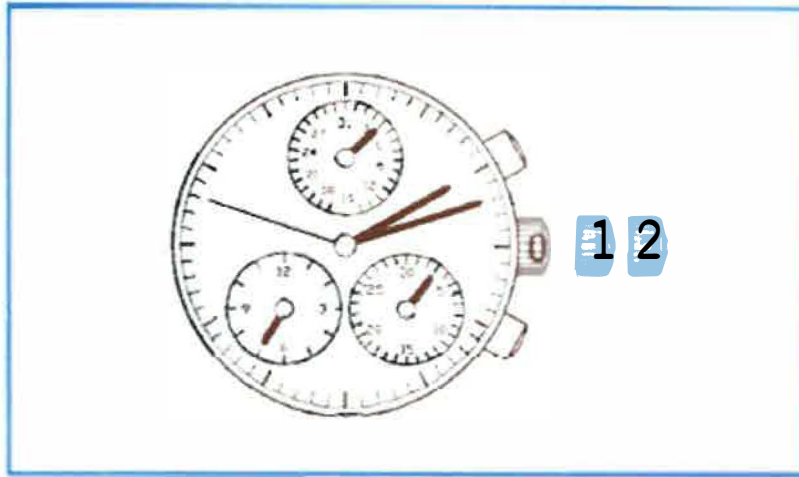


***setting the chronoreflex
212P movement***



TIME SETTING FUNCTIONS



Position 0 : no function

Position 1 : time belts setting

Position 2 : time setting

Caution

The time setting of time belt change functions can only be performed if the stop-watch function is not turned on.

The time setting of time belt change functions can only be performed if the stop-watch function is not turned on.

TIME SETTING



Pull the crown to position 2.

Turn the crown "FORWARDS" by 1 notch.

The hour and minute-hand advances 1 step per notch.

By holding the crown in the "FORWARDS" position, between 2 notches, this causes a rapid advance of the hands.

The same operation in the "BACKWARDS" position produces the opposite effect.

The watch and chronograph are stopped during this operation.

When the crown is returned to the "0" position, the minute-hand will take the next step after 12 seconds.

The function of the calendar is linked directly to the time setting and the date changes on each midnight.

TIME ZONES CHANGE



Pull the crown into the intermediate position 1.

Turn the crown "FORWARDS" or "BACKWARDS".

Each notch moves the hour and minute-hands by 1 hour.

The watch operates normally during this operation.

The calendar function is directly linked to the time zones change and the date changes at each midnight.

END OF LIFE BATTERY INDICATION



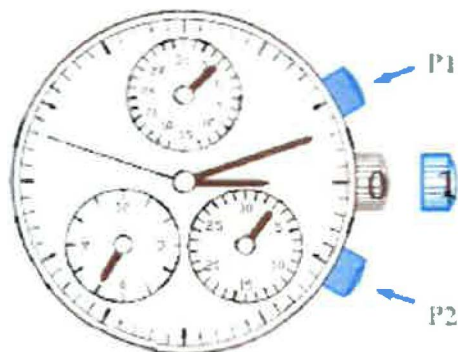
The fact that the battery is dead is indicated by the movement of the chronograph hand.

The places itself on "2 O'clock" on the dial and keeps to this static position.

The movmeent is stopped but its memory is preserved.

After changing the battery, reset the time and correct the calendar.

CORRECTION TO A SHIFT IN THE CHRONOGRAPH HANDS.



Operations to enter into "correction mode":

Pull the crown to position 1.

Hold push button P1 pressed down and press 3 times on push button P2.

Then, push-button P2 enables us to modify the position of the chronograph hand.

Each pressure applied to this part causes an advance of the chronograph hand by 1 step.

Rapid advance can be obtained by holding the push-button pressed down.

By pressing P1, you terminate the chronograph hand correction and enter the hours and minutes counters hand correction mode.

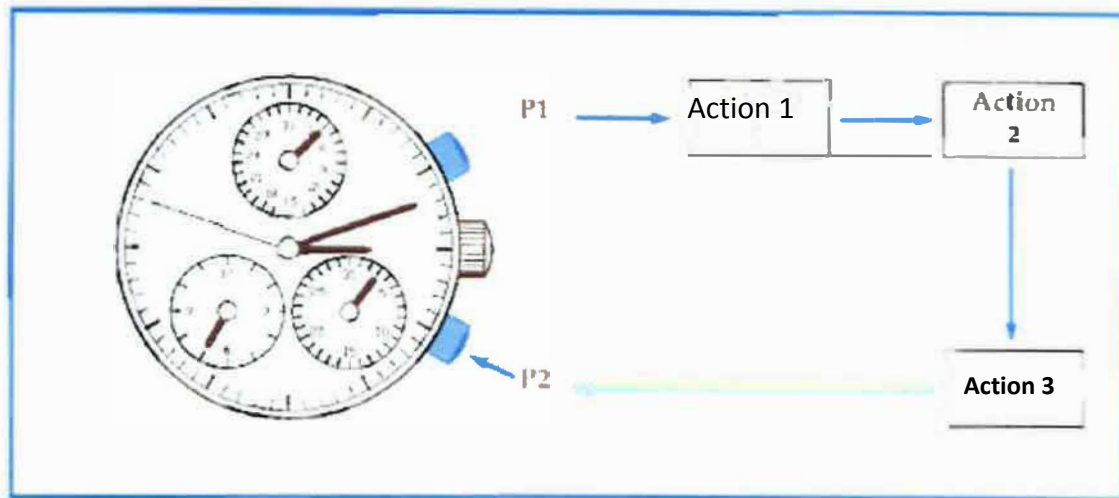
Press again on P2, each pulse causes a step-by-step movement of the aforesaid counter hands.

Holding pressure on the push-button has the effect of advancing the hands rapidly.

A further pulse on push-button P1 puts an end to the correction operation.

Return the crown to position 0.

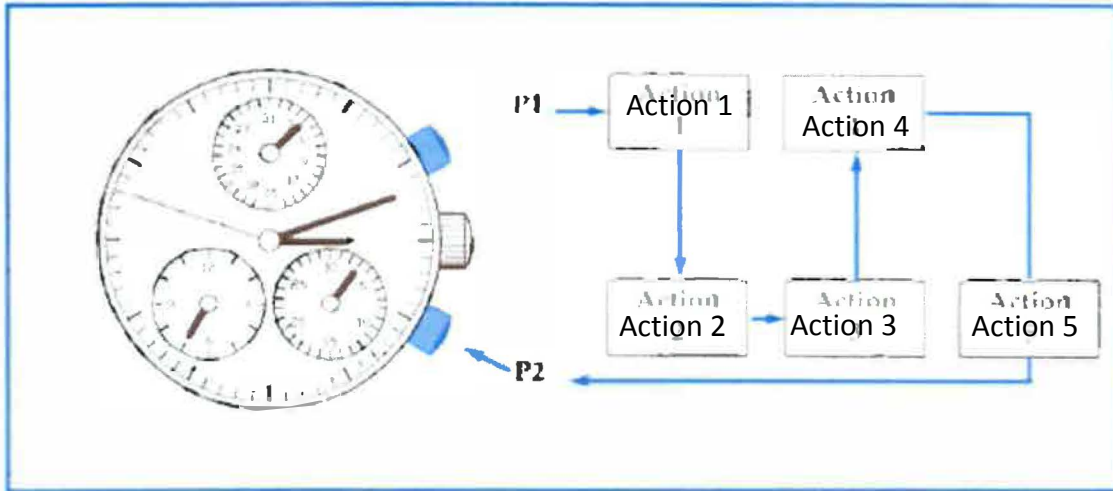
SIMPLE CHRONOGRAPH FUNCTION



	Push-buttons	Functions
Action 1	! 1 pressure on P1	Actuation of the chronograph The second-hand and counters are in activity.
Action 2	! 1 pressure on P1	Halting of the chronograph function. The second-hand and counters are not operating. Reading of the time measured.
Action 3	! 1 pressure on P2	Reset of the counters and second-hand

The "CHRONOGRAPH" function can be engaged for maximum 12 hours consecutively.

SPLIT-SECONDS CHRONOGRAPH FUNCTION



	Push-buttons	Functions
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ACTION 1	1 pressure on P1	Actuation of the chronograph. The second-hand and counters are in action.
ACTION 2	1 pressure on P2	Halting of the chronograph function. The second-hand and counters are halted. Reading of the time measured. (The electronic counter continues to operate.)
ACTION 3	1 pressure on P2	Correction of the state of the electronic counter (time elapsed between actions 2 and 3)
ACTION 4	1 pressure on P1	Final halting of the chronograph function. Reading of the time measured.
ACTION 5	1 pressure on P2	Reset of the counters and second-hand.

It is always possible to switch from the "SIMPLE CHRONOGRAPH" function to "SPLIT-SECONDS CHRONOGRAPH FUNCTION" function and vice-versa.

INITIALISATION OF THE MOVEMENT

Before commencing the initialisation functions it is necessary to know the function of the dial and the second-hand.

These are the bases for reading and locating the different states.

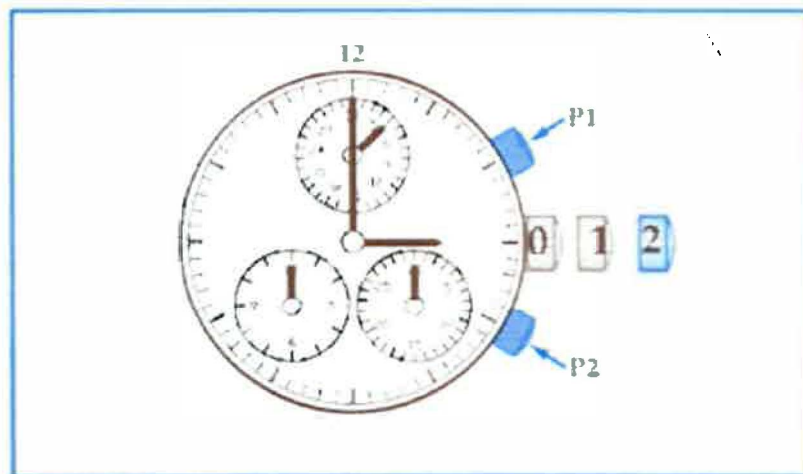
Thus, the initialisation should always be performed when the watch is equipped with its dial preferably fitted on.

The established order of initialisation is as follows: **year, month, date, time.**

To enter into "INITIALISATION MODE", proceed as follows:

- 1) Pull the crown into position 2.
- 2) Adjust the hands on a full hour, (e.g. 3.00 h, 4.00 h, etc.) so that the minute-hand is placed on the "12" of the dial.
- 3) Press first 3 times on push-button P2 and then 3 times on push-button P1.

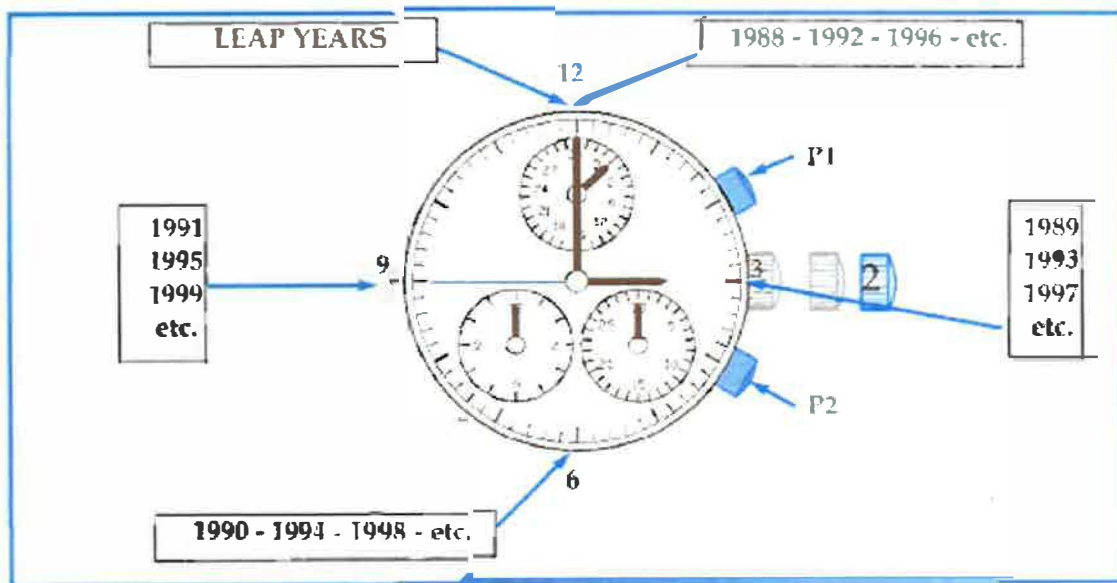
As from this moment initialisation of the movement can commence.



INITIALISATION : YEAR

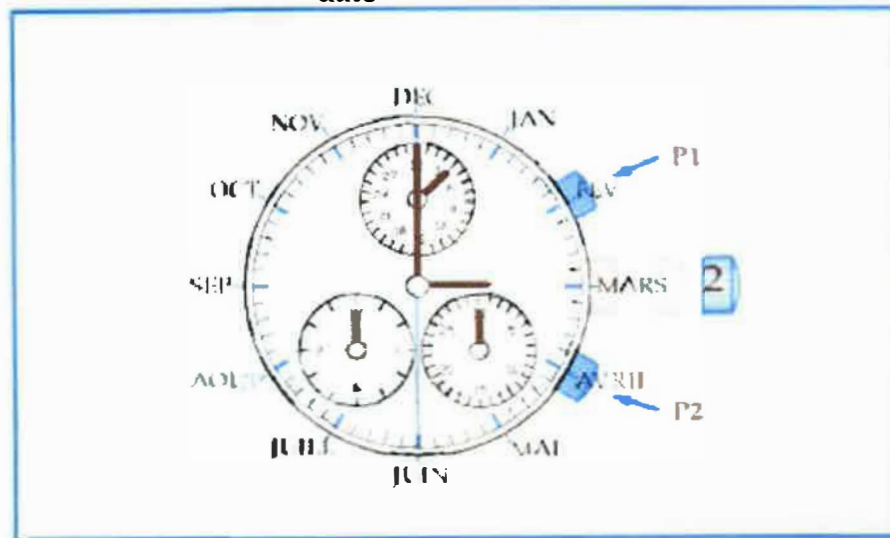
Before performing the operations in view of accessing the initialisation mode, you are automatically in the first phase of reading, that of the year.

- Function of the dial :** The dial is divided into 4/4.
Each 1/4 (digits 3, 6, 9, 12) corresponds to a given year.
The leap years are identified by the digit 12.
- Second-hand :** Indicates the year recorded in the memory.
E.g.: for the year 1991, the hand positions itself on digit 9 on the dial.
- Push-button P2 :** The push-button operates as corrector.
On each pressure applied the second-hand advances by 1/4 turn.
In this way the year required can be entered.
- Push-button P1 :** This confirms the storage of the year in memory by a pressure and enables direct access to the successive phase, initialisation of the month.



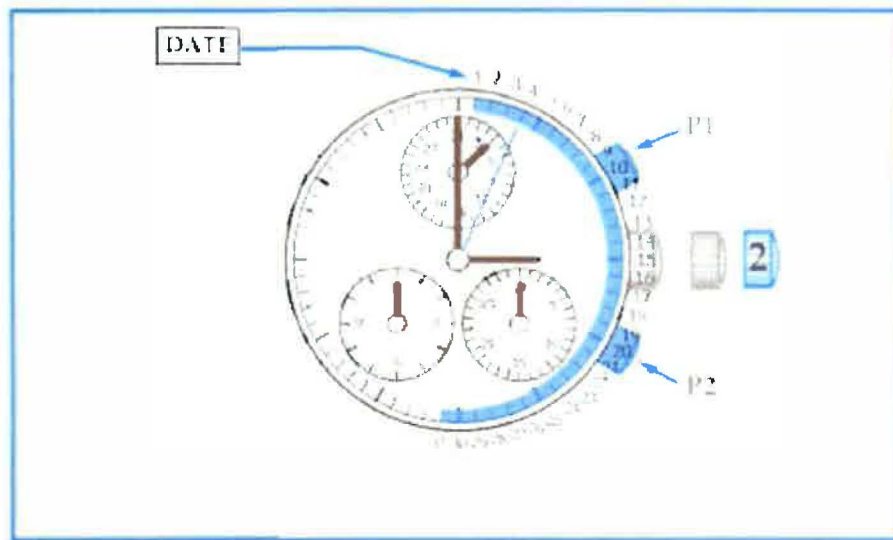
INITIALISATION : MONTHS

- Function of the dial :** The 12 hours on the dial correspond to the 12 months of the year.
- Second-hand :** The second-hand will place itself on the month recorded in the memory.
E.g.: positioning of the hand on digit 6 on the dial = month of June.
- Push-button P2 :** Push-button operates as corrector.
On each pressure applied the second-hand advances by 1 hour (1/12) on the dial so it is possible to enter the month required.
- Push-button P1 :** A pressure on this button confirms the storage in memory of the month, enables terminating initialisation of the month and direct accessing to the initialisation of the date



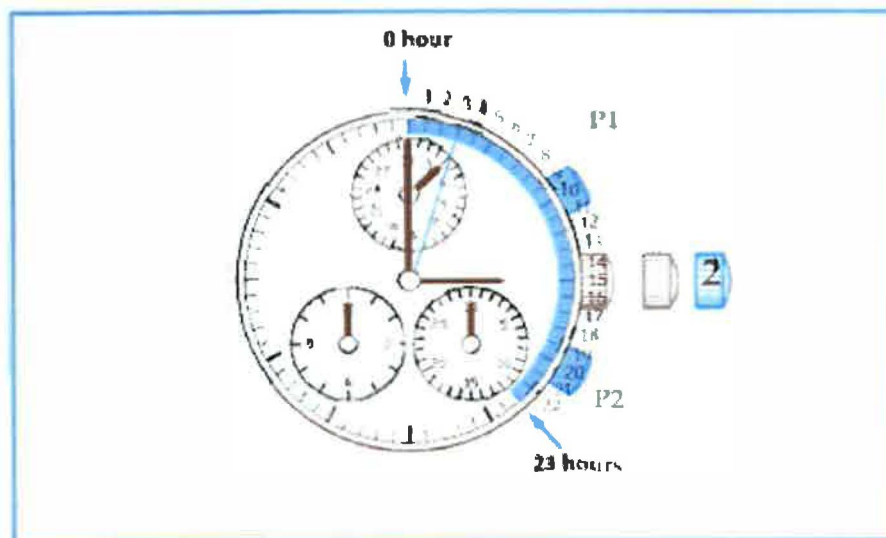
INITIALISATION : DATE

- Function of the dial :** To read the date, the minutes on the dial are taken into consideration.
The first 31 minutes correspond to the dates of a month.
- Second-hand :** The positioning of the second-hand on one of these minutes indicates the corresponding date in memory of the time of the check.
E.g.: halting of the hand on the 4th minute = 4th day of the month.
- Push-button P2 :** The push-button operates as corrector.
Each pressure received advances the second-hand by one step (1 minute on the dial), so that the date can be adjusted.
After the 31st day, the hand returns automatically to 1 (1st minute) and the cycle can recommence.
- Push-button P1 :** Pressure on this push-button confirms the storage in memory of the date selected, enables this phase to be terminated and switching to initialisation of the time.



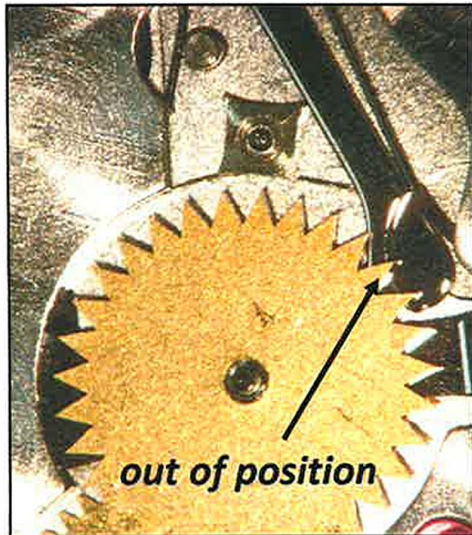
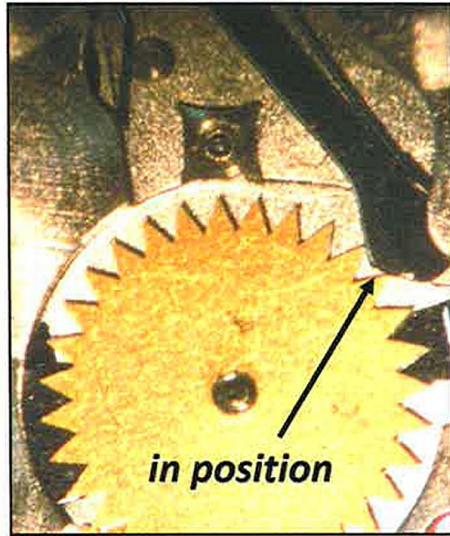
INITIALISATION : HOUR

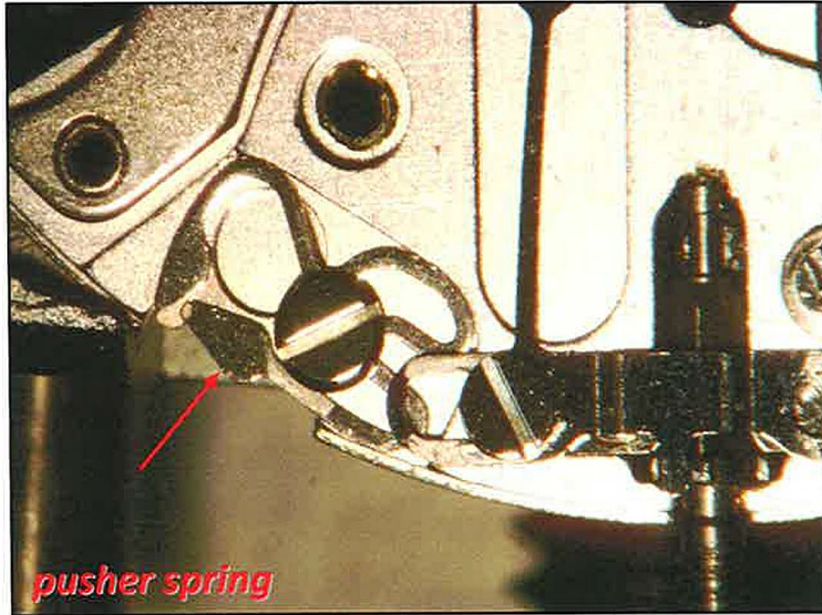
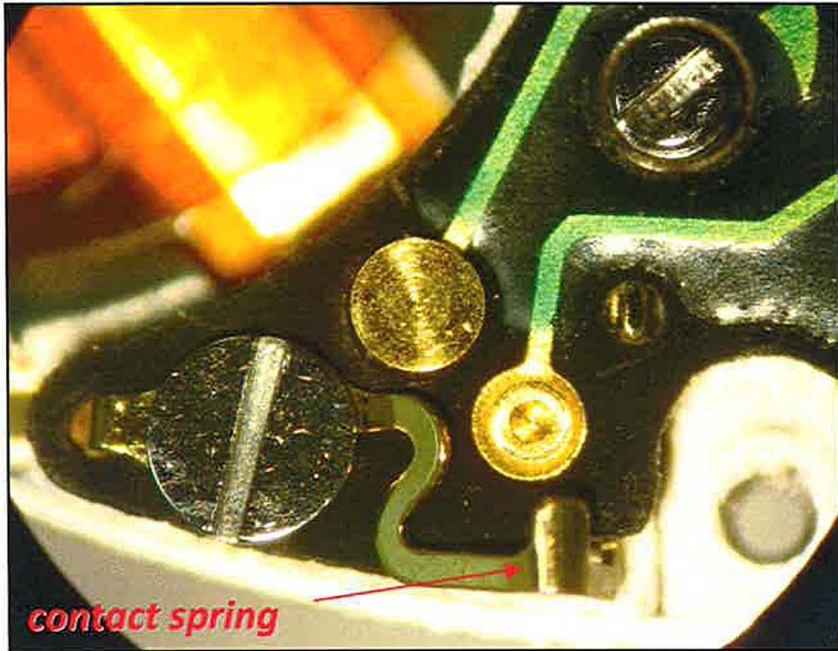
- Function of the dial :** The minutes on the dial are taken into consideration.
The first 23 minutes (*starting from 12 h*) correspond to the 24 hours of a day.
The time "0" is represented by the digit 12 on the dial.
- Second-hand :** The second-hand should indicate the time on which we have set hour watch at the start of initialisation.
Here, the importance can be perceived of exactly setting the minute-hand on the "12" of the dial.
- Push-button P2 :** The push-button operates as corrector.
Each pressure received advances the hand by one step (1 minute on the dial) thus, accessing the time setting.
After the 23rd hour the hand returns to 12 on the dial which corresponds to the hour "0".
- Push-button P1 :** Pressure on this push-button confirms the storage in memory of the time and puts an end to the initialisation cycle.
Push the crown into position 0.

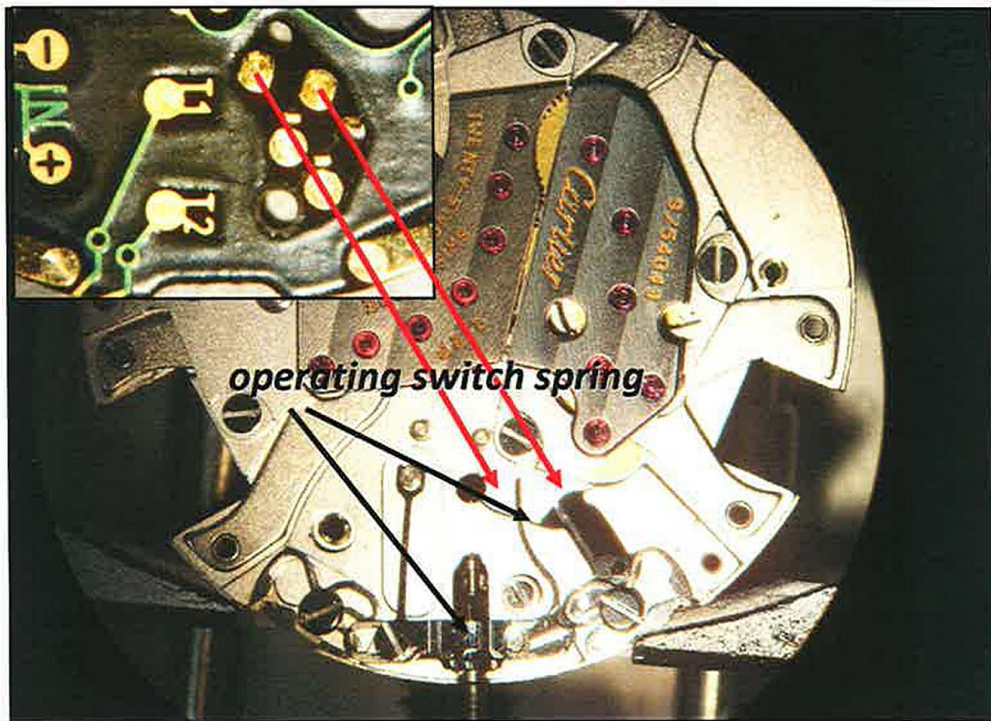
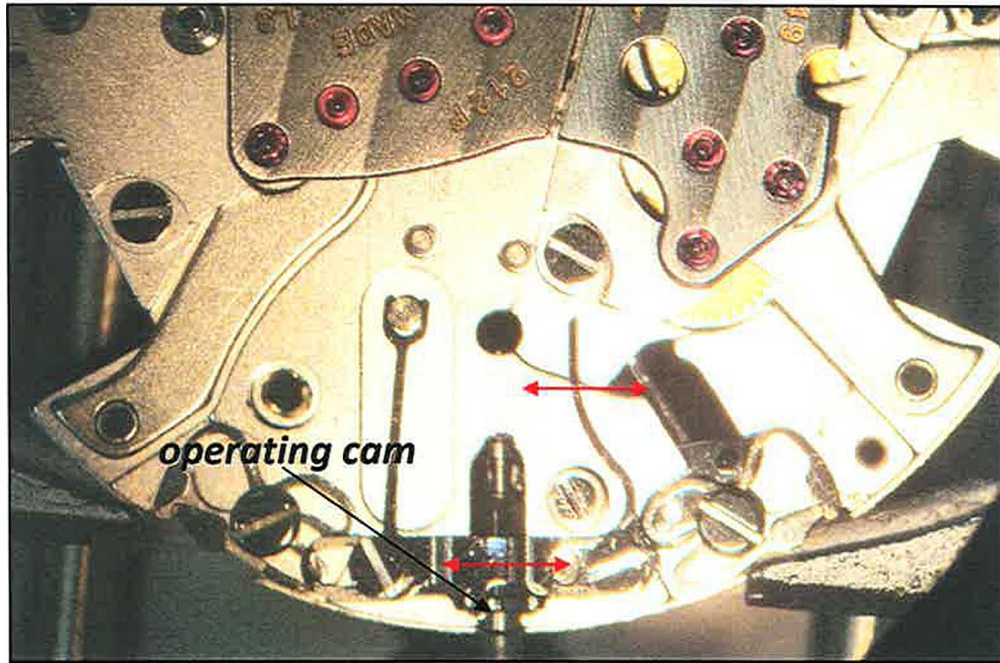


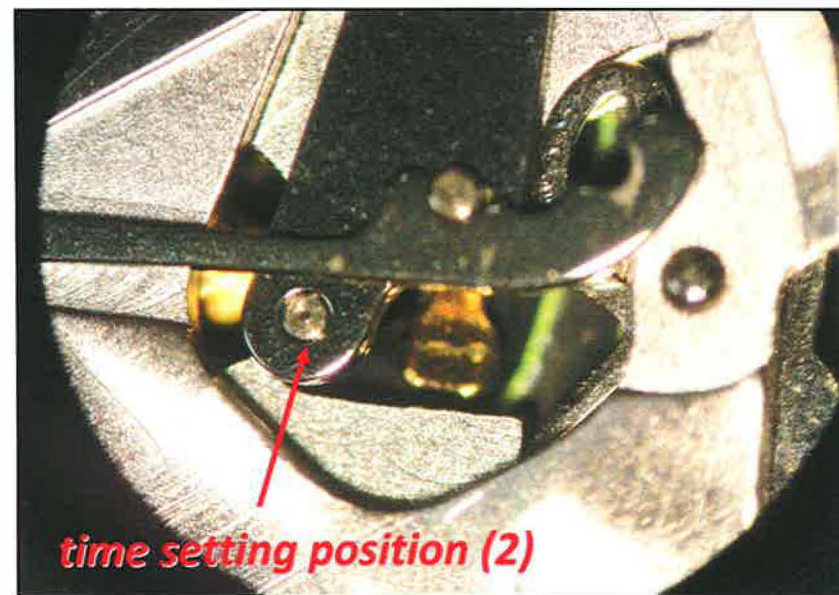
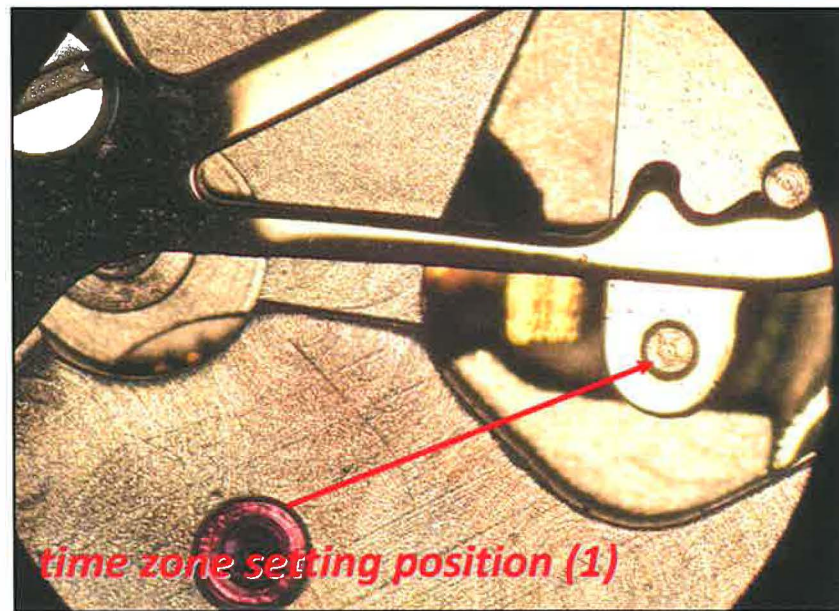
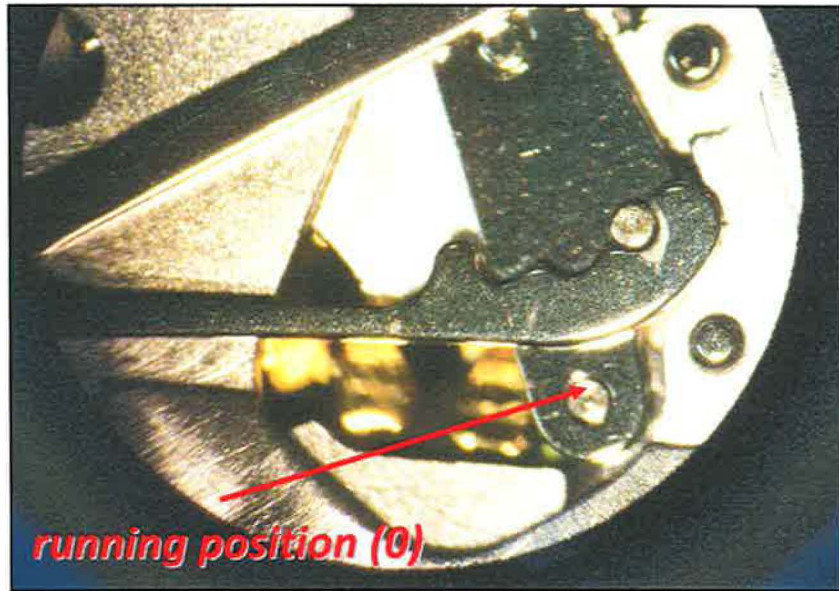
***characteristics of the
chronoreflex 212P movement***

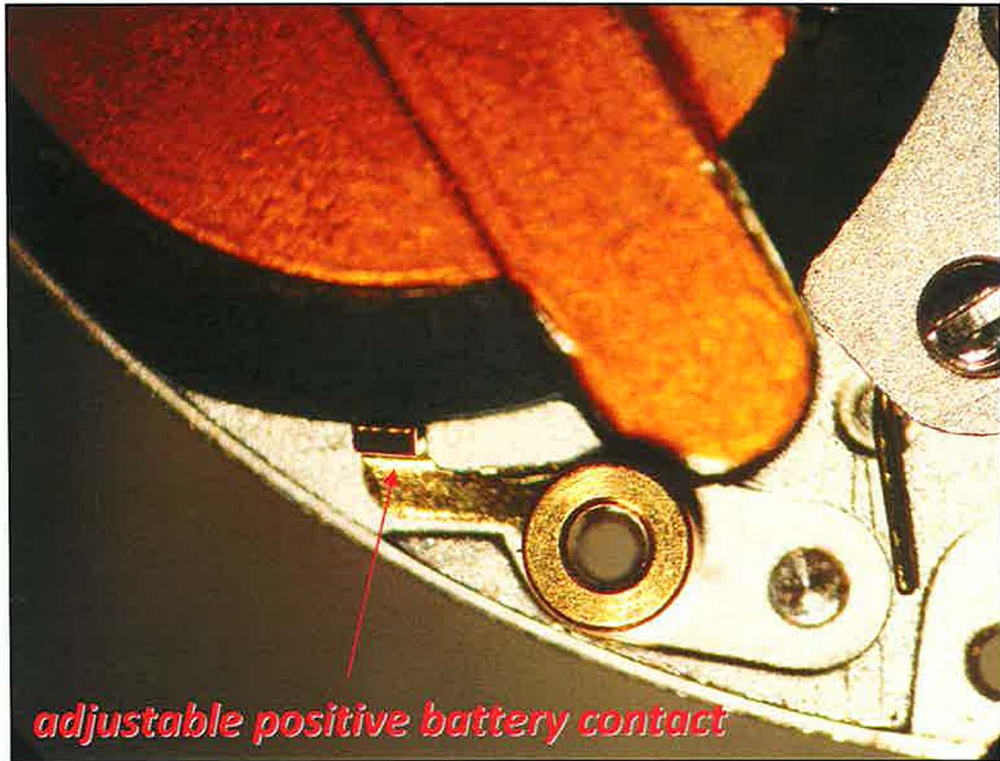




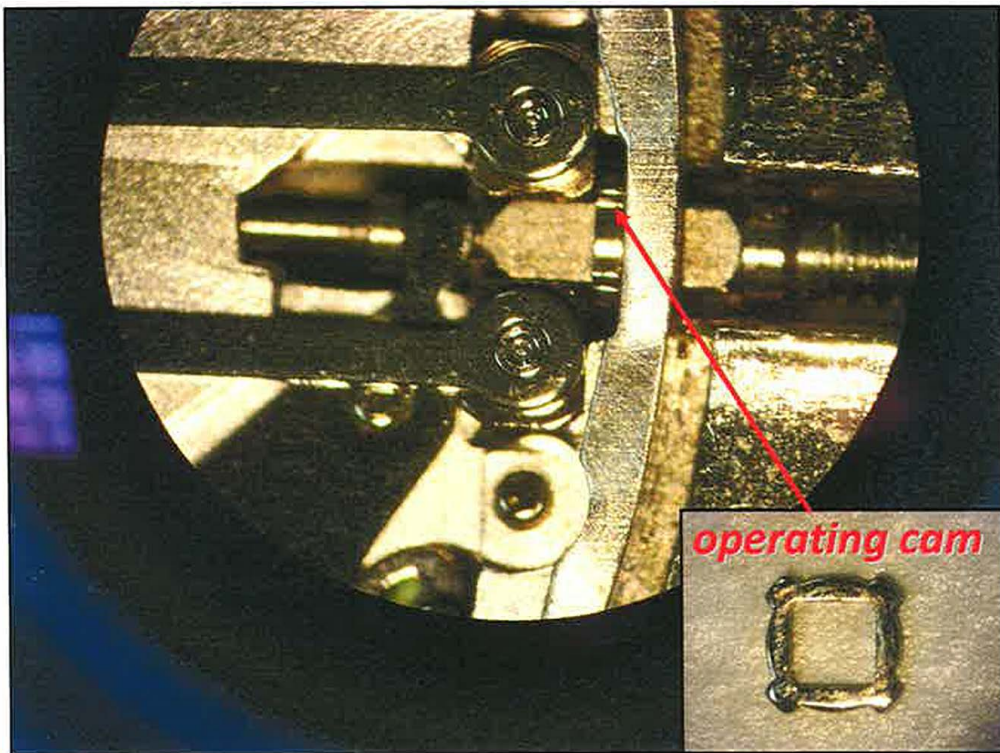








adjustable positive battery contact



operating cam

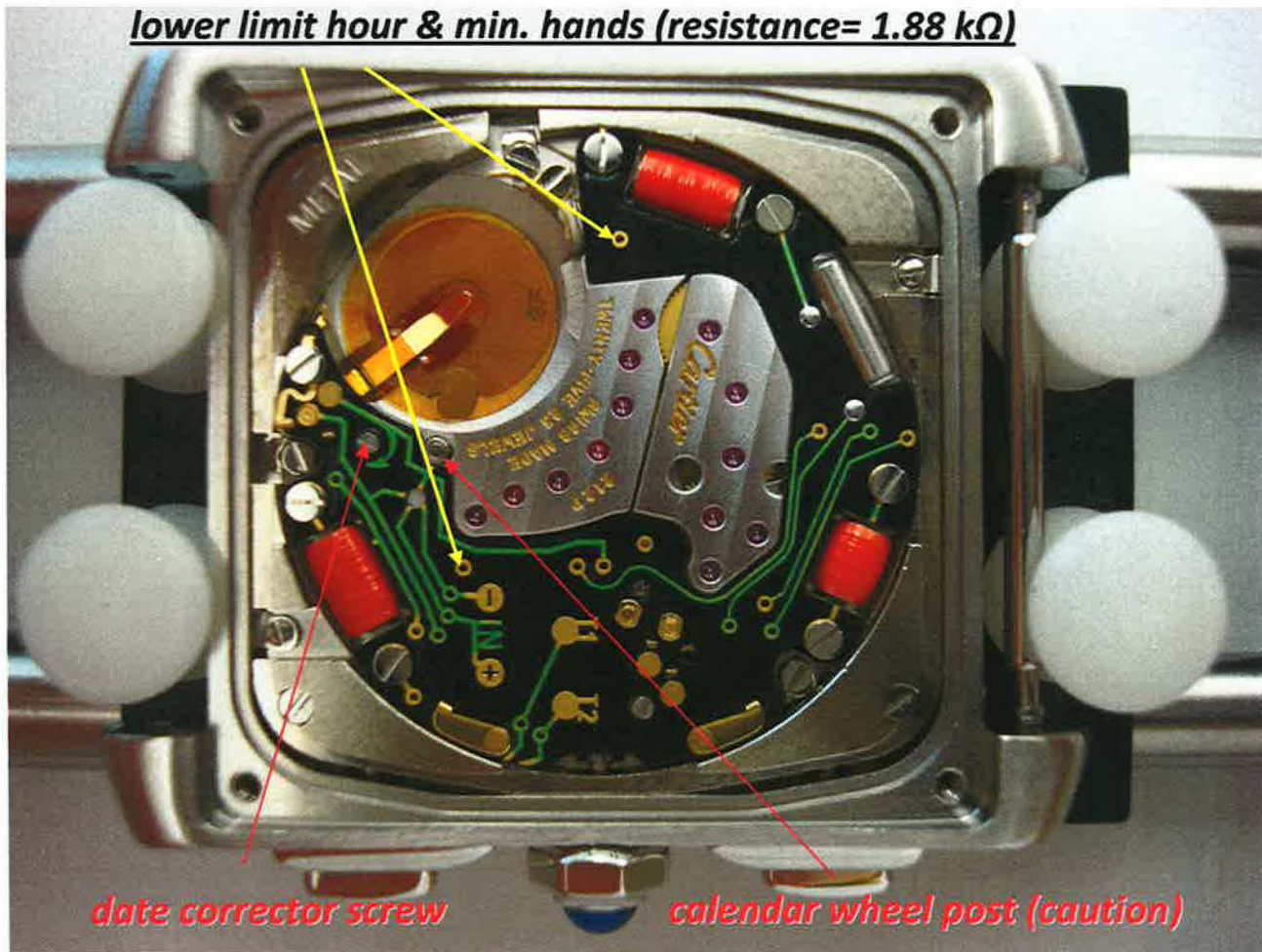
***electrical testing of the
chronoreflex 212P movement***



**movement testing for quartz watches
chronoreflex witschi qt6000
lower limit and coil resistance**

**set witschi 6000 test mode module to pulse generator for lower
limit function test. for coil resistance set test mode module
to resistance.**

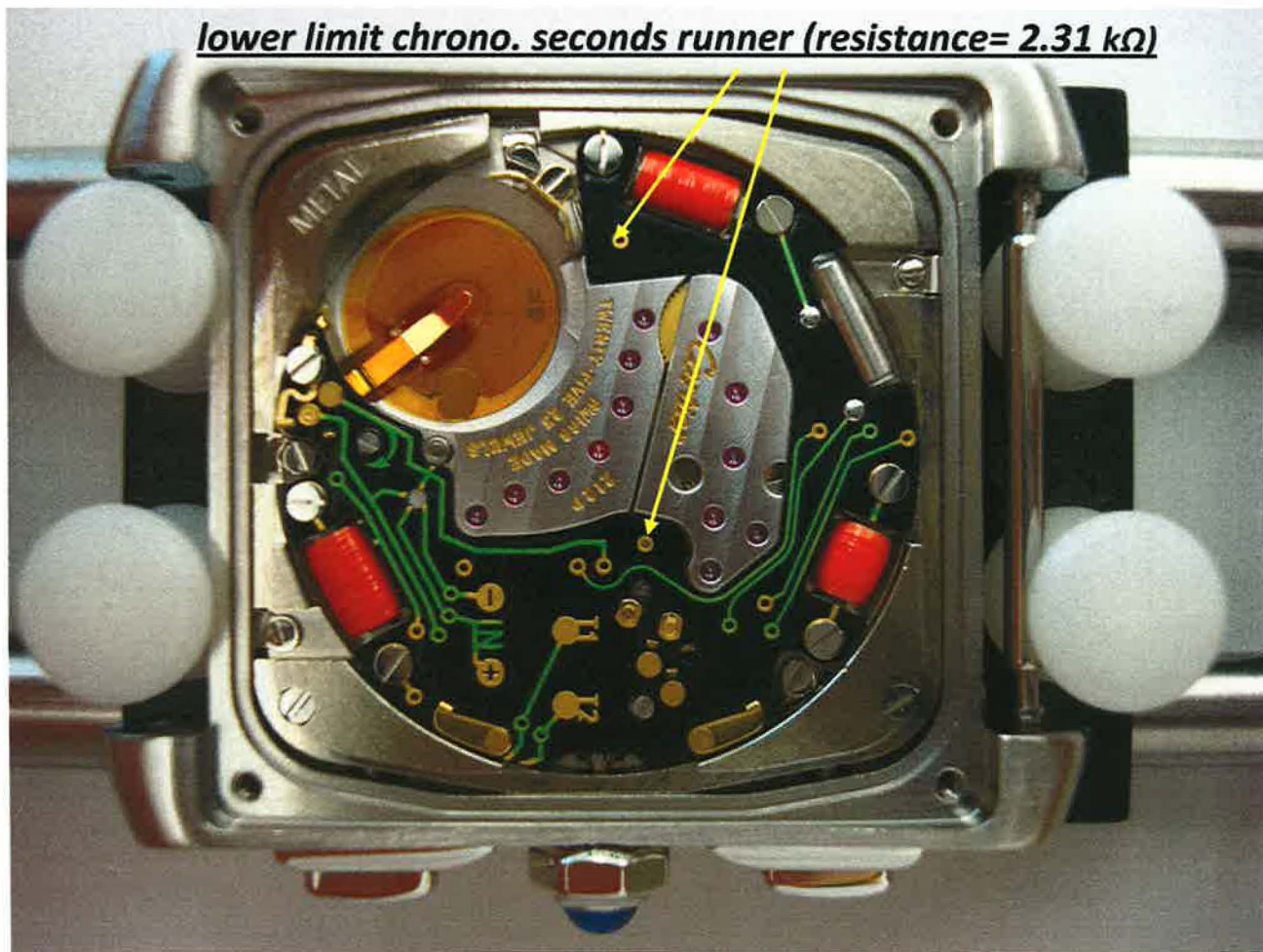
lower limit hour & min. hands (resistance= 1.88 k Ω)



- **rate: -0.1 + .5 sec/day**
- **consumption (max.): 0.50 μ A + chrono 13 μ A**
- **running lower limits: 1.20 V**
- **coil resistance all 3 coils: 5.1 – 5.5 k Ω**

**movement testing for quartz watches
chronoreflex witschi qt6000
lower limit and coil resistance**

**set witschi 6000 test mode module to pulse generator for lower
limit function test. for coil resistance set test mode module
to resistance.**

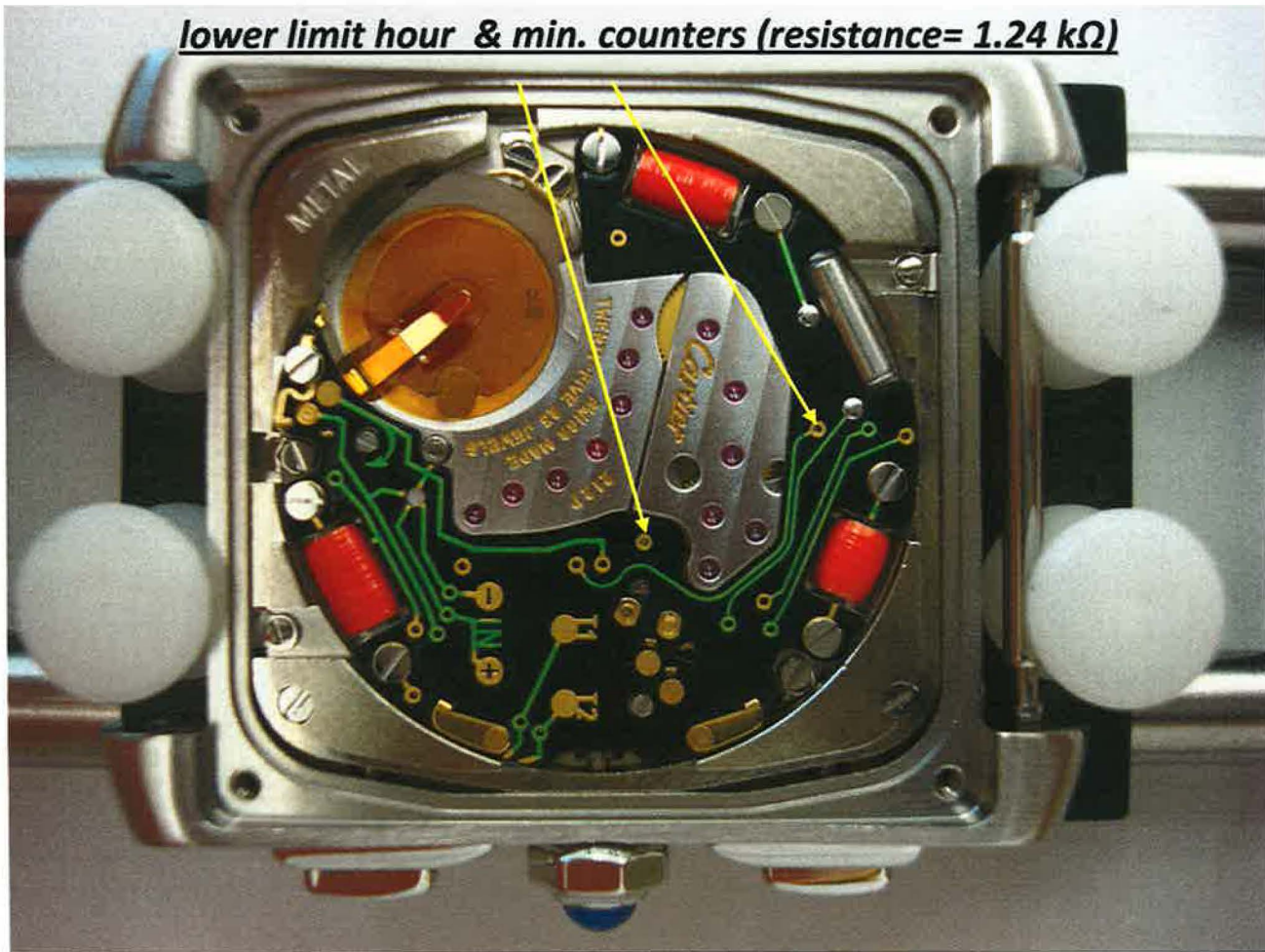


- **rate: -0.1 + .5 sec/day**
- **consumption (max.): 0.50 μ A + chrono 13 μ A**
- **running lower limits: 1.20 V**
- **coil resistance all 3 coils: 5.1 – 5.5 k Ω**

**movement testing for quartz watches
chronoreflex witschi qt6000
lower limit and coil resistance**

set witschi 6000 test mode module to pulse generator for lower limit function test. for coil resistance set test mode module to resistance.

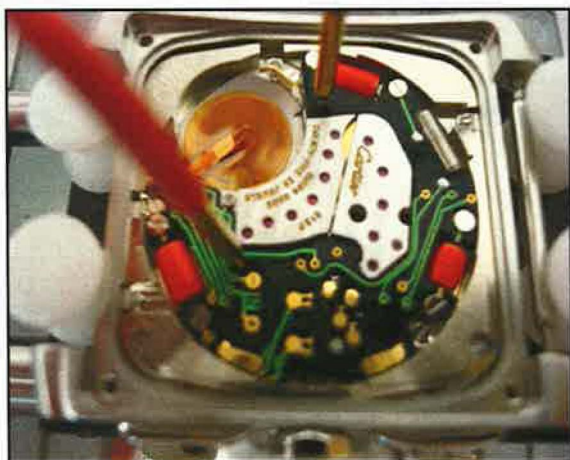
lower limit hour & min. counters (resistance= 1.24 k Ω)



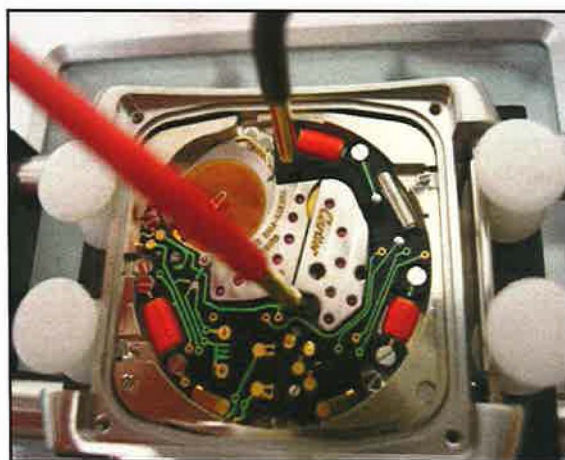
- **rate: -0.1 + .5 sec/day**
- **consumption (max.): 0.50 μ A + chrono 13 μ A**
- **running lower limits: 1.20 V**
- **coil resistance all 3 coils: 5.1 – 5.5 k Ω**

**movement testing for quartz watches
chronoreflex witschi qt6000
lower limit and coil resistance**

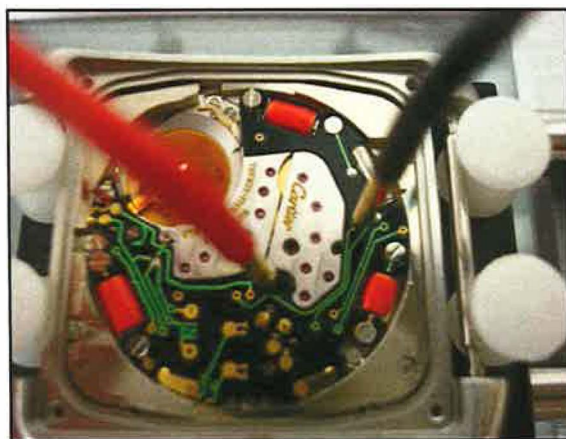
**set witschi 6000 test mode module to pulse generator for lower
limit function test. for coil resistance set test mode module
to resistance.**



**hour and minute hand
lower working limit
function**



**chrono seconds runner
lower working limit
function.**

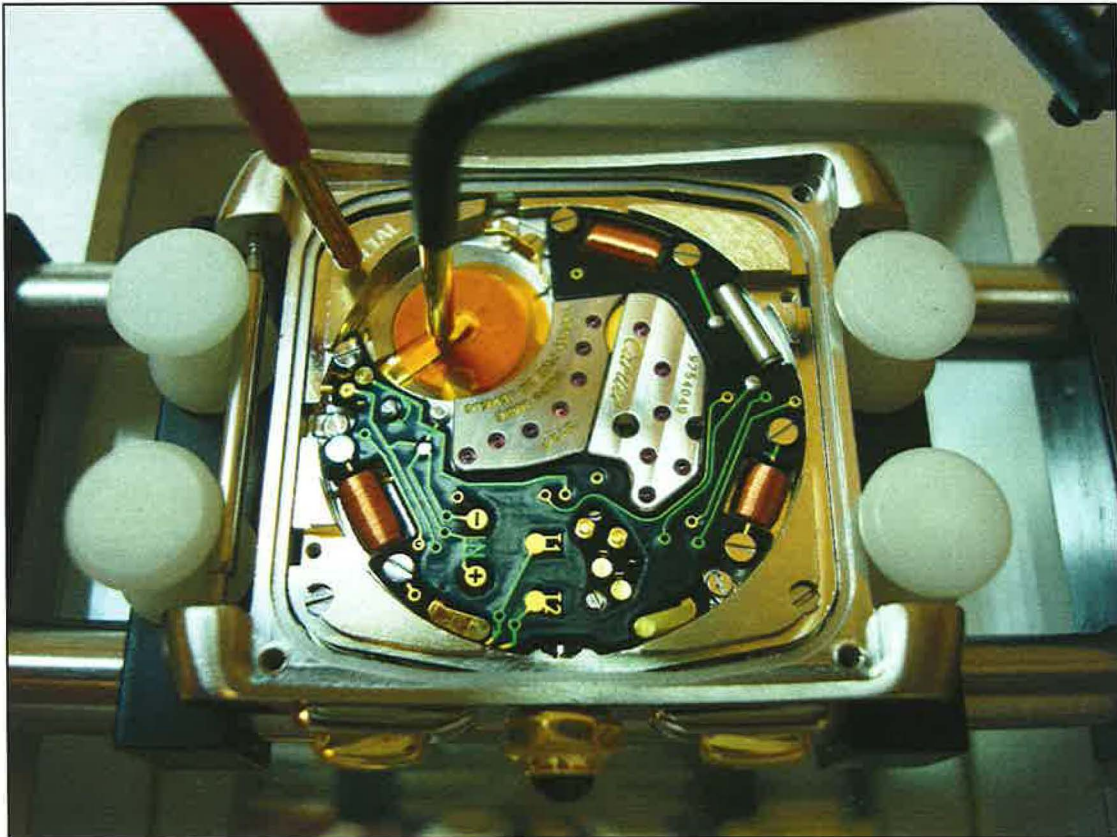


**hour and minute counters
lower working limit
function.**

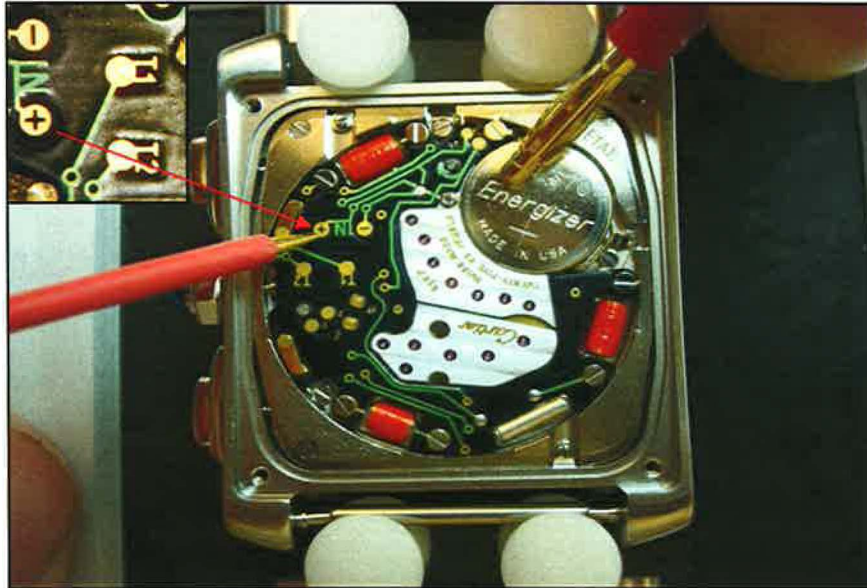
***movement testing for quartz watches
chronoreflex witschi qt6000
consumption measurement***

standard base consumption: 0.30 μ A (max. 0.50 μ A)

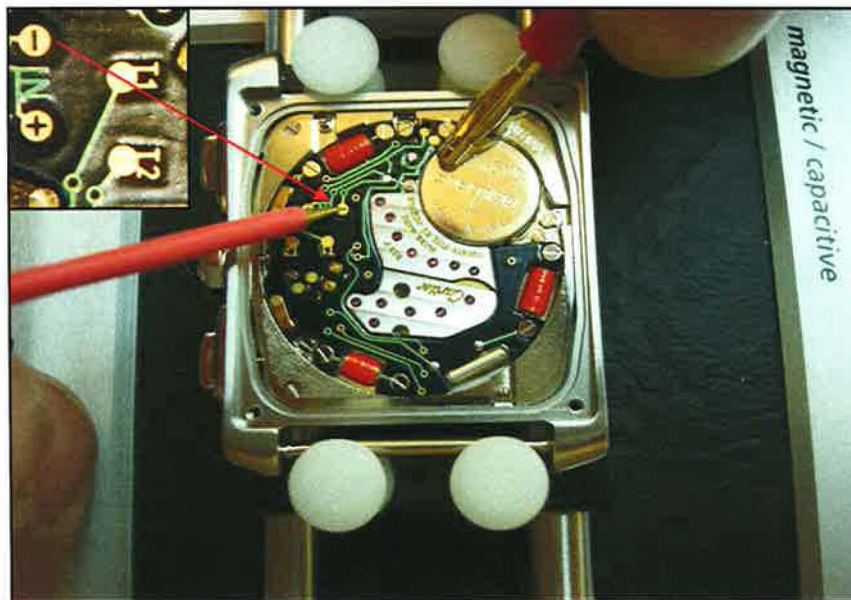
***testing is done without motor pulse and with case back off
with the power supply at 1.55V and the probes connected.***



**movement testing for quartz watches
chronoreflex witschi qt6000
rate adjustment "bridging"**



**increase rate
each contact or "bridging" is + 7 sec / month
or + .022 sec / day**



**decrease rate
each contact or "bridging" is - 7 sec / month
Or - .022 sec / day**

INSTRUCTIONS FOR USING THE TABLE FOR ADJUSTING THE RATE

In the column titled "sec / month" and "1/100ths of a sec / day" are listed rates compared to the perfect rate, +/- 0.

The column titled "bridgings" indicates the bridgings to be done between the track "-" and the earth if the movement goes too fast, or between the track "+" and the earth if the movement goes too slow.

Tolerance: the rate is accepted when it is between +1 and -6 seconds per month, which is +3.33 and + 20 1/100ths of a second per day.

Example: a watch placed on a tester shows a rate of "-163" secs / month, which is -543 1/100ths of a sec / day. By looking at the column "secs / month", the closest higher value that can be found is "166". Therefore, the corresponding value in the column "bridgings" is "25", which means that 25 bridgings between the earth and the track "+" are necessary to bring the rate of this movement between +1 and +6 secs / month. The final rate will be "+3" secs / month.

Bridgings	SEC/MONTH (+/-)	1/100ths of SEC/DAY (+/-)	Bridgings	SEC/MONTH (+/-)	1/100ths of SEC/DAY (+/-)
1	7	22	26	173	572
2	13	44	27	180	594
3	20	66	28	186	616
4	26	88	29	193	632
5	33	110	30	200	660
6	40	132	31	206	682
7	46	154	32	213	704
8	53	176	33	220	726
9	60	198	34	226	748
10	66	220	35	233	770
11	73	242	36	240	792
12	80	264	37	246	814
13	86	286	38	253	836
14	93	308	39	260	858
15	100	330	40	266	880
16	106	352	41	273	902
17	113	374	42	280	924
18	120	396	43	286	946
19	126	418	44	293	968
20	133	440	45	300	990
21	140	462	46	306	1012
22	146	484	47	313	1034
23	153	506	48	319	1056
24	160	528	49	326	1078
25	166	550	50	333	1100