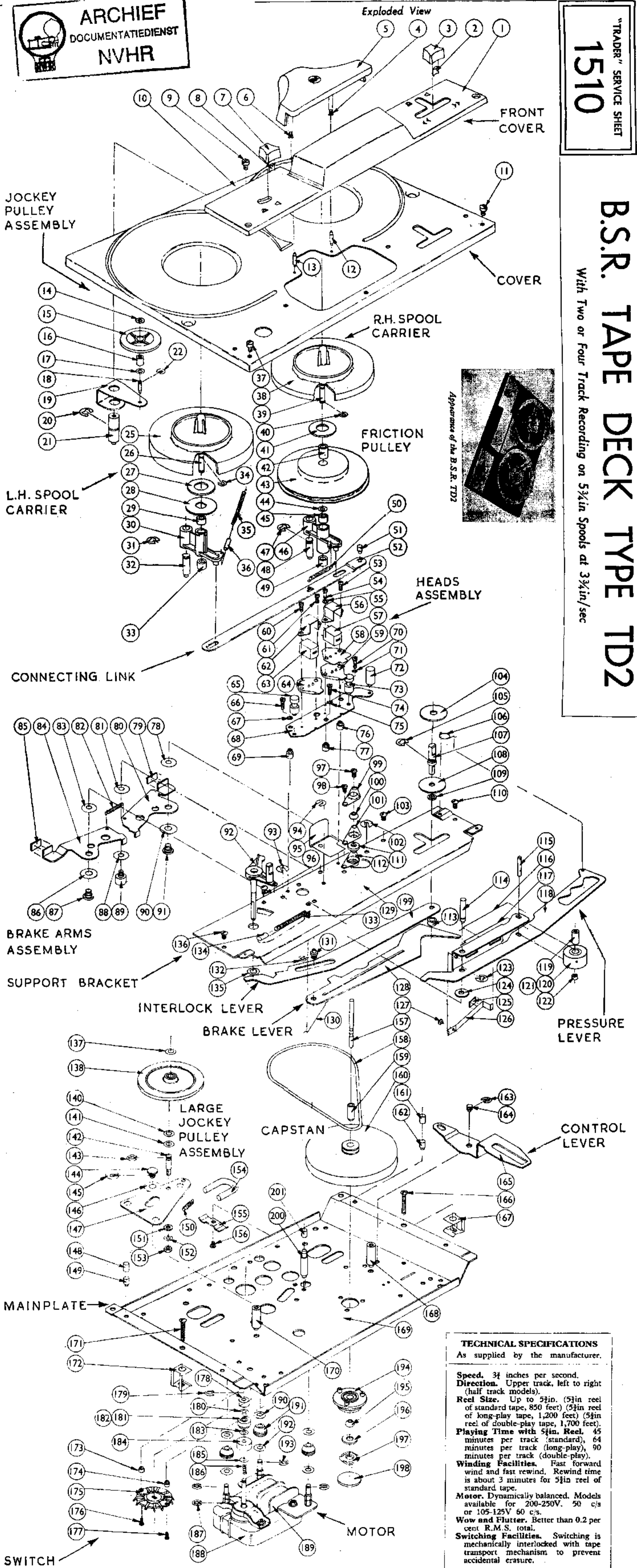


"TRADER" SERVICE SHEET
1510

B.S.R. TAPE DECK TYPE TD2
With Two or Four Track Recording on 5 1/2 in Spools at 3 3/4 in/sec



TECHNICAL SPECIFICATIONS
As supplied by the manufacturer.

Speed. 3 1/4 inches per second.

Direction. Upper track, left to right (half track models).

Reel Size. Up to 5 1/2 in. (5 1/2 in reel of standard tape, 850 feet) (5 1/2 in reel of long-play tape, 1,200 feet) (5 1/2 in reel of double-play tape, 1,700 feet).

Playing Time with 5 1/2 in. Reel. 45 minutes per track (standard), 64 minutes per track (long-play), 90 minutes per track (double-play).

Winding Facilities. Fast forward wind and fast rewind. Rewind time is about 3 minutes for 5 1/2 in reel of standard tape.

Motor. Dynamically balanced. Models available for 200-250V. 50 c/s or 105-125V 60 c/s.

Wow and Flutter. Better than 0.2 per cent R.M.S. total.

Switching Facilities. Switching is mechanically interlocked with tape transport mechanism to prevent accidental erasure.

In this exploded view of the B.S.R. TD2 tape deck, individual parts which make up small assemblies are linked by faint broken lines along the centre lines of these assemblies (in most cases) and through the points where they are joined to the main assembly. Reference numbers are the same as those used in the components table overleaf. The tape heads illustrated are not necessarily fitted to all decks and care should be taken to ensure that the exact replacement is ordered (see diagram cols. 1 and 2 overleaf).

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DESIGNED for simplicity of operation, the B.S.R. type TD2 tape deck comprises a mechanical unit for incorporation in tape recorders. This *Service Sheet* is limited to the mechanical operation of the unit since the electronic details will vary with the amplifier design. Record/Playback knob operates the switch pawl (92). The switch pawl shaft extends below the tape deck and is shaped to permit its use as the centre spindle of a rotary-type switch unit which will function as the record/playback switch. A four-pole changeover switch wafer (175) may be supplied by the tape deck manufacturers.

The TD2 will operate on 200-250V 50c/s A.C. mains supply and by fitting an alternative motor it can be made suitable for operation on 105-125V at 60c/s. It has a single speed of 3½in/sec and will accommodate spool sizes up to 5½in. Any pair of three different sets of heads may be fitted providing either two-track or four-track recording (see Record/Playback and Erase Heads below).

RECORD/PLAYBACK ERASE HEADS

The tape deck may be fitted with one of three alternative sets of heads. The type fitted will depend on the requirements of the tape recorder manufacturer. Two types are for twin-track recording and the third type is for four-track recording. All conform to the international standard.

The diagram below illustrates the heads as they appear from the front of the mounting plate, and the erase head removed from its mounting. When ordering replacements it is important to state the correct type. Our sample tape deck was fitted with Marriott twin track heads.

During cleaning or servicing of the recording heads a metal screwdriver or anything made of iron or steel should not be

allowed to make contact with the heads, otherwise serious damage may result.

After a period of use the heads may require cleaning. To do this it is necessary to remove the head cover as described under "Dismantling." Symptoms such as low output, poor H.F. response and faulty erasure may be due to accumulated oxide dust and cellulose forming a sticky paste on the faces of the heads. Using a soft cloth dampened with methylated spirits, clean both heads. Do not use petrol or carbon tetrachloride otherwise the pressure roller and plastic covers may be adversely affected.

Azimuth Alignment.—The record/playback head is adjusted at the factory for optimum H.F. response and is unlikely to require attention. However, if the head has been replaced or if the securing screws (53 or 54) have been disturbed, realignment will be necessary.

Connect an output meter across the tape recorder loudspeaker. Play a 3½in/sec 5kc/s test tape. By adjustment to screws 53 and 54 rock the head for maximum output.

Operating Conditions.—It is emphasized that electrical operating conditions for the erase and record/playback heads will be covered by the recorder manufacturers' service manual. The following conditions are typical of those which may be employed by the recorder manufacturer and have been included for reference purposes.

Marriott twin track heads: bias current at 50kc/s, 0.8mA. Recording current 50µA. Erase voltage, 20V. Erase current 90mA.

Marriott four-track heads: bias current 0.6mA. Recording current 65µA. Erase voltage 10V. Erase current 55mA. No D.C. resistance readings are given for the tape heads but they may be tested for continuity using a low voltage A.C. source

only. D.C. current must not be applied to the heads or they may be magnetized.

SERVICE NOTES

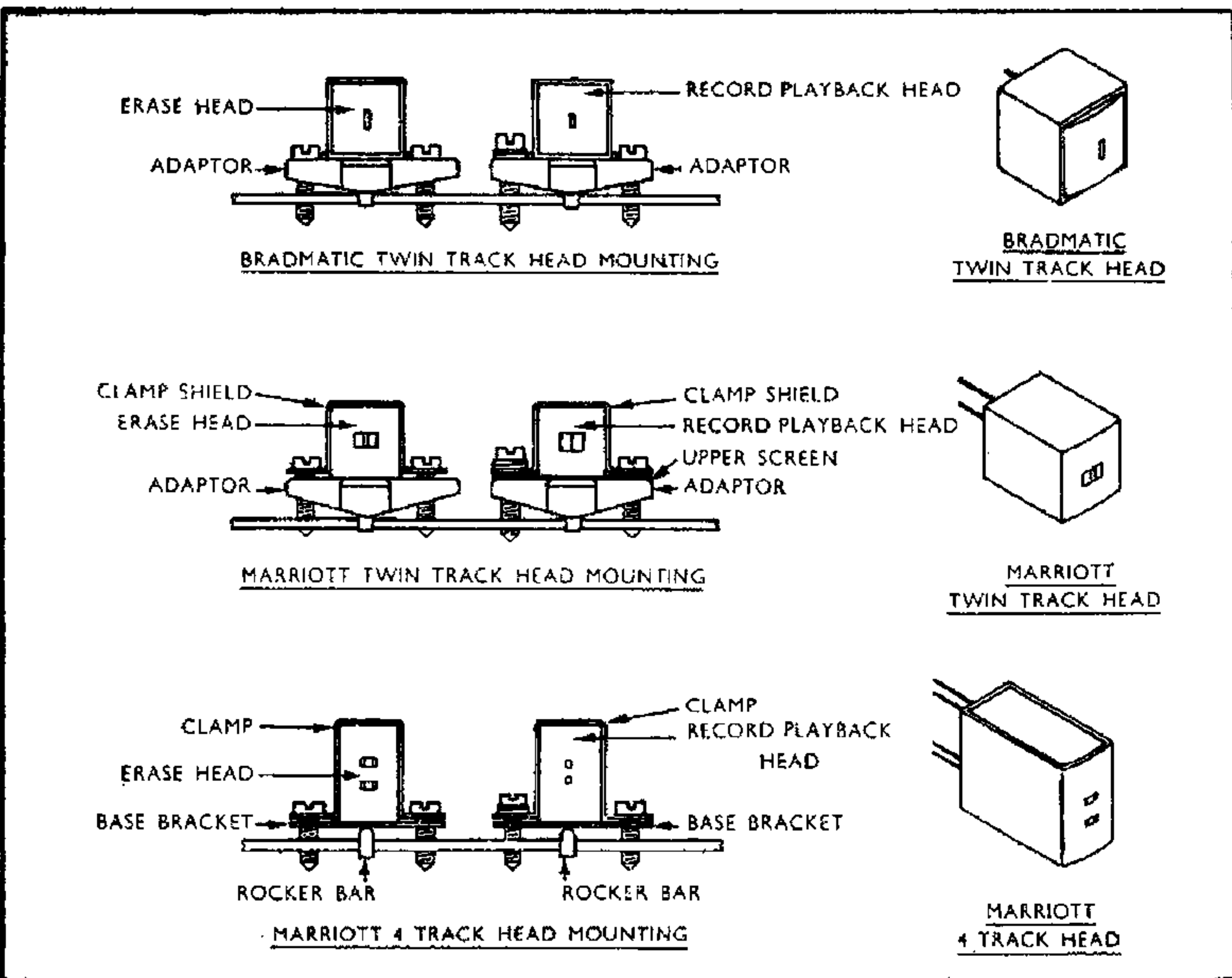
The following are some fault symptoms which may be encountered on the TD2 tape deck. They are accompanied by likely reasons, supplied by the manufacturer, for failure of the unit.

- 1.—**Failure to operate in any switch position.**
No current to motor, defective motor or seized motor bearings.
- 2.—**Tape will not feed in record or playback position.**
Front cover (1) and pressure roller spindle binding, preventing engagement of pressure roller (120/1) and capstan spindle (157). Toggle spring (106) rubbing on cover assembly (10). Large jockey pulley (138) not engaging capstan machining (160). Toggle spring (106) broken.
- 3.—**No fast forward wind.**
R.H. support arm spring (50) strained or detached. R.H. support arm (46) tight on pivot (48).
- 4.—**No fast rewind.**
Support arm spring (35) strained or detached. L.H. support arm (30) tight on pivot (32). Internal wiring of amplifier fouling support arms.
- 5.—**Sluggish action of control knob.**
Toggle spring (106) broken or binding on cover assembly.
- 6.—**R.H. spool carrier (38) fails to revolve on record or playback.**
Take up drive belt (158) stretched, or detached from friction pulley.
- 7.—**R.H. spool carrier (38) speed slow when taking up tape on record or playback.**
Take up belt (158) slipped from groove in capstan machining.
- 8.—**Noise during record and playback.**
Copper rings round motor laminations loose. Refix with adhesive. Large jockey pulley slide (147) distorted allowing excess movement. Defective large jockey pulley (138). Loose parts in cover assembly (10).
- 9.—**Weak or no record and replay.**
Build up of foreign matter on replay head surface (57). Defective wiring to replay head. Defective head. Defective switch (175). Defective amplifier.
- 10.—**Partial or no erase.**
Build up of foreign matter on erase head (63) surface. Defective head. Defective wiring. Defective switch (175). Defective amplifier.
- 11.—**Playback from recorded tape but no record.**
Defective record/replay head. With this type of defect, the head short-circuits when bias voltage is applied on record.
- 12.—**"Wow"** (variation of frequency of sustained note).
Pressure roller (121) worn. Capstan spindle (157) bent. Pressure roller (121) not engaging capstan spindle (157). Faulty tape.

GENERAL NOTES

Lubrication.—The tape deck is correctly lubricated at the factory but after prolonged use the following parts should be lubricated using a light oil.

- 1.—The top bearing of the capstan (100). This bearing can be reached after



Any pair of tape heads in the above diagram may be fitted to the TD2 tape deck. The heads in the exploded drawing overleaf are Marriott twin-track.

removing the head cover (5) (see Dismantling). Excess oil should be removed from that portion of the capstan spindle against which the pressure roller runs.

- 2.—Jockey pulley bearings (16 and 138) and pressure roller bearing (119). Lubricate these parts ensuring oil does not get on the rubber rim of the pulleys.
- 3.—Motor bearings. Lubricate these ensuring no oil is allowed on to the drive pulleys. Pay particular attention to the top motor bearing, which must be adequately lubricated.

Dismantling.—Before dismantling, check that the mains supply is disconnected from the unit. To obtain access to the heads, take off the removable head cover (5) by carefully easing it vertically off the two locating pins. When replacing, do not distort the top cover (10) by undue pressure.

To remove the top cover first pull off the control knobs.

Take out three cover securing screws, one on either front corner and one between the spool carriers.

Lift the cover clear and expose the mechanism.

To remove the capstan, note the head lead connections and unsolder the leads.

Remove two self tapping screws (110 and 136) and two 4BA screws (96 and 103) from the support bracket assembly.

Take off support bracket assembly by gently easing upwards.

Lift capstan out of bottom bearing. When replacing ensure that the lower end of the R.H. control knob spindle (107) is inserted into the slot in the control lever (165) and that the spindle of the record/playback lever (92) is fitted into

the slot(s) in the switch wafer(s) beneath the mainplate.

The tape heads can be removed as an assembly by removing the three screws (66, 70 and 74).

The heads can be removed individually by removing the two screws situated one on either side of the head. When the heads are replaced they must be adjusted for correct azimuth alignment.

Safety Interlock.—When the R.H. control knob is moved to the forward position (record and playback), the interlock lever (199) prevents movement of the switch pawl (92). Therefore, unless the record/playback knob is deliberately held in the record position while the R.H. knob is operated, it cannot subsequently be moved from the playback position while the tape is in motion. This arrangement prevents accidental erasure.

COMPONENT PART NUMBERS AND DESCRIPTIONS

Items in these tables marked with an asterisk should be purchased in the assembled form as listed on page 3.

ITEM	PART No.	DESCRIPTION
1	*C102452	Front cover
2	A102456	Knob clip
3	A102450	Knob
4	A102635	Clip
5	C102451	Removable cover
6	A102635	Clip
7	A102450	Knob
8	A102456	Knob, clip
9	—	Screw. 4 B.A. by 1/4 in filister hd.
10	*D102454	Cover
11	—	Screw. 4 B.A. by 1/4 in filister hd.
12	*A102472	Locating stud
13	*A102472	Locating stud
14	A101620	Jockey pulley washer
15	*A101622	Jockey pulley moulding
16	*A101624	Jockey pulley bearing
17	A101620	Jockey pulley washer
18	*A103288	Jockey pulley spindle
19	*A102811	Jockey arm
20	A102823	Circlip
21	*A102814	Jockey arm pivot
22	A100762	Circlip
25	*B102845	Spool carrier (left)
26	*A102419	Carrier spindle
27	A102473	Friction disc
28	A102437	Washer
29	*A102408	Bearing bush (support arm)
30	*B102405	Support arm (left)
31	A101526	Circlip
32	*A102886	Pivot (left)
33	*A102408	Bearing bush (support arm)
34	A100762	Circlip
35	A103025	Spring (left support arm)
36	—	5 mm P.V.C. sleeving
37	—	Screw. 4 B.A. by 1/4 in filister hd.
38	*B102407	Spool carrier (right)
39	*A102419	Carrier spindle
40	A100762	Circlip
41	A102473	Friction disc
42	*A102409	Bearing bush (friction pulley)
43	*B102404	Friction pulley
44	A102104	2 B.A. plain washer
45	*A102408	Bearing bush (support arm)
46	*B102406	Support arm (right)
47	A101526	Circlip
48	*A102887	Pivot (right)
49	*A102408	Bearing bush (support arm)
50	A102493	Spring (right support arm)
51	*A102447	Shouldered pin
52	*B103007	Connecting link

ITEM	PART No.	DESCRIPTION
53	A102992	Screw. 6 B.A. by 3/8 in ch. hd.
54	A103170	Screw. 6 B.A.
55	—	6 B.A. Thackray washer
56	A103112	Clamp shield
57	A102874	Record/playback head (Marriott)
58	A103111	Upper screen
59	A103113	Adaptor; record/playback (Marriott)
60	A102992	Screw. 6 B.A. by 3/8 in ch. hd.
61	A102992	Screw. 6 B.A. by 3/8 in ch. hd.
62	A103112	Clamp shield
63	A102875	Erase head (Marriott)
64	A103114	Adaptor; erase (Marriott)
65	*A102438	Tape guide
66	A102992	Screw. 6 B.A. by 3/8 in ch. hd.
67	—	6 B.A. lockwasher
68	*A102797	Mounting plate
69	*A102440	Spacer
70	A102992	Screw. 6 B.A. by 3/8 in. ch. hd.
71	—	6 B.A. lockwasher
72	*A102807	Tape post
73	*A102438	Tape guide
74	A102992	Screw. 6 B.A. by 3/8 in ch. hd.
75	—	6 B.A. lockwasher
76	*A102440	Spacer
77	*A102440	Spacer
78	A103020	Washer
79	A102467	Brake pad
80	B103429	Brake arm (right)
81	A103020	Washer
82	A103433	Spring (brake arm)
83	A103020	Washer
84	B103430	Brake arm (left)
85	A102467	Brake pad
86	A103021	Washer
87	A103019	Pivot (brake arm)
88	A103020	Washer
89	A103115	Support rivet
90	A103021	Washer
91	A103019	Pivot (brake arm)
92	B102805	Switch pawl
93	A102108	Circlip
94	A102128	Circlip
95	A103110	Lower screen
96	—	Screw. 4 B.A. by 1/4 in r. hd.
97	—	Screw. 6-20 by 1/4 in type 25 b. hd.
98	—	Screw. 6-20 by 1/4 in type 25 b. hd.
99	A103123	Capstan bearing plate
100	A100617	Bearing
101	A103123	Capstan bearing plate
102	A102108	Circlip

Component Part Numbers and Descriptions—continued

ITEM	PART No.	DESCRIPTION	ITEM	PART No.	DESCRIPTION
103	—	Screw. 4 B.A. by 1/4 in r. hd.	153	—	4 B.A. nut
104	A102767	Washer	154	—	5 mm. P.V.C. sleeving
105	A102110	Circlip	155	A102718	Cable clamp
106	A102498	Toggle spring	156	—	Screw. 6-20 by 1/4 in type 25 b. hd.
107	*A103432	Knob spindle	157	*A103421	Capstan spindle
108	*A102461	Washer	158	A102442	Belt (take-up drive)
109	*A102458	Spacer	159	*A103420	Capstan bush
110	—	Screw. 6-20 by 1/4 in type 25 b. hd.	160	*A103005	Capstan machining
111	A103579	Oiling pad (capstan top bearing)	161	A103137	Damping sleeve
112	A103578	Capstan oil pad retainer	162	*A102737	Support pillar
113	*A102459	Sleeve	163	A100762	Circlip
114	*A102857	Pivot (pressure lever)	164	*A102891	Peg
115	A102812	Roller spindle	165	B102429	Control lever
116	A102500	Pressure roller spring	166	—	Screw. No. 8 by 1 in type J b. hd.
117	A102500	Pressure roller spring	167	A102633	Cabinet clamp
118	B102806	Pressure lever	168	*A102815	Locating pillar
119	*A102808	Bearing bush (pressure roller)	169	*C102436	Mainplate
120	*A102810	Pressure roller	170	*A102815	Locating pillar
121	*A102820	Pressure roller moulding	171	—	Screw. No. 8 by 1 in type J b. hd.
122	A102813	Roller spacer	172	A102633	Cabinet clamp
123	A102110	Circlip	173	*A102817	Switch spacer
124	A102880	Washer	174	*A102817	Switch spacer
125	A102470	Pressure pad	175	A102837	Switch
126	A102445	Pressure spring	176	—	Screw. 6 B.A. by 1/8 in r. hd.
127	A102098	Rivet	177	—	Screw. 6 B.A. by 1/8 in r. hd.
128	B102833	Brake lever	178	A102848	Drive sleeve
129	*C102433	Support bracket	179	A100762	Circlip
130	A103024	Damping spring	180	A101620	Washer
131	*A102478	Pivot (brake lever)	181	A103138	Motor pulley sleeve
132	A100762	Circlip	182	A103139	Motor pulley moulding
133	A102123	Spring (switch pawl)	183	A101620	Washer
134	—	5 mm. P.V.C. sleeving	184	A103133	Motor pulley
135	A102825	Clip	185	A101620	Washer
136	—	Screw. 6-20 by 1/4 in type 25 b. hd.	186	A103103	Friction spring
137	A100614	Paper washer	187	A100762	Circlip
138	A103227	Jockey pulley assembly (large)	188	*—	T.P.8/17 motor (see 188A)
140	A102595	Washer	189	*—	Motor coil (see 189A)
141	A103069	Washer	190	A101646	Mounting washer (3-off)
142	A103009	Jockey pulley spindle (large)	191	A102181	Rubber mounting (3-off)
143	A100762	Circlip	192	A101646	Mounting washer (3-off)
144	A103064	Pivot	193	A100762	Circlip (3-off)
145	A102108	Circlip	194	*B103122	Capstan bearing
146	A103021	Fibre washer	195	*A100617	Bearing
147	A103008	Slide	196	*A100616	Felt washer
148	A103137	Damping sleeve	197	*B100594	Bearing pressure spring
149	*A102737	Support pillar	198	*A103121	Bearing plate
150	A103011	Spring (jockey pulley)	199	*B103431	Interloc. lever
151	A100621	Spacer washer	200	*A103451	Support pin
152	—	4 B.A. lockwasher	201	A103137	Damping sleeve

COMPONENT SUB-ASSEMBLIES PART NUMBERS AND DESCRIPTIONS

ITEM	PART No.	DESCRIPTION	ITEMS INCLUDED IN ASSEMBLY
10A	C102630	Cover assembly	1, 10, 12, 13
15A	A102415	Jockey pulley assembly	15, 16
19A	A103535	Jockey arm riveting assembly	18, 19
25A	A102846	Spool carrier assembly (left)	25, 26, 27
30A	A102413	Support arm assembly (left)	29, 30, 33
38A	B102416	Spool carrier assembly (right)	38, 39, 41
43A	A102414	Friction pulley assembly	42, 43
46A	A102412	Support arm assembly (right)	45, 46, 49
52A	B103012	Connecting link assembly	51, 52
68A	A102839	Mounting plate riveting assembly	65, 68, 69, 72, 73, 76, 77
121A	A102821	Pressure roller assembly	119, 120, 121
129A	C103441	Support bracket riveting assembly	107, 108, 109, 113, 114, 129, 131, 199
160A	A103423	Capstan assembly	157A, 160
169A	C103443	Mainplate riveting assembly	21, 32, 48, 149, 162, 164, 168, 169, 170, 173, 174, 194A, 200
188A	B102985	T.P.8/17 motor assembly	
189A	B102983	T.P.8/17 bobbin assembly	
194A	A103134	Capstan bearing assembly (bottom)	194, 195, 196, 197, 198
157A	A103422	Capstan spindle assembly	157, 159

Note. Dealers are asked to quote part number and/or description when ordering a replacement. Colour, voltage and frequency should also be stated. The number stamped on the underside of the mainplate should be quoted on all correspondence concerning a tape deck.