

## CLEANING AND LUBRICATION

**CLEANING.** The use of cleaning fluids such as petrol or carbon-tetrachloride which might damage plastic surfaces or rubber drives should be avoided.

A soft cloth dampened with methylated spirit should be used to clean the working surfaces of the spool carriers, capstan, pinch-wheel, motor pulley and spooling wheels.

Oxide deposits on the magnetic heads and tape guides may be removed in the same manner, but objects such as screw-drivers should be kept away from the heads to avoid magnetization. Pressure pad and friction ring surfaces should be kept clean and fluffy.

**LUBRICATION.** A fine graphite grease should be applied sparingly to the parts listed after dismantling and cleaning, whenever signs of friction between bearing surfaces become apparent. Take care that it does not get onto the drive surfaces of wheels or the motor pulley. If this happens, the grease must be removed using a cloth dampened with methylated spirit.

1. Pause key latch assembly.
2. Pinch-wheel carrier arm.
3. Slot in pinch-wheel carrier.

**Important.** Do not lubricate tape position indicator.

## DISMANTLING FOR SERVICE

For access to certain mechanical parts on the underside of the deck it is necessary to release the printed circuit board; this operation is described in the service manual for the individual model.

**TOP PLATE ASSEMBLY.** Detach tape position indicator drive belt and pulley on feed spool carrier spindle from underside of deck. Take off circlip and washer to remove take-up spool carrier and remove feed spool carrier in similar manner. The removal of the spool carriers reveals nylon friction discs. The take-up spool friction disc is driven by a small belt from the motor pulley, but the feed spool disc is prevented from rotating by a tongue which protrudes into a hole in the deck.

**'PLAY' KEY LEVER ASSEMBLY REMOVAL.** Take off tape position indicator drive belt and nylon pulley on feed spool carrier spindle, then remove circlip and washer to lift out carrier and nylon friction disc. Remove 'Play' lever tension spring and muting switch actuator on underside of deck. To remove 'Play' lever, take off 'Pause' brake assembly by removing circlip and spring securing it to the 'Play' lever, taking care not to lose a washer operating in conjunction with a pin into an extension on the pinch-wheel assembly. Take off grip ring securing 'Play' lever, raise and slide assembly clear.

**OPERATING PLATE AND REWIND PLATE.** Having removed the 'Play' lever assembly, the sections of the operating plate and rewind plate assembly can be lifted out. Release the main drive belt, return spring and tension spring. Invert deck and remove a circlip, washer, spring washer and plain washer securing the sections to the deck.

**HEAD ASSEMBLY.** The erase and record heads are independently mounted on the head plate with screw adjustments provided for height and level correction. Adjustments are described in the individual model service manual.

*continued*

# BRC service manual

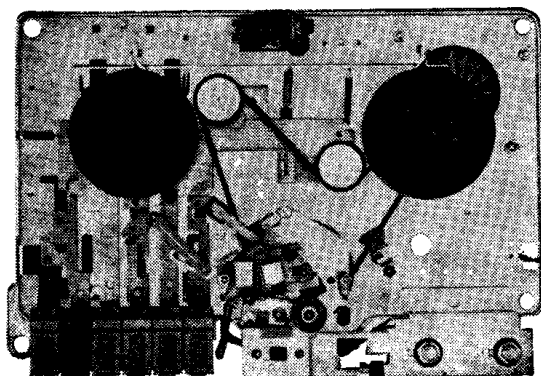
*Price: Two Shillings and Sixpence*

## BRC TAPE DECKS

**TWO-TRACK SINGLE-SPEED TYPE ... DD210**

**FOUR-TRACK SINGLE-SPEED TYPES ... DD410  
and DF410**

**FOUR-TRACK TWO-SPEED TYPE ... DF422**



DD210

The basic deck is produced in single-speed or two-speed form and is fitted with either two-track or four-track heads, depending on individual model presentation. Maximum spool diameter is 7 inches. Type DF422 is fitted with 'Stop' and 'Pause' solenoids. Speeds are as follows: Single-speed deck— $3\frac{3}{4}$  ips; two-speed decks— $1\frac{7}{8}$  ips and  $3\frac{3}{4}$  ips. Prefix DF denotes deck with flat 'piano' keys; DD denotes raised moulding type keys.

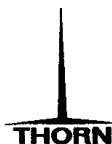
## BRITISH RADIO CORPORATION LIMITED

### SERVICE DEPOTS

**LONDON**  
P.O. Box No. 121, Lea Valley Trading Estate, Angel Road,  
Edmonton, London, N.18. Tel. 01-807 3060  
Spare Parts Tel. 01-807 0791; Ansafone Spares Tel. 01-807 6332

**MANCHESTER**  
Thorn House, Derby Street, Cheetham,  
Manchester 8. Tel. 061-832 2499

**GLASGOW**  
155 Shieldhall Road, Glasgow, S.W.1.  
Tel. 041-882 4512



British Radio Corporation Limited is a  
member of the Thorn Group

**PINCH-WHEEL CARRIER ASSEMBLY.** The pinch-wheel carrier assembly can be lifted from its spindle after disengaging the 'Pause' brake arm and removing a circlip and washer.

**MOTOR.** The motor is secured on a 'floating' suspension by four nuts and spring washers, one of which can be reached after removing the right-hand spool carrier and friction disc. Note and disconnect soldered connections if the motor is to be completely detached.

**OPERATING KEYS REMOVAL.** The 'Forward', 'Play', 'Rewind' or 'Record' key can be removed by depressing the key and taking off the tension spring. Ease the key in an upward direction to free it from the assembly; the corresponding lever will automatically return to its natural position.

To replace key, pull the particular lever into its tensioned state, insert key so that the slot engages with the latch bar lug, its front edge behind the lever fork, press home, trip 'Stop' key and reconnect tension spring.

**'PAUSE' KEY AND LEVER REMOVAL.** Remove 'Pause' brake spring (39) and hinged 'Play' bracket tension spring. Carefully disengage pinch-wheel carrier arm and hinged 'Play' bracket arm (40) by lifting nylon arm slightly, taking care not to lose the washer that rides along the pinch-wheel carrier arm.

From underside of deck, take off 'Pause' lever tension spring and 'Standby' arm tension spring. Swivel aside pinch-wheel carrier arm and release 'Pause' key tension spring. Swivel 'Pause' latch to left-hand side and with a small pair of pliers ease 'Pause' lever over edge of operating plate, at the same time pressing down operating plate, to permit 'Pause' lever to clear a cut-out in deck; then lift lever and key clear of deck.

**'STOP' KEY REMOVAL.** Pull off circlip securing Track Selector, then ease clear of bracket, taking care not to lose ball bearing, then remove track selector support bracket. (Note: On two-track models only the bracket needs to be released.) Release tension spring on 'Stop' key and remove key as described for 'Operating Keys Removal'.

When replacing key, fit slot under latch plate lug then, raising the lug and key to place into correct position, press key into position on assembly. Finally, refit tension spring and refit Track Selector and support bracket into position.

**'FORWARD' OR 'REWIND' LEVER REMOVAL.** Invert deck and take off tape position indicator drive belt. Remove pulley on feed spool carrier spindle and take off 'Forward' or 'Rewind' lever tension spring. Take off circlip and washer securing feed spool carrier, then grip ring and washer securing 'Forward' or 'Rewind' lever.

Place deck right way up and lift off feed spool carrier and friction disc, then take off washers and grip ring on feed spool carrier bush. Release operating plate tension spring. Take off hinged 'Play' bracket tension spring, then circlip and washer securing it to chassis. Lift off bracket complete with 'Pause' brake spring and pad. Raise operating plate as high as possible and pull the 'Forward' or 'Rewind' lever as far to the rear of the chassis as possible to permit the tongue at the forked end of the levers to clear holes in chassis, then manoeuvre required lever clear of deck.

**REMOVAL OF 'FORWARD' OR 'REWIND' PULLEY.** Release main drive belt (36), then take off, from underside of deck, a small nylon securing washer and a washer. Pull pulley

*continued*

## Dismantling for Service—continued

wheel (5) away from rewind plate assembly (11) taking care not to lose small washer on spindle bush.

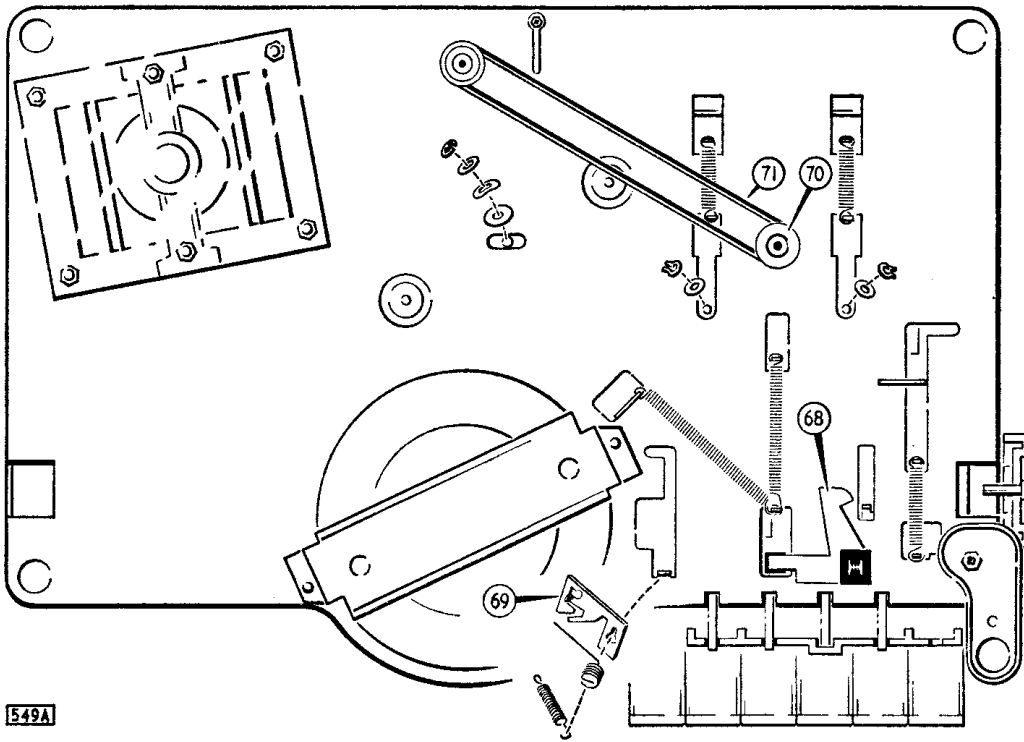
**REMOVAL OF HEAD PLATE ASSEMBLY.** Release flywheel support bracket (38) by removing 2 screws and washers; lift off plastic dust washer from capstan spindle and lower flywheel from underside of deck disengaging main drive belt at the same time. Disengage hinged 'Play' bracket (40) from pinch-wheel arm (41) noting small washer on 'Play' bracket locating peg. Extract magnetic heads from housings noting their positions for correct refitting. Disengage 'Pause' brake spring (39) and unhook tension spring (under deck) from standby arm (45). (Where a 'Pause' solenoid is fitted, uncouple from the standby arm.) Remove 3 screws and distance bushes (59) to release head plate assembly; unhook pinch-wheel arm tension spring for access to one of the screws.

*Note:* When refitting, ensure main drive belt is positioned to relocate in flywheel pulley.

**REMOVAL OF FLYWHEEL AND CAPSTAN ASSEMBLY (37 & 38).** Slacken off main drive belt (36) and remove capstan dust washer (29). Take out two screws and spring washers securing flywheel support bracket (38) to deck, then pull flywheel clear of its bushing.

## FAULT-FINDING CHART

SYMPTOM	CAUSE	REMEDY
1. Wow and flutter	(a) Dirty capstan (b) Bent capstan or motor shaft (c) Weak pinch-wheel pressure spring (d) Belt wear	Clean Replace faulty part Replace spring Replace belt
2. Slow running	(a) Oil on flywheel, motor pulley, pinch-wheel or drive belt (b) Weak pinch-wheel pressure spring (c) Speed-change belt slipping	Clean all drive surfaces with methylated spirit Replace spring Replace belt or clean
3. Motor fails to run	(a) Wiring fouling fan (b) Broken motor lead	Re-route wiring Reconnect
4. Counter inaccurate	(a) Oil on drive belt or pulley (b) Oil gumming pulley bearing (c) Fluff in counter gears	Clean belt and pulley Clean out bearing and shaft with small brush dipped in benzine Remove with tweezers or replace counter
5. Counter not registering	(a) Counter drive belt stretched or out of position (b) Counter jamming	Replace or refit belt Fit new counter
6. No tape motion 'Play' or 'Record'	(a) 'Pause' solenoid energized (b) 'Pause' mechanism jammed	Check for wiring fault Check operation of 'Pause' switch on microphone Check operation of pause claw, etc.
7. Pinch-wheel assembly not returning fully	(a) Fouling on pivot	Oil pivot
8. Control keys not latching	(a) Latch plate spring disconnected or weak (b) Auto-stop solenoid incorrectly adjusted	Refit or replace Readjust
9. Tape spillage	(a) Misalignment of brakes	Reset or replace brake pads

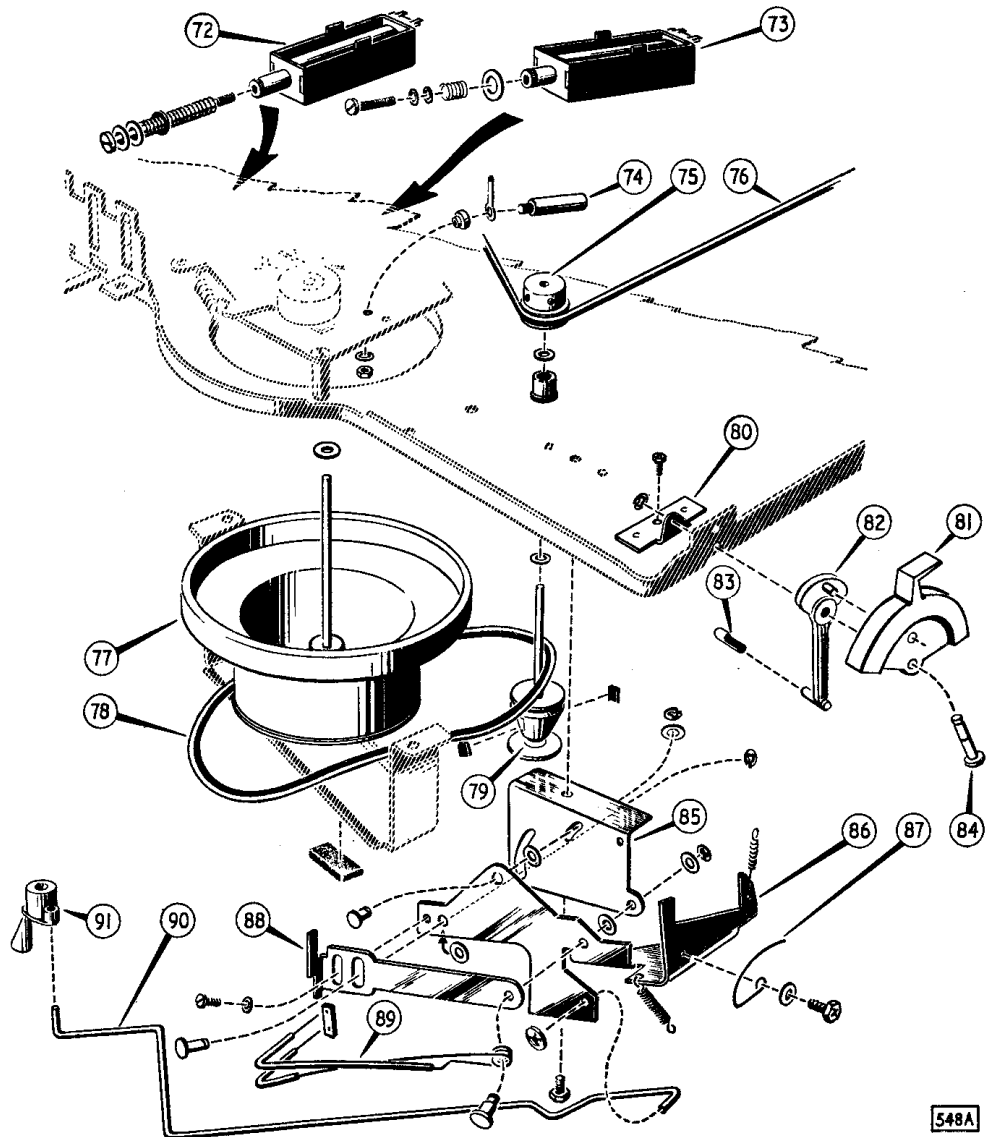


**Right:** General exploded view of four-track single-speed decks DD410 and DF410. The two types differ only in the shape of the 'piano' key.

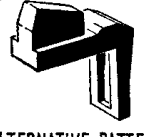
**Left:** Underside view of four-track single-speed deck (DD410 or DF410).

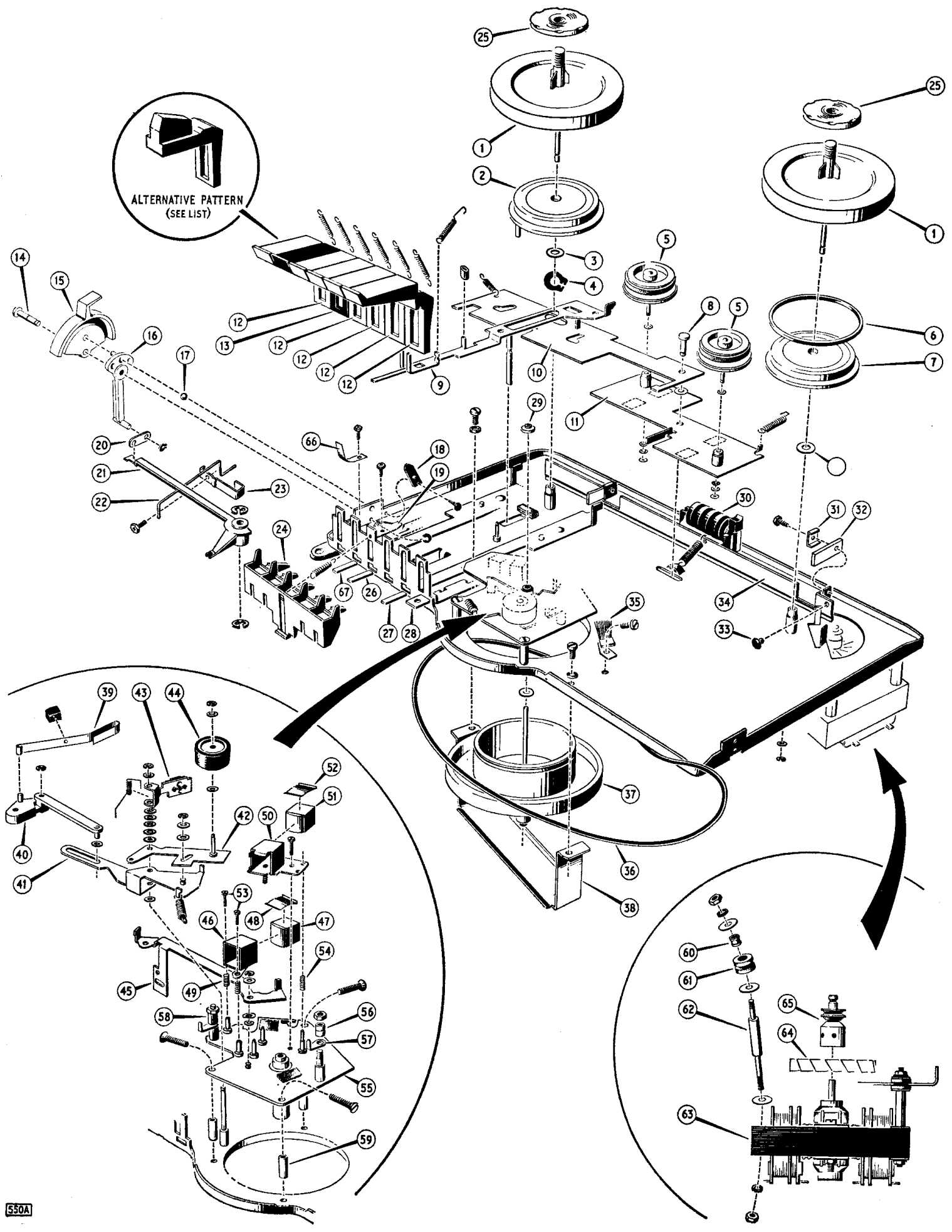
**Below:** Showing items which differ for the two-speed deck, DF422.

549A



548A


  
 ALTERNATIVE PATTERN
   
 (SEE LIST)



# REPLACEMENT PARTS

When ordering replacement parts, please quote Tape Deck type number and include the description or function given with the part number.

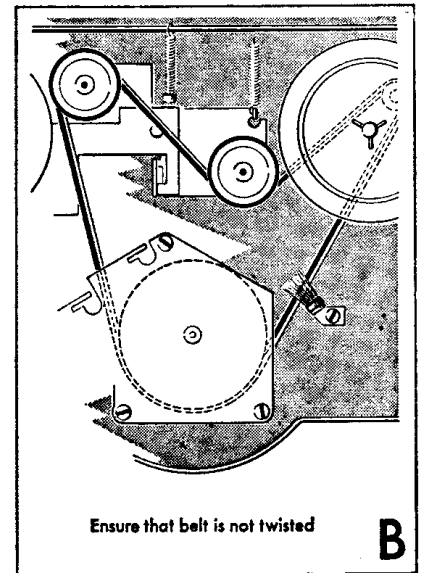
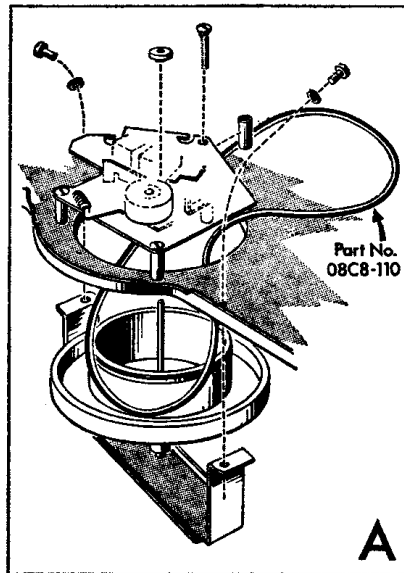
Differences between single-speed and two-speed decks are shown in the illustrations.

Items which differ for two-speed decks are listed from 72 onwards.

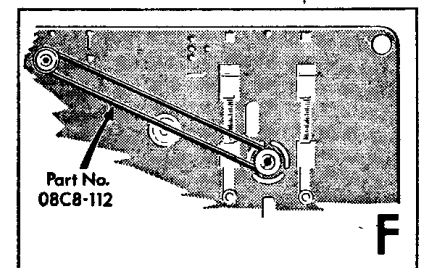
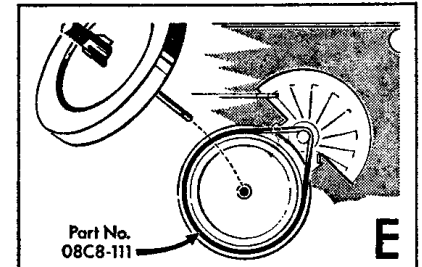
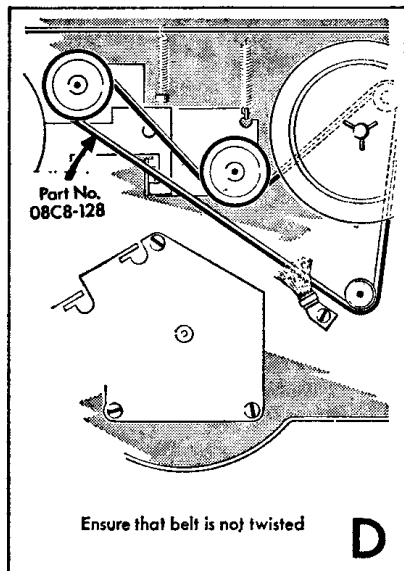
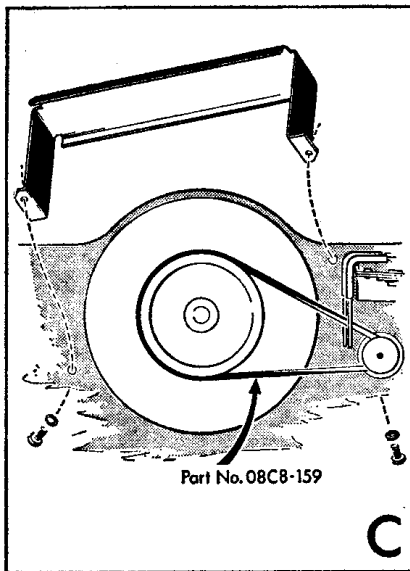
(1) Spool carrier ... ..	08M5-014	(51) Record/Play head (4-track) ... ..	08D5-024
Friction ring (fitted to item 1) ... ..	08F7-026	Record/Play head (2-track) ... ..	08D5-021
(2) Friction disc, left-hand ... ..	08C8-114	Adjustment screw (Azimuth) ... ..	SM25CC15
(3) Cellulose acetate washer ... ..	08L6-045	(52) Head clamping spring ... ..	08B5-002
(4) Grip ring ... ..	08L3-019	(53) Erase head adjustment screw ... ..	SM25CC05BX
(5) Rewind pulley ... ..	08M4-103	(54) Compression spring, signal head (Azimuth) ... ..	08B5-129
(6) Friction belt ... ..	08C8-111	(55) Head plate riveting assembly ... ..	08M1-075
(7) Friction disc, right-hand ... ..	08C8-098	(56) Tape guide boss, right-hand ... ..	08B3-200
(8) Operating plate pin ... ..	08B3-170	(57) Tape guide platform ... ..	08B1-225
Special washer ... ..	08L6-047	(58) Tape guide boss, left-hand ... ..	08B3-189
(9) Play lever ... ..	08B1-195	Nut for items 56 and 58 ... ..	NFHM40
Tension spring ... ..	08B5-121	(59) Head plate distance bush ... ..	08B3-181
Sleeve ... ..	08C7-001	Screw ... ..	SM40KK22
Damping pad ... ..	08F7-033	(60) Grommet distance bush ... ..	08B3-225
(10) Operating plate ... ..	08B0-047	Special washer ... ..	08L6-047
Tension spring ... ..	08B5-120	(61) Grommet ... ..	08C3-016
(11) Rewind plate riveting assembly ... ..	08M1-055	(62) Motor stud ... ..	08B3-227
Tension spring ... ..	08B5-154	Spring washer ... ..	WSSM40
(12) Control key (flat type) ... ..	08C8-107/001	Nut ... ..	NFHM40
Control key (raised moulding type) ... ..	08C8-103/001	(63) Motor (240V, 50Hz); (117V, 60Hz, 0809-012/003) ... ..	08D9-012/001
Tension spring ... ..	08B5-123	(64) Fan ... ..	08C8-143
(13) Record key (flat type) ... ..	08C8-107/002	(65) Motor pulley (50Hz); (60Hz, 08D3-221) ... ..	08D3-192
Record key (raised moulding type) ... ..	08C8-103/002	(66) Leaf spring for 'Stop' key ... ..	08B5-163
Tension spring ... ..	08B5-123	(67) Record lever ... ..	08B1-200
(14) Track knob pin ... ..	08B3-211	Tension spring ... ..	08B5-130
(15) Track knob ... ..	08B8-161	(68) Record latch ... ..	08B1-204
(16) Track knob shank ... ..	08C8-160	Washer ... ..	WPLB04
(17) Ball bearing ... ..	08C5-068	Push-on-fix ... ..	03L2-052
(18) Track knob spring ... ..	08B5-136	(69) Pause latch ... ..	08B1-201
(19) Track knob bracket ... ..	08B1-238	Return spring ... ..	08B5-108
(20) Connecting link ... ..	08B0-057	(70) Tape position indicator pulley ... ..	08C8-099
(21) Track switch bell crank ... ..	08C8-166	Compression ring ... ..	08L3-207
(22) Interlock rod ... ..	08B5-147	(71) Tape position indicator belt ... ..	08C8-112
(23) Record/Play switch coupling ... ..	08B5-145	(72) Stop solenoid assembly ... ..	08M1-070
(24) Latch bar ... ..	08C8-102	Plunger ... ..	08B3-228
Tension spring ... ..	08B5-150	Compression spring ... ..	08B5-142
(25) Spool retainer ... ..	08C8-120	Washer ... ..	08L6-042
(26) Rewind lever riveting assembly ... ..	08M1-052	Screw ... ..	SM25CC55
Tension spring ... ..	08B5-120	Circlip ... ..	08L3-024
(27) Forward lever riveting assembly ... ..	08M1-051	(73) Pause solenoid assembly ... ..	08M1-070
Tension spring ... ..	08B5-123	Plunger ... ..	08B3-206
(28) Pause lever ... ..	08B1-199	Compression spring ... ..	08B5-141
Tension spring ... ..	08B5-150	Washer ... ..	08L6-041
(29) Dust washer ... ..	08C8-141	Screw ... ..	SM25CC15
(30) Tape position indicator ... ..	08F4-005	Special washer ... ..	08L6-066
Screw ... ..	SZ04HP03	(74) Stop solenoid contact pin ... ..	08B3-207
(31) Brake keeper ... ..	08B1-283	Contact pin insulating bush ... ..	08C8-140
(32) Brake shoe ... ..	08C8-208	Solder tag ... ..	08K8-002
Screw ... ..	SZ04HP04	Washer ... ..	08L6-041
(33) Buffer ... ..	08C8-068	Nut ... ..	NFHM30
(34) Brake arm ... ..	08B1-193	(75) Lay pulley ... ..	08B3-231
Tension spring ... ..	08B5-126	Grub screw ... ..	SM30AC05
(35) Brush assembly ... ..	08M4-119	(76) Drive belt ... ..	08C8-128
Screw ... ..	SM40CC06	(77) Flywheel assembly ... ..	08M4-108
(36) Drive belt ... ..	08C8-110	(78) Speed change belt ... ..	08C8-159
(37) Flywheel assembly ... ..	08M4-107	(79) Stepped pulley spindle assembly ... ..	08M4-147
Washer ... ..	08L6-042	(80) Speed change knob bracket ... ..	08B1-237
Flywheel pivot ... ..	08C8-100	(81) Speed change knob ... ..	08C8-157
(38) Flywheel support bracket ... ..	08B1-205	(82) Knob shank ... ..	08C8-160
(39) Pause brake spring ... ..	08B5-112	(83) Compression ring ... ..	08B5-144
Pause brake pad ... ..	08C8-115	(84) Knob pin ... ..	08B3-211
(40) Hinged play bracket assembly ... ..	08M1-067	(85) Fork bracket ... ..	08B1-239
Circlip ... ..	08L3-024	Fork bracket pin ... ..	08B3-230
Tension spring ... ..	08B5-124	Washer ... ..	08L6-043
(41) Pinch-wheel arm riveting assembly ... ..	08M1-066	Circlip ... ..	08L3-025
Tension spring ... ..	08B5-125	(86) Fork index ... ..	08B1-274
(42) Pinch-wheel plate riveting assembly ... ..	08M1-074	(87) Speed change detent spring ... ..	08B5-159
(43) Pressure bracket assembly ... ..	08M1-063	(88) Fork stop ... ..	08B1-258
Pressure bracket spring ... ..	08B5-132	Fork pin ... ..	08B3-224
(44) Pinch-wheel grinding assembly ... ..	08M4-157	Washer ... ..	08L6-043
Tension spring ... ..	08B5-125	Circlip ... ..	08L3-025
Washer ... ..	08L6-044	Adjusting screw ... ..	SM25CC05BX
Circlip ... ..	08L3-024	(89) Speed change fork ... ..	08B5-148
(45) Standby arm ... ..	08B1-202	Damping pad ... ..	08C8-222
Tension spring ... ..	08B5-118	Fork hinge pin ... ..	08B3-229
Felt pad ... ..	08F7-033	Washer ... ..	08L6-043
(46) Erase head retaining bracket ... ..	08M1-056	Circlip ... ..	08L3-025
(47) Erase head (4-track) ... ..	08D5-025	(90) Connecting rod ... ..	08B5-158
Erase head (2-track) ... ..	08D5-022	(91) Speed compensation lever ... ..	08C8-165
(48) Head clamping spring ... ..	08B5-002		
(49) Compression spring, erase pillar ... ..	08B5-156		
(50) Record/Play head bracket ... ..	08M1-057		

The manufacturers reserve the right to vary specifications or use alternative materials as may be deemed necessary or desirable at any time.

## BELT REPLACEMENT



560 A



### MAIN DRIVE BELT—Single-speed Decks

To replace the drive belt, first lower the flywheel by releasing two screws securing the flywheel support bracket, taking care to retain the nylon dust washer for refitting. Remove screw and distance piece from rear of head plate to allow the drive belt to be fed under and around spindle bush, see (A). Position flywheel and fit replacement belt to pulley, then secure flywheel bracket. Replace screw and distance piece in head plate and refit nylon dust washer to spindle.

It is not necessary to remove the take-up spool carrier (secured by a circlip and washer below deck) to fit the belt to the drive pulley on the motor shaft, although this can be done if preferred. Note, however, that a few pulleys have an extra groove for 60Hz mains operation. Where such pulleys are encountered in service, use the second groove up for 50Hz mains operation.

The complete drive belt arrangement is shown in diagram (B).

*Note:* It is important to check that the replacement drive belt is not twisted after fitting.

### SPEED CHANGE BELT—Two-speed Decks

Release the flywheel bracket as described for single-speed models and fit the belt over the flywheel and pulley as shown in (C).

### MAIN DRIVE BELT—Two-speed Decks

The drive belt for these models is not taken round the flywheel but to a pulley on top of the deck. The complete arrangement is shown in (D). As in single-speed models, it is not necessary to remove the take-up spool.

*Note:* It is important to check that the replacement drive belt is not twisted after fitting.

### TAKE-UP BELT—All Decks

The following applies to both types of tape deck, but in this case the take-up spool carrier is removed to enable the take-up belt to be fitted; shown at (E).

### TAPE POSITION INDICATOR BELT—All Decks

An additional belt below the tape deck is used to drive the tape position indicator. This is fitted to all models and is shown in (F).

## ADJUSTMENTS

Mechanical tolerances and clearances given below are provided as a guide for use when clearing a mechanical fault. A correctly operating deck need not necessarily be within the stated limits.

**Diagram A** shows the space required between the spool carrier and the drive pulleys. With the keys in the neutral position and the rewind plate held to the left-hand side against the operating pin, the clearance between the rewind pulley and spool carrier should be within the limits shown. A similar space should exist between the take-up pulley and spool carrier when the rewind plate is held to the right-hand side.

Adjustment is by bending the central lug on the rewind plate.

**Diagram B** indicates pressure and clearances with 'Play' key latched. The pressure between the capstan and pinch-wheel should be within the limits stated, any correction can be made by bending the sleeved lug on 'Play' lever.

The clearance between the lug on the standby arm and the pinch-wheel plate should not exceed the clearance stated. Any adjustment required can be made by bending the lug on the standby arm.

The clearance between the pinch-wheel arm and the pinch-wheel plate should not be less than shown. Correction can be made by bending sleeved lug on 'Play' lever.

**Diagram C** shows the space between the capstan and the pinch-wheel with the 'Play' and 'Pause' keys depressed. To correct, if necessary, bend the lug on 'Pause' lever. Depress 'Stop' key to check that pause brake clears rewind spool carrier.

**Diagram D** shows that with 'Record' and 'Play' keys latched simultaneously, a space appears between the foot of the 'Record' key and the 'Record' lever.

Adjustment is by bending the lug on the underside of the 'Record' lever.

**Diagram E** shows the take-up tension and back tension on the tape during normal forward motion.

*Note:* The brake arm rubber pad *must* disengage the take-up spool carrier before any motion takes place. For correct operation, bend the lugs contacting the brake arm on the 'Rewind', 'Play' and 'Forward' levers.

### SOLENOID ADJUSTMENT—Two-speed Decks

If the 'Pause' solenoid is out of adjustment proceed as follows:

1. Depress 'Play' key and check that brake pad is clear of left-hand spool carrier by .030in. With the plunger held into the solenoid, turn the plunger screw in a clockwise direction until a gap of .008in.—.010in. is obtained between the capstan and pinch-wheel.

2. Operate 'Stop' key and, with the 'Pause' solenoid de-energized but with the 'Pause' key depressed, bend lug on standby arm to provide a gap of .030in. between 'Pause' brake pad and left-hand spool carrier.

3. Operate 'Play' key and finally release both 'Play' and 'Pause' keys to ensure that pinch-wheel carrier returns and that brake pad is clear of left-hand spool carrier.

If the 'Stop' solenoid is out of adjustment, proceed as follows: Depress 'Forward' wind key then, with plunger held into solenoid, adjust screw linking solenoid to latch plate, so that the latch plate trips key. Turn the screw a further half turn, taking care that the screw head is kept to the bottom of slot in latch plate. Depress 'Play' and 'Record' keys, then energise 'Stop' solenoid when, if correctly adjusted, the latch bar will release both keys.

