

# BULOVA WATCH COMPANY, Inc.

## TECHNICAL BULLETIN



### BULOVA MODELS

11 AOAC - 11 AOACD  
 11 AOACB  
 Automatic  
 Automatic Date  
 Automatic Day + Date

Scale 1:1

### Specifications

#### Movement

11½"  
 Lever escapement  
 17 or 23 jewels  
 Unbreakable and self-lubricated mainspring  
 Total running time: 42 hours  
 Screwless, beryllium copper balance  
 Compensating alloy hairspring  
 21,600 beats per hour  
 Adjustable stud-holder  
 KIF Elastor shock-resisting device  
 Instant date setting  
 Diameter of plate 25.60 mm  
 Angle of lift 46°

#### Automatic Mechanism

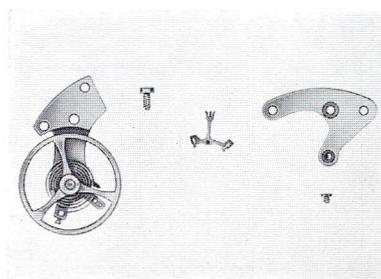
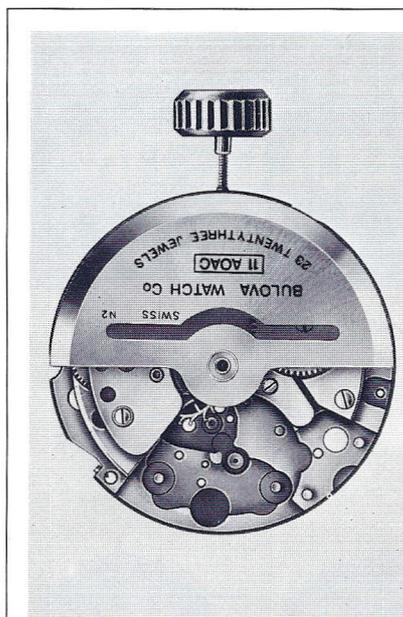
The oscillating weight, made of heavy alloy, is mounted on its axle located in the center of the movement and is free to swing in either direction. Mounted partly on the combined bridge and partly on the pillar plate, the automatic mechanism transmits the winding movement from the oscillating weight to the barrel arbor by means of two reversing gear units, a connecting wheel for auxiliary reverser, a reduction gear, a driving gear for crown wheel, the crown wheel and the ratchet wheel. Each reversing gear unit consists of a reversing gear and a reversing gear pinion, the latter being held in position by a spring. Whichever way the weight turns, one reversing gear meshes with the automatic train while the other slips. In either case, a fairly continuous self-winding action will follow. Winding can also be done by hand, using the stem and crown.

### Designation of Types

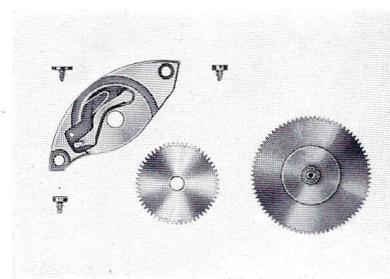
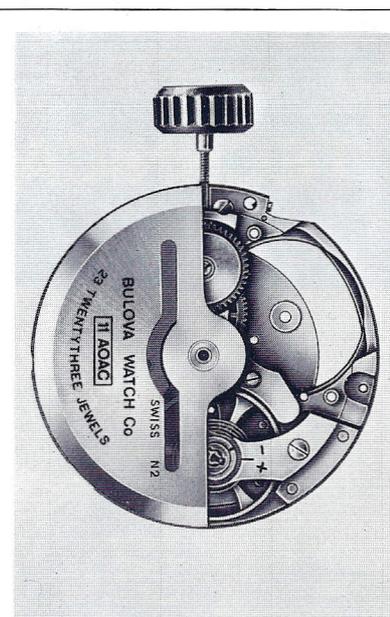
Caliber	Description	Height
11 AO	Handwound, without second	3.35 mm
11 AOC	Handwound, with center sweep second	3.35 mm
11 AOCD	Handwound, with center sweep second and date	3.35 mm
11 AOAC	Automatic, with center sweep second	4.50 mm
11 AOACD	Automatic, with center sweep second and date	4.50 mm
11 AOACB	Automatic, with center sweep second, date and day	5.27 mm

## Characteristics 11 AOAC

1. In this movement, as in the 11 ANAC series, the hairspring does not move freely between the boot and pin of the regulator, but **leans** against the pin. It must continue to do so, even when it is at maximum open position.
2. The oscillating weight axle is **part** of the combined bridge. In the rare case that it might be necessary to replace it, a new combined bridge is required.
3. The minute wheel spring (129) and clutch lever spring (26) are **riveted** to the pillar plate in order to prevent their loss. They are therefore part of the pillar plate and not available separately.
4. The beryllium copper bushing for the top pivot of the sweep second wheel is fitted inside the bottom part of the oscillating weight axle. Bulova recommends oiling this bushing from under the bridge, **before** fitting the latter.
5. In this movement there are two identical setting wheels (29). The setting wheel which meshes with the clutch wheel (17) is fitted with the **bevelled side up**.



**Figure 1**  
Removal of the balance wheel and pallet.



**Figure 2**  
Removal of the barrel.

## Disassembling the watch

### Uncasing

The movement is held in place either by two casing clamps (191), or by a movement ring.

### Removing the dial and the calendar mechanism

After removing the hands and releasing the two lateral dial screws (47), the dial may be removed. The day star with dial disk (591) can be lifted up and the day and date mechanisms removed.

A dial rest (148) is necessary on caliber 11 AOACB when fitted with a flat dial, and in other models as the need arises.

### Checking the automatic gear train

By moving the oscillating weight (344) in both directions, the transmission of power from the oscillating weight (344) to the ratchet wheel (13) can be checked.

### Removing the oscillating weight

The oscillating weight is held in place by a gib (343). To remove the weight, unscrew the gib screw (366) and remove the gib.

### Releasing the mainspring

With the oscillating weight (344) removed, the mainspring can be released as follows:

1. Disengage the click (32), holding it in disengaged position by means of a pin or a screw inserted in the hole provided for that purpose in the barrel bridge.
2. Press with a pointed tool on one arm of the Breguet spring (326) through the hole made in the upper bridge for automatic device (341) and **at the same time**
3. turn the winding crown 1/4 turn forward, then let it turn **slowly backwards** until movement is completely run down.

### Cleaning the escapement

As shown in figure 1, the balance and pallet fork are readily removed without disassembling any other parts of the movement.

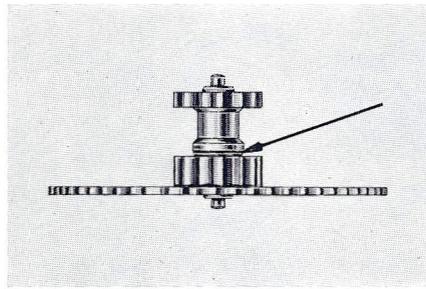
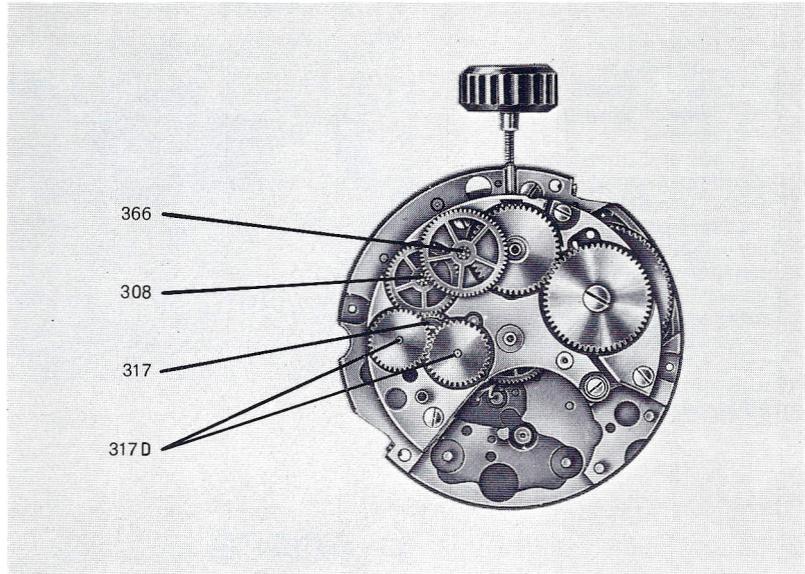
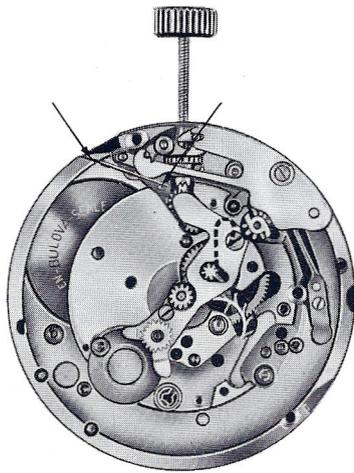
### The mainspring barrel

Figure 2 shows how easily the main-spring barrel (1S) is removed without disassembling the self-winding mechanism.

Slipping of the brake spring should take place only after 6 complete revolutions of the barrel arbor. This corresponds to a power reserve of over 40 hours.

An unbreakable and lifetime lubricated mainspring is used. Therefore, periodic cleaning of the barrel and mainspring is unnecessary.

**Do not dismantle the barrel assembly.** In case of difficulty with the duration of run and if the basic movement seems to perform normally, check the function of the automatic mechanism. If it is completely free, wind it fully by hand and let the piece run down. If total running time is less than 35 hours, replace the complete barrel assembly (1S).



- ◀ **Figure 3**  
The minute wheel spring. The clutch lever spring. The guide mark for loading the clutch lever spring.
- ▲ **Figure 4**  
The automatic gear train.
- ◀ **Figure 5**  
Oiling of the cannon pinion of the large driving wheel.

## Reassembling and oiling the watch

### Dial side

1. The tension of the clutch lever spring (26) is correct when the spring is tangent to the setting lever (25) side of the guide mark made in the pillar plate (figure 3).
2. The functions of the winding mechanism must be lubricated as usual.
3. The centre pipe (106) requires **no lubricant**, for the cannon pinion (94A) must turn freely on the pipe.
4. Lubricate the pivot of the minute wheel (8) and before fitting the latter, make sure that the minute wheel spring, which is riveted in the pillar plate, is properly set, i.e. that it is pressing against the pivot of the minute wheel.
5. After fitting the minute-work cock (9) it is very important to check the endshake and the freedom of the cannon pinion (94A), and to make sure that the minute wheel spring is pressing the minute wheel against the cannon pinion (94A).

### Train side

1. Before installing the gear train, lubricate the cannon pinion of the

large driving wheel (4F) as shown in figure 5. When setting the hands, the cannon pinion slips on the axle of the wheel, that is why it is necessary to make sure that the friction (torque) between the cannon pinion and the axle is correct.

2. Install the Breguet spring (326) if removed, the gear train and the combined bridge (226).  
NOTE: We recommend oiling the top pivot of the sweep second wheel (6K) on the bushing fitted under the oscillating weight axle **before** fitting the bridge.
3. Install the mainspring barrel and its bridge.
4. Lubricate gear train. If the top bushing of sweep second wheel was not oiled before fitting the bridge, lubricate **through** the oscillating weight axle with an appropriate oiler.
5. Lubricate lower bearings of the automatic train.
6. Lubricate stud of connecting wheel for auxiliary reverser.
7. Lubricate Breguet teeth of both reversing gears.  
NOTE: Before installing both reverser gear units (317C, 317D), check the Breguet spring (326). Normal loading is reached when the two arms of the spring attain 3/4 the height of the **stud** of the connecting wheel for auxiliary reverser (317).
8. Install automatic mechanism (as shown in figure 4) and lubricate upper pivots.

9. Install, lubricate and adjust as necessary pallet and balance assemblies with bridges.
10. Check that the hairspring presses against the pin (Characteristics 11 AOAC, point 1).
11. Fit the oscillating weight (344) and oil its axle and gib (343).

### Checking the automatic winding

Wind up the mainspring six turns. Hold the movement or the watch in a vertical plane and turn it slowly round the axis of the hands. The oscillating weight will now wind up the mainspring and it should drop under its own weight. Malfunction may be caused by excessive tension of the Breguet spring (326) or by friction elsewhere.

### Checking the minute wheel spring

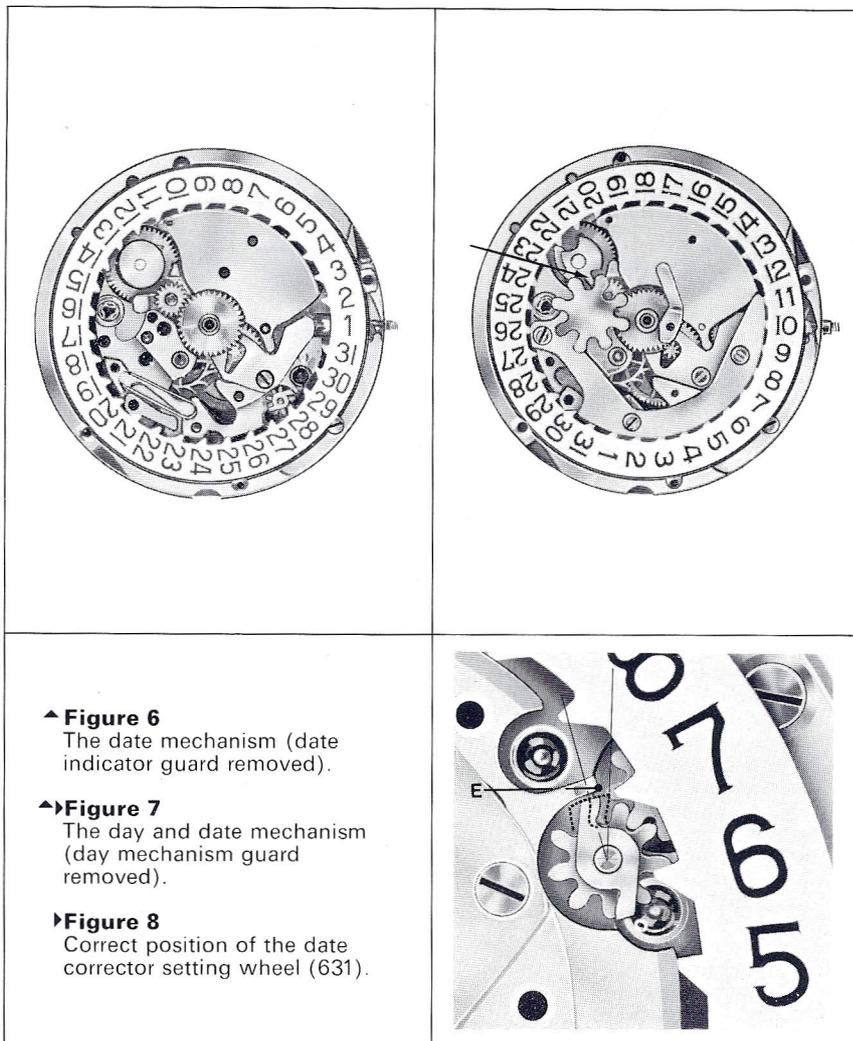
After affixing the dial and hands, it is recommended to check the functioning of the minute wheel spring by pushing the **minute hand** slightly forward (clockwise) with the aid of a pegwood stick. Under the tension of the spring the minute hand must always come back to its original position. This is necessary in order to overcome normal backlash in the hands caused by the cannon pinion turning freely on the center pipe.

## Oiling recommended

### Moebius

1. Winding mechanism	8300
2. Setting wheel studs	8300
3. Minute wheel pivot	8300
4. Cannon pinion of the large driving wheel (4F)	8030
5. Gear train	9010
6. Barrel arbor	8030
7. Stud of connecting wheel for auxiliary reverser (317)	8300
8. Crown wheel	8300
9. Breguet teeth of both reversing gears and pignons (317D/317C)	8300
10. Automatic train	8030
11. Pallet stones	941
12. Balance wheel	9010
13. Oscillating weight axle and gib (343)	8300
14. Stud of intermediate setting wheel date corrector (630)	8300
15. Stud of intermediate date wheel (581)	8300
16. Stud of date indicator driving wheel (574)	8300
17. Stud of intermediate day wheel (609)	8300
18. Nose of click driving the date indicator (on wheel 574)	8030
19. Function of date jumper (596)	8030
20. Function of day jumper (586)	8030

NOTE: The cannon pinion (94A) turning on the center pipe (106), the pivots of pallet (57) and the pivoting posts of the day and date jumpers (586 and 596) **require no lubrication.**



▲ **Figure 6**  
The date mechanism (date indicator guard removed).

↗ **Figure 7**  
The day and date mechanism (day mechanism guard removed).

▶ **Figure 8**  
Correct position of the date corrector setting wheel (631).

## Calendar mechanism

### Type

There are three possible positions of the winding stem, that is:

1. Winding (innermost)
2. Hand setting (intermediate)
3. Date correcting (outermost)

The date is changed instantly simply by pulling the crown out from first to third position.

### Disassembling and reassembling

Disassembling and reassembling of the day and date mechanisms can be done without difficulty; however, special attention should be given to the following points:

1. When fitting the date corrector setting wheel (631) make sure that the beak of the finger is located exactly opposite the point "E" indicated on the pillar plate, see figure 8. One half finger width can be tolerated on either side of point "E".

If the setting wheel (631) cannot be set within the tolerance indicated, turn it through 180°. If necessary, change it or change the intermediate date corrector setting wheel (629).

Improper positioning of the date corrector setting wheel (631) would cause the date indicator (576)

to advance either two days at a time or not at all, when using the stem to change the date.

2. After having fitted the intermediate day wheel (609, cal. 11 AOACB), turn the calendar mechanism by means of winding stem and ensure that the **finger** of the date indicator driving wheel (574) comes **between two teeth** of the intermediate day wheel (609) as indicated on figure 7, this to prevent the said finger from butting against a tooth of the intermediate day wheel (609).

3. To fit the day dial disk (591), press on it lightly and, with the aid of a pointed tool through the hole, pull the day jumper (586) backwards (towards the stem) in order to set it between two teeth of the day star.

4. A dial rest (148) is necessary on caliber 11 AOACB when fitted with a flat dial, as well as on other models as the need arises.

### Checking the movement in the case

1. After fitting the movement into the case, make certain the oscillating

weight functions normally with no contact against the back of the case.

2. With crown in intermediate position, turn the hands clockwise to make sure that the day and date indicators jump correctly at approximately 12 o'clock midnight.
3. To check operation of the instant date setting mechanism: with crown in innermost position, pull crown out through intermediate to outermost position. Date must advance.

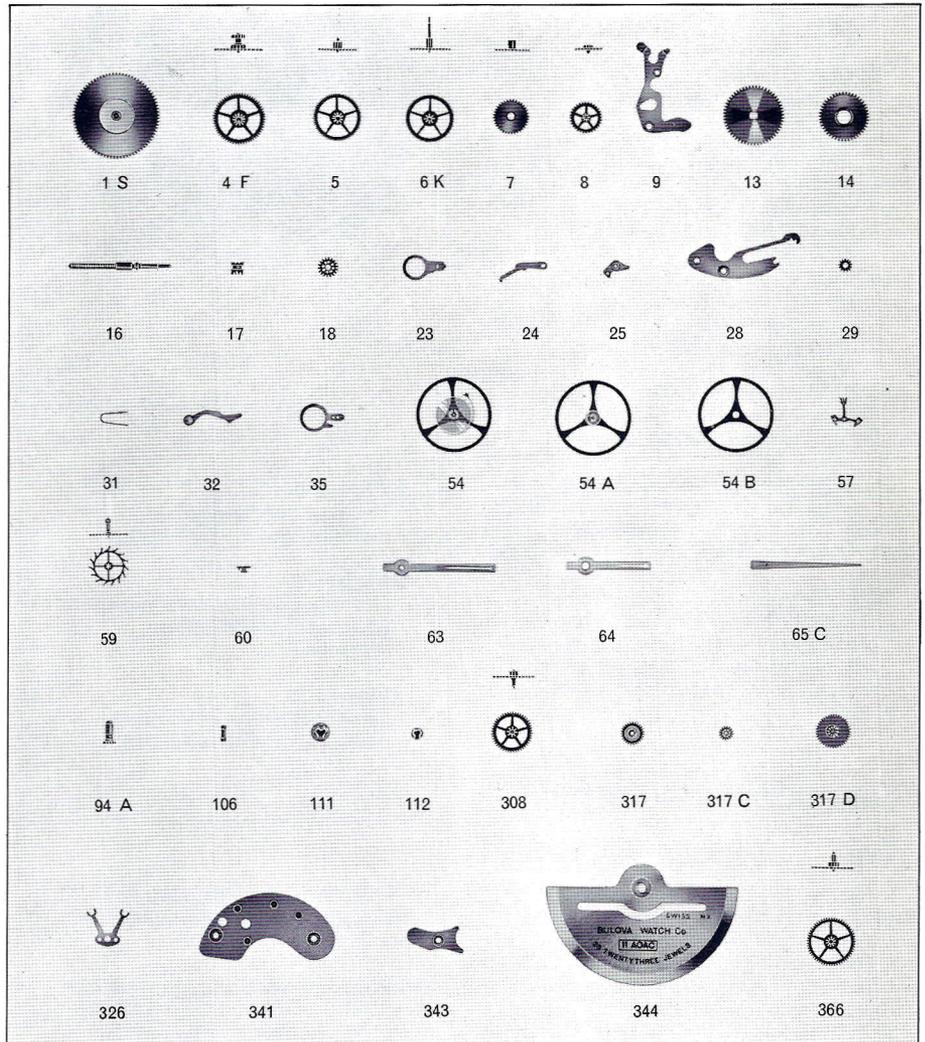
### Setting the day and the date

1. With the crown in the intermediate position, set the **day** by turning the hands in either direction until correct day appears in the dial aperture.
2. Set **date** by moving crown back and forth between the innermost and outermost positions until the correct date appears in the aperture. Push crown in.
3. Set the **time** with the crown in the intermediate position, turning the hands a further 12 hours if the setting is for P.M.

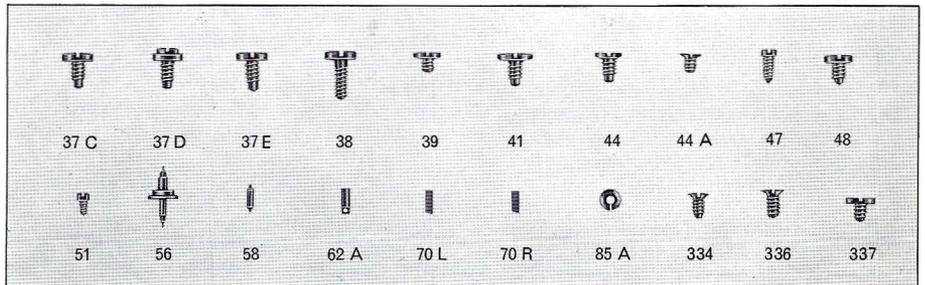
# Parts Index

## 11 AOAC Parts

- 1S Barrel complete
- 4F Large driving wheel with cannon pinion
- 5 Third wheel
- 6K Sweep second wheel
- 7 Hour wheel
- 8 Minute wheel
- 9 Minute work cock
- 13 Ratchet wheel
- 14 Crown wheel
- 16 Winding stem
- 17 Clutch wheel
- 18 Winding pinion
- 23 Stud holder
- 24 Clutch lever
- 25 Setting lever
- 28 Setting lever spring
- 29 Setting wheel
- 31 Ratchet click spring
- 32 Ratchet click
- 35 Regulator
- 37C Combined bridge screw
- 37D Special combined bridge screw
- 37E Barrel bridge screw
- 38 Balance cock screw
- 39 Pallet bridge screw
- 41 Ratchet wheel screw
- 44 Screw for setting lever spring
- 44A Screw for minute wheel bridge
- 45C Casing clamp screw\*
- 47 Dial screw
- 48 Setting lever screw
- 51 Hairspring stud screw
- 54 Balance complete
- 54A Balance with roller
- 54B Balance
- 56 Balance staff
- 57 Pallet fork complete
- 58 Pallet arbor
- 59 Escape wheel
- 60 Roller
- 62A Hairspring stud
- 63 Minute hand
- 64 Hour hand
- 65C Sweep second hand
- 70L Exit pallet jewel
- 70R Entry pallet jewel
- 85A Hairspring collet
- 94A Cannon pinion without clam notch
- 106 Center pipe
- 111 Upper block KIF Elastor complete
- 112 Lower block KIF Elastor complete
- 191 Casing clamp\*
- 201 Pillar plate\*
- 203 Barrel bridge\*
- 212 Balance bridge\*
- 216 Pallet bridge\*
- 226 Combined bridge\*
- 308 Reduction gear
- 317 Connecting wheel for auxiliary reverser
- 317C Reversing gear pinion
- 317D Reversing gear
- 326 Breguet spring
- 334 Screw for upper bridge of automatic device
- 336 Screw for screw gib
- 337 Breguet spring screw
- 341 Upper bridge for automatic device
- 343 Screw gib
- 344 Oscillating weight
- 366 Driving gear for crown wheel



Scale 1:1

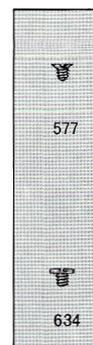
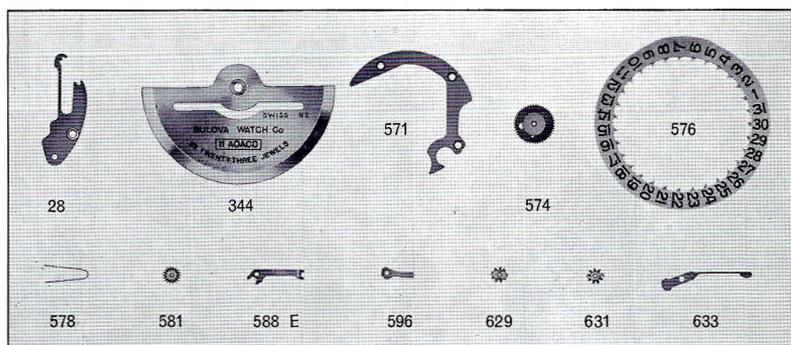


Scale 3:1

\* Not illustrated

## 11 AOACD Additional or varying parts from 11 AOAC

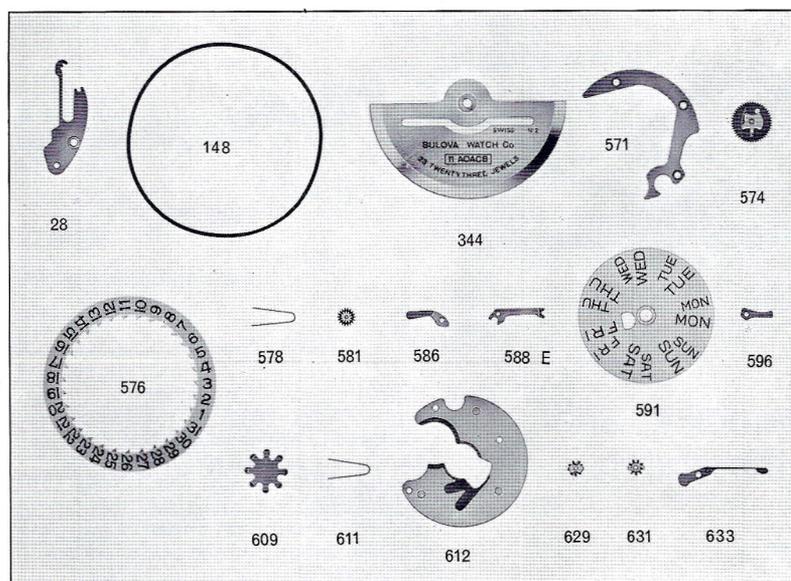
- 28 Setting lever spring
- 344 Oscillating weight
- 571 Date indicator guard
- 574 Date indicator driving-wheel
- 576 Date indicator
- 577 Date indicator guard screw
- 578 Date jumper spring
- 581 Intermediate date wheel
- 588E Date corrector lever
- 596 Date jumper
- 629 Intermediate setting wheel of date corrector
- 631 Setting wheel of date corrector
- 633 Jumper for intermediate setting wheel corrector
- 634 Screw of the jumper for intermediate setting wheel corrector



Scale 1:1 Scale 3:1

## 11 AOACB Additional or varying parts from 11 AOAC

- 28 Setting lever spring
- 148 Dial rest
- 344 Oscillating weight
- 571 Date indicator guard
- 574 Date indicator driving wheel
- 576 Date indicator
- 577 Date indicator guard screw
- 578 Date jumper spring
- 581 Intermediate date wheel
- 586 Day jumper
- 588E Date corrector lever
- 591 Day star with dial disk
- 596 Date jumper
- 609 Intermediate day wheel
- 611 Day jumper spring
- 612 Day mechanism guard
- 613 Day mechanism guard screw
- 629 Intermediate setting wheel of date corrector
- 631 Setting wheel of date corrector
- 633 Jumper for intermediate setting wheel corrector
- 634 Screw of the jumper for intermediate setting wheel corrector



Scale 1:1 Scale 3:1

NOTE: When ordering dial rest (148), in addition to the caliber please indicate the case reference.  
When ordering date indicator (576) and day star with dial disk (591), please indicate the caliber, the number printed under the disk, the colour and the language.

**For complete interchangeability of parts, please refer to the Bulova Spare Parts catalogue.**

All information contained in this bulletin is based on the latest product information available at the time of printing. We reserve the right to make changes at any time without notice.

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