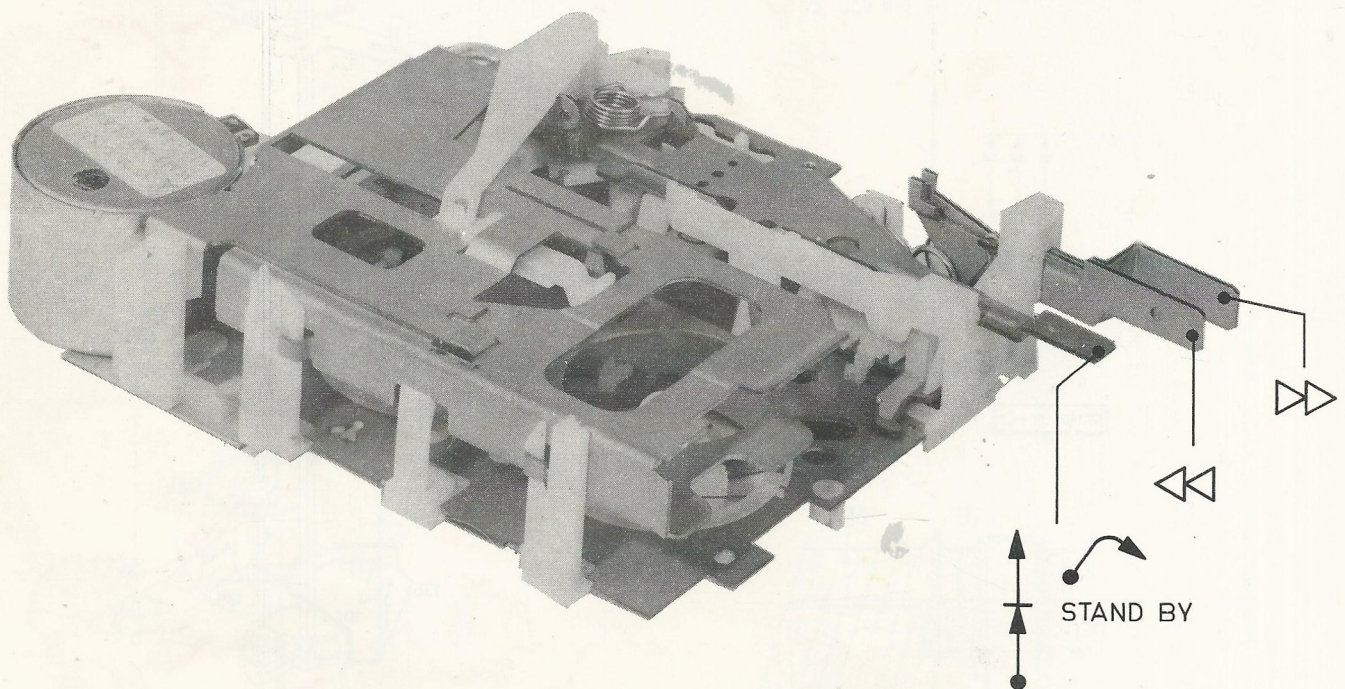


Service
Service
Service

Service Manual



SPECIFICATION

Tape speed	: 4.76 cm/sec. \pm 2% (10-45°C)
Working voltage	: 8.4-15 V
Wow and flutter	: \leq 0.3% (10-45°C)
Crosstalk	: \geq 35 dB (1 kHz)
Fast-wind time (C60)	: \leq 110 sec.
Number of tracks	: 2 x 2

36910A

OPERATION OF TAPE TRANSPORT (Figs. 1 ... 5)

In the aforementioned Figures arrows indicate the movements made by the parts to accomplish a definite operation.

The appended tables show the sequence of the movements as they should be read in the Figures.

For this, the following system has been adopted:

- 1 → 3 : movement of two different parts
2
- 1 → 2 : movement of a part composed of several pieces, which, for improved clarity of the Figure, is drawn at different places (e.g. friction).
→ 2a

Fig. 1 indicates the initial position

Figs. 2 ... 5 show the situation at the end of the sequence of movements starting from the situation shown in Fig. 1 (cassette inserted; tape transport in PLAY position).

MAINTENANCE

It is recommended to clean the tape transport and lubricate the principal points at regular intervals.

1. To be cleaned with alcohol or spirit

- playback head
- capstan
- pressure roller
- pulley

To clean head, pressure roller and capstan it is also possible to use a drop-in cleaning cassette (SBC114-4822 389 20015).

2. Lubricating instructions

- See exploded view 34 974E.

SERVICING HINTS

In a few places parts are locked by synthetic bosses. To be able to demount these parts, the bosses have to be bent, displaced, etc.

Gearwheel 128b and pressure roller bracket 119 are attached to the spindles by means of a snap connection. These parts can be demounted with a screwdriver. If gearwheel 128b has to be replaced, the corresponding bracket 128a should be replaced also.

For replacement of the various parts see Figs. 6 ... 9.

ADJUSTMENTS AND CHECKS

Measuring equipment required

- Universal test cassette SBC419-4822 397 30069
- Universal test cassette SBC420-4822 397 30071
- Friction test cassette 4822 395 30054
- AC millivoltmeters
- Spring scale 3-55 gr
- Wow-and flutter meter

1. Azimuth (Figs. 11, 12)

- Apply a 4 Ω load to both loudspeaker outputs.
- Connect an AC millivoltmeter across both loudspeaker outputs.
- Play the 10 kHz signal of test cassette SBC419 or SBC420.
- Adjust screw A for the average of the max. output voltages.
- The maximum allowed difference between both channels is 4 dB

2. Play tape-up torque and supplying reel drag

- Insert the friction test cassette.
The play tape-up torque should be 45 to 55 g.cm, measured after a 2-minute run-in time.
- The supplying reel drag should be 4-6 g.cm.
- In case of deviating values, the play take-up torque or supplying reel drag should be replaced.

3. Pressure roller 119

- Check acc. to Fig. 13.

The pressure of the pressure roller cannot be adjusted; in case of a deviating value spring 507 should be replaced.

4. Wow and flutter/tape speed

This check should be performed on a complete carradio.

Proceed as follows:

- Connect wow-and-flutter meter to loudspeaker outputs.
- Insert test cassette SBC419 or SBC420 and play the 3150 Hz signal.
- The wow-and-flutter value should be max. 0.3%.
- The tape speed should be 4.76 cm/sec \pm 2%.
- The speed can be adjusted with screw B (Fig. 10).

In case of excessive wow-and-flutter values the following components should be checked for correct working (adjustment).

- motor 132
- pressure roller 119
- friction clutch 103
- flywheel 137
- belt 117

5. Flywheel 137

- See Fig. 14.

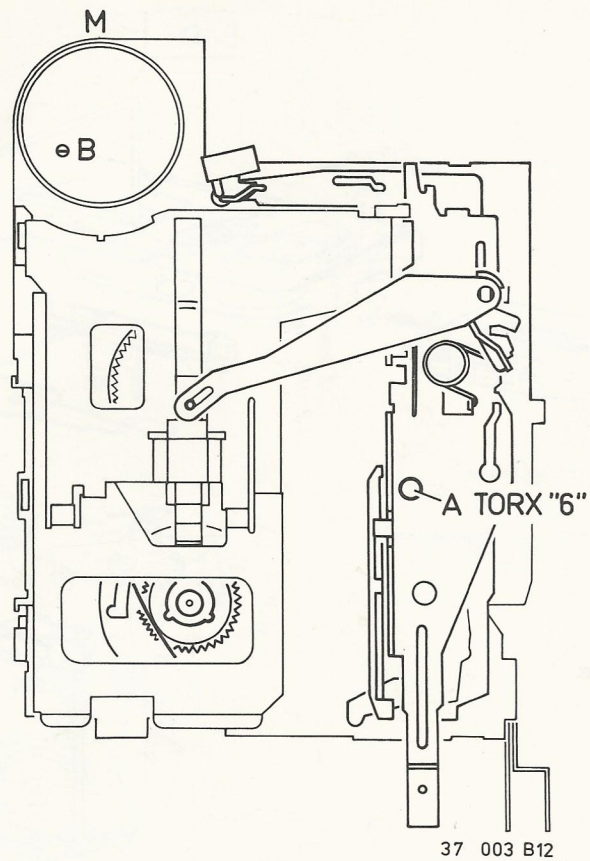


Fig. 11

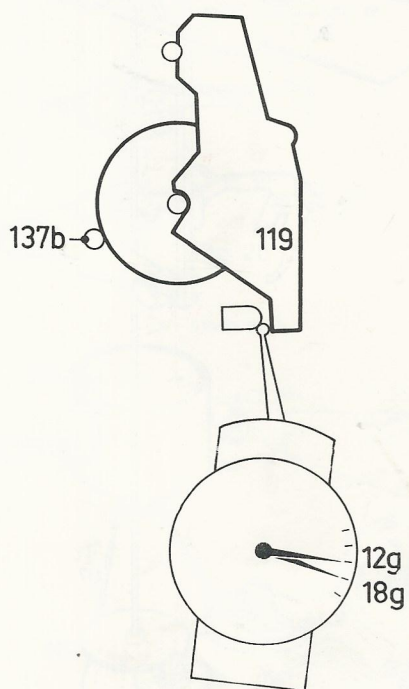


Fig. 13

35 979 A12

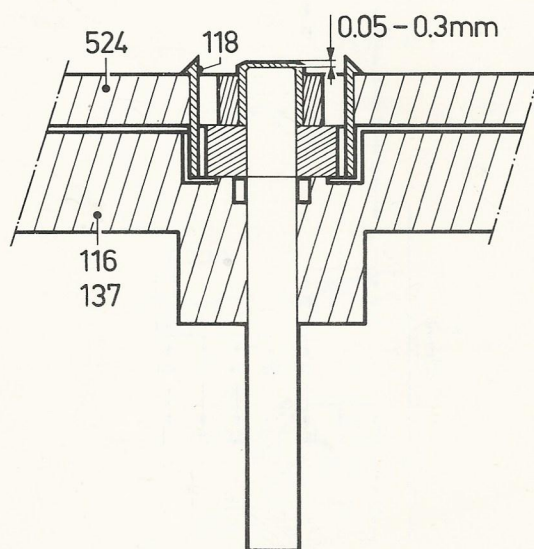
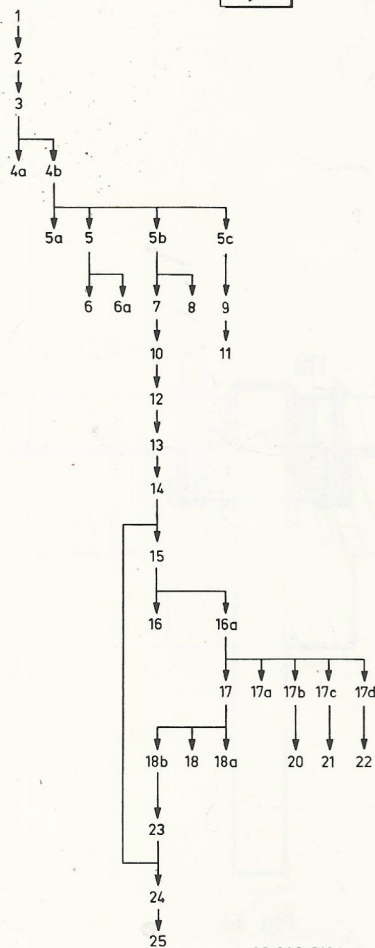
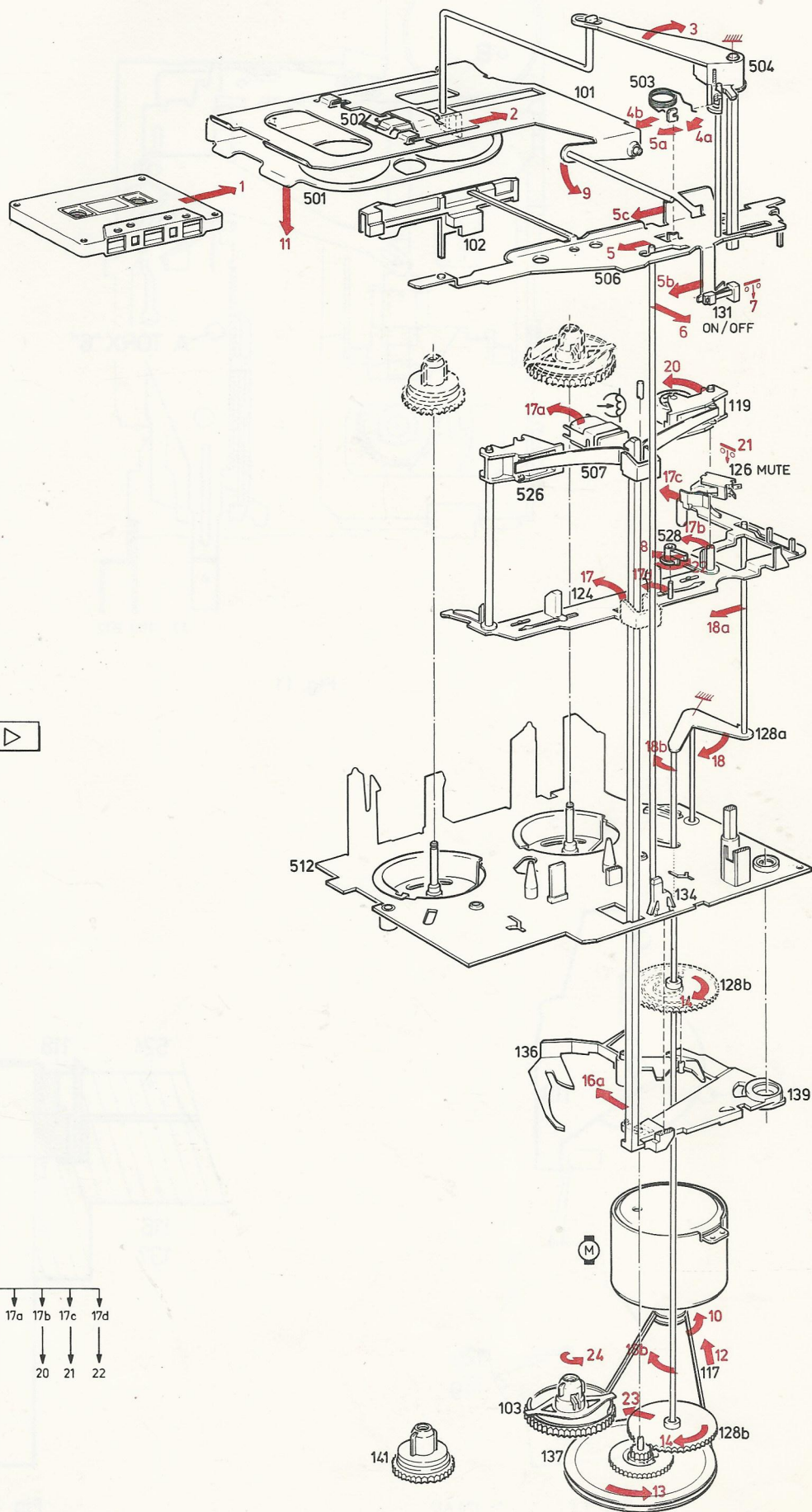


Fig. 14

35 980 A12/A



36 936 C12

Fig. 1a

36 933 E12

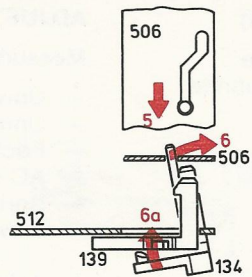


Fig. 1b

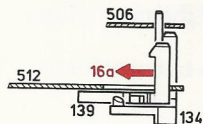


Fig. 1c

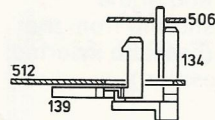
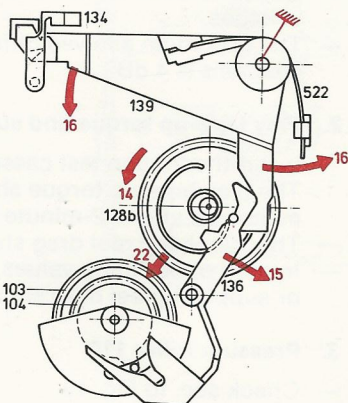


Fig. 1d

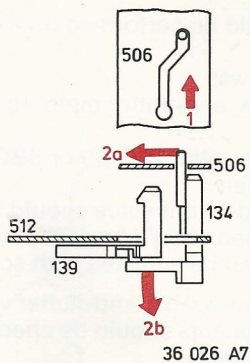
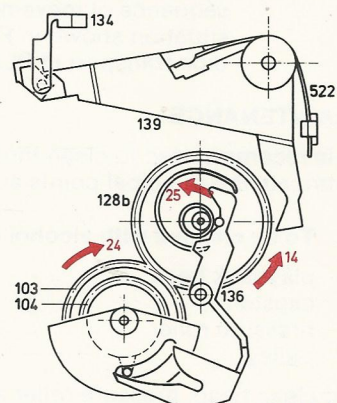


Fig. 2b

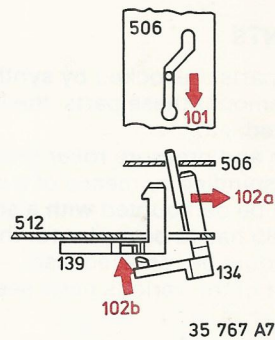


Fig. 2c

▷ — STAND BY 3

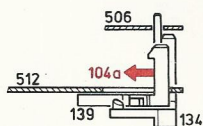


Fig. 2d

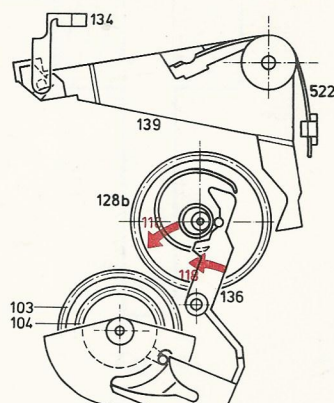
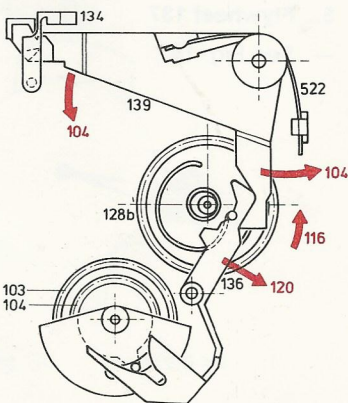
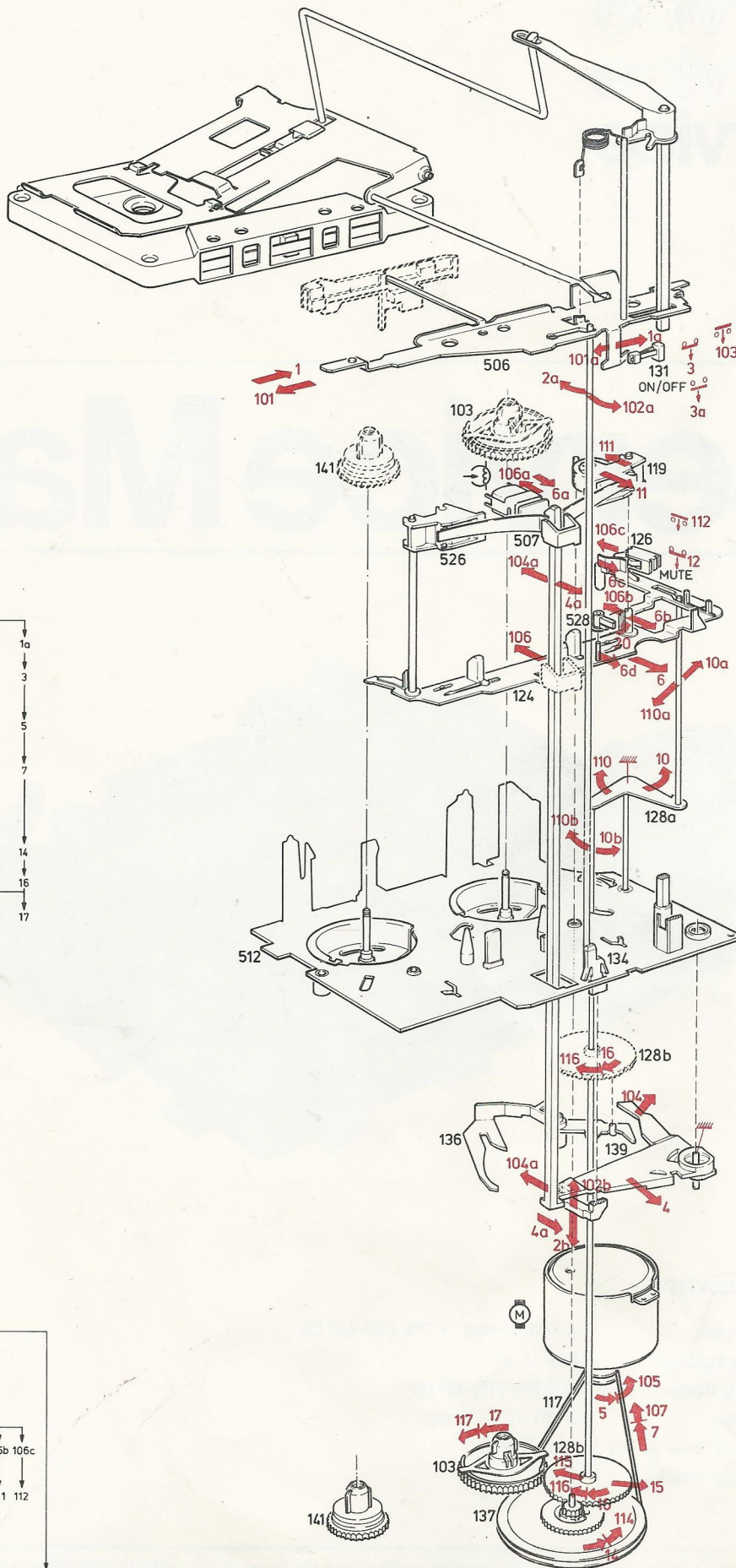


Fig. 2e

36 941 B12

▷STAND BY◁



BELT 117, FLY WHEEL 137

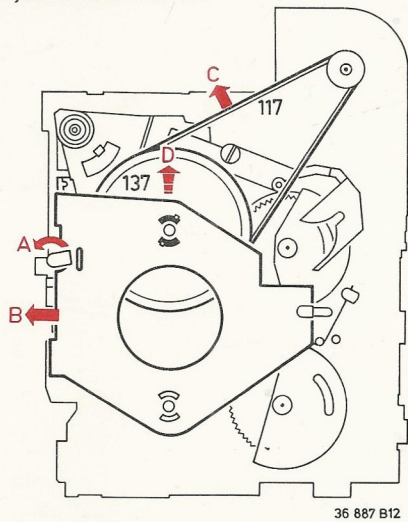


Fig. 6

PRESSURE ROLLER 119, HEAD 122

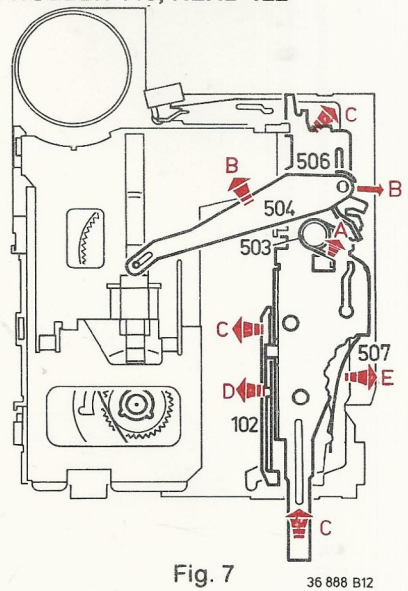


Fig. 7

HEAD BRACKET 124

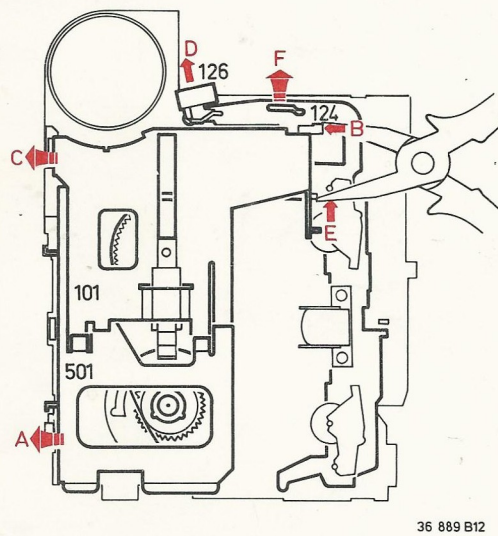


Fig. 8

CLUTCH 103, CARRIER 141

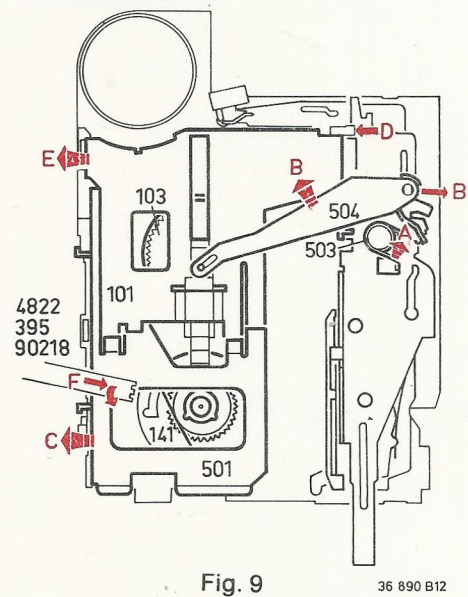


Fig. 9

COG WHEELS 109, 128

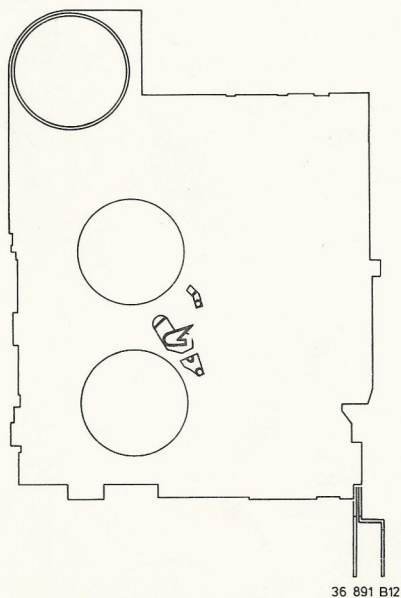


Fig. 10a

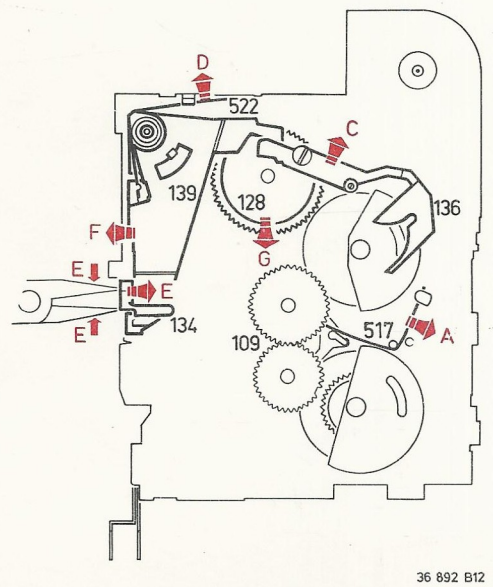


Fig. 10b

Exploded view diagram of a mechanical assembly, likely a watch movement. The diagram shows various components and their assembly sequence, indicated by red arrows and numbers.

Assembly Sequence Legend:

- 7c → 7d
- 11 → 12 → 14 → 17 → 18 → 19

Key Components and Labels:

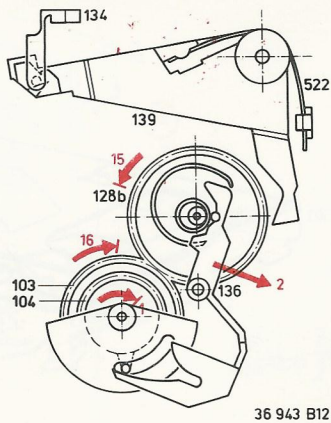
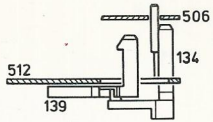
- 103: Gear
- 131: ON/OFF switch
- 119: MUTE
- 126: MUTE
- 526: Component
- 507: Component
- 528: Component
- 124: Component
- 512: Component
- 134: Component
- 128a: Component
- 128b: Component
- 136: Component
- 139: Component
- 137: Component
- 141: Component
- 117: Component
- 128b: Component
- 13: Component
- 15: Component
- 16: Component
- 17: Component
- 18: Component
- 19: Component

```

graph TD
    1 --> 2
    2 --> 3
    2 --> 4
    3 --> 5
    3 --> 6
    5 --> 6
    5 --> 6a
    6a --> 7
    6a --> 7a
    6a --> 7b
    6a --> 7c
    6a --> 7d
    7 --> 9a
    7 --> 9
    7 --> 9b
    9b --> 13
    13 --> 15
    13 --> 16
    7d --> 12
    7d --> 14
    7d --> 17
    7d --> 18
    7d --> 19
    12 --> 10
    12 --> 11
  
```

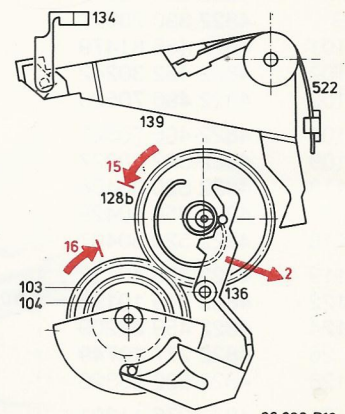
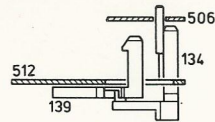
37 001 E7

Fig. 3a



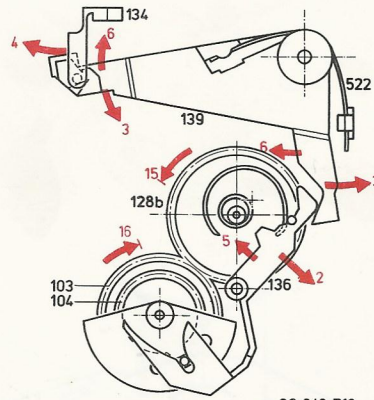
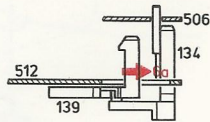
36 943 B12

Fig. 3b



36 939 B12

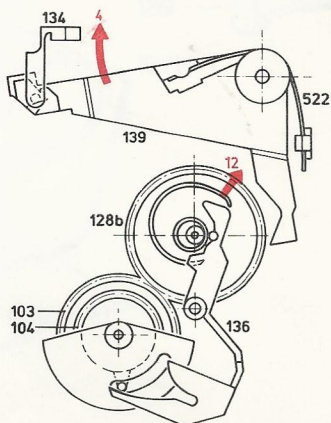
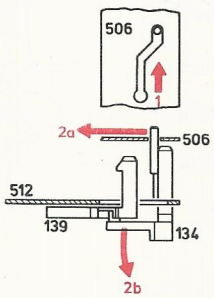
Fig. 3c



36 942 B12

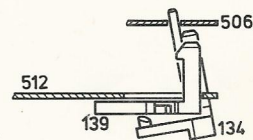
Fig. 3d

1
2a



36 998 B7

Fig. 4b



35 769 A7

Fig. 4c

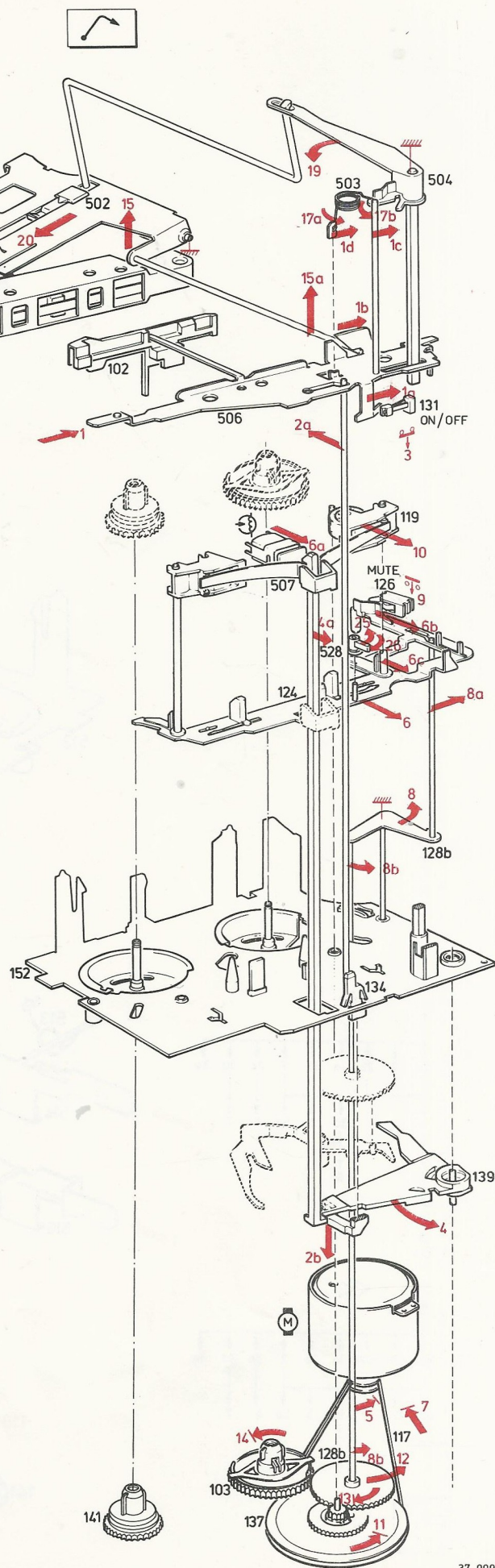
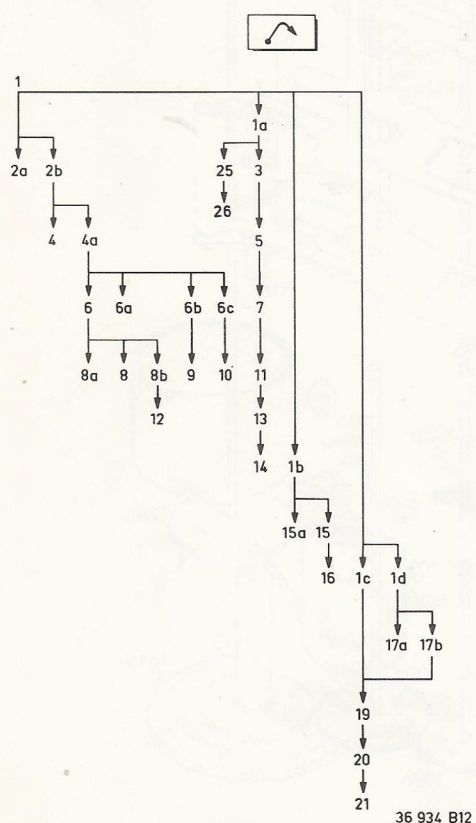
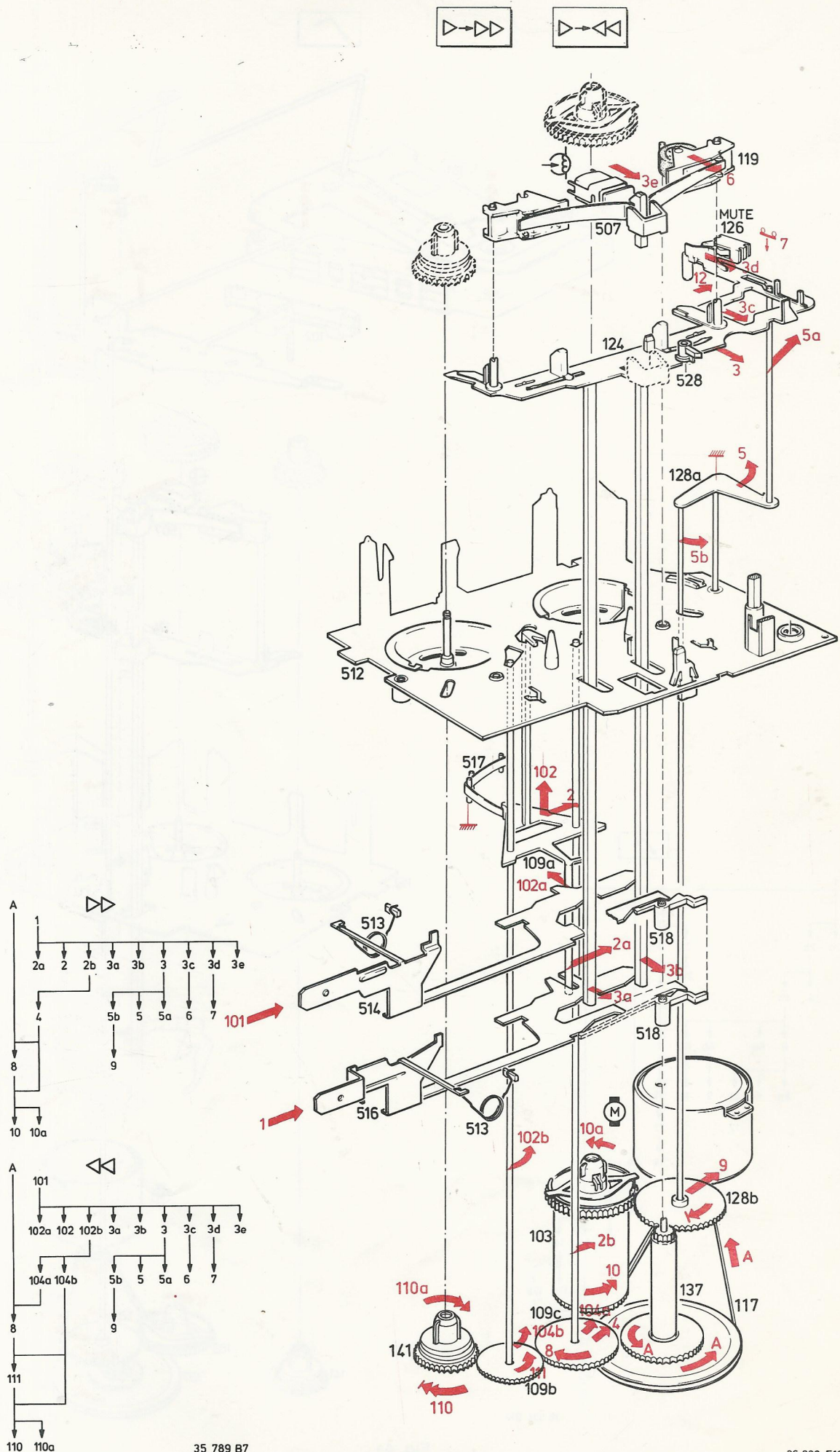


Fig. 4a



35 789 B7

Fig. 5

36 932 E12

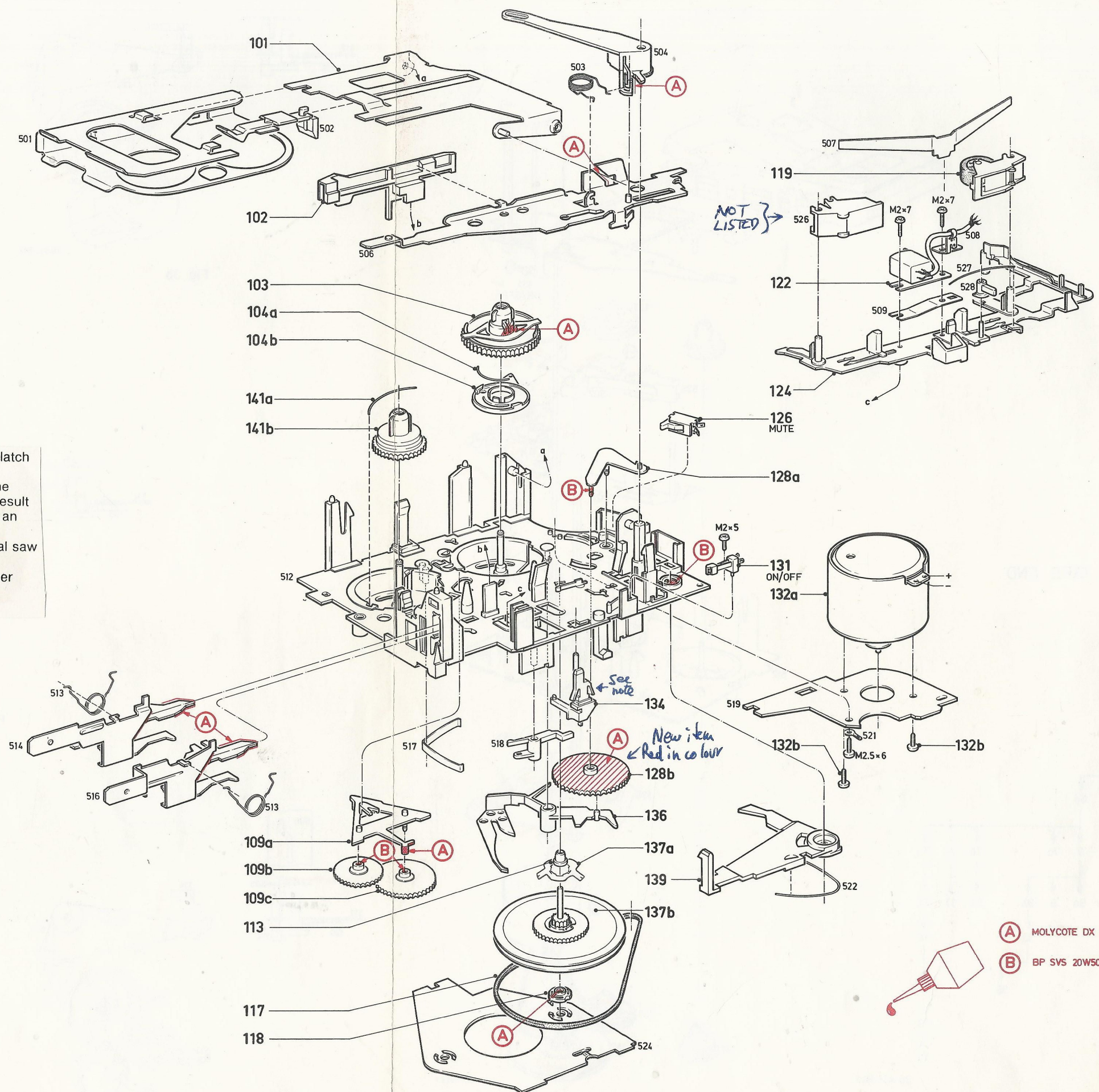
Also see Later Service Sheet Attached.

A	4822 390 10069
B	4822 390 20027
101	4822 466 81479
102	4822 462 30242
103	4822 466 70526
104	4822 466 70527
109	4822 522 20327
113	4822 520 30406
117	4822 358 30429
118	4822 520 30407
119	4822 403 40157
122	4822 249 10195 - P/N may be changed
124	4822 459 80209
126	4822 277 10749
128	4822 522 20326
131	4822 276 11291
132	4822 361 20505
134	4822 403 10225
136	4822 403 52031
137	4822 528 80984
139	4822 403 52029
141	4822 528 20399

the production method of latch lever 134 has been changed. At the same time, however, an additional rib has been added and the clearance in chassis 512 locally increased. As a result it is impossible to mount a changed latch lever in an unchanged mechanism. There are two solutions:

- Enlarge clearance in chassis by means of metal saw and a smooth file. See Fig. 1.
- Replace the complete mechanism (order number 4822 701 10123).

The above only applies to P1-0.



(A) MOLYCOTE DX 4822 390 20027
(B) BP SVS 20W50 4822 390 10069

THIS REPLACES A86-317

Previously published: A85-317 } P1-0
A85-323 }

Correction to Service Manual/Information

- A85-317 mentions that the production method of latch lever 134 has been changed. At the same time, however, an additional rib has been added and the clearance in chassis 512 locally increased. As a result it is impossible to mount a changed latch lever in an unchanged mechanism. There are two solutions:
 - a. Enlarge clearance in chassis by means of metal saw and a smooth file. See Fig. 1.
 - b. Replace the complete mechanism (order number 4822 701 10123).

The above only applies to P1-0.

- To be added: Code number of grease (A) Aeroshell 22C is 4822 390 20117. Also see A85-317.
- Auxiliary tool 4822 395 90218 to remove the carriers from the shafts appeared not to be satisfactory. That is why it has been replaced by 4822 395 60039.

Changes introduced in the course of production

- With code WA05536 carrier 141b has been changed, spring 141a deleted and a second disc (with spring) 104 and spring 114 have been added.
- As of week 538 a boss of bracket 128a has been changed.
Reason: needed for improved switching function in mechanism P6S.
- As of week 544 the shape of push-button rods 514 and 516 has been changed (beveling of one leg deleted). See exploded view.
Reason: needed for new version P1-4

- As of week 545 the material thickness of disc 104 has been increased.
Moreover, control lever 136 changed.
Reason: improvement of stability.
Also flywheel 137 changed.
Reason: improvement of friction stability.
- With code WA06547 head bracket 124 and transport lever 139 have been changed.
Reason: improvement of working at low temperatures.
- As of week 603 spring 137a has been changed.
Reason: reduction of production tolerances.
- As of week 604 leaf spring 172 has been changed.
Reason: increasing the hold-down force.
- As of week 608 the material thickness of the large toothwheel of flywheel 137b has been increased.
Reason: prevent flywheel from interfering with control lever 136.
Moreover, the depth of bearing 118 has been increased.
Reason: quality improvement.

Remark: To all changed components applies that, if necessary, the stock of Concern Service has been adapted.

NOTE: MODIFICATION ITEM 132B INTO ITEM 133 TO BE PUBLISHED IN SERVICE INFORMATION A86-321.

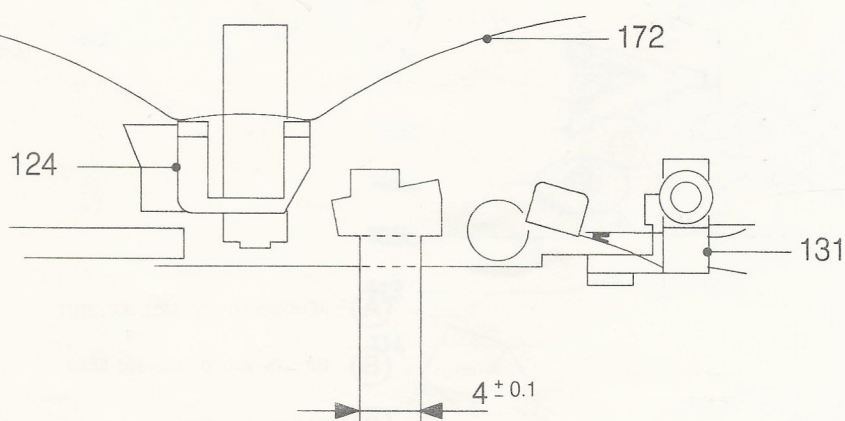


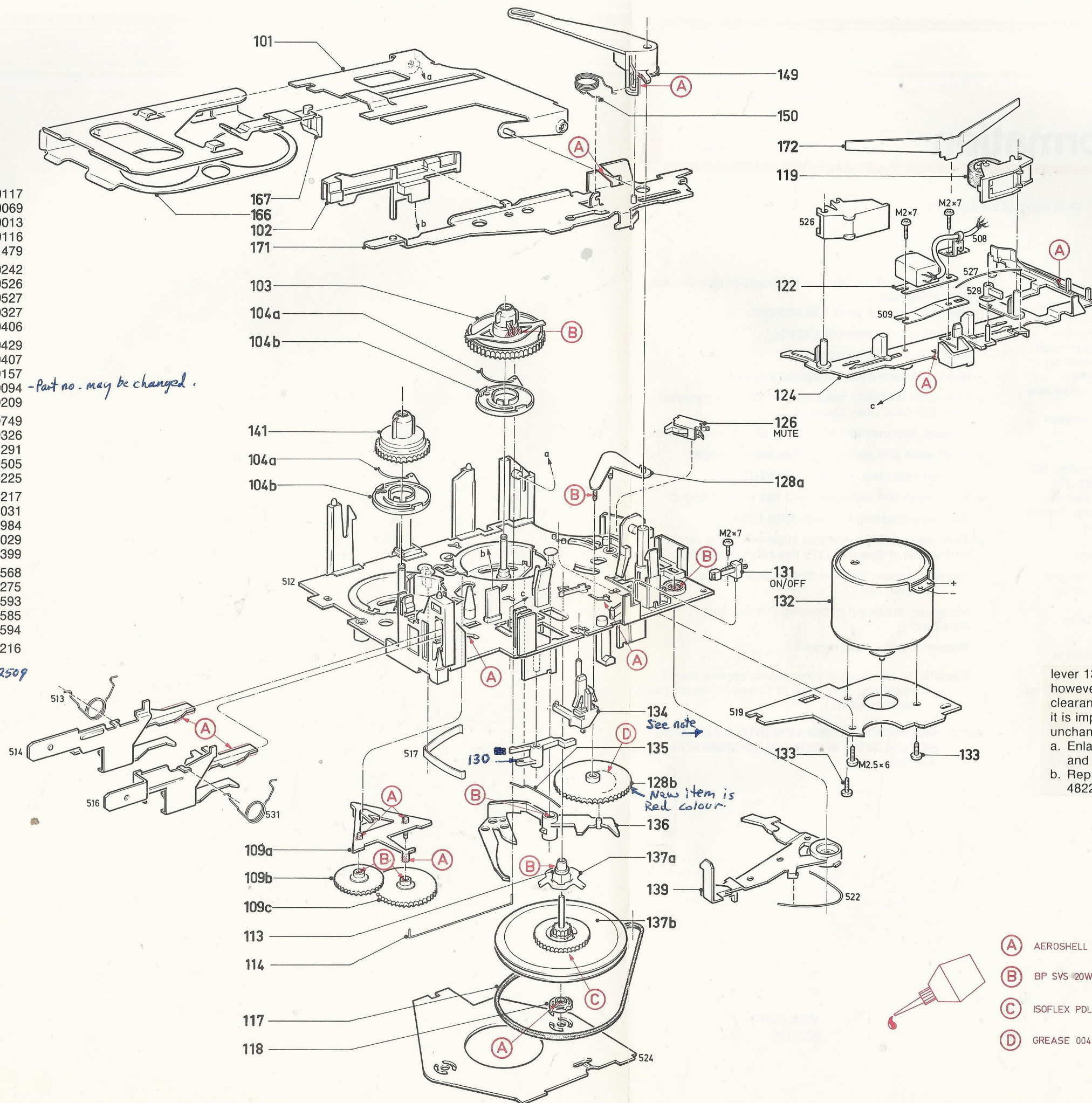
Fig. 1

MDA.00315
622/T19

- | | |
|-----|----------------|
| A | 4822 390 20117 |
| B | 4822 390 10069 |
| C | 4822 390 20013 |
| D | 4822 390 20116 |
| 101 | 4822 466 81479 |
| 102 | 4822 462 30242 |
| 103 | 4822 466 70526 |
| 104 | 4822 466 70527 |
| 109 | 4822 522 20327 |
| 113 | 4822 520 30406 |
| 117 | 4822 358 30429 |
| 118 | 4822 520 30407 |
| 119 | 4822 403 40157 |
| 122 | 4822 249 30094 |
| 124 | 4822 459 80209 |
| 126 | 4822 277 10749 |
| 128 | 4822 522 20326 |
| 131 | 4822 276 11291 |
| 132 | 4822 361 20505 |
| 134 | 4822 403 10225 |
| 135 | 4822 492 63217 |
| 136 | 4822 403 52031 |
| 137 | 4822 528 80984 |
| 139 | 4822 403 52029 |
| 141 | 4822 528 20399 |
| 149 | 4822 404 20568 |
| 150 | 4822 492 41275 |
| 166 | 4822 404 20593 |
| 167 | 4822 404 20585 |
| 171 | 4822 404 20594 |
| 172 | 4822 492 63216 |

130 4822.403.52509

-Part no. may be changed.



the production method of latch lever 134 has been changed. At the same time, however, an additional rib has been added and the clearance in chassis 512 locally increased. As a result it is impossible to mount a changed latch lever in an unchanged mechanism. There are two solutions:
a. Enlarge clearance in chassis by means of metal saw and a smooth file. See Fig. 1.
b. Replace the complete mechanism (order number 4822 701 10123).

- | | |
|-----|-------------------------------|
| (A) | AEROSHELL 22C 4822 390 20117 |
| (B) | BP SVS 20W50 4822 390 10069 |
| (C) | ISOFLEX PDL250 4822 390 20013 |
| (D) | GREASE 004 4822 390 20116 |

Corrections to the Service Manual

- Please change the text of the erratum (page CS98918) as follows:
From the start of production, 116-4822 528 80945 and 523 have been added, 117 has been changed into 4822 358 30405, 132 has been changed into 4822 361 20487. Furthermore two pieces of item no. 113 and two pieces of 118 are mounted.
See expl. view 34975E22.
Item number 128 b has been changed as well.
Can be recognized by its red colour.
With code WA01, 116, 523, 113 (1x) have been deleted, 117 has been changed into 4822 358 30429 and 132 into 4822 361 20505.
See exploded view 34974E22.
- In the parts list (page CS 98815, top centre) the code numbers of "A" and "B" have been exchanged.
- Add to "Adjustments and checks":

6. Bearing 118

- Displace in such a way that both bosses are situated in the middle of the slots in bearing plate 524.

Changes introduced in the course of production

- At the start, transport lever 139 was changed into a version of metal and plastic.
In week 516 this level was strengthened.
Reason: Avoiding that the lever warps.
- Grease 004-4822 390 20116 and grease Kluber PDL250-4822 390 20013 were added at the start.
See modified lubricating instructions.
- From week 448, Molykote DX (A) has been replaced by Aeroshell 22C.
The code number will be mentioned in a "Code number publication".
Reason: Better functioning at very low temperatures.
- Item 107a (4822 522 20325) has been added with code WA01.
Reason: Improving the unlocking of head bracket 124.
- Head bracket 124 has been changed with code WA02507.
Reason: Quality improvement.

- As from week 510, cassette lift 101 has been provided with an embossment in the upper side.
Reason: Avoiding that cassette holder 502 gets stuck.

Furthermore flywheel 116 has been changed.

Reason: Stability improvement.

- Disc 104 has been changed with code WA03512.
Reason: Avoiding that the supplying reel drag becomes too great, so that in the rewind mode the "end-of-tape" circuit becomes operative.

Furthermore head 122 has been replaced by 4822 249 30087.

Reason: Quality improvement.
See also below.

- As from week 514, stop 526 has been changed (grey colour) and lever 107a has been deleted.
Reason: Definitive solution.
- As from week 518 the modified command disc 128b available (see also erratum P1).
- Head 122 has been changed in 4822 249 30094 with code WA0425.
Reason: Final solution quality problems with original head.
Head 4822 249 30094 can also be used in the P1 tape-deck as replacement for the previously mentioned 4822 249 30087.
- In the course of production, the manufacturing method of the following parts has been changed: control lever 136, locking lever 134, plate with gearwheels 109.

To all changed parts applies that the inventory of Concern Service has been adapted where necessary.

Previously published: A85-317, A85-323, A86-317a,
A86-321, A86-331.

Correction to A86-331.

- * Please change the cause for too high a wow and flutter value (see corrections to Service Documentation point 5-a) as follows:
 - a) Bearing 113 worn or a bearing that is not "loose" enough in chassis 512 (Bearing should have some space for motion).

Changes introduced during production

- * As from week 635 the contact springs in switches 126 and 127 are fixed by gluing.
Reason: Improving the positioning of the switch contacts.
- * As from week 637 one end of latch 130 is bevelled.
Reason: Avoiding contact with 134.
- * As from week 642 disc 401 is made of a non-transparent material.
Reason: Avoiding humidity problems.
- * As from week 644 a slot is increased at lift 101 and a recess and the height of a boss are increased at shaft 105.
Reason: Avoiding rattling between cassette lift and holder.
- * As from week 652 the fixing hook for spring 150 is changed.
Reason: Simplifying the mounting of spring 150.