

Watch Movement Specification and Drawing

CHRONOGRAPH

Cal. YM91A

Movement Size

12'''

Casing Diameter

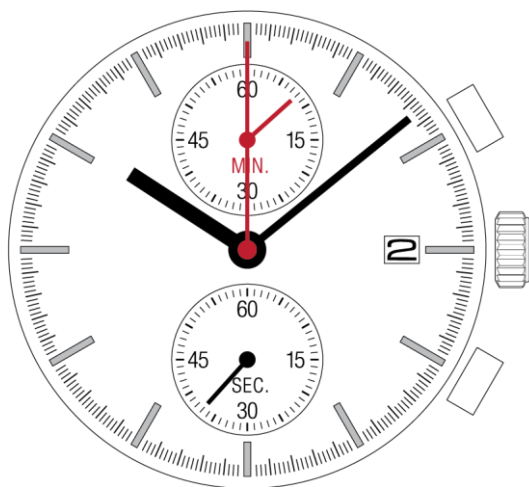
Ø 27.0mm

Height

3.70mm

Battery Life

5 years

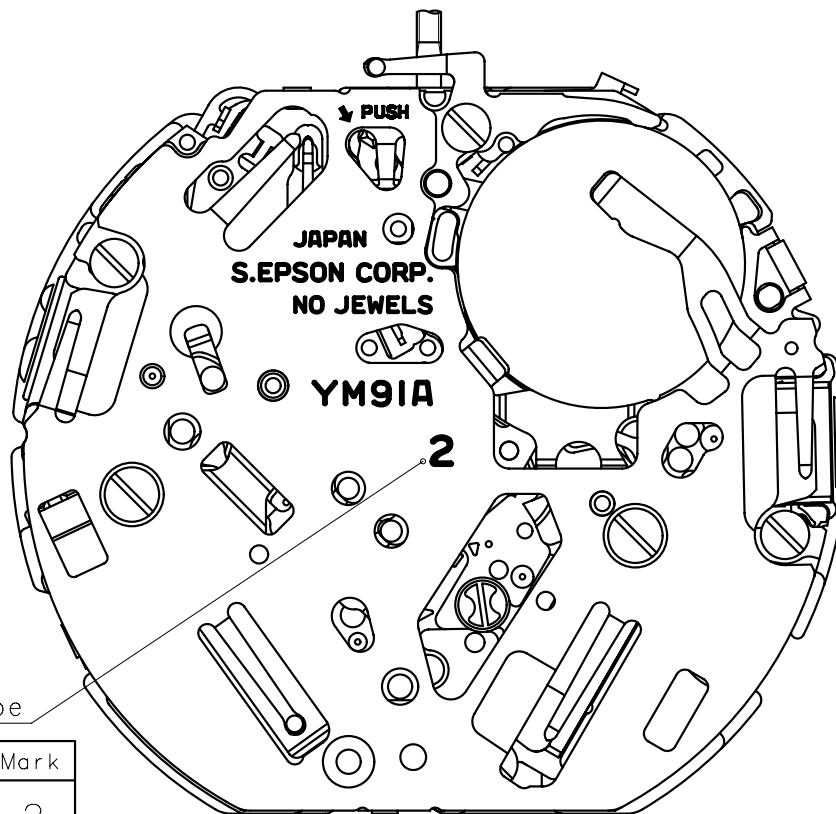


Date: 22/Aug./'23

Cal. YM91A

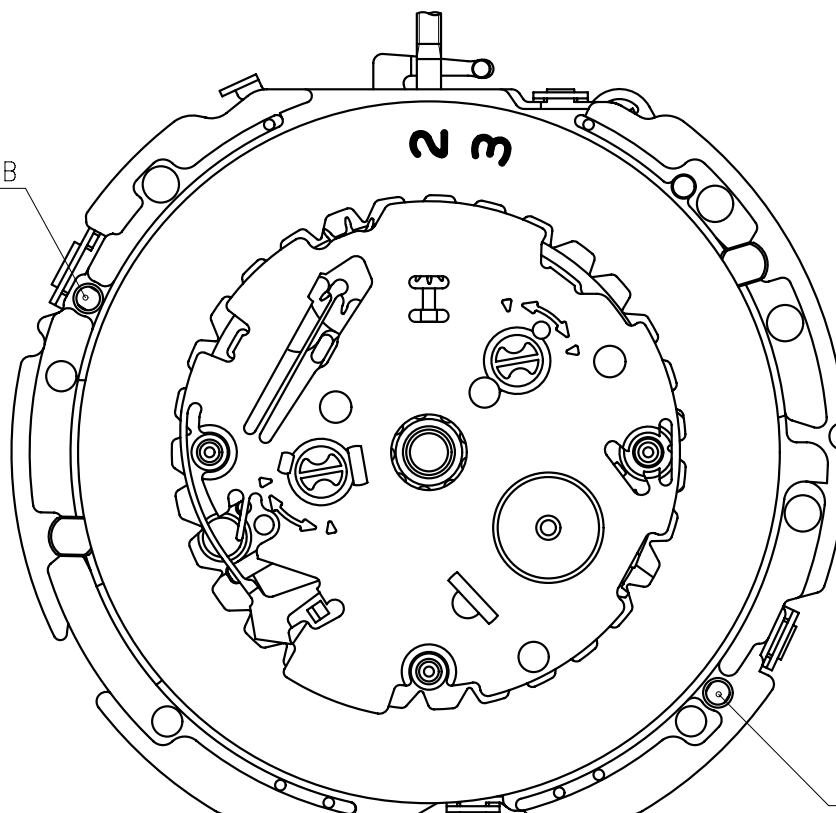
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Cal.	YM91A	Specifications	Date : 22/Aug./'23
			Rev. : 05
Analog Quartz 12''' Center second Chronograph Movement			
1. MOVEMENT DIMENSIONS			
Outside diameter		ϕ 27.60mm(12H-6H) × 24.00mm(3H-9H)	
Casing diameter		ϕ 27.00mm(12H-6H)	
Total height		3.7mm (including battery)	
2. TIME STANDARD			
Type of quartz oscillator		Tuning fork	
Frequency of quartz oscillator		32,768 Hz	
Accuracy		±20 seconds per month (on wrist)	
Operating temperature range		−5°C to +50°C	
Regulation device		Nil (Pre-adjusted)	
3. INDICATOR / FUNCTIONS			
3 Hands		Hour / Minute / 1/5 second chronograph (Center)	
Small hands		Small second (6H) / Minute chronograph (12H)	
Calendar		Instant setting device for date calendar	
Reset switch			
Power depletion warning function (BLD)			
(Small second hand moves at 2-second intervals)			
Chronograph		The chronograph can measure up to 60 minutes in 1/5 second increments, capable of timing 12 hours.	
4. FEATURES			
Jewels		0 Jewels	
Anti-magnetism		Over 1600A/m (Direct current magnetic field)	
Maximum unbalance of hands		Small second hand	: 0.03 μ N·m
		Minute chronograph hand	: 0.03 μ N·m
		1/5 second chronograph hand	: 0.09 μ N·m
		Minute hand	: 0.70 μ N·m
Moment of Inertia	1/5 second chronograph hand	: less than 0.2 μ g·m²	
5. BATTERY			
Type / Size		Silver oxide battery / ϕ 9.5mm × t 2.73mm	
Recommended battery		SR927SW	
Nominal voltage		1.55 V	
Battery life		Approx. 5 years	
		(2 hours chronograph operation per day)	
Driving current consumption		Approx. 0.80 μ A	
Operation stopping voltage		0.9 V	
6. SEPARATED PARTS (Parts code)			
Hand setting stem		0351584 (Standard)	
Holding ring for dial		0866650 (Standard)	
Battery		SR927SW	
7. TEST OF ACCURACY			
Equipment to be used		SEIKO quartz tester QT-99, QT2100	
		Greiner quartz timer-C , Witschi Q-tester 4000	
Duration of measurement		10 seconds	
Microphone to be used		Electromagnetic detection type	
All specifications are subject to change without notice.			



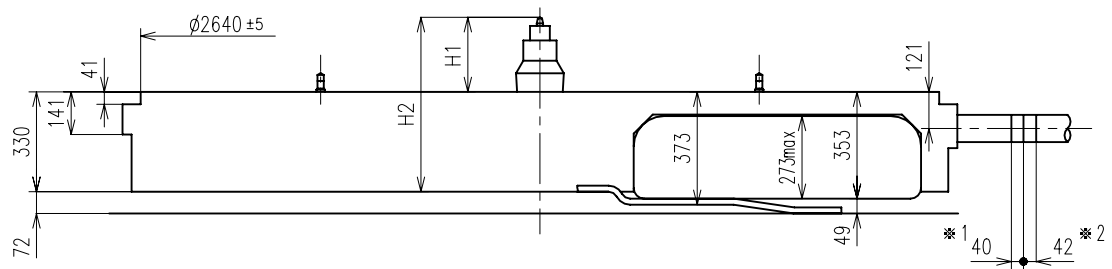
Hands type

	Mark
Type(M) YM91A**	2



Dial leg hole B

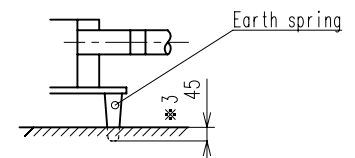
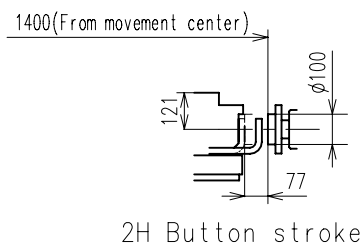
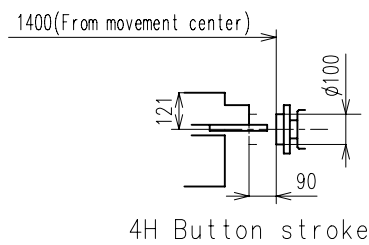
Dial leg hole A



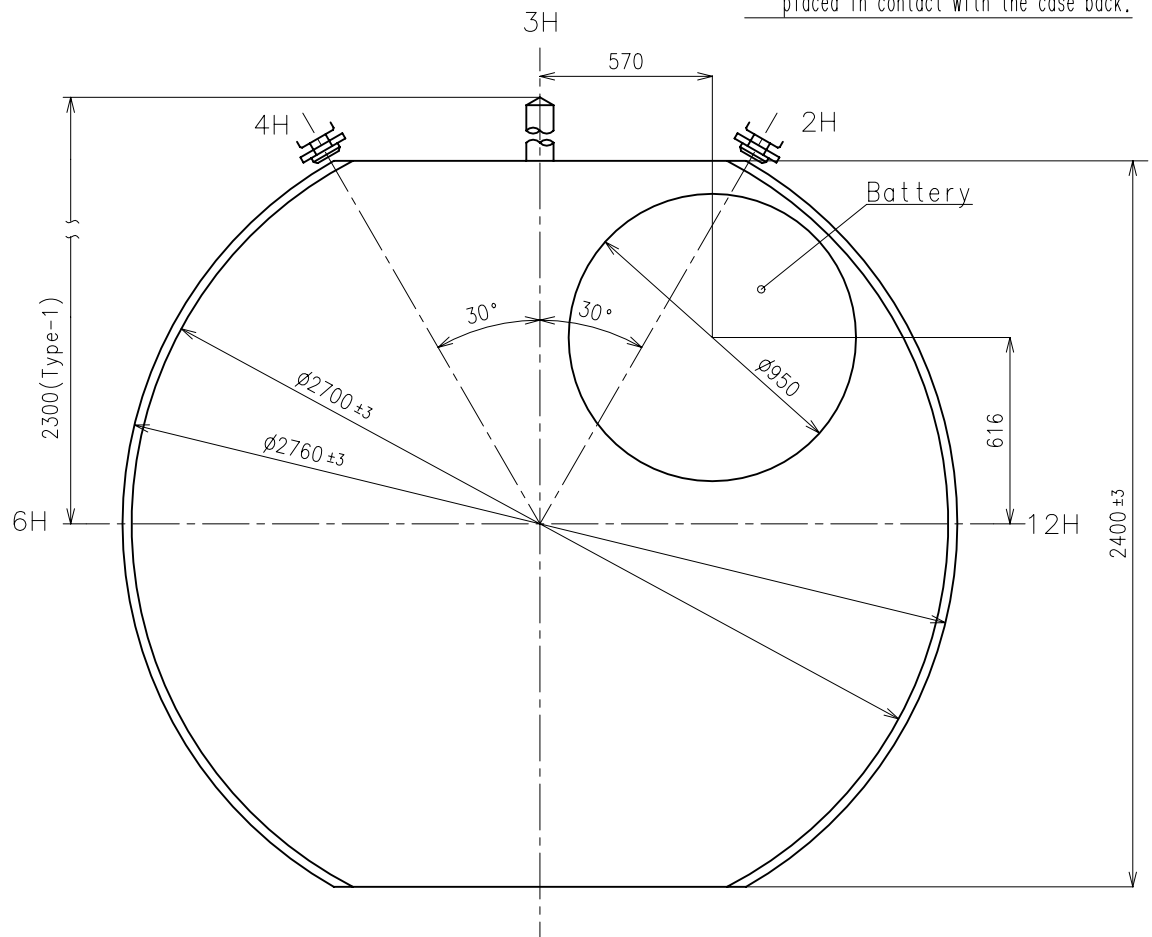
Center post		Type M (2) YM91A**
Maximum height from dial support	H1	246.5
Total height including movement	H2	576.5

*1:First pullout stroke

*2:Second pullout stroke



*3:The earth spring is absolutely placed in contact with the case back.

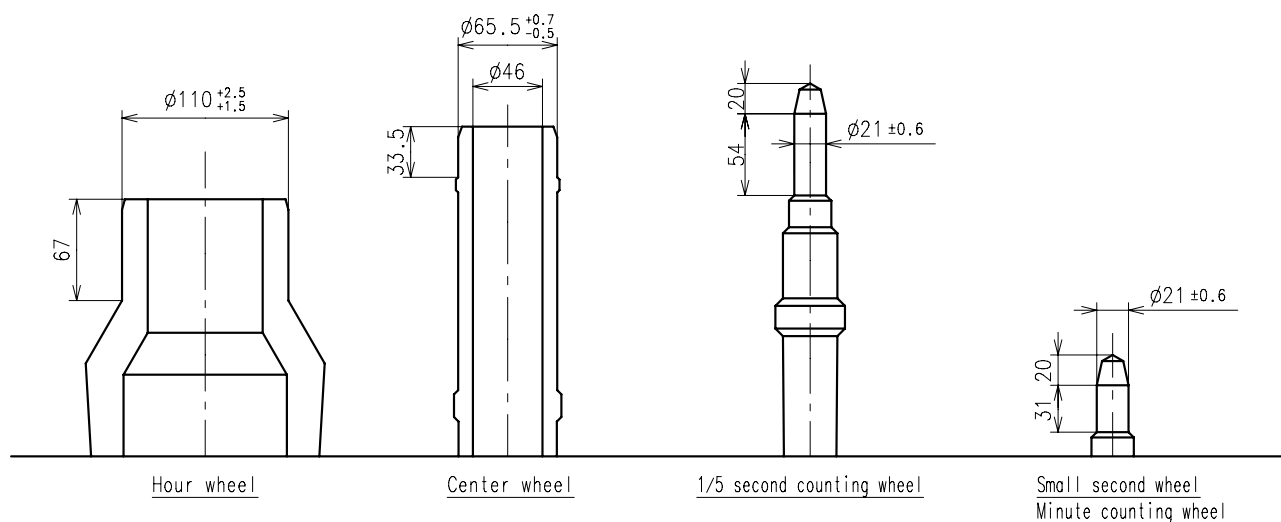


※ Unbalance

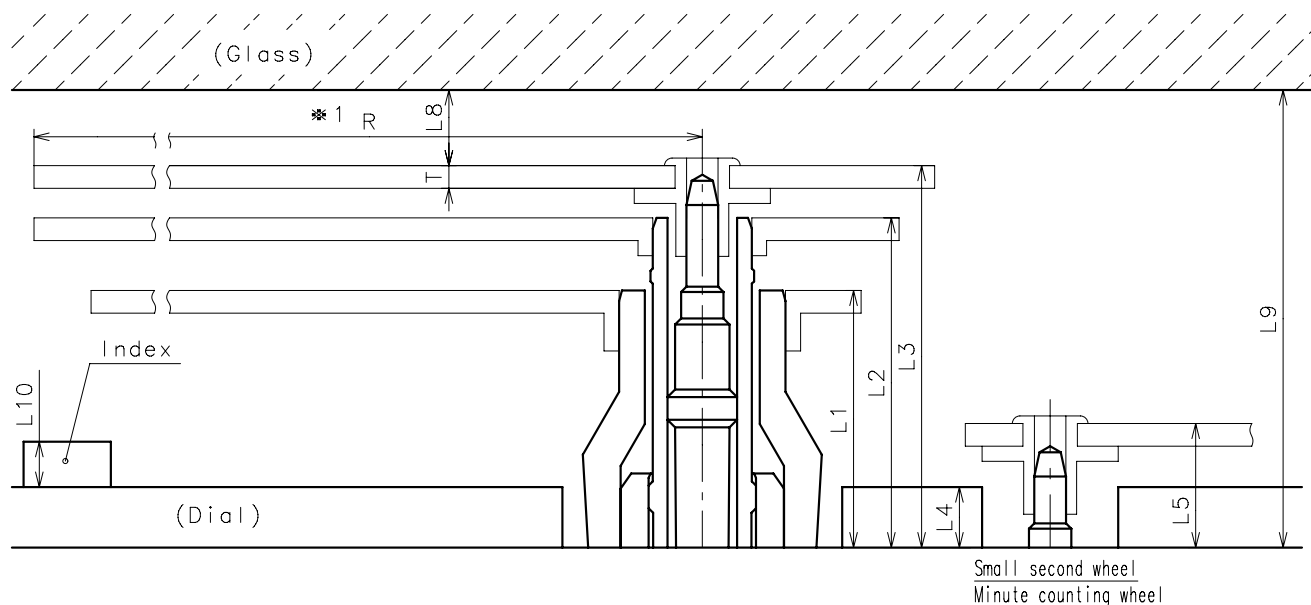
- Small second hand $\leq 0.03\mu\text{ N}\cdot\text{m}$ ($3\mu\text{ g}\cdot\text{m}$)
- Minute chronograph hand $\leq 0.03\mu\text{ N}\cdot\text{m}$ ($3\mu\text{ g}\cdot\text{m}$)
- 1/5 second chronograph hand $\leq 0.09\mu\text{ N}\cdot\text{m}$ ($9\mu\text{ g}\cdot\text{m}$)
- Minute hand $\leq 0.70\mu\text{ N}\cdot\text{m}$ ($70\mu\text{ g}\cdot\text{m}$)

※ Moment of inertia

- 1/5 second chronograph hand $\leq 0.2\mu\text{ g}\cdot\text{m}^2$

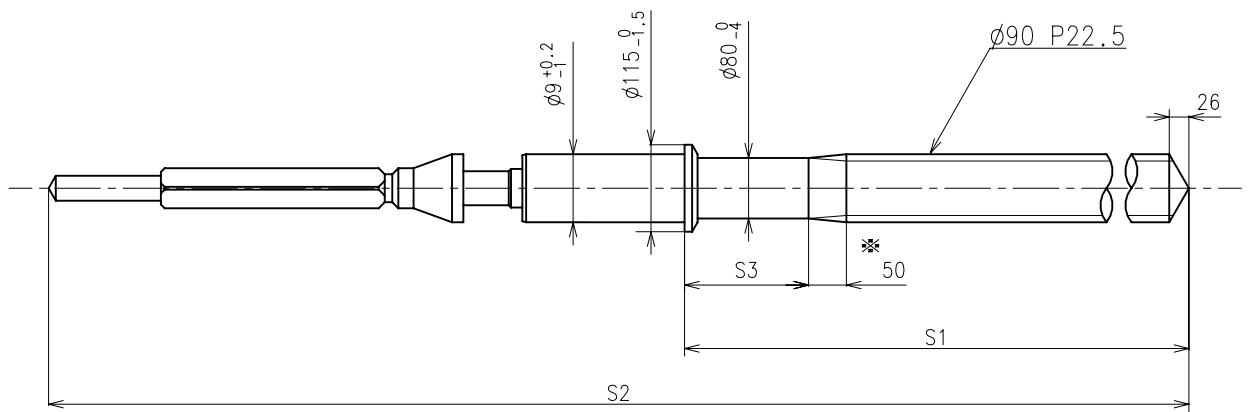


	Parts No.				
	Hour wheel	Center wheel	1/5 second counting wheel	Small second wheel	Minute counting wheel
Type M (2) YM91A**	0271588	0221583	0888582	0240582	0902580



	L1	L2	L3	L4	L5	—	—	L8	L9	L10	T	*1 R
Type M (2) YM91A**	170	218	252.5	40	82	—	—	MIN: 50	MIN: 302.5	MAX: 50	15	MAX: 1250

※1: It is the size taken into consideration for hands attachment.
Please observe some standard value specified in unbalance and moment of inertia when using long hands.

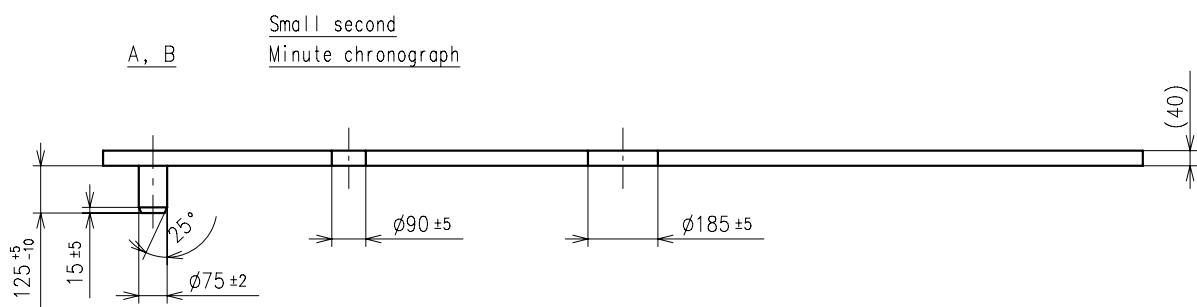
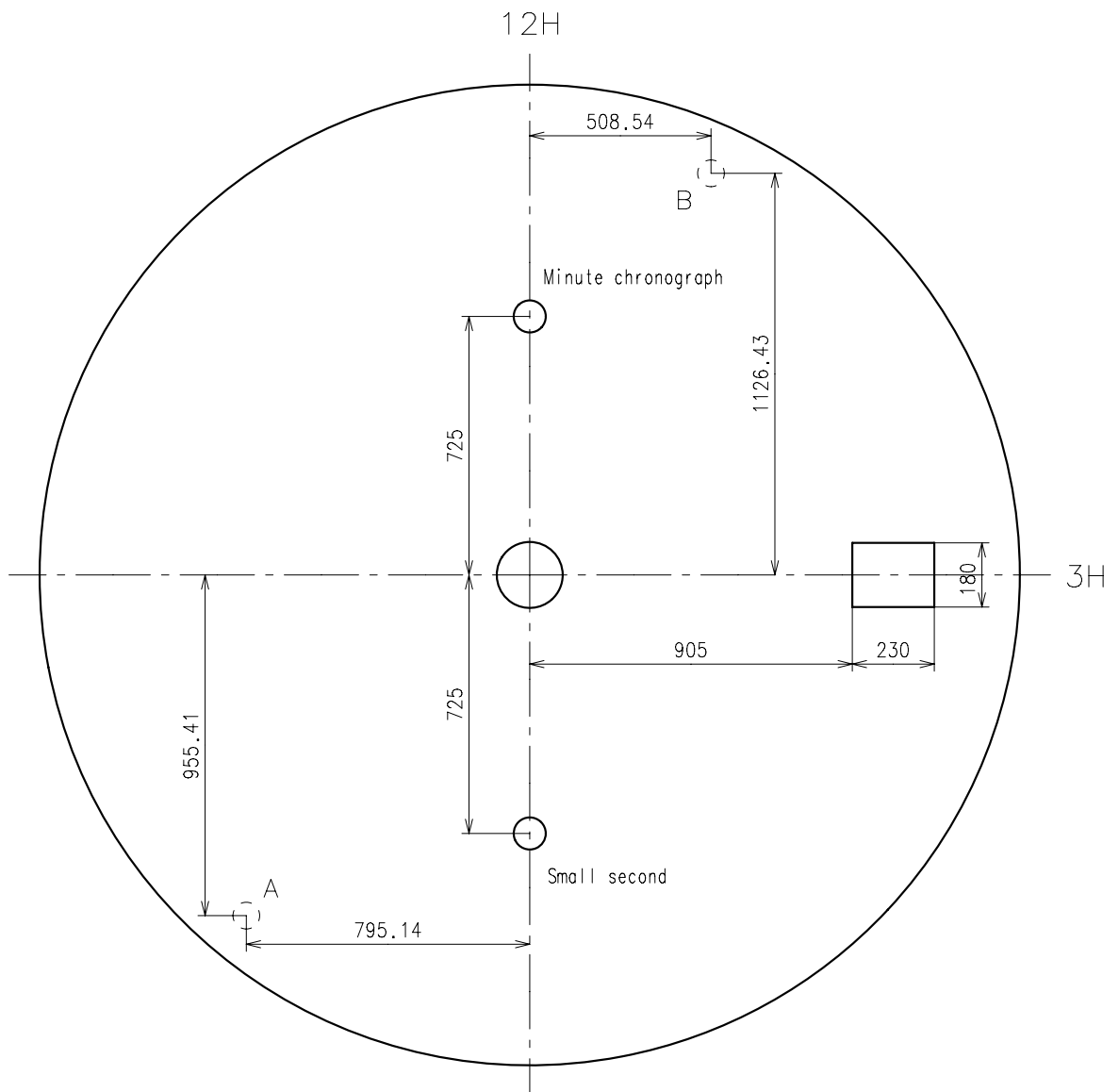


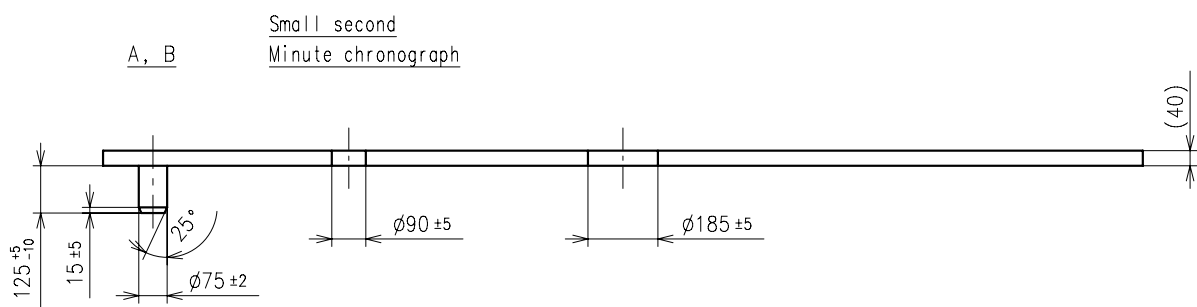
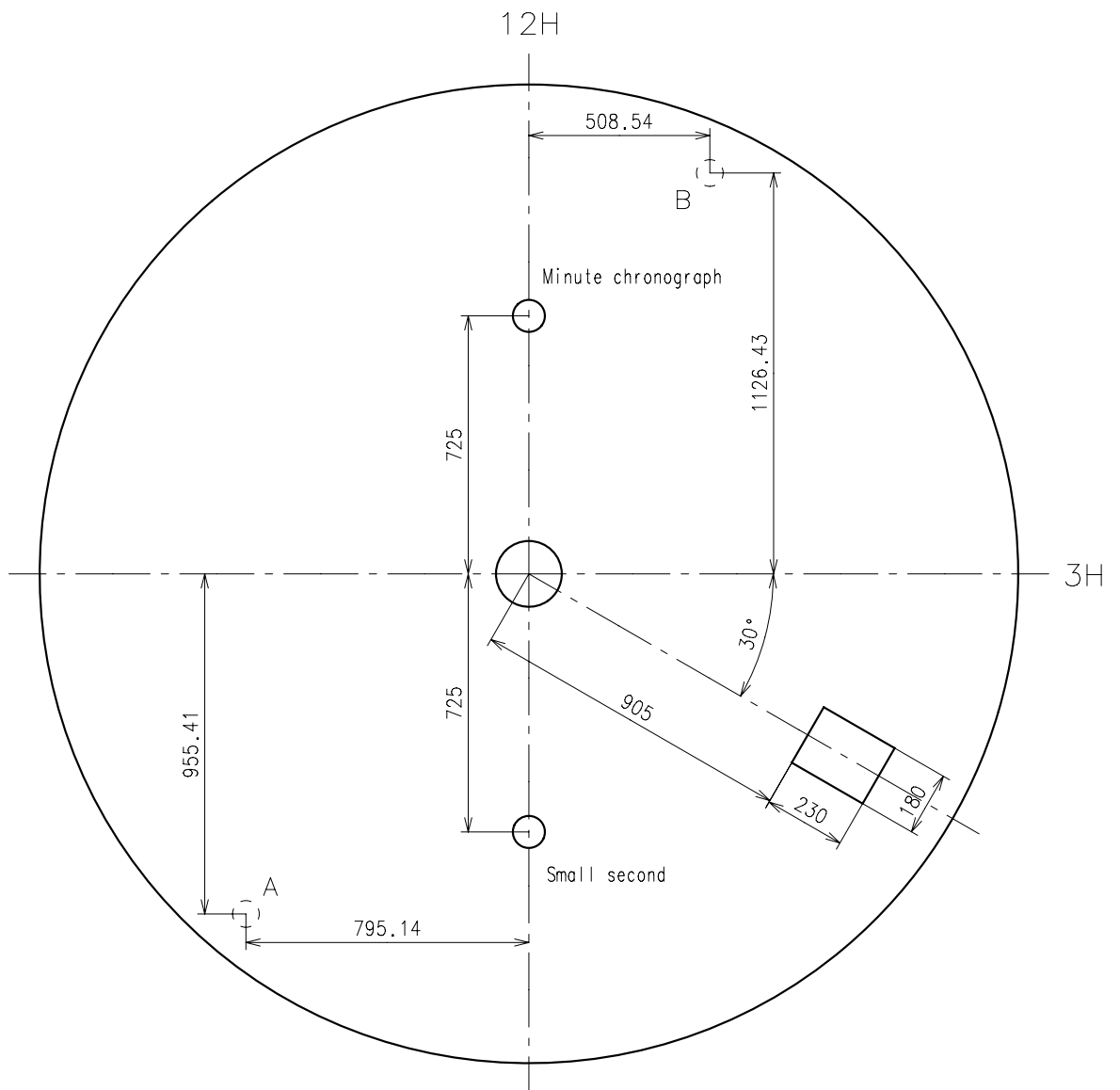
✱ Not threaded

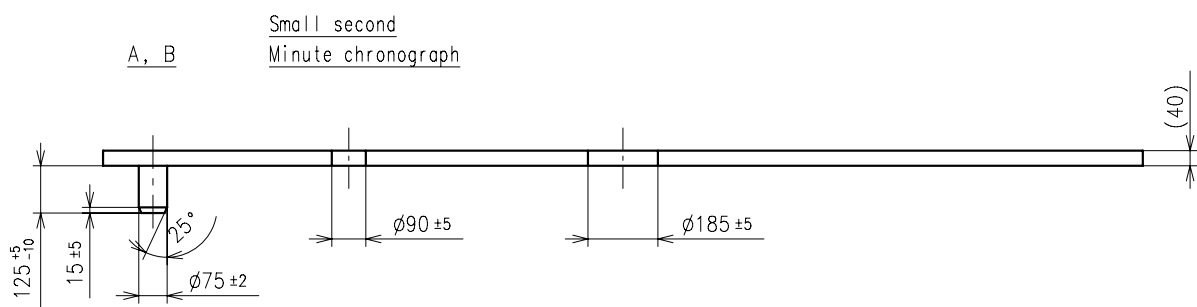
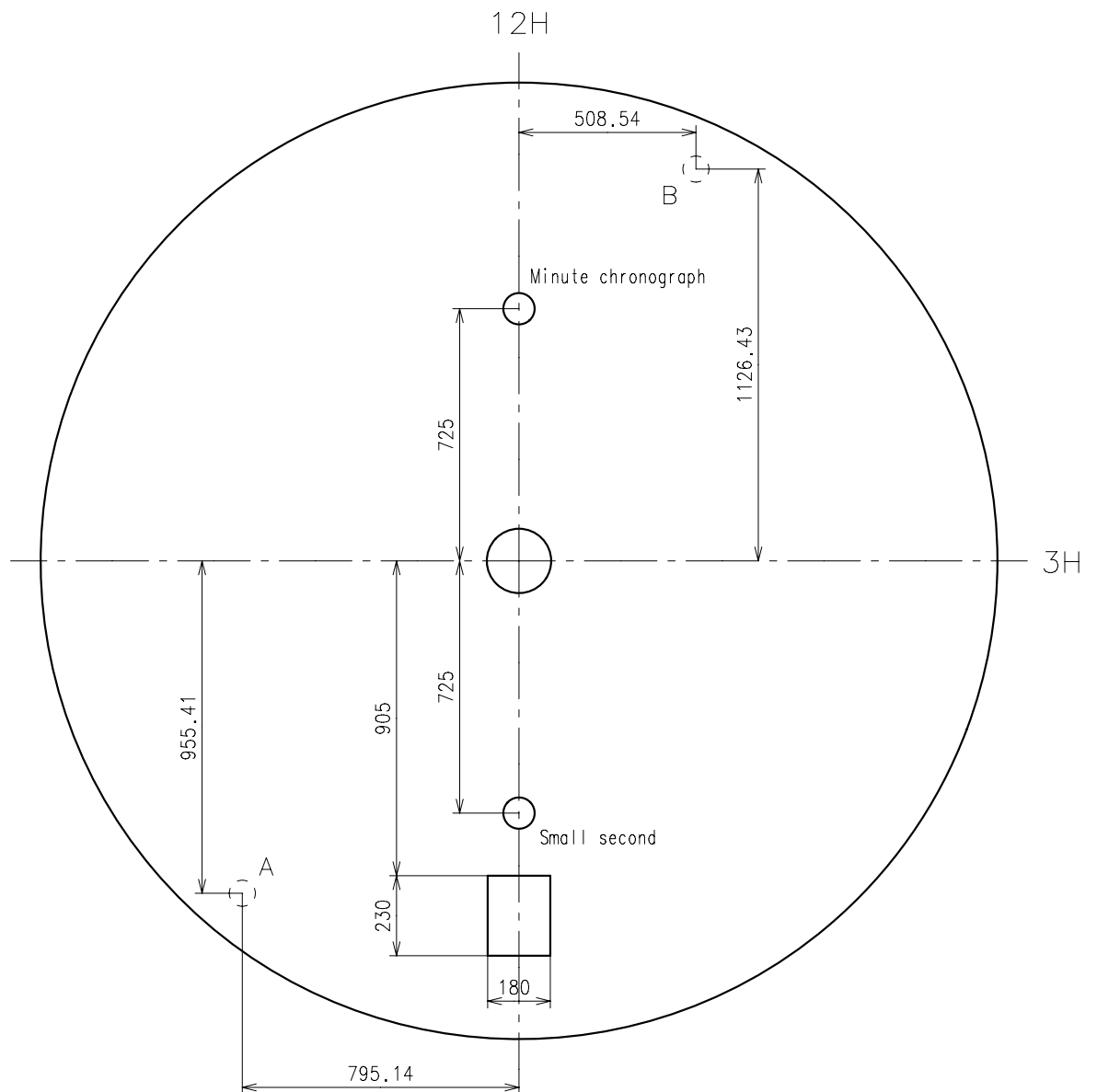
	Part No.	S1	S2	S3
Type-1 (Standard)	0351584	1164	2005.5	164

Material : Steel

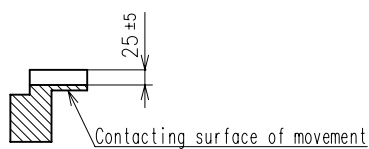
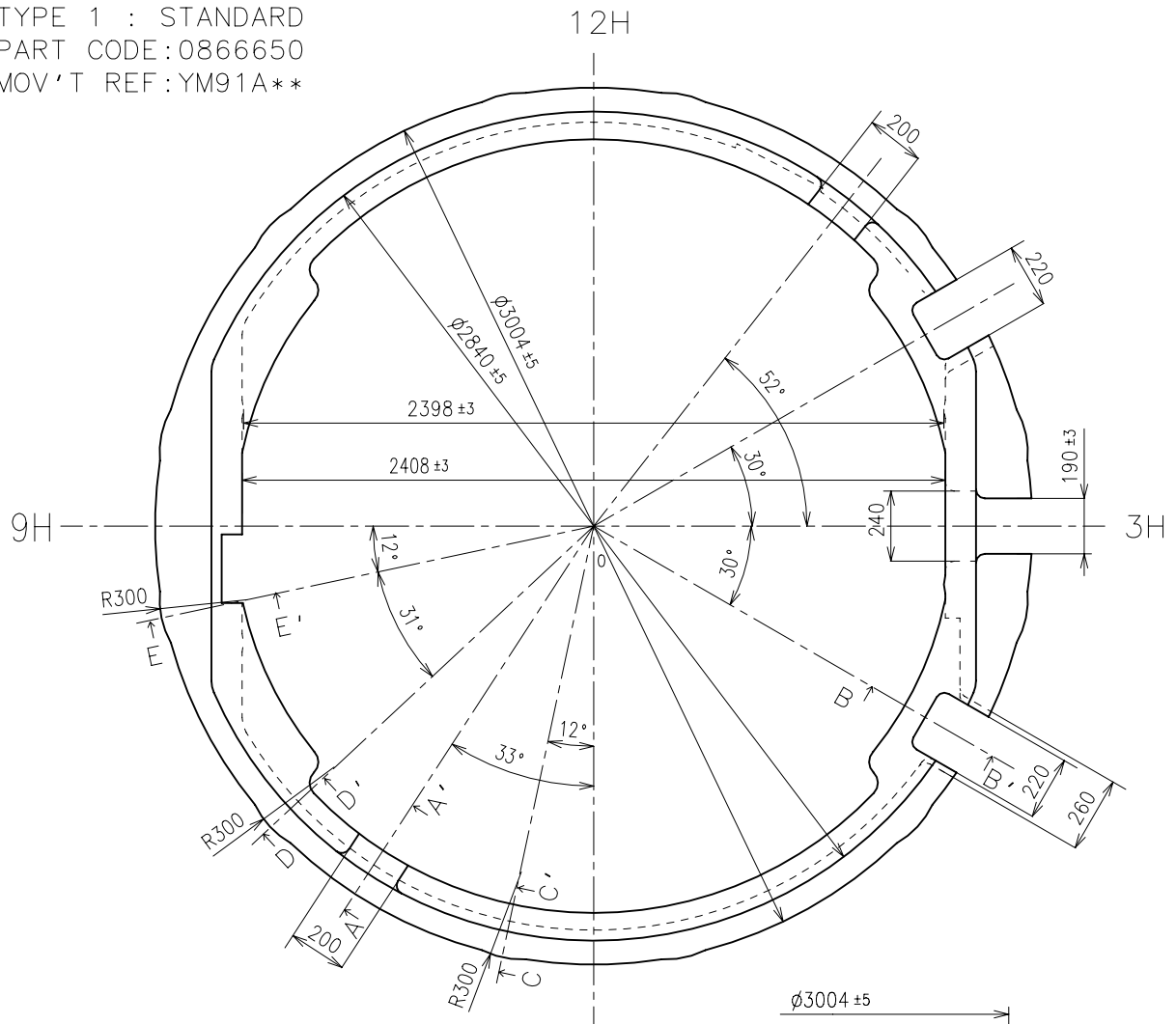
Hardness : Vickers 600±50



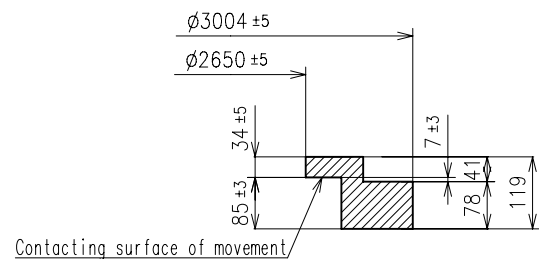




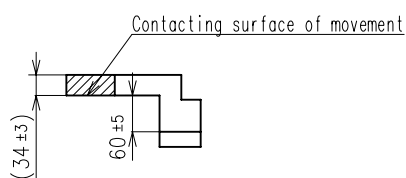
TYPE 1 : STANDARD
PART CODE:0866650
MOV'T REF:YM91A**



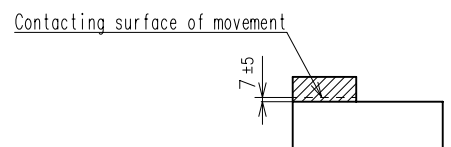
A-A' section



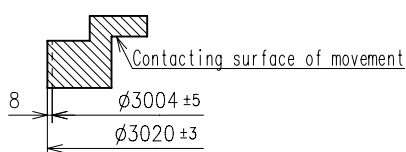
0-12H section



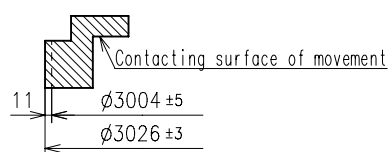
B-B' section



0-3H section

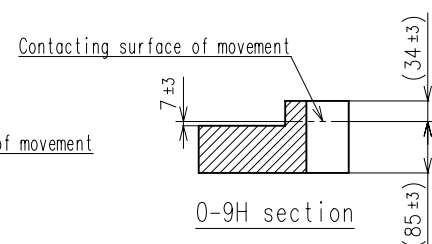


C-C' section



D-D' section

E-E' section



0-9H section

1.How to replace the battery

- Please use the specified battery to keep the stable performance for a long time.
- Please install the minus part of the battery towards inside of the watch.
- When installing or changing the battery, it is recommended to remove two battery clamp screws first, then remove the battery clamp not to damage the movement parts.
If you install the battery without removing the battery clamp, please install the battery from [→] direction as illustrated below Fig.[1].
- Install the battery under the circuit cover as illustrated below Fig.[1] and Fig.[2].
- System-reset is not required.
- After installing the battery, set the current time and then set the 1/5 second chronograph hand and minute chronograph hand at "0" position.

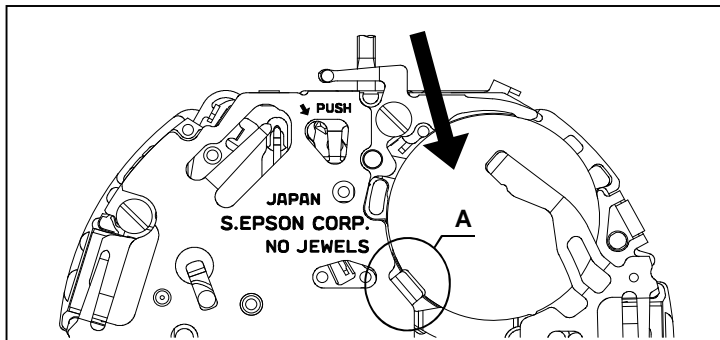


Fig.[1]

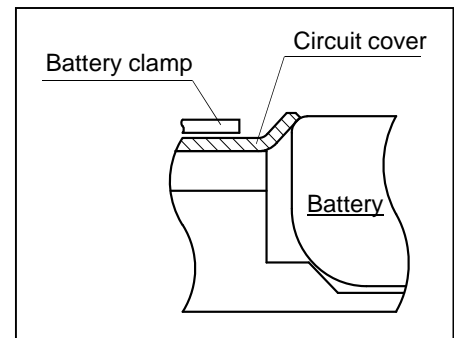


Fig.[2] A section

2.How to remove the stem

- When removing the stem, pull out the crown at 1st click position and then remove the stem while pressing the hollow portion of setting lever by tweezers. (Refer to the Fig.[3].)

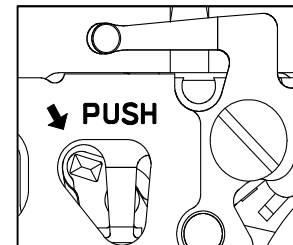


Fig.[3] Crown pulled out at 1st click

3.How to set the hands

- Each hand moves at step interval. Set the each hand at correct position according to the scale on the dial in order not to make a mistake in reading time.
- Do not turn the hand forcibly.

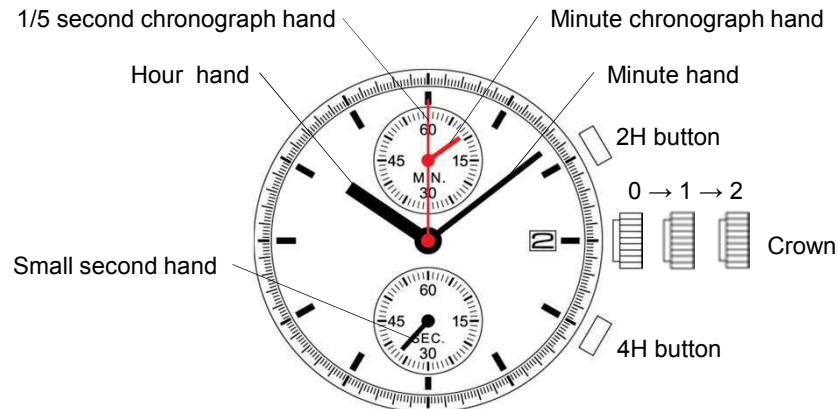
4.How to remove the hands

- When removing the hands, use exclusive fork-shaped tools.
- Do not remove the dial under the condition that any hands are set.

5.How to test the accuracy

- When measuring the time accuracy, use specified Quartz Tester and change the gate time in 10 seconds.

Cal. YM91A	Attention of casing part structure	Date : 31/Jul./'14 Rev. : 02
<p>1.Minute hand</p> <p>The center wheel have a safety stopper structure to prevent the minute hand from being pressed too much. However pay attention to the contact between hour hand and minute hand.</p> <p>2.Holding ring for dial</p> <p>Use the specified holding ring for dial to prevent rotation of the movement inside of the case in order to stabilize the button operation. Refer to the [Holding ring for dial] page instruction as to the shape and tolerance.</p> <p>3.Case</p> <p>Use the metal case to prevent from the movement mal-function by static electricity.</p> <p>4.Hour wheel</p> <p>When set and remove the hour hand repeatedly, it may reduce the hand fixing torque because the hour wheel is made by plastic. To ensure the enough fixing torque, it isn't recommended to re-assemble the hour hand more than five times.</p>		



	Crown position		
	0 click	1st click	2nd click
Crown	Free	Turn clockwise for date change	Time setting
2H button	Chronograph Start/Stop Restart	Chronograph Start/Stop Restart	[*1]
4H button	Chronograph Reset Split Split release	Chronograph Reset Split Split release	[*1]

[*1] How to set the "0" position

Pull crown out to the 2nd click position.



Press 2H button for 2 seconds.

Minute chronograph hand turns a full round and can now be set to correct "0" position.



Press 4H button repeatedly to set it to "0" position.



Press 2H button for 2 seconds.

1/5 second chronograph hand turns a full round and can now be set to correct "0" position.



Press 4H button repeatedly to set it to "0" position.

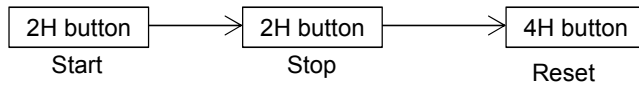


Push crown back to normal position.

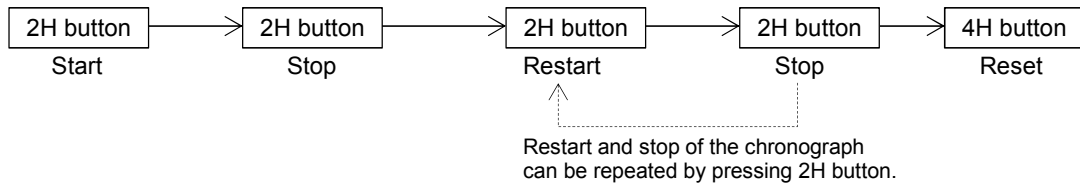
Chronograph function

- The chronograph can measure up to 60 minutes in 1/5 second increments, capable of timing 12 hours.
- When the measurement reaches 12 hours, the chronograph automatically stops counting.

■ Standard measurement



■ Accumulated elapsed time measurement



■ Split time measurement

