(1)BASIC SPECIFICATION

CALIBRE	6T51	8205	8215	821A
Ligne Size*mm	8-3/4 Φ19.8mm	11-1/2 Φ26mm		
Total height	5.98mm	5.67mm		
Day	○	○	○	○
Date	○	○	×	×
Vibration frequency	28800times /hour	21600times/hour		
Mainspring wounding direction	Right rotation	Left rotation There is an arrow mark on oscillating weight block		
Jewels	21 Jewels			

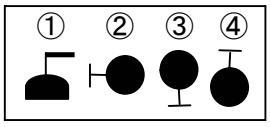
(2)TIME PERFORMANCE

※Accuracy of the mechanical watch is different from the daily rate of the quartz watch and the accuracy will change maximum of several ten seconds during rewinding the spring, then the accuracy of the half winding condition will be different from that if full winding condition.

Standard	CALIBRE			
Time Performance	6T51	8205	8215	821A
Accuracy	−20～+40 seconds／day			
Posture difference	Under 50 seconds			
Duration time	More than 40 hours			

<Measurement Condition>

Accuracy Measure within lapse of 10～60 minutes from full winding.



Posture difference Measure accuracy in 4 different postures shown on the right picture within lapse of 10～60 minutes from full winding.

※Direction of 4 postures ①Date Dial Up ②6 o'clock up ③9 o'clock up ④3 o'clock up

Duration time In automatic winding, measure the operating time after winding the mainspring by the mainspring winding up device (60 minutes) and leaving itself on natural condition with posture.

※When setting the movement to the mainspring winding up device, set the direction of the mainspring winding up device and the mainspring winding direction in the same direction.

※If oscillating weight makes 116.5 rotation, ratchet wheel rotates once. And when ratchet wheel rotates 7.5 times, mainspring becomes full winded. So to full wind the mainspring, rotating the oscillating weight for 116.5×7.5=873.75 times is needed. Check the time of the rotation of oscillating weight on the rotation speed of below 40 rpm of the mainspring winding up device. 60 minutes time is given considering the rotation loss.

(3)Function ①Automatic winding and the one side mainspring winding up system

②Date,day calendar corrector function on (No calendar corrector function on the day of 6T51)

(4)Operation method **6T51**

method Winding the mainspring, adjusting the hand, day/date is done by the below procedure.
day adjustment→hand adjustment→date adjustment

(1) Winding the mainspring
Automatic winding watch can also be hand winded by turning the crown in “A” position.
Wind 15～20 times. It will start to move naturally after shaking slightly.

(2) Adjusting day
Change the day on “B” position by moving the hand on the dial back and forth between 9 P.M. through 4 A.M.

(3) Adjusting hand
Rotate the crown in “B” position and set the standard time.
Then check if it is morning or the afternoon and adjust correctly.

(4) Adjusting date
Pull the crown in “B⇔C back and forth”position until that days date appear.

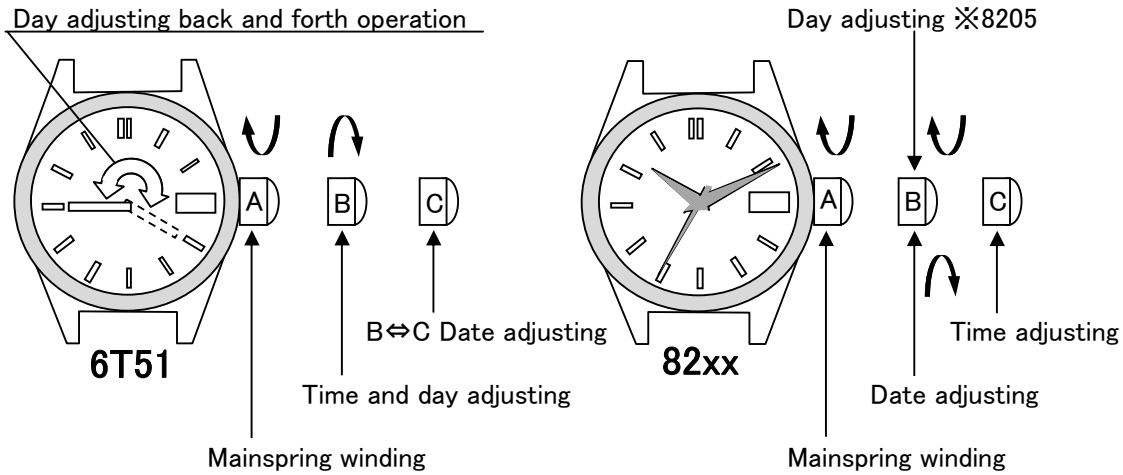
82xx
Winding the mainspring, adjusting the hand, day/date is done by the below procedure.
date adjustment→day adjustment→hand adjustment

(1) Winding the Mainspring
Automatic winding watch can also be hand winded by turning the crown in “A” position.
Wind 15～20 times. It will start to move naturally after shaking slightly.

(2) Adjusting date
Adjust the date by rotating the crown left in “B” position.

(3) Adjusting day
Adjust the date by rotating the crown right in “B” position. ※Only 8205

(4) Adjusting hand
Rotate the crown in “C” position and set the standard time.
Then check if it is morning or the afternoon and adjust correctly.



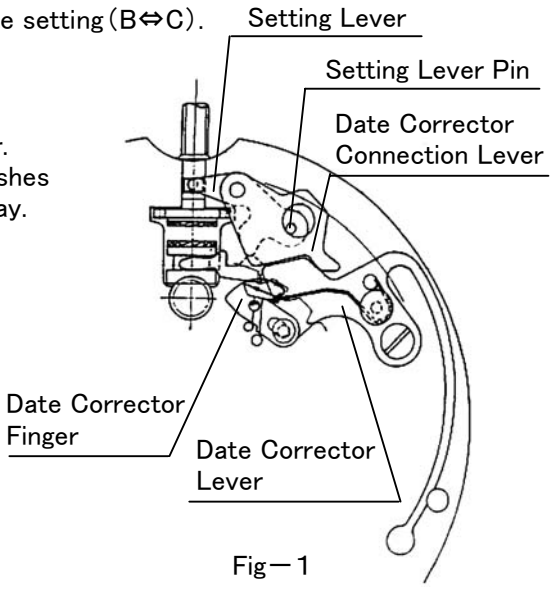
(5)Structure 1、6T51Dial side mechanism

①Quick date setting device (Fig－1)

・The crown position can be switched to 3 positions: A,mainspring winding: B, day and time settings: C, date setting (B⇔C).

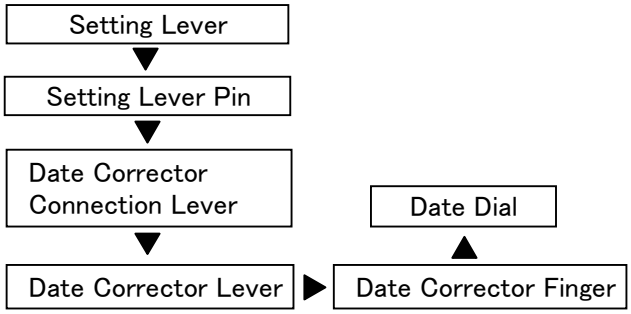
・When the crown is pulled out from position B to C, the date corrector turns a fixed angle by the setting lever pin through the date corrector connection lever. Through this motion, the tip of the date corrector pushes the date dial teeth to advance the date dial by one day.

・When the crown is released at C position, the date corrector, date corrector connection lever, setting lever and the crown are returned to the B position through the spring power of the date corrector. When the date corrector returns, the date corrector finger is pushed against the date corrector finger pin by the fingerspring so the tip of the date corrector finger returns without touching the date dial teeth.



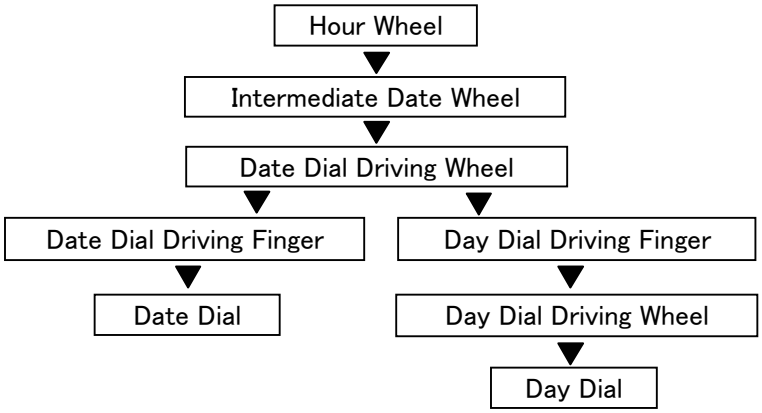
Fig－1

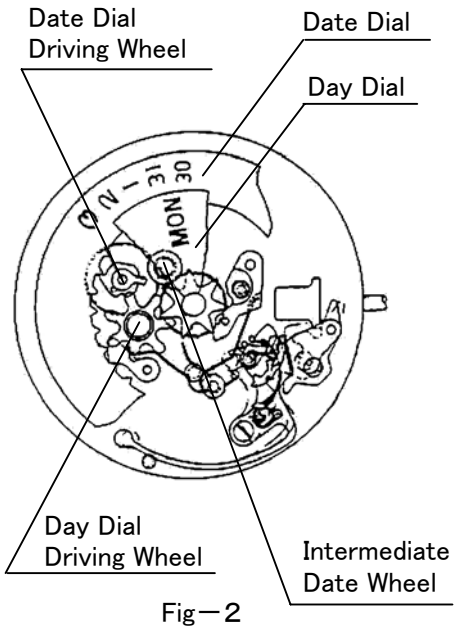
◎The power transmitting process is as follows.



②Day and date mechanism (Fig－2)
The rotation of the hour wheel is transmitted to the date dial driving wheel, which rotates once a day, via the intermediate date dial driving wheel and the date dial is advanced by the date dial driving finger, whereas the day dial is advanced by the day dial driving wheel via the day dial driving finger.

◎The power transmitting process is as follows.



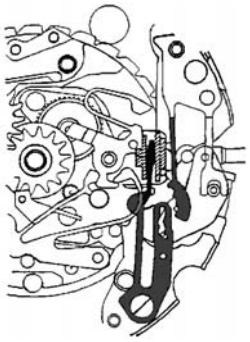


Fig－2

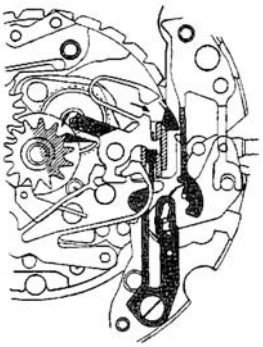
2、82xx Dial side mechanism (Quick day and date setting device)

The function of dial side mechanism is divided into the following three conditions.

①Main spring winding condition (Fig－3)
The clutch wheel is controlled from yoke to the basic plate stem side and engaged with the crown wheel on the barrel and train wheel bridge side, thus winding the mainspring.

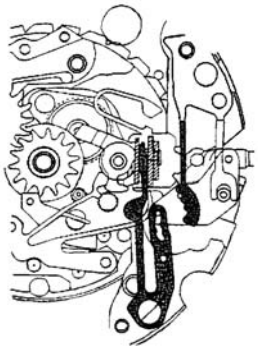

Fig－3

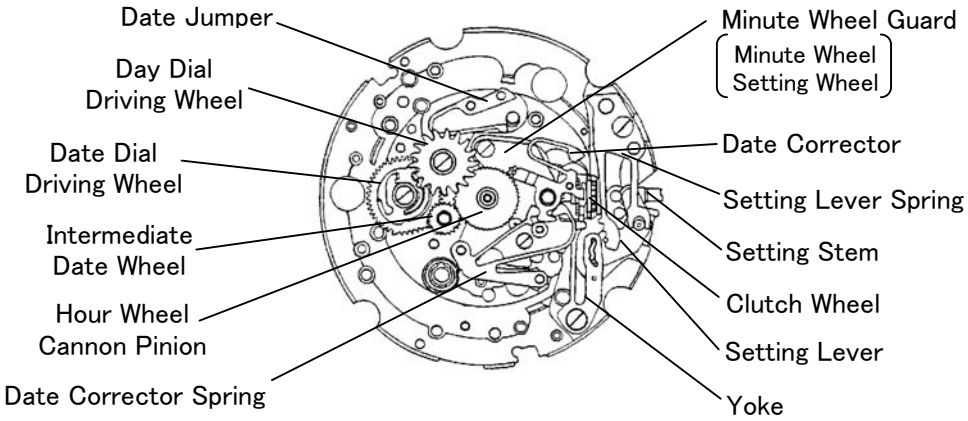
②Quick day and date setting condition (Fig－4)
At the position where the crown is pulled out one step, the clutch wheel is moved to the center position by the yoke and the two protuberance on the periphery of clutch wheel actuate the date corrector to the direction shown by the arrow mark.
●Quick date setting
When the crown is rotated counterclockwise, the pawl on the date dial of the quick correction lever is moved to the direction shown by the arrow mark, thus sending the teeth of date dial one by one.
●Quick day setting
When the crown is rotated clockwise, the pawl on the day dial side of quick correction lever moves to the direction of arrow mark, thus sending the teeth of day dial one by one.


Fig－4

③Hand setting condition (Fig－5)
At the position where the crown is pulled out two steps, the clutch wheel is moved by the yoke to the setting wheel side and hands can be set.

④Layout of parts for dial side
Date dial and day dial are disengaged.


Fig－5



(6)Supplementary explanation

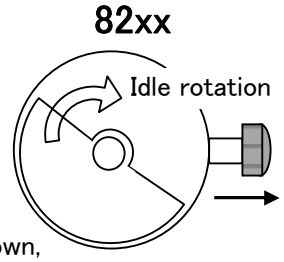
①Term explanation for watch test

Start	Beginning operation on the condition of giving utmost power.
Accuracy	Time of gain or delay in some unit and usually converting this time to 24 hours.
Daily rate	The time of gain or delay after 24 hours past from start.
Posture error	Difference between daily rate of one posture of the watch and another posture.
Endurance time	Time from start to stop.
Isochronism	As time processes, enery inside the watch (mainspring) emits and oscillation falls which changes time.

②Automatic winding structure (Explanation of mainspring half winding method)

For movement of a human arm, we know that there is more slight movement than strong movement. We can think of the mechanism of winding by the slight movement from the explanation below.

By moving the watch as Fig－6, rotating oscillating weight rotates as the arrow direction shown on the picture. In this time, for the case of both winding method, the amount of rotation becomes less since the oscillating weight have to overcome the mainspring. On the other hand, when the oscillating weight on half side winding method rotates idle, there is no brake like the above mainspring so it rotates very well. Of course, it is idle rotation so it does not have the winding performance. However the rundown process by the empty weight wounds the mainspring. Especially the beginning of rundown, there is an angle where mainspring torque does not work on the oscillating weight. So it gives more energy for the rotation of oscillating weight that gives more convenience for winding.



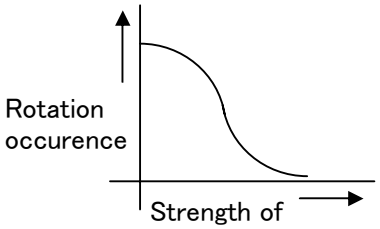
Fig－6

This is why half side winding method

○Wounds well in slight movement

○The strengths of the human arm ranges as Fig－7 and shows that slight movement creates much more rotation.

From these two facts, we know that we can wind better by half side winding method.



Fig－7

③Accuracy of mechanical (hand winding・automatic winding) watch

Mechanical watch operates by elaborate combination of delicate parts (gear,mainspring) and maintains accuracy. This is why time accuracy changes everyday.

Temperature differece, change in magnetism, the difference in the living environment of the watch user, all affects accuracy. Also, not much as analogue quartz but in strong magnetic circle, gains, delay, or stop might occur.

Also, oscillation changes by casing from the movement condition. (Holding the hour wheel by dial washer, the join of the weight of the hand, and movement itself warps a bit. Especially it becomes larger by using the screw for case clamp.) This is why there can be a accuracy equation. After casing, if conducting a fitting in modification for accuracy, maintaining accuracy in certain level is possible. However, effect of posture difference, isochronism, temperature, etc is 100 ～ 1000 times larger than the quartz watch.

④About mainspring (hand winding・automatic winding)

Generally, hand winding watch continues to move for 2 days by winding the mainspring very hard. However, to keep the watches accuracy, winding the mainspring regularly at the same time everyday is recommended. Please stop winding the mainspring when power is felt on the finger of which you have winded the mainspring.

The structure of a automatic winding watch is that the movement of the arm moves the rotar inside the watch and this power automatically winds the mainspring. The watch will continue to move for around 2 days if you put on the arm for 8 hours or more in daily life. However, there will be a slight difference depending on the persons living environment. If putting on a watch when just commuting to office or on a holiday when taking the watch off and leaving it out somewhere for a quite a long time, the delay or stop might occur. But in most cases, it is not broken. Please wind the mainspring and lookout for awhile.

(7)Separated Parts

PARTS NAME	6T51	8205	8215/1A
WINDING STEM	065-117	065-212	←
MOVEMENT HOLDER	500-662	500-710	←
SCREW FOR DIAL CLAMP	928-150	929-610	←