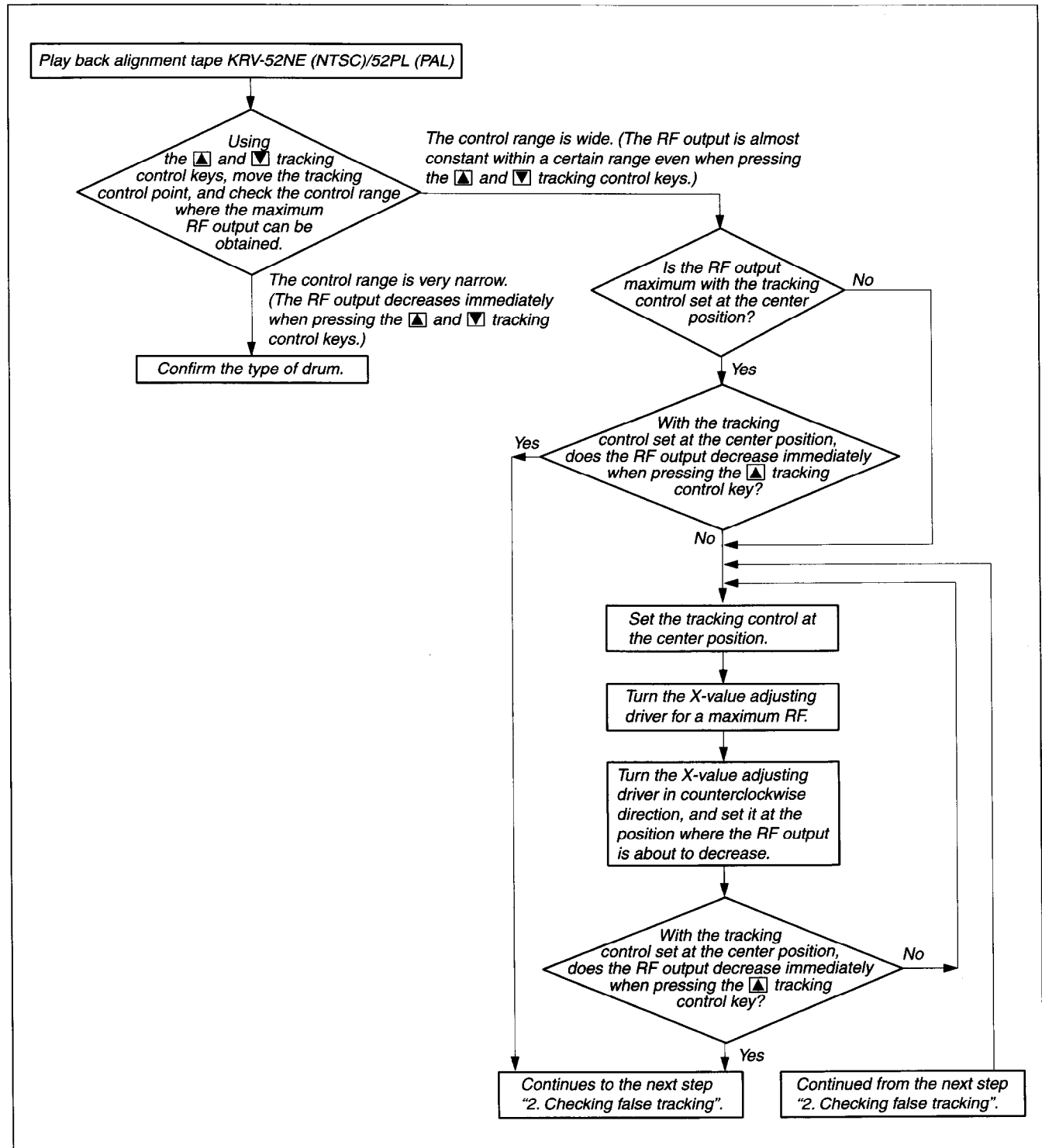


Table. 4-4

2. Checking false tracking
(Using the tape having the version No.)

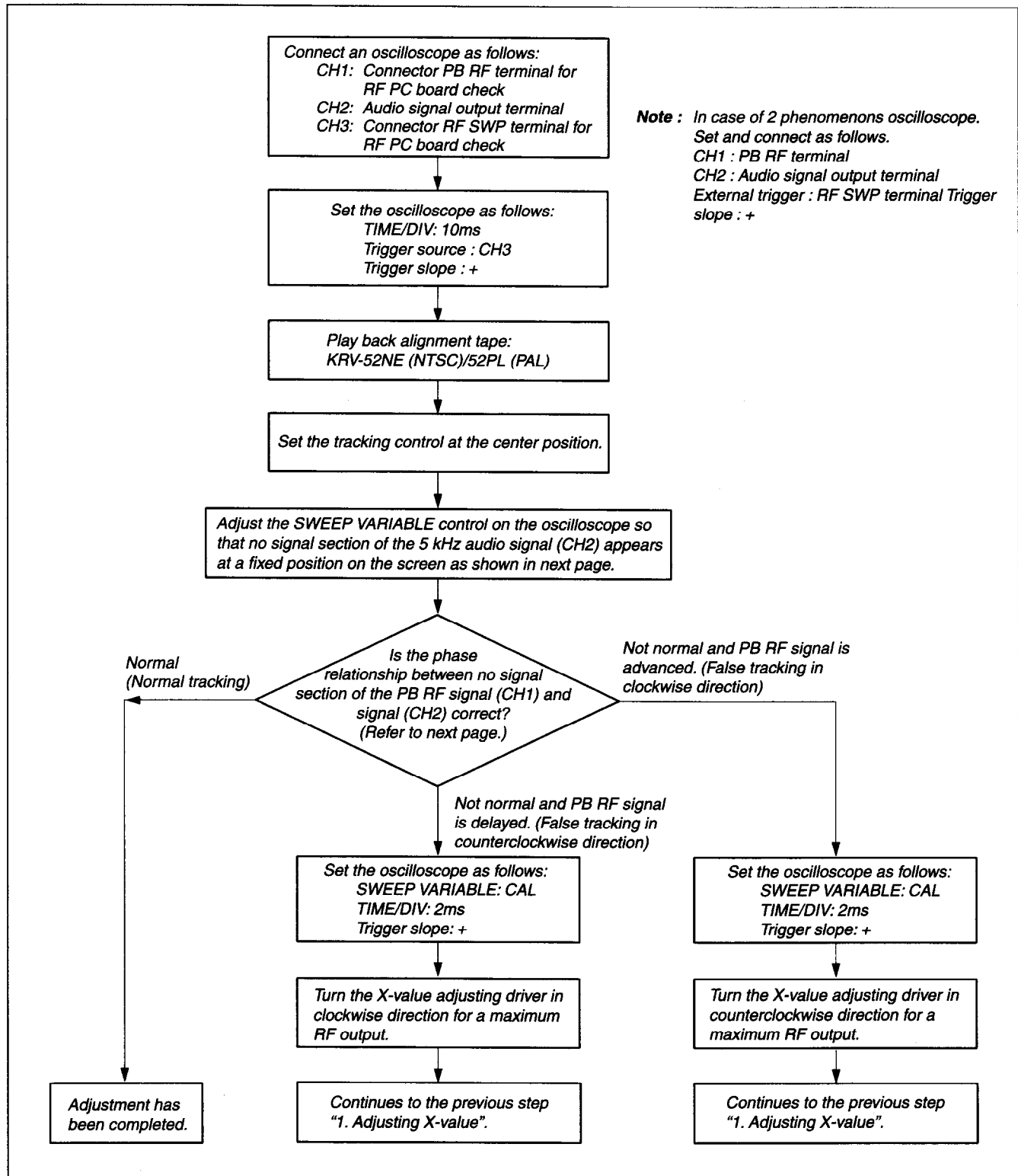


Table. 4-5

Using the tape having the version No.

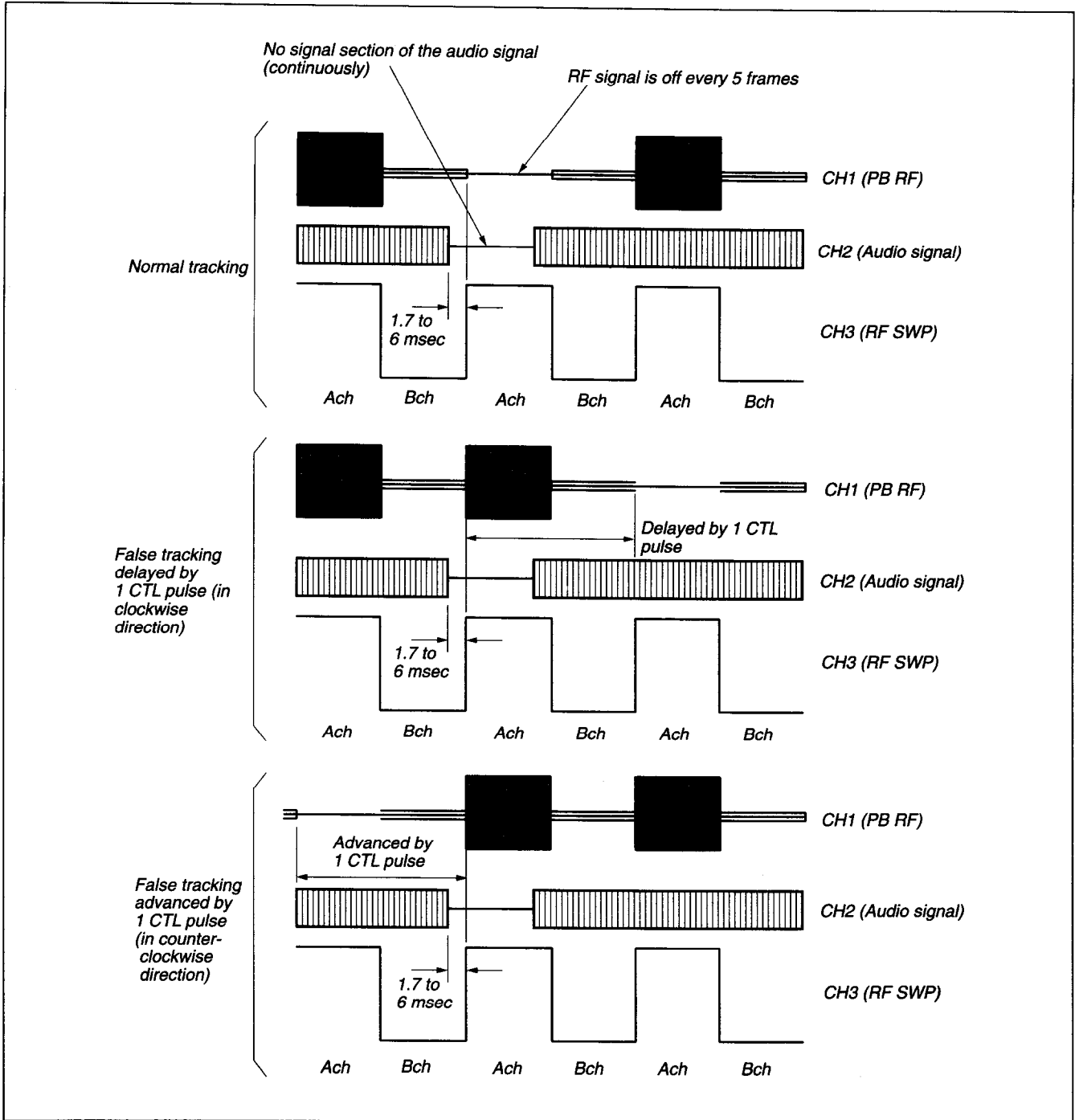


Table. 4-6

3-22. CAM MOTOR ASSEMBLY, LIMITER SELECTION ARM

- 1) Remove FL complete assembly. (Refer to 3-1.)
- 2) Remove rubber belt. (Refer to 3-4.)
- 3) Remove FL slider block assembly. (Refer to 3-12.)
- 4) Remove worm wheel. (Refer to 3-13.)
- 5) Remove pulley gear assembly with clutch gear. (Refer to 3-19.)
- 6) Remove and reel direct assembly. (Refer to 3-20.)
- 7) Remove cam motor retainer ① in the arrow B while pushing its claw in the arrow A direction.
- 8) Then cam motor assembly ② is out of place.
- 9) Remove the boss of limiter selection arm ③ from the hole on the mechanical chassis by pushing in the arrow C direction and push it in the arrow D direction and remove it in the arrow E direction.

[Note on Mounting]

- Before attaching cam motor assembly ②, confirm the specified locations are coated with grease SG-646 (Ref. No. J-6).

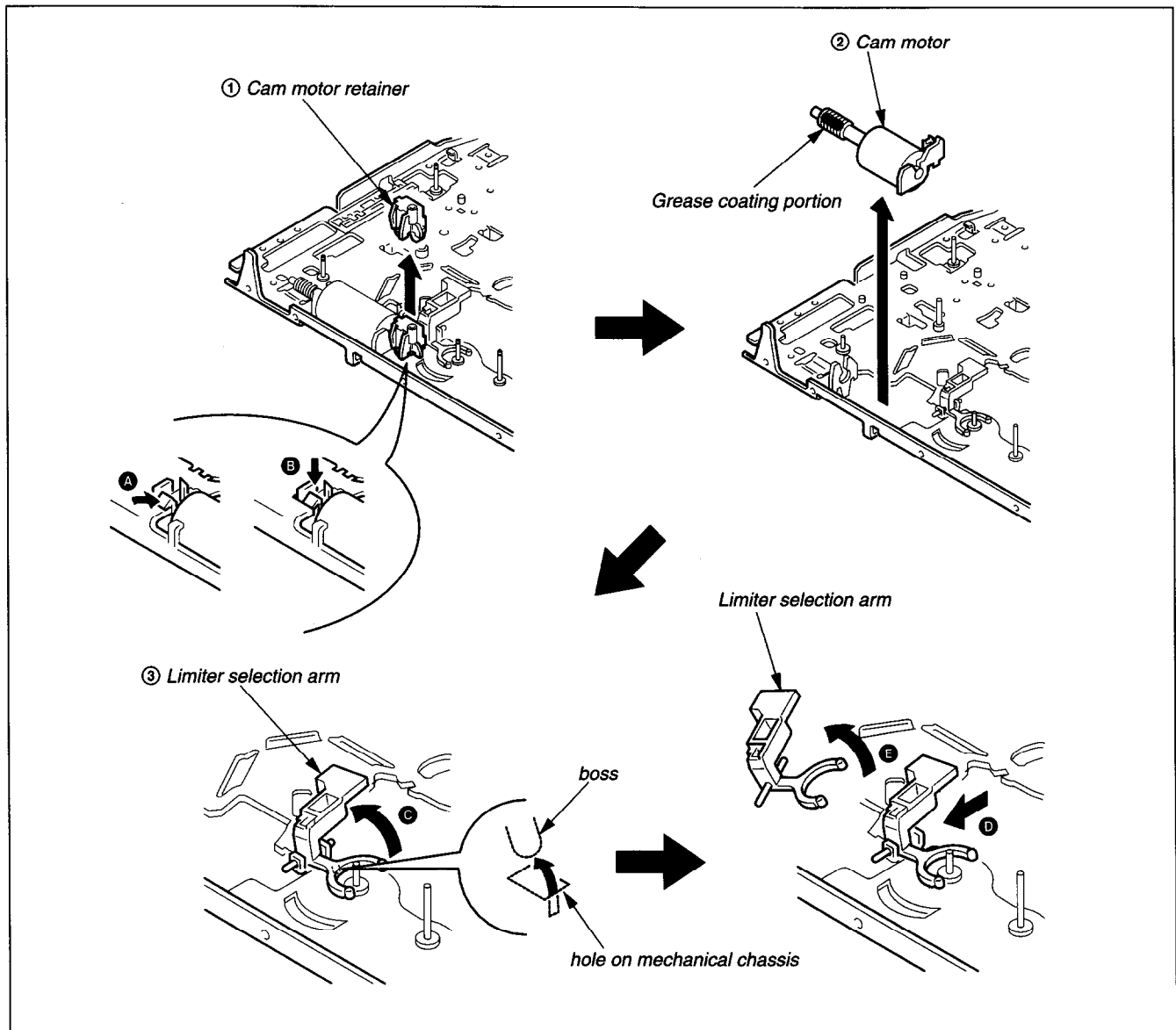


Fig. 3-27

Reference

• X-VALUE ADJUSTMENT

(Using KRV-52NE having no version No.)

Purpose : To obtain compatibility with other VCRs.

Precaution : Before starting to adjust X-value, set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys. Press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

[Adjustment Method]

Set the tracking control at the center position. For the VCRs equipped with standard gap video heads, set the X-value adjustment screw where a maximum RF output is obtained. For the VCRs equipped with wide gap video heads, set the X-value adjustment screw both where a maximum RF output is obtained and where the RF output decreases immediately when the ▼ tracking control key is pressed.

Mode	Playback
Signal	Alignment tape: KRV-52NE (For NTSC having no version No.)
Measuring instrument	Oscilloscope TIME/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH1: Connector PB RF pin for RF PC board check CH2: Connector RF SWP pin for RF PC board check
Adjustment locations	ACE base assembly

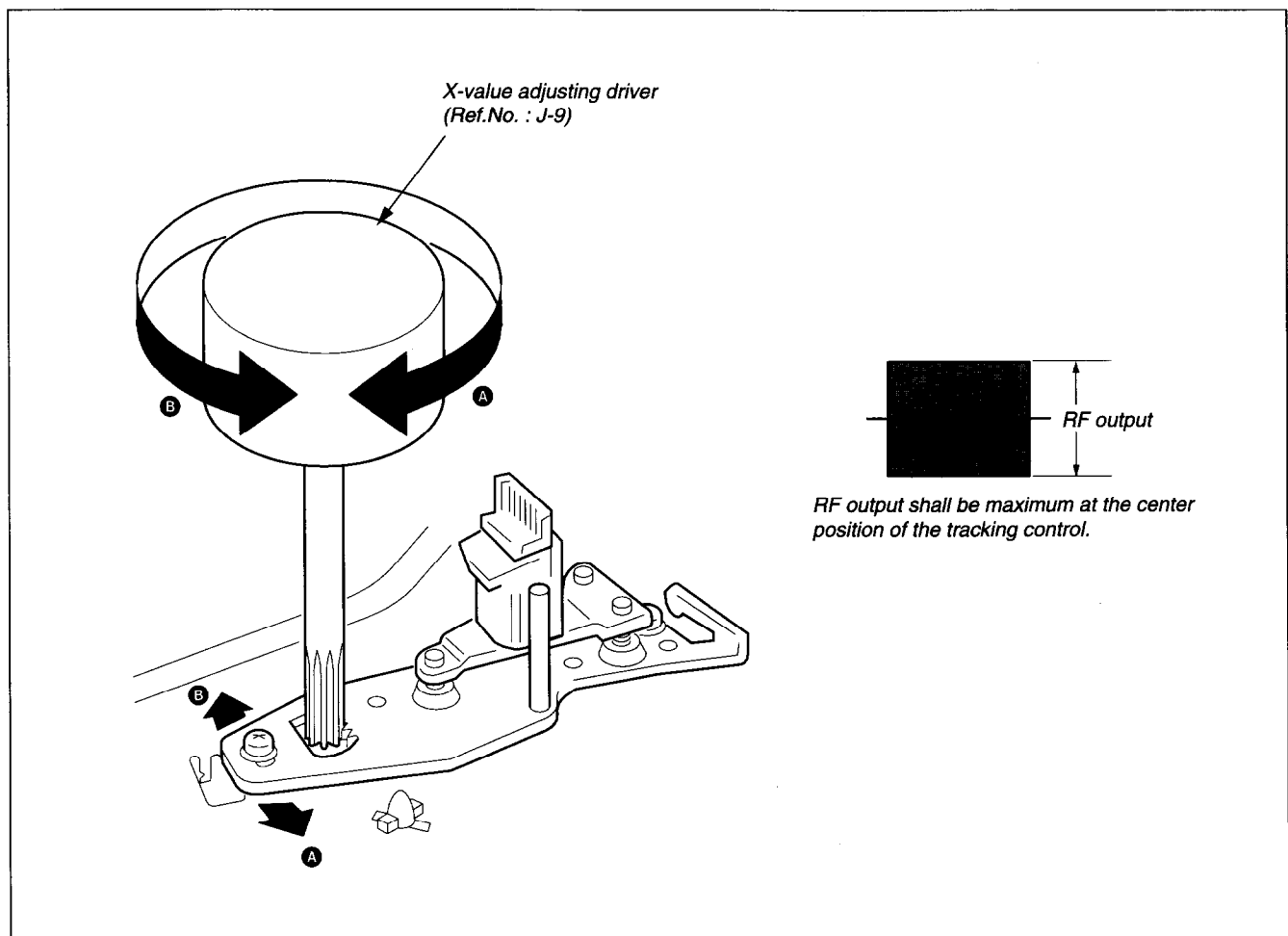
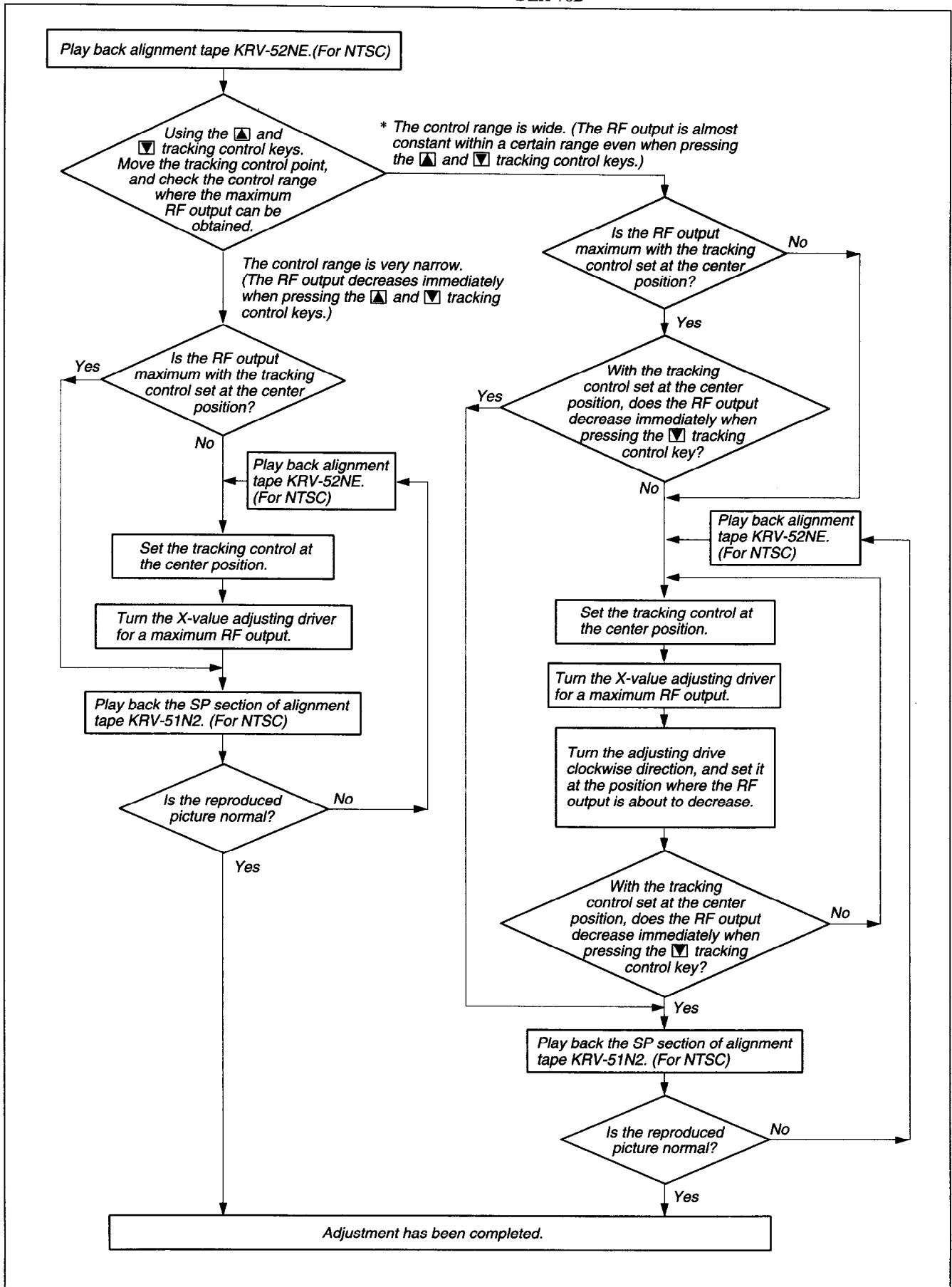


Fig. 4-3

X-VALUE ADJUSTMENT
 (Using the tape having no version No.)

* TYPE OF DRUM

DZH-68D	DZH-89A
DZH-71D	DZH-90A
DZH-77A	DZH-91A
DZH-78A	DZH-92A
DZH-78B	

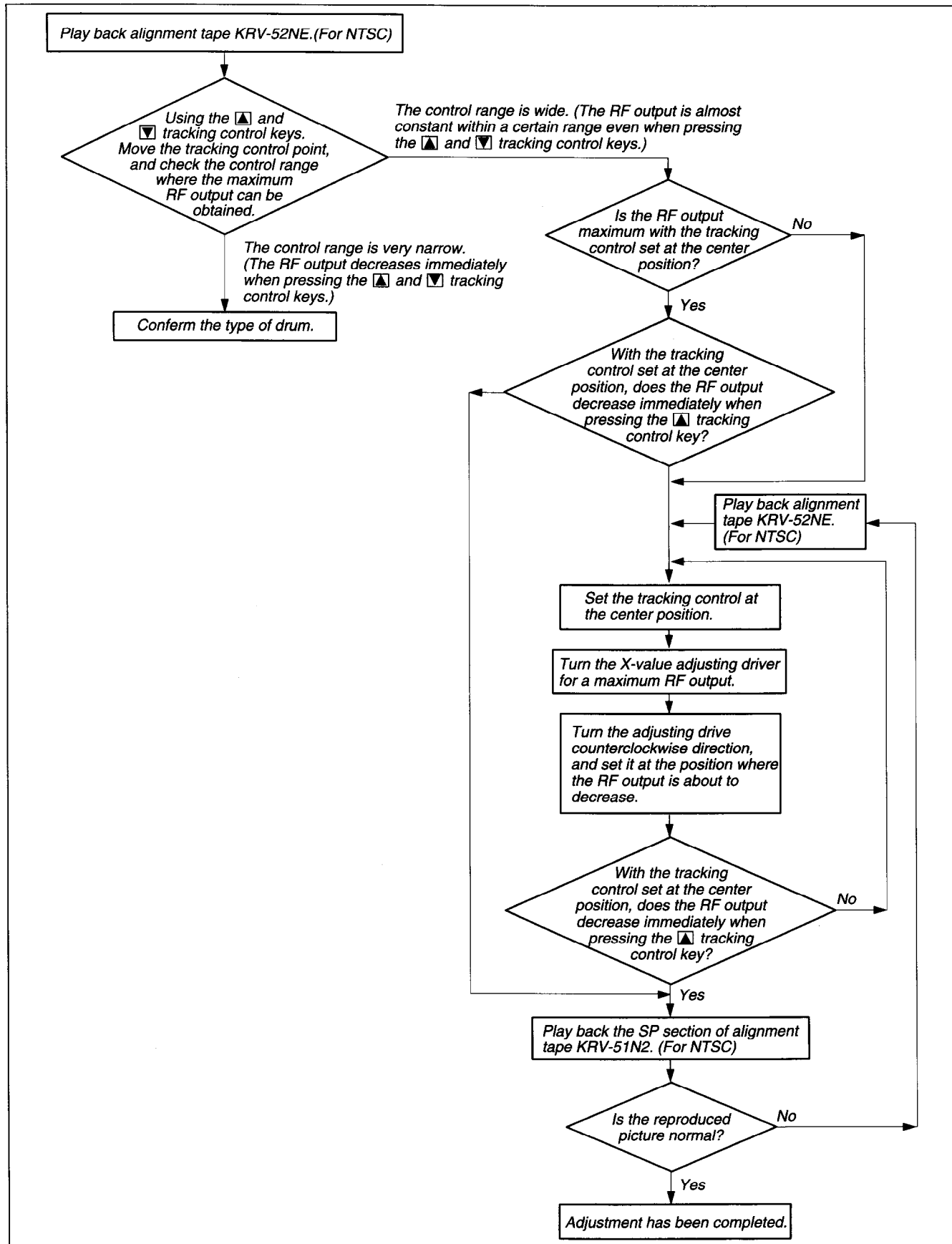


[Adjustment Method (*For the VCRs Equipped with Narrow Gap Video Heads)]

Set the tracking control at the center position. Set the ACE head position with X-value adjusting driver both where a maximum RF output is obtained and where the RF output decreases immediately when the ▲ tracking control key is pressed.

* TYPE OF DRUM
DZH-98A

Using the tape having the version No.





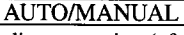


4-1-4. HEIGHT ADJUSTMENT OF GUIDE ROLLERS NO. 3 AND NO. 6

Mode	Playback
Signal	Alignment tape: KRV-52NE (NTSC)/52PL (PAL)
Measuring instrument	Oscilloscope TIME/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH1: Connector PB RF pin for RF PC board check CH2: Connector RF SWP pin for RF PC board check
Adjustment locations	Height adjustment screw for No. 3 tape guide roller Height adjustment screw for No. 6 tape guide roller

[Adjustment Method]

The following adjustment shall be carried out after completed Section 4-1-2. X-VALUE ADJUSTMENT.

- 1) Deactivate the automatic tracking control, and set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the  and  tracking control keys, press both the  and  tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking  key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

- 2) Check if the RF output changes in amplitude by pressing the tracking control key. The RF output should change periodically (changes from a minimum amplitude to a maximum amplitude, and to the minimum amplitude again).

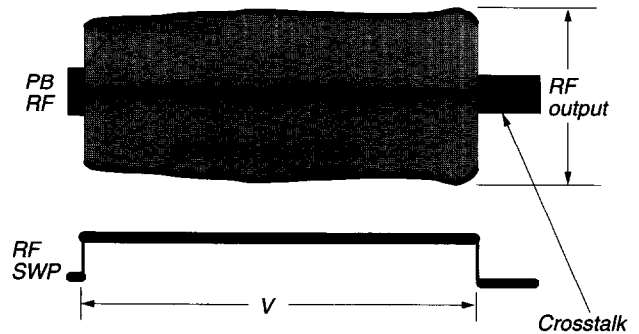




Fig. 4-4

- 3) Turn the height adjustment screws of tape guide rollers No. 3 and No. 6 so that the RF output envelope becomes as flat as possible.
- 4) Press the  tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.
- 5) Press the  tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.

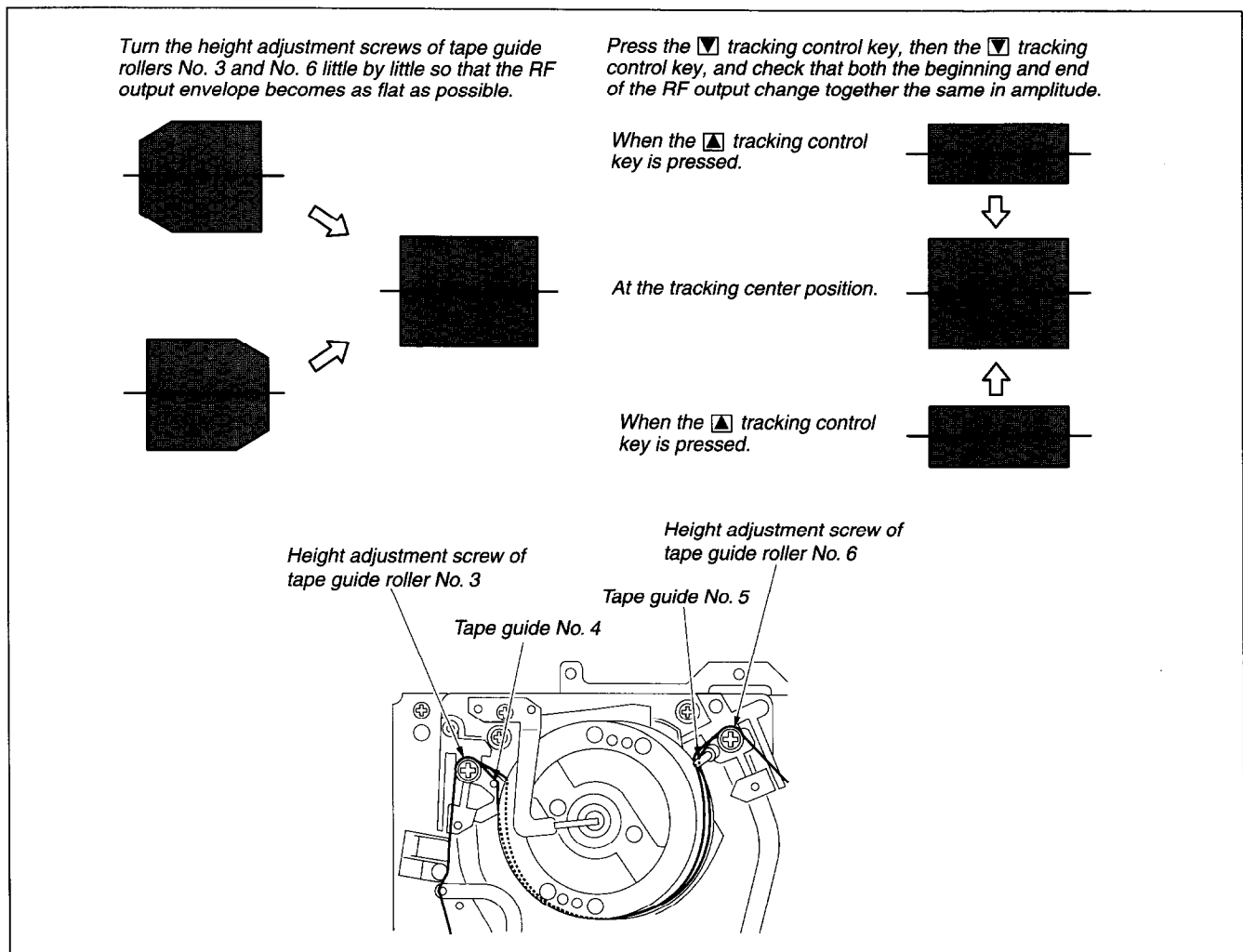


Fig. 4-5

4-1-5. ACE HEAD ASSEMBLY HEIGHT AND AZIMUTH ADJUSTMENT

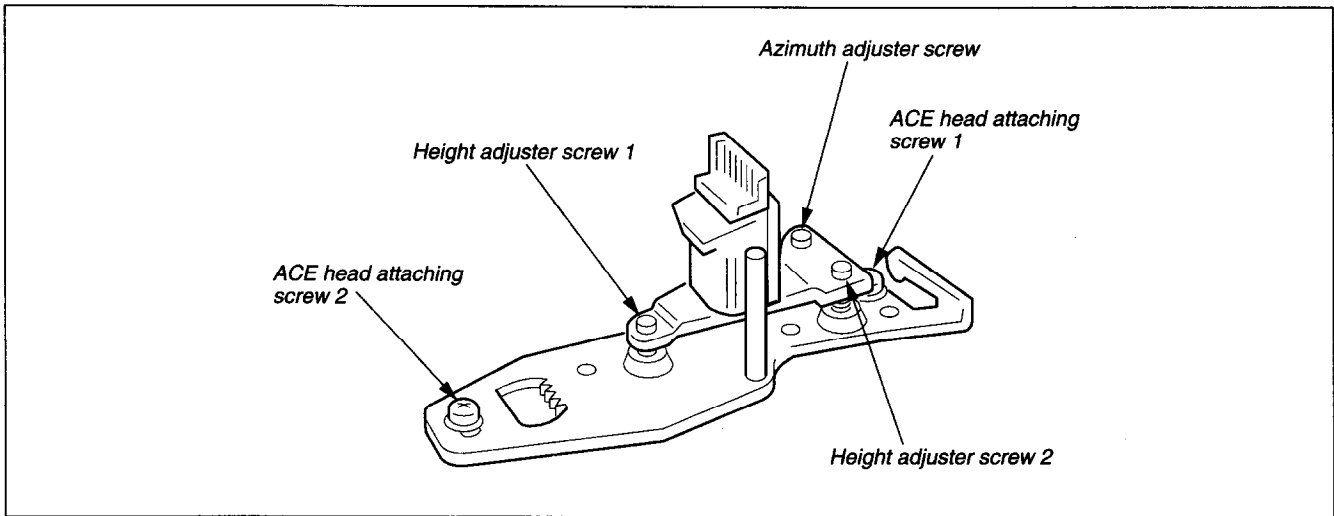


Fig. 4-6

Mode	Playback
Signal	Alignment tape: (5kHz) KRV-52NE (NTSC)/52PL (PAL)
Measuring instrument	Oscilloscope
Measuring point	Audio output terminal
Adjustment locations	Azimuth adjuster screw, Height adjuster screws 1 and 2.

[Adjustment Method]

- 1) Adjust the height as shown in the figure with turning the height adjuster screws 1 and 2, and the azimuth adjuster screw in the same direction, the same degree gradually.

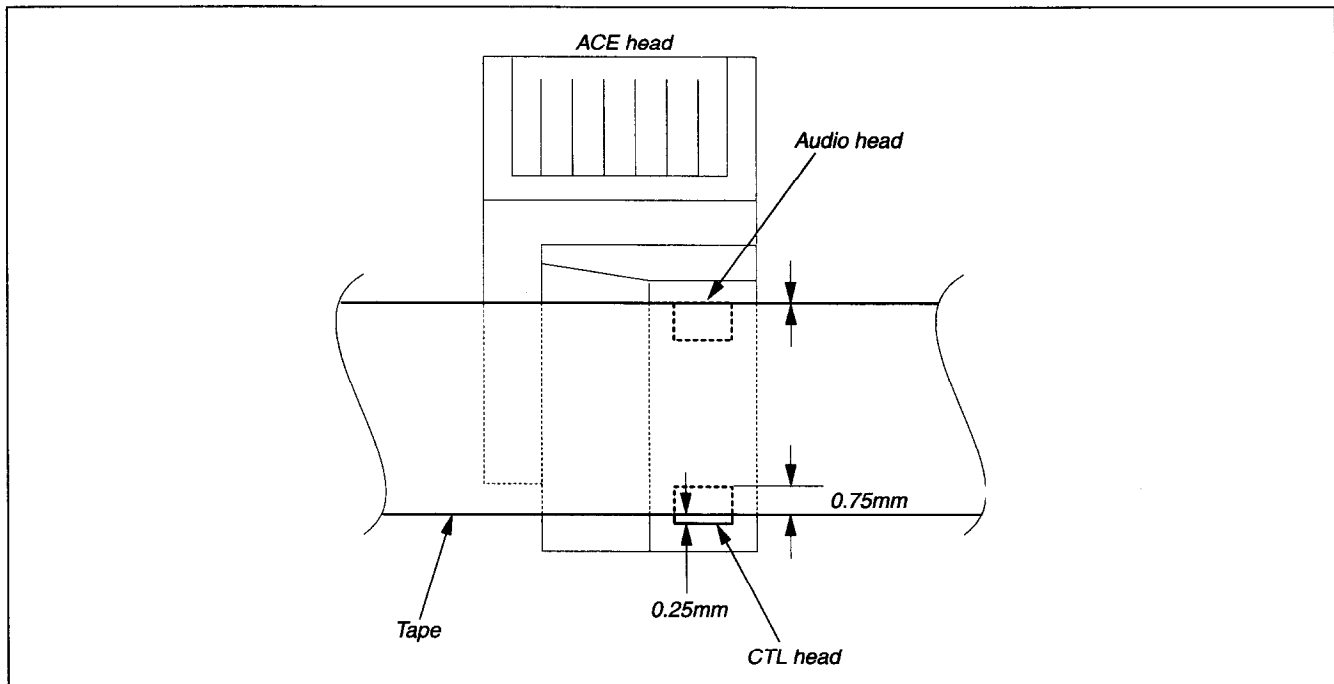


Fig. 4-7

- 2) Alternately adjust the azimuth adjuster screw to make A maximum and B minimum. (To maintain even audio output at maximum with minimum deviation.)
- 3) Perform section 4-1-2. X-VALUE ADJUSTMENT.
- 4) Tighten ACE head attaching screw 2. (Torque: More than 0.29 N•m (3.0 kg•cm)).

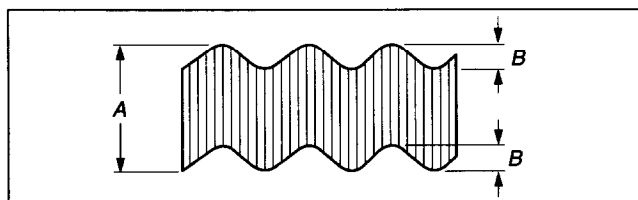


Fig. 4-8

4-1-6. X-VALUE FINE ADJUSTMENT

The procedure is the same as the item 4-1-3. Please refer to pages 37 to 46.

4-1-7. HEIGHT ADJUSTMENT OF GUIDE ROLLER NO. 8

Note : Applicable to the set having TG8 height adjusting screw as shown in the figure. Do not adjust when TG8 height adjusting screw is not attached.

Mode	Playback
Signal	Any signal on thin tape (T-160 or the like) near the tape top.
Adjustment location	TG8 height adjusting screw

[Adjustment Method]

- 1) Confirm there is no wrinkles of tape between TG8 and capstan and no tape curl at the upper or the lower flanges of TG8 during 10 seconds CUE running.
- 2) When there is curls or wrinkles, adjust with TG8 height adjusting screw.
- 3) Confirm there is no wrinkles of tape between TG8 and capstan and no tape curl at the upper or the lower flanges of TG8 during 8 seconds REV running.
- 4) When there is curls or wrinkles, adjust with TG8 height adjusting screw.

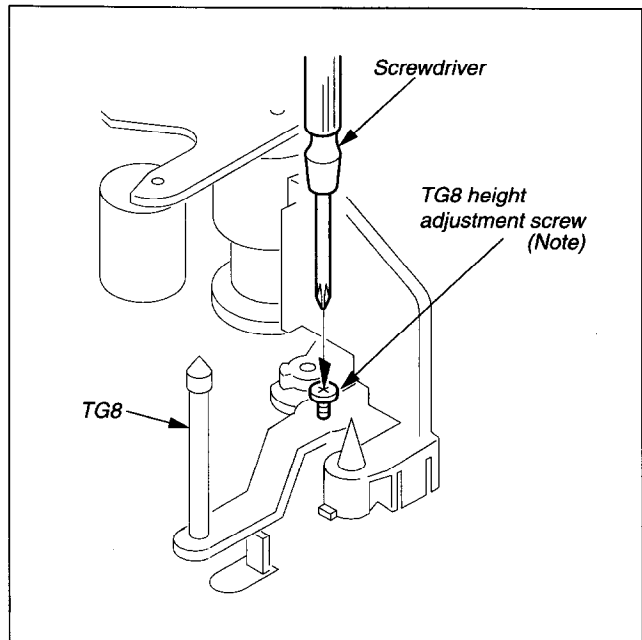


Fig. 4-9

4-1-8. CHECKING THE LINEARITY AND FLUCTUATION OF THE RF OUTPUT

- 1) Set the RF output to the maximum level using the tracking buttons.

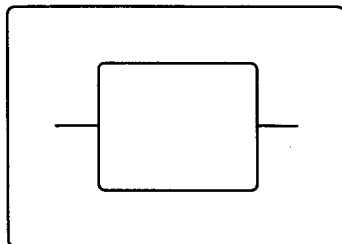


Fig. 4-10-1

- 2) Perform fine adjustment of the voltage level range of the oscilloscope, adjust the RF output deviation to within 6 gradations.

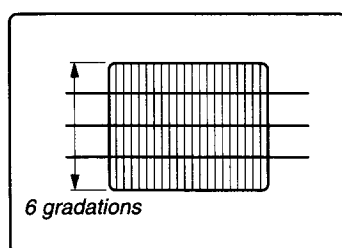


Fig. 4-10-2

- 3) Press the tracking buttons and adjust the maximum amplitude of the RF output to within 4 gradations.
- 4) At this time, check if the minimum amplitude is more than 2 gradations.

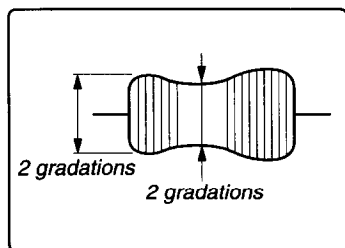


Fig. 4-10-3

- 5) Check that RF output fluctuation between minimum and maximum levels is within 13%.

5. EXPLODED VIEWS

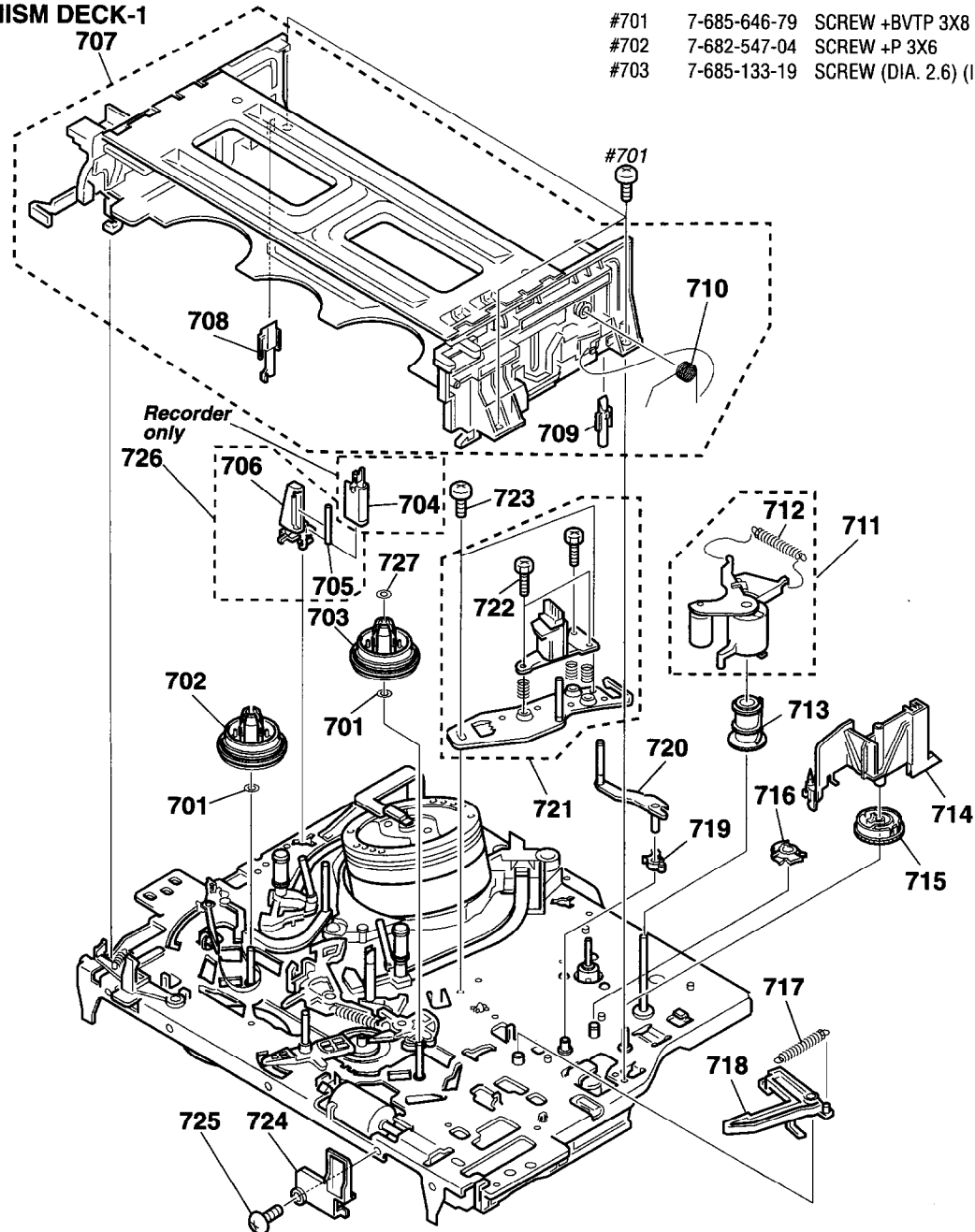
Note:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

HARDWARE LIST

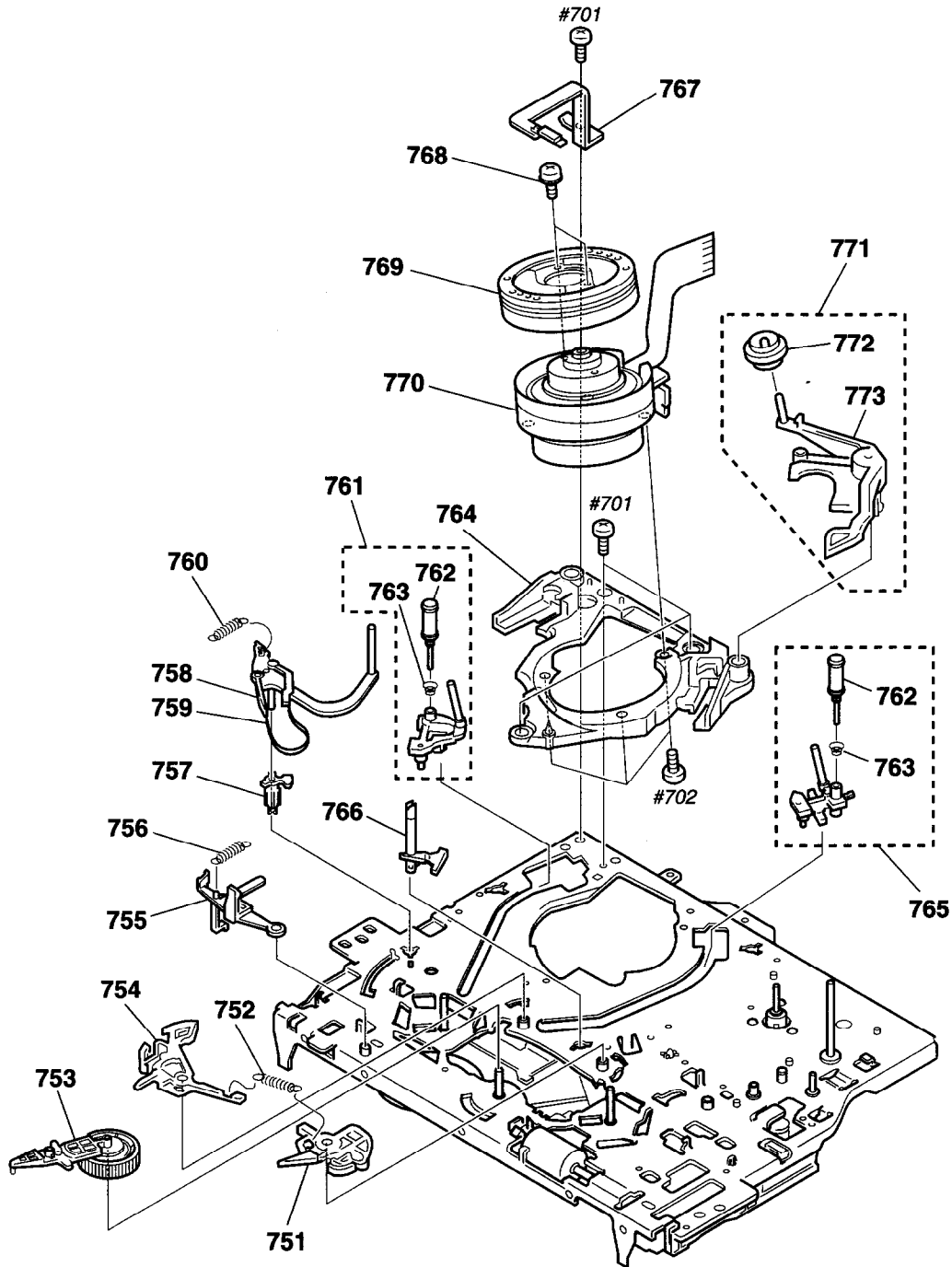
5-1. MECHANISM DECK-1

#701	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3
#702	7-682-547-04	SCREW +P 3X6
#703	7-685-133-19	SCREW (DIA. 2.6) (IT3B)



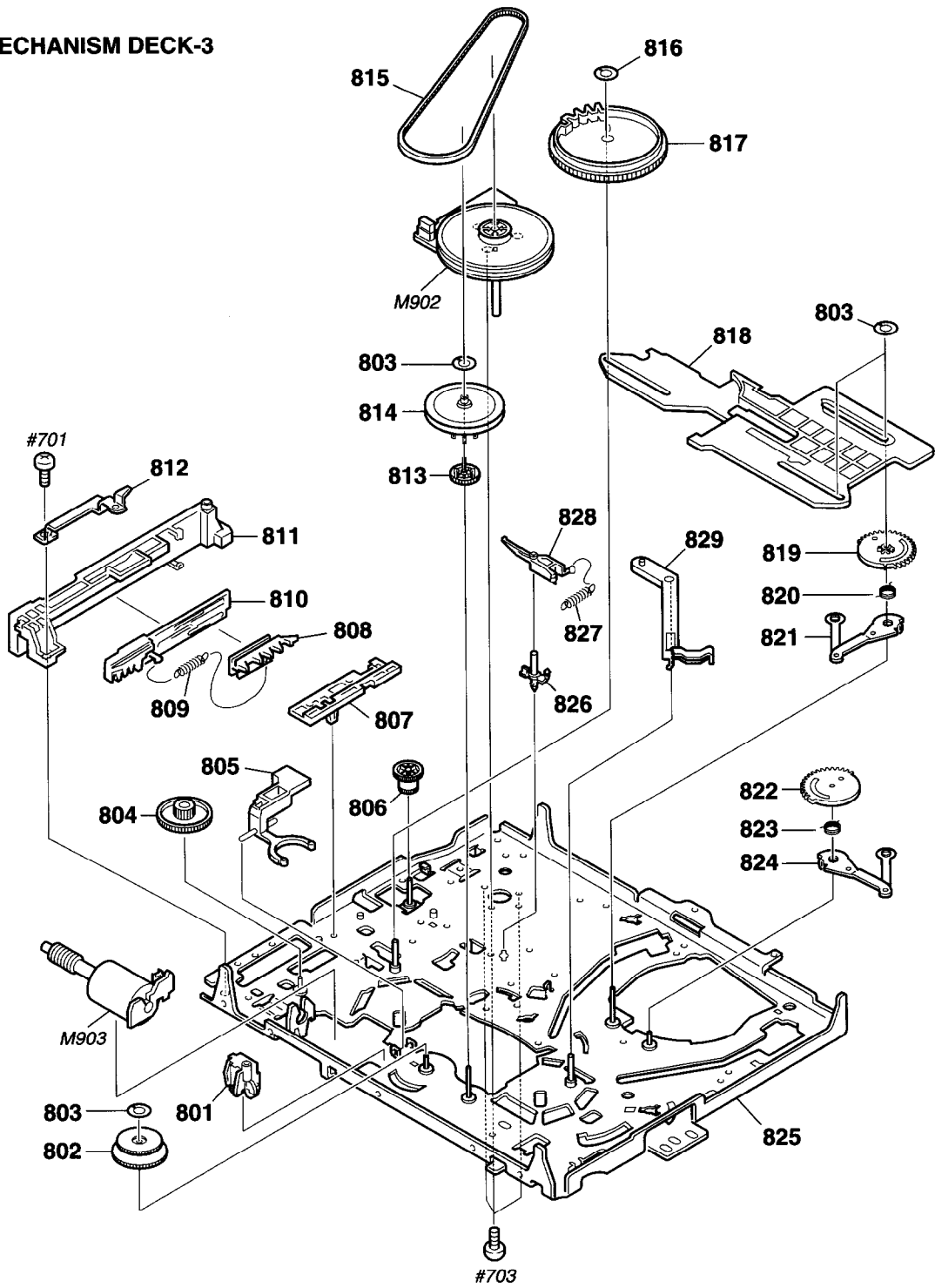
Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
701	3-977-509-01	WASHER, THRUST		715	3-977-441-01	GEAR, PINCH PRESSING	
702	3-977-507-01	TABLE, REEL (S) (GRAY)		716	3-977-445-01	GEAR, TG8 ARM DRIVING	
703	3-977-508-01	TABLE, REEL (T) (BLACK)		717	3-977-465-01	SPRING, EXTENSION (RVS BRAKE)	
704	1-500-144-11	HEAD, FE (RECORDER)		718	X-3947-582-1	ARM ASSY, RVS BRAKE	
705	3-977-495-01	SHAFT TG2 (RECORDER)		719	3-977-446-01	GEAR, TG8 ARM	
706	3-977-494-01	HOLDER, FEH (RECORDER)		720	X-3947-590-1	TG8 ASSY	
707	A-6759-619-A	FL COMPLETE ASSY BOARD, COMPLETE		721	A-6759-620-A	HEAD BLOCK ASSY, ACE (TDK)	
708	3-977-535-01	PLATE, LUMINOUS (END SENSOR)		722	3-974-556-01	+ HEXA TT 2.6X9 (TAPER)	
709	3-977-536-01	PLATE, LUMINOUS (TOP SENSOR)		723	3-979-508-01	SCREW	
710	3-970-471-01	SPRING (DECK OPEN), TORSION		724	3-978-485-01	PLATE, GUIDE CASSETTE	
711	A-6759-615-A	PRESS BLOCK ASSY, PINCH		725	3-696-519-01	+P IT3 SCREW 3X8	
712	3-958-455-01	SPRING (PINCH), TENSION		726	X-3947-817-1	FEH, ASSY (PLAYER)	
713	3-977-447-01	GEAR, ELEVATOR		727	3-977-443-01	WASHER, STOPPER	
714	3-977-514-01	OPENER, LID					

5-2. MECHANISM DECK-2



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
751	X-3947-581-1	BRAKE ASSY,MAIN(T)		763	3-965-178-01	SPRING	
752	3-977-462-01	SPRING,EXTENTION. (MAIN BRAKE)		764	3-969-629-01	BASE, DRUM	
753	X-3947-573-1	ARM ASSY, PENDULUM		765	A-6750-325-A	SHUTTLE (T) BLOCK ASSY	
754	X-3947-580-1	BRAKE ASSY, MAIN(S)		766	3-977-501-01	PLATE, LUMINOUS	
755	3-977-513-01	LEVER, REC. PROOF		767	X-3943-899-8	GROUND ASSY, SHAFT	
756	3-976-767-01	SPRING, TENS. (REC. PROOF)		768	2-643-205-01	SCREW	
757	3-977-487-01	BOSS, TG1 FULCRUM		769	Refer to the service manual for each model.		
758	X-3947-587-1	TG1 ASSY		770	Refer to the service manual for each model.		
759	X-3947-589-1	BAND ASSY, TG1		771	A-6759-614-A	ROLLER BLOCK ASSY, HC	
760	3-977-488-01	SPRING (POWER TENSION)		772	X-3947-255-1	ROLLER ASSY, HC	
761	A-6750-324-A	SHUTTLE (S) BLOCK ASSY		773	3-977-537-01	ARM, HC ROLLER	
762	X-3944-378-1	ROLLER ASSY, GUIDE					

5-3. MECHANISM DECK-3



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
* 801	3-977-437-01	RETAINER,CAM MOTOR		817	3-977-439-01	GEAR, CAM	
802	X-3947-584-1	ASSY, REEL DIRECT		818	3-977-442-01	SLIDER	
803	3-977-443-01	WASHER, STOPPER		819	3-977-455-01	GEAR, LOADING(T)	
804	3-977-438-01	WORM - WHEEL		820	3-977-456-01	SPRING, TORSION (LOAD T)	
805	3-977-506-01	ARM, LIMITTER SELECTION		821	X-3947-579-1	LEVER ASSY, LOADING(T)	
806	3-977-444-01	GEAR, PINCH TRANSMISSION		822	3-977-451-01	GEAR, LOADING(S)	
807	3-977-515-01	GUIDE, FL SLIDER		823	3-977-452-01	SPRING, TORSION (LOAD S)	
808	3-977-517-01	PLATE, SLIDE, FL		824	X-3947-578-1	LEVER ASSY, LOADING(S)	
809	3-977-519-01	SPRING, TENS. (LIMIT, FL)		825	X-3947-576-1	CHASSIS ASSY, MECHANICAL	
810	3-977-518-01	PLATE, LIMITTER, FL		826	3-977-468-01	SHAFT, CAPSTAN BRAKE	
811	3-977-516-01	HOLDER, FL SLIDER		827	3-977-467-01	SPRING, CAP BRAKE	
812	3-977-877-01	PLATE, RETAINER		828	X-3947-583-1	BRAKE ASSY, CAPSTAN	
813	3-977-504-01	GEAR, CLUTCH		829	3-977-489-01	ARM, TG1 DRIVING	
814	X-3947-585-1	GEAR ASSY, PULLEY		M902	1-698-971-11	MOTOR, DC	
815	3-977-510-01	BELT, RUBBER		M903	X-3947-577-1	MOTOR ASSY, CAM	
816	3-977-440-01	WASHER, STOPPER					

