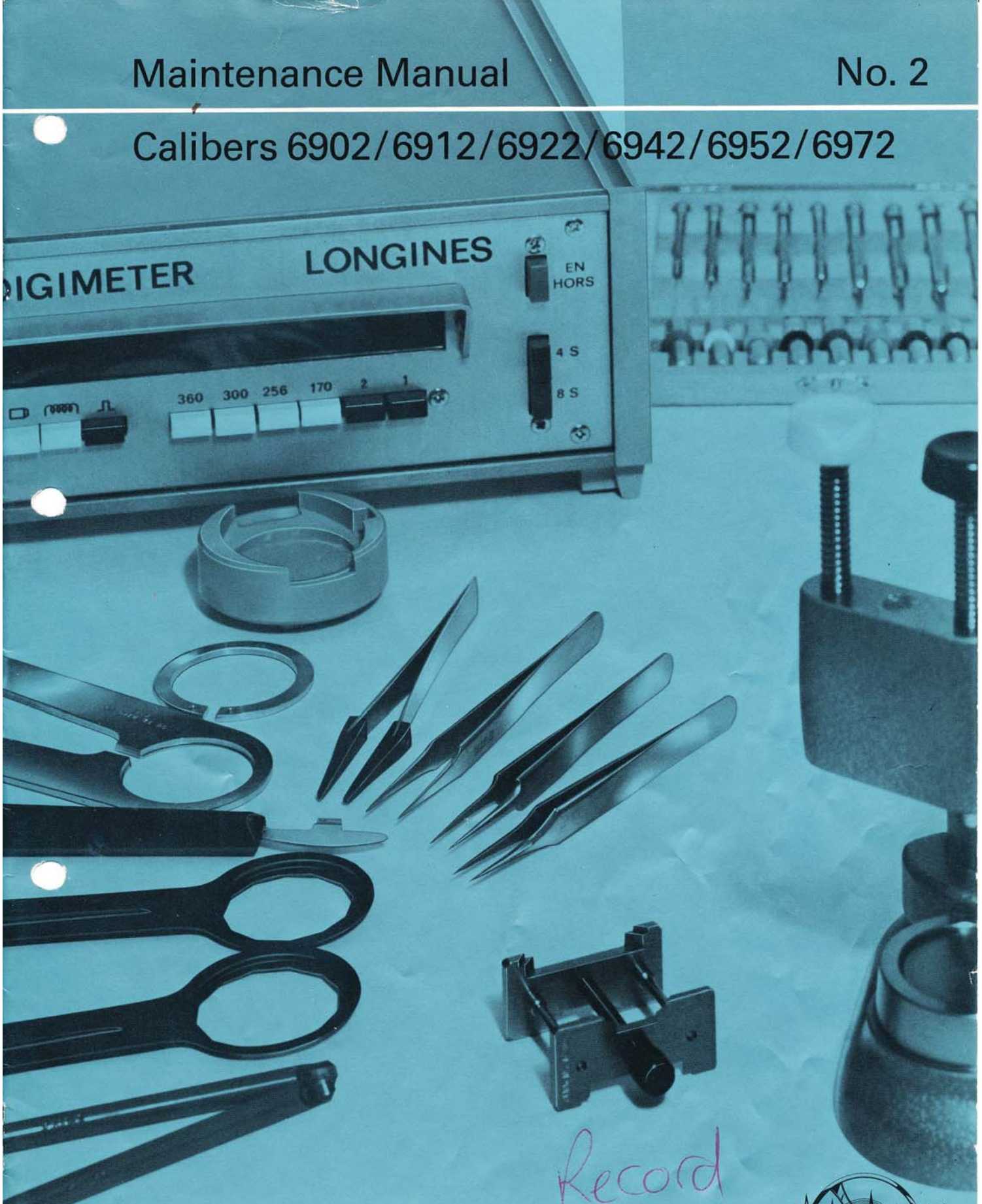
Maintenance Manual No. 2

Calibers 6902/6912/6922/6942/6952/6972



Record 6112

LONGINES

CALIBER 6902

Without second

Round movement, 12 ½ ‴

17 jewels

Lever escapement

28,800 vibrations per hour

CALIBER 6912

Without second

Window-type calendar with corrector actuated bv means of a three-position stem.

CALIBER 6922

Off-set second

CALIBER 6942

Direct sweep second

Stop-second device

CALIBER 6952

Direct sweep second

Stop-second device

Window-type calendar with corrector actuated by means of a three-position stem.

CALIBER 6972

Direct sweep second

Stop-second device

Window-type calendar with corrector actuated by means of a three-position stem and with day-indicator.

1) Presentation:

These optimalized high-frequency movements, which belong to the second generation, are of robust, modern design and insure remarkable stability of rate. Thanks to the use of well-tried technical procedures which meet the severest LONGINES quality requirements, constructional simplicity is combined with operational reliability.

Cal. 6902/6922/6942

Cal. 6912/6952/6972

Cal. 6902/6922

Cal. 6942

RECORD c/s
6113

Cal. 6972

Cal. 6912

Cal. 6952

2) General characteristics:

Diameter	28.00 mm
Height	
cal. 6902/6912/6922	
6942/6952	3.85 mm
cal. 6972	4.45 mm

2.2 BALANCE

Annular, screwless, protected by shock-absorbers.

2.3 HAIRSPRING

Non-magnetic, self-compensating

2.4 MAINSPRING

Stainless, self-lubricated

2.5 POWER RESERVE

Sufficient for 44 hours' operation.

2.6 RATE ADJUSTMENT

Spirofin system.

3) Technical description and instructions:

3.1 MOTOR ORGAN

The barrel cover is marked "Mainspring self-lubricated". The self-lubricated, practically unbreakable mainspring of stainless alloy requires no attention. In the event of damage, the motor organ should be replaced ; for this purpose, use a genuine factory-made complete barrel (ref. No. 6902-180/1). The barrel cover has a red tracing for calibers 6902, 6912 and 6922 and a black tracing for calibers 6942, 6952 and 6972.

3.2 TRANSMISSION ORGAN

In the versions without second and with off-set second, the arbors turn in ruby bearings.

In the versions with direct sweep second, the upper pivot of the center wheel turns in a beryllium-bronze bush.

3.3 ESCAPEMENT

The escapement is of the standard lever type. The steel escape wheel has 20 teeth.

3.4 REGULATING ORGAN

The screwless monometal balance coupled with a self-compensating hairspring which is insensitive to variations of temperature and to ordinary magnetic fields, insures an excellent rate in actual wear.

The balance pivots are protected by a shock-absorber system.

The rate is adjusted by means of the Spirofin system. See section 5.1.1.

3.5 WINDING, HAND-SETTING, DATE-SETTING AND STOP-SECOND MECHANISMS

The three-position winding-stem performs the following functions :

3.5.1 When pushed in, winding by hand.

3.5.2 In the intermediate position, rapid setting of the date-indicator in either direction, without shifting the hands.

3.5.3 When pulled out, setting the hands to the right time ; this can be done to the exact second in the case of calibers fitted with a stop-second device. The hand is stopped when it reaches the numeral 60. The movement starts working again as soon as the stem is pushed right home.

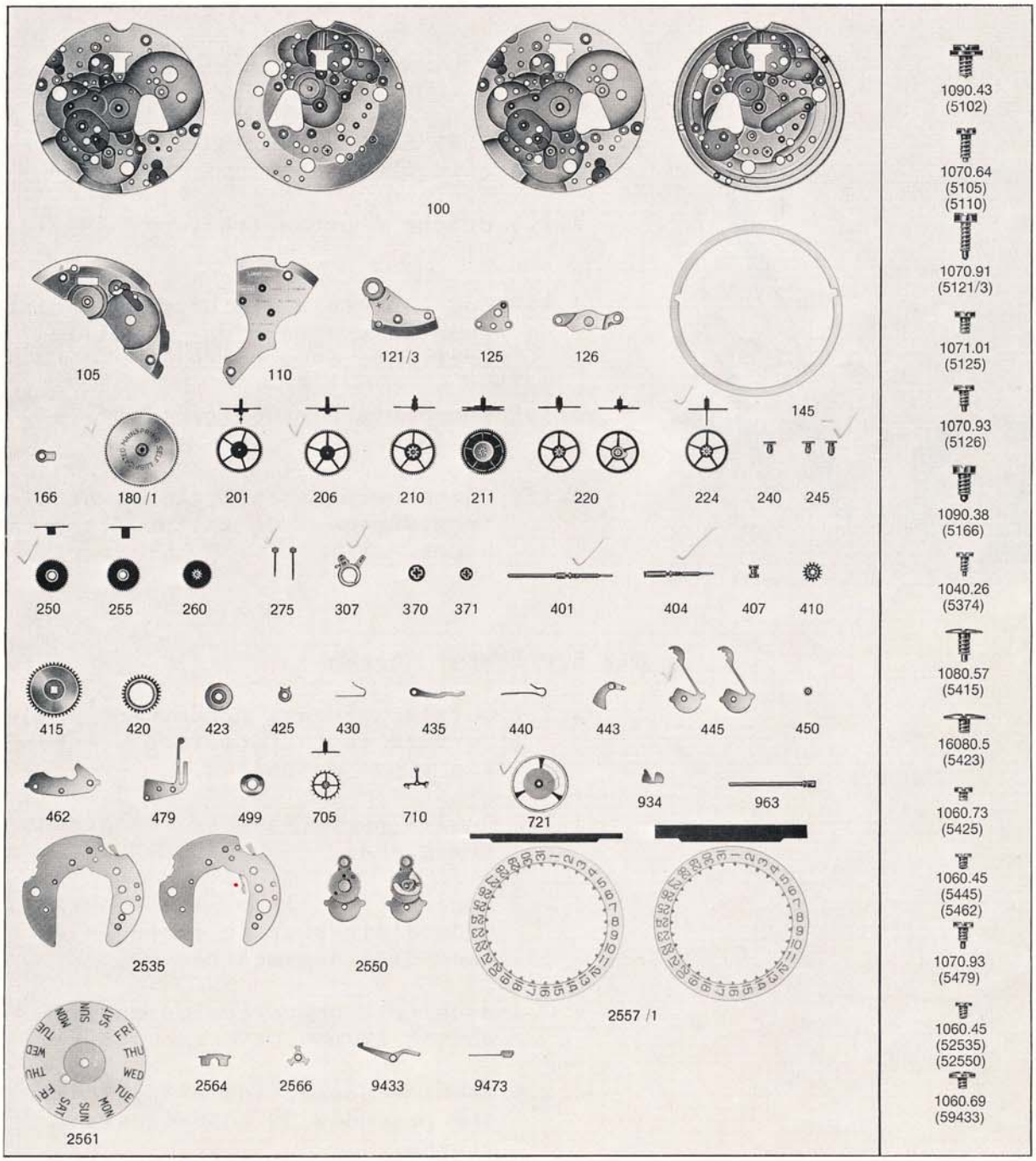
The stem can be extracted from its fitting by pressing the setting-lever axle with the appropriate tool. See section 5.3.

N.B.

Do not set the date-indicator between 11 p.m. and midnight.

Number	6902	6912	6922	6942	6952	6972	Name
100	XX		XX	XX			Plate
100		XX			XX	XX	Plate
105	XX	XX	XX	XX	XX	XX	Barrel bridge
110	XX						Train bridge
110		XX					Train bridge
110			XX				Train bridge
110				XX			Train bridge
110					XX		Train bridge
110						XX	Train bridge
121/3	XX	XX	XX	XX	XX	XX	Balance cock
125	XX	XX	XX	XX	XX	XX	Pallet cock
126				XX	XX	XX	Center-wheel cock
145						XX	Dial rest
166	XX	XX	XX	XX	XX	XX	Casing-clamp
180/1	XX	XX	XX				Barrel, complete (with mainspring)
180/1				XX	XX	XX	Barrel, complete (with mainspring)
201	XX	XX	XX				Center wheel
206				XX	XX	XX	Center wheel
210	XX	XX	XX				Third wheel
211				XX	XX	XX	Double third wheel
220	XX	XX					Fourth wheel,without bit
220				XX	XX	XX	Fourth wheel,without bit
224			XX				Fourth wheel with bit
240	XX	XX	XX				Cannon pinion
245				XX	XX		Cannon pinion
245						XX	Cannon pinion
250	XX	XX	XX	XX	XX		Hour wheel
255						XX	Hour wheel
260	XX	XX	XX	XX	XX	XX	Minute wheel
275				XX	XX		Sweep-second pinion
275						XX	Sweep-second pinion

Number	6902	6912	6922	6942	6952	6972	Name
307	XX	XX	XX	XX	XX	XX	Device complete (Spirofin)
370	XX	XX	XX	XX	XX	XX	Kif-jeweled, upper
371	XX	XX	XX	XX	XX	XX	Kif-jeweled, lower
401	XX	XX	XX	XX	XX	XX	Winding-stem
404	XX	XX	XX	XX	XX	XX	Stem for waterproof case
407	XX	XX	XX	XX	XX	XX	Clutch wheel
410	XX	XX	XX	XX	XX	XX	Winding-pinion
415	XX	XX	XX	XX	XX	XX	Ratchet wheel
420	XX	XX	XX	XX	XX	XX	Crown wheel
423	XX	XX	XX	XX	XX	XX	Crown-wheel core
425	XX	XX	XX	XX	XX	XX	Click
430	XX	XX	XX	XX	XX	XX	Click spring
435	XX	XX	XX	XX	XX	XX	Yoke
440	XX	XX	XX	XX	XX	XX	Yoke spring
443	XX	XX	XX	XX	XX	XX	Setting-lever
445	XX		XX	XX			Setting-lever spring
445		XX			XX	XX	Setting-lever spring
450	XX	XX	XX	XX	XX	XX	Setting-wheel
462	XX		XX	XX			Minute-work cock
479	XX	XX	XX	XX	XX	XX	Pressure spring for setting-lever
499						XX	Metal foil
705	XX	XX	XX	XX	XX	XX	Escape wheel
710	XX	XX	XX	XX	XX	XX	Jeweled pallet fork and staff
721	XX	XX	XX	XX	XX	XX	Balance with flat hairspring, regulated
934	XX	XX	XX	XX	XX	XX	Dial bolt
963	XX	XX	XX	XX	XX	XX	Stem for waterproof crown
2535		XX			XX		Date-indicator guard
2535						XX	Date-indicator guard
2550		XX			XX		Calendar plate, mounted
2550						XX	Calendar plate, mounted
2557/1		XX			XX		Date-indicator, transferred
2557/1						XX	Date-indicator, transferred
2561/1						XX	Day-indicator, transferred
2564		XX			XX	XX	Date-corrector guard
2566		XX			XX	XX	Date-corrector
9433				XX	XX	XX	Stop lever
9473				XX	XX	XX	Stop-lever spring
5102	XX	XX	XX	XX	XX	XX	Case screw, special
5105	XX	XX	XX	XX	XX	XX	Barrel-bridge screw
5110	XX	XX	XX	XX	XX	XX	Train-bridge screw
5121/3	XX	XX	XX	XX	XX	XX	Balance-cock screw
5125	XX	XX	XX	XX	XX	XX	Pallet-cock screw
5126				XX	XX	XX	Center-wheel cock screw
5166	XX	XX	XX	XX	XX	XX	Casing-clamp screw
5374	XX	XX	XX	XX	XX	XX	Hairspring-holder screw
5415	XX	XX	XX	XX	XX	XX	Ratchet-wheel screw
5423	XX	XX	XX	XX	XX	XX	Screw for crown-wheel core
5425	XX	XX	XX	XX	XX	XX	Click screw
5445	XX	XX	XX	XX	XX	XX	Screw for setting-lever spring
5462	XX		XX	XX			Minute-work cock screw
5479	XX	XX	XX	XX	XX	XX	Screw for pressure spring for setting-lever
52535		XX			XX	XX	Screw for date-indicator guard
52550		XX			XX	XX	Screw for calendar plate
59433				XX	XX	XX	Screw for stop lever



Date Jumper + Date Jumper Spring are attached to P.N. 2535

4) Apparatus and tools:

The following equipment is required for performing the various operations at the level of the Repair and Maintenance Center. It can be obtained from the LONGINES WATCH COMPANY, CH - 2610, Saint-Imier.

4.1 SPECIFIC EQUIPMENT FOR CALIBERS BELONGING TO THE 6900 FAMILY

4.1.1 Broach with stop (ref. No. 6902-443/9).

4.1.2 Movement-holder with adjustable supporting-screw, for fitting hands (ref. No. 6902-001/9).

4.1.3 Screwdriver with pipe (ref. No. 6902-307/9).

4.1.4 Timing-machine equipped for recording 28,800 vibrations per hour.

4.2 GENERAL EQUIPMENT

4.2.1 Suitable tools for opening and closing all types of cases.

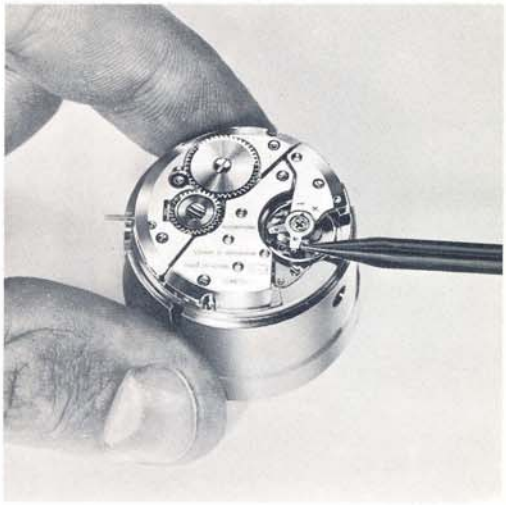
4.2.2 Tools for replacing crystals.

4.2.3 Vacuum apparatus for testing the water-resistance of watches.

4.2.4 Machine for cleaning assembled or non-assembled movements.

4.2.5 Machine for lubricating by the filmogenic process.

5) Minor operations:



5.1 ADJUSTMENT OF RATE

Spirofin system

5.1.1 When the case is of the one-piece ("Monocoque") type, the movement must be taken out. Detailed indications on the removal of movements from their cases are given in our "Technical Information file No.1"- Cases, etc.

5.1.2 To correct the beat, it is only necessary to turn the hairspring - holder round the shock-absorber block until a perfect beat is obtained.

5.1.3 Thanks to the micrometer screw of the Spirofin, very fine corrections can be made with the greatest of ease.

5.1.4 To adjust the rate, it is necessary to turn the micrometer screw by means of the tool (ref. no. 6902 - 307/9).

N.B.

The use of this tool eliminates any risk of damaging the micrometer screw.

5.1.5 To obtain a slower rate, sign -, turn the micrometer screw counter-clockwise (this reduces the distance between the stud and the curb pins).

5.1.6 To obtain a faster rate, sign +, turn the micrometer screw clockwise (thus increasing the distance between the stud and the curb pins).

5.2 REPLACING THE CRYSTAL

Detailed indications for replacing the crystal are given in our "Technical Information file No.1" - Cases, etc.

5.3 REPLACING THE WINDING-STEM

5.3.1 To extract the stem, press the setting-lever axle with the special tool (ref. No. 6902-443/9). For this operation, the stem must be in its pulled-out position.

N.B.

The use of this tool eliminates any risk of damaging the setting-lever spring.

5.3.2 To re-insert the winding-stem, press the crown.

6) Standard movement exchange:

This operation consists in exchanging the movement which needs repairing for a reconditioned movement.

N.B.

The reconditioning procedure is described in detail in section 7.

6.1 TAKE THE MOVEMENT OUT OF THE CASE

Detailed indications on the removal of movements from their cases are given in our "Technical Information file No.1"- Cases, etc.

6.2 REMOVE THE HANDS AND THE DIAL

The dial is retained by two bolts which grip its feet. Disengage the two bolts with a screwdriver. Remove the dial. Push the bolts back into their initial position.

6.3 EXCHANGE THE MOVEMENT

Before fitting the "standard exchange" movement into the case, check according to section 6.6.

6.4 FIT THE DIAL AND THE HANDS

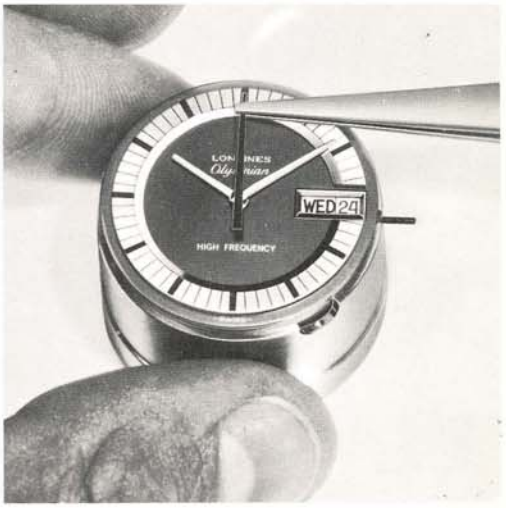
6.4.1 Draw the bolts aside.

6.4.2 Place the movement on the movement-holder. Make sure that the adjustable stop sustains the pivot of the center wheel or that of the sweep-second wheel.

6.4.3 Fit the dial (in the "day + date" version, make sure that the washer is fitted on to the day disk).

6.4.4 Push the bolts back.

6.4.5 Fit the hour and minute hands.



6.4.6 Fit the second hand (off-set second for cal. 6922 ; sweep second for cal. 6942, 6952 and 6972, after actuating the stop-second device).

N.B.

In the case of the calendar calibers 6912, 6952 and 6972, fit the hands so that the change of date occurs at midnight.

6.5 CASING

Detailed indications on casing are given in our "Technical Information file No.1"- Cases, etc.

CAUTION : For water-resistant cases, make sure that the crown, the crystal and the joints are capable of insuring water-resistance according to the table included in our "Technical Information file No.1", under the heading 1.5 - "Water-resistance".

6.6 CHECKING THE RATE-ADJUSTMENT

The test limits are the following :

6.6.1 Movement fully wound, less $\frac{1}{2}$ hour.

6.6.2 Test positions : DU - PD - PL.

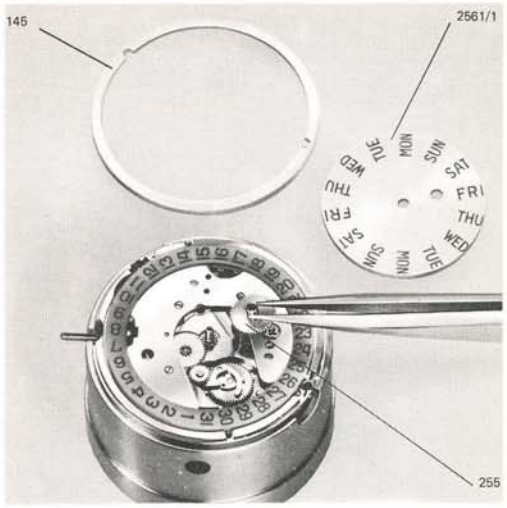
6.6.3 Error of rate : - 7 + 12 seconds.

6.6.4 Maximum positional error :14 seconds

6.7 TESTING FOR WATER-RESISTANCE

Detailed indications on the water-resistance test are given in our "Technical Information file No.1", under the heading 1.5 - "Water-resistance".

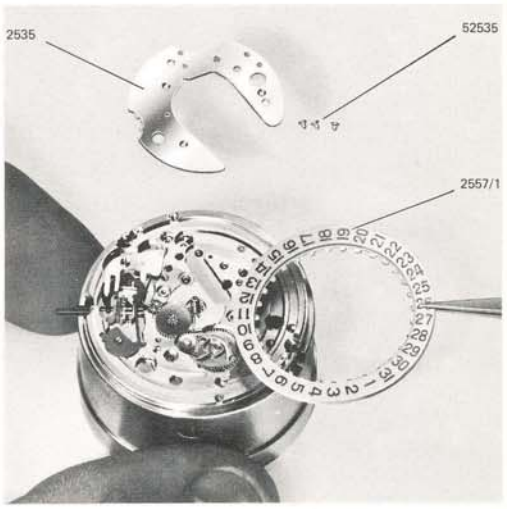
7) Reconditioning the movement:



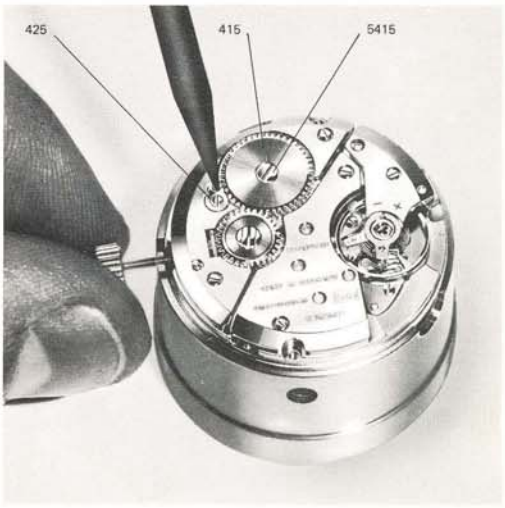
7.1 Indication on the reconditioning of movements are given in our "Technical information file no.2", under the heading 1.1 "Standard Exchange and Reconditioning of the movement".

We will mention here only the special points that must be borne in mind in applying these procedures to the calibers belonging to the 6900 family.

7.1.1 Remove the day disk 2561/1, the dial rest 145 and the hour wheel 255.



7.1.2 Loosen the three screws (52535), lift the guard 2535, remove the date-indicator 2557/1 and replace the guard, fixing it by means of its screws.



7.1.3 Let down the mainspring after having disengaged the click 425 from the ratchet wheel 415.

N.B.

In the case of watches equipped with two-piece stems (one-piece cases), hold back the ratchet wheel 415 by retaining its screw (5415) with a screwdriver.

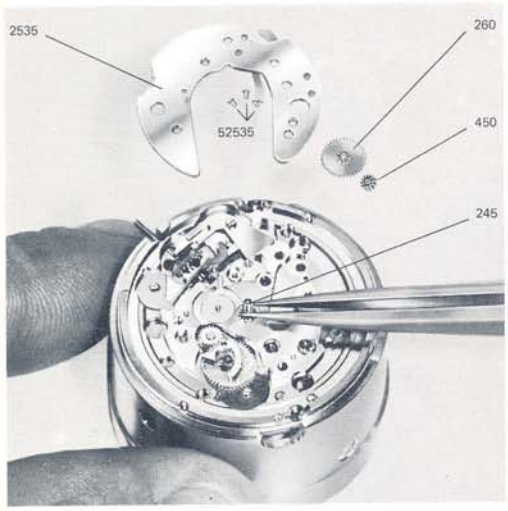
7.1.4 Remove the balance-cock assembly 121/3.

7.1.5 Loosen the screw 5374 and pull the hairspring out of its holder 374. Remove the sprung balance 721.

7.1.6 Remove the endstones and the jewel settings of the shock-absorbers 370 and 371.

7.2 CLEANING

Detailed indications on cleaning are given in our "Technical Information file No.2", under the heading 1.1 - "Standard Exchange and Reconditioning of the Movement".



7.3 COMPLETE DISMANTLING

If examination of the movement shows that complete dismantling is necessary, proceed as follows :

7.3.1 Loosen the three screws (52535) and remove the guard 2535, the minute wheel 260, the setting-wheel 450 and the cannon pinion 245.

7.3.2 Loosen the screw (52550) and remove the calendar-plate assembly 2550.

7.3.3 Remove the pallet cock 125 and disengage the pallets 710.

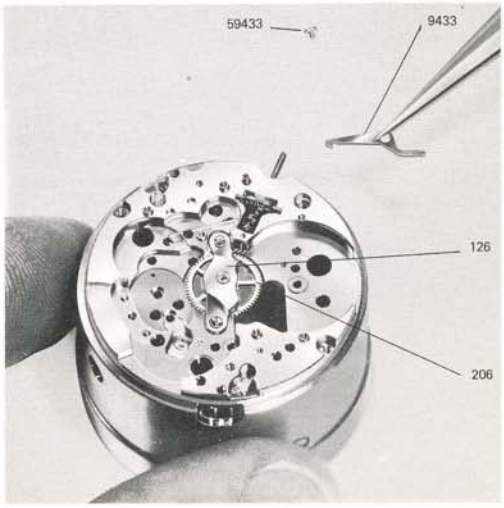
7.3.4 Dismantle the rest of the movement in the normal way, removing in order : the train bridge 110 and the barrel bridge 105.

7.3.5 If the winding and setting-mechanism does not need to be dismantled, it is necessary to pull out the winding-stem as far as it will go so that the following parts can be easily removed as follows :

7.3.6 Loosen the screw (59433) and remove the stop lever 9433.

7.3.7 Loosen the two screws (5126) and remove the center-wheel cock 126 and the center wheel 206.

7.3.8 Push back the winding-stem.

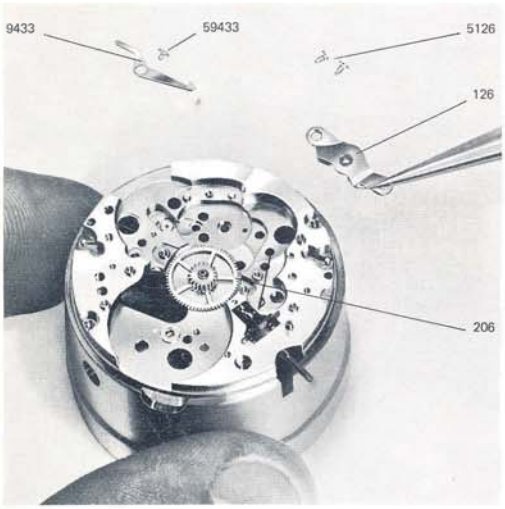


7.4 REPLACEMENT OF COMPONENTS

Genuine factory-made components must be substituted for those which show traces of wear or fail to work correctly. For ordering spare parts, use the document provided for the purpose.

7.5 PARTIAL ASSEMBLY

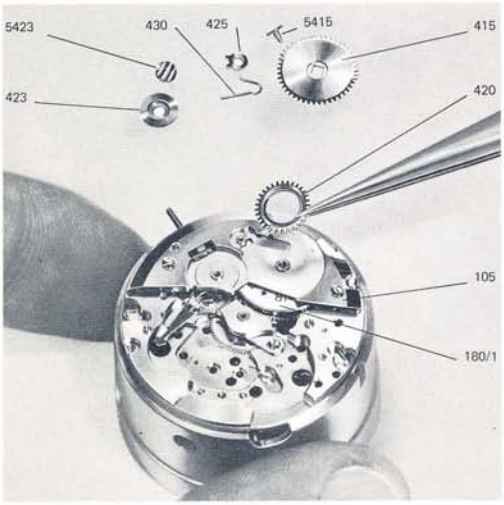
If the winding- and setting-mechanism has not been dismantled, it is necessary to pull out the winding-stem as far as it will go so that the following parts can be easily fitted as follows :



7.5.1 Fit the center wheel 206 and the center-wheel cock 126, fixing it by means of its two screws (5126).

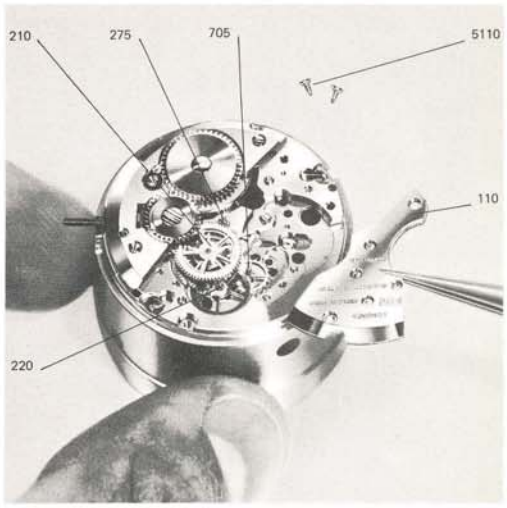
7.5.2 Fit the stop-second lever 9433 and fix it by means of its screw (59433).

7.5.3 Push back the winding-stem.

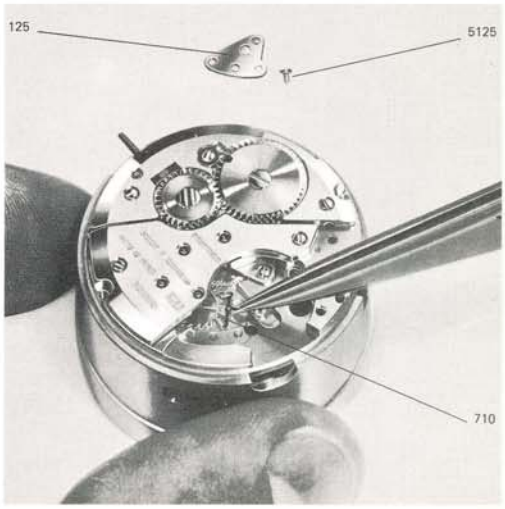


7.5.4 Fit : the complete barrel 180/1, the barrel bridge 105, fixing it by means of its two screws (5105), the click spring 430, the click 425, fixing it by means of its screw (5425), the crown wheel 420 and the crown-wheel core 423, fixing it by means of its screw (5423).

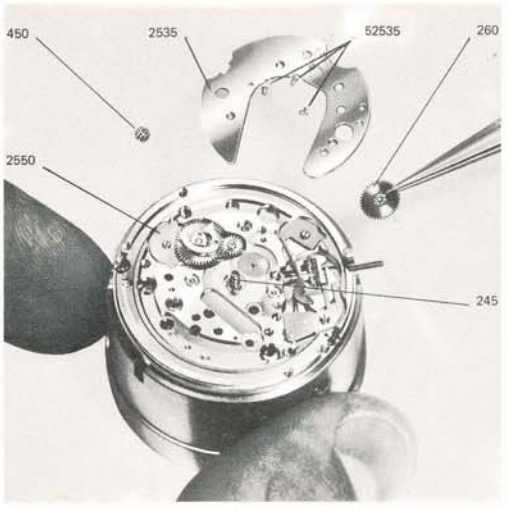
7.5.5 Fit in the following order : the escape wheel 705, the fourth wheel 220, the third wheel 210-211, the center wheel 200 (for cal. 6902, 6912 and 6922), the sweep-second pinion 275 (for cal. 6942, 6952 and 6972) and the train bridge 110, fixing it by means of its two screws (5110).



7.5.6 Fit the pallets 710 and the pallet cock 125, fixing it by means of its screw (5125).



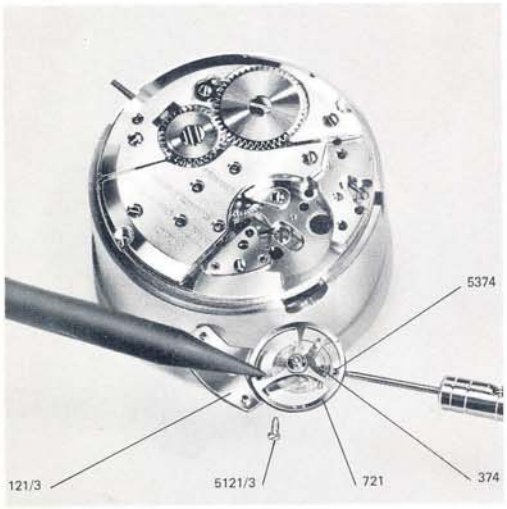
7.5.7 Fit : the calendar-plate assembly 2550, fixing it by means of its screw (52550), the cannon pinion 245, the minute wheel 260, the setting-wheel 450 and the guard 2535, fixing it by means of its three screws (52535).



7.6 LUBRICATION

Detailed indications on lubrication are given in our "Technical Information file No.2", under the heading 1.2 - "Filmogenic Lubrication".

7.7 FINAL ASSEMBLY



7.7.1 Fix the sprung balance 721 to the hairspring-holder 374 by means of its screw (5374).

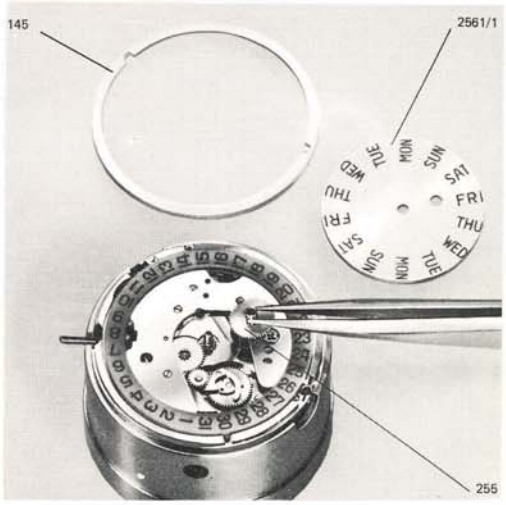
7.7.2 Fit the balance cock 121/3 with the sprung balance 721 and fix it by means of its screw (51121/3).

7.7.3 Oil the endstones (Lo 125 or Synt-A-Lube) and place them on the jewel settings of the balance. Insert the oiled capped jewels (jewel hole - endstone) into the shock-absorbers 370 and 371 and bolt the springs.

With the winding-stem pushed right in, make sure that supporting-spring of the setting-lever positions two of the three arms of the date-corrector so as to allow the date-indicator teeth to pass freely when the corrector is in any position.

7.7.4 Loosen the three screws (52535), lift the guard (2535) and fit the date-indicator 2557/1. Fit the guard in position and fix it by means of its three screws.

7.7.5 Fit in the following order : the hour wheel 255, the dial rest 145 and the day disk 2561/1.



7.8 CHECKING THE RATE-ADJUSTMENT

See section 6.6

7.9 STOCKING

Detailed indications on the stocking of movements are given in our "Technical Information file No.2", under the heading 1.1 - "Standard Exchange and Reconditioning of the Movement".