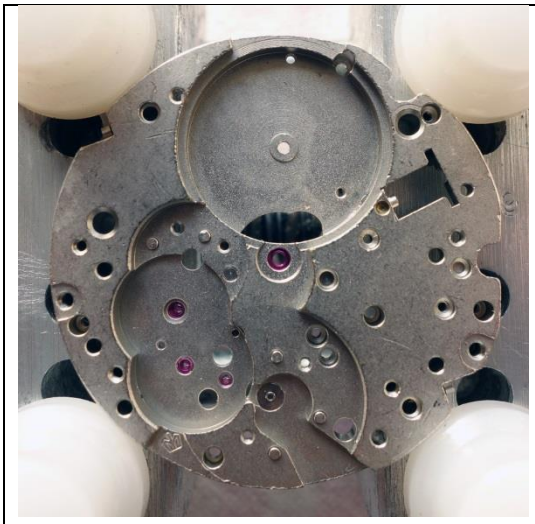
Servicing a Poljot 3133 movement

A service guide made by WUS member SLLS, 2nd edition November 2016
Editor: WUS member Polmax3133

Use this guide at your own risk.

To dismantle a 3133 movement, just start at the end of this document and work your way up to the start.
The movement parts, except the balance wheel , are cleaned using an ultra-sonic cleaner.
Remove the balance wheel from the balance bridge and clean it separately (clean with lighter fluid, rinse with isopropyl alcohol). Put back the balance bridge on the plate before cleaning.



Step 1

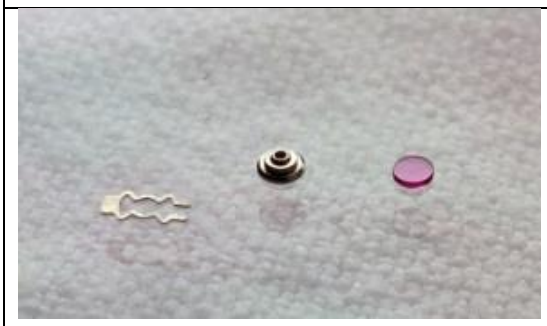
100: Plate

The numbers before a part are the Swiss watch part numbers.

Used oils are Moebius 9010, 9020, 9415, 8300, D5 and Bergeon KT-22. Oil pens 2mm and 3mm (Bergeon red and blue).

With the base plate we start building up the 3133 movement, and start with assembling the Incabloc jewels followed by the wheel train of the movement.

Like to know more about the wheel train?
Check the following page:
http://en.wikipedia.org/wiki/Wheel_train



Step 2

Pierced Jewel and Bezel
Jewel cap
Jewel spring
Oil: Moebius 9010

Note: putting back the jewels for the balance pivots is a delicate job. You can choose to let them stay during the cleaning process. Use after the cleaning process a tooth pick to check if the jewels are clean. In this case you don't need to perform the following…

The jewel has a flat and a domed side. You need a strong magnifier to see it. Install the metal bezel with pierced jewel into the plate bloc and insert the cap jewel on top of the bezel with the domed side up. Install the spring which holds the jewel assembly onto the bloc.

With retaining spring attached, be sure that the cap jewel is perfectly parallel with the bezel/pierced jewel, and then align the jewel bezel from the shaft side of the plate so that it is centered within the bloc and the pieced jewel is perfectly perpendicular to the balance axis.

Add just a tiny drop of Moebius 9010 through the center of the bezel shaft and pierced jewel. Do not touch the shaft with oil.

Repeat with the jewel assembly on the balance cock.

Note:
There is a small change the way I handle the balance now. I remove both balance's jewels and let the balance wheel, spring and balance cock stay where they are during the cleaning process (ultra sonic cleaning). After the cleaning process I oil the jewels, put them back in place and secure them with the tiny jewel spring. When I have done that, I remove the whole balance and put it back at step 18. This way the jewels can be oiled the best way and they fit as before.

Step 3

206: Centre wheel
245: Cannon pinion
Oil: Moebius D5

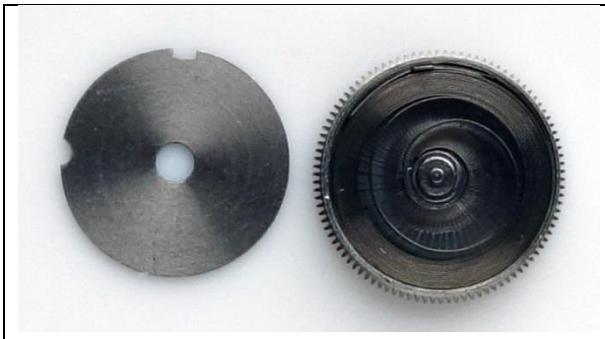
Oil the small gear of the centre wheel with D5, put the centre wheel in position, oil the jewel with D5 and add the cannon pinion.

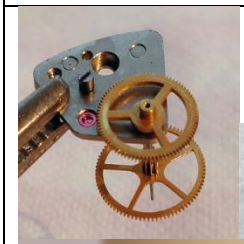
Note: when you add the cannon pinion you feel some friction. If the cannon pinion is too loose, it can slip. In this case the minute and hour hand don't run as they should.

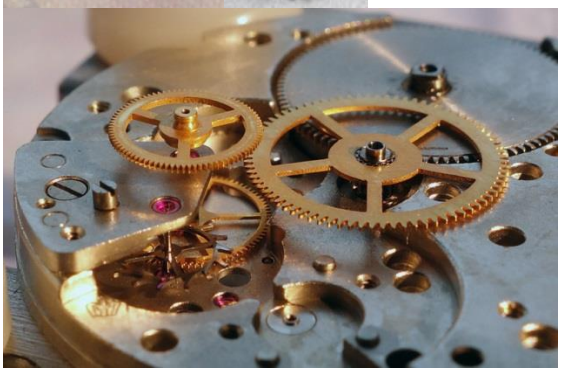
Step 4

182: Barrel and cover
195: Barrel arbour
770: Mainspring (1.60 x 12.5 x 0.13 x 430mm)
Oil: Moebius 8300 and D5

The complete mainspring exists of 3 accessories, here already put together. You can remove the cover with a little screwdriver and carefully remove the mainspring. Use Moebius 8300 for the mainspring and put it back in place (clockwise). Note the lug at the end of the mainspring. It should fall into the recess of both the barrel and cover.
Put D5 at the bottom side of the barrel arbor (round part is bottom, square part is top).







Step 5

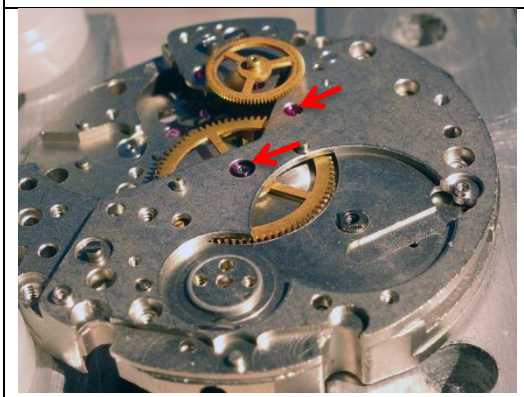
110: Train wheel bridge
225: 4th wheel
8060: Driving wheel
705: Escape wheel
Oil: Moebius 9010 and 9020

Take the train wheel bridge, oil the jewels for the 4th wheel with 9020, add the 4th wheel and put the driving wheel on the pivot. This avoids falling out the 4th wheel when putting the bridge on its place. Put 9010 on both jewels for the escape wheel. Put the escape wheel in the jewel on the plate and gently put the train wheel bridge in place. Check continuously if the pivots of the wheels fall in the jewel holes correctly. Check if the gears run as they should and screw the bridge on the plate.

Step 6

210: 3th wheel
Plate for 3th wheel
Oil: Moebius 9020

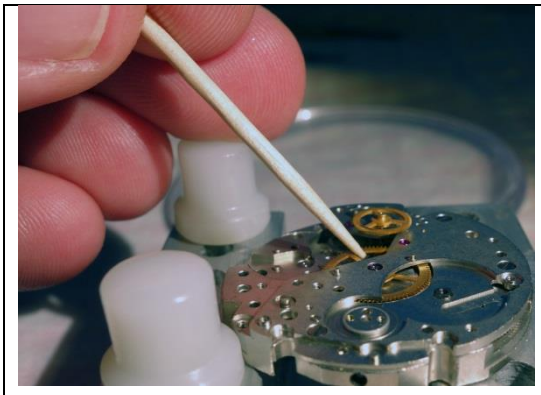
Oil the jewel with 9020 and screw the plate for the 3th wheel on the plate. Add the 3th wheel.



Step 7

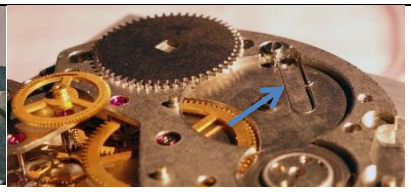
105: Barrel bridge
Oil: Moebius 9020

Gently put the barrel bridge on the plate with extra attention for the pivot of 3th wheel. Screw the barrel bridge (3 screws) and oil the jewels with 9020 (see arrows).



Step 8

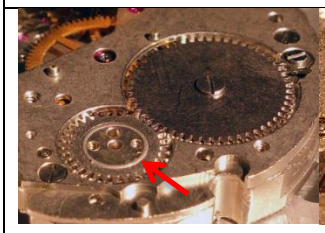
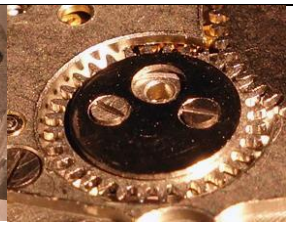
Now it's time again to check if the wheel train works smoothly. Turn the centre wheel a bit.

Step 9

425: Click
430: Click spring
Oil: Moebius D5

Put D5 where you add the click. Add the click and put the click spring in place (see arrow). Put your finger on the spring when you put in place (use finger caps).

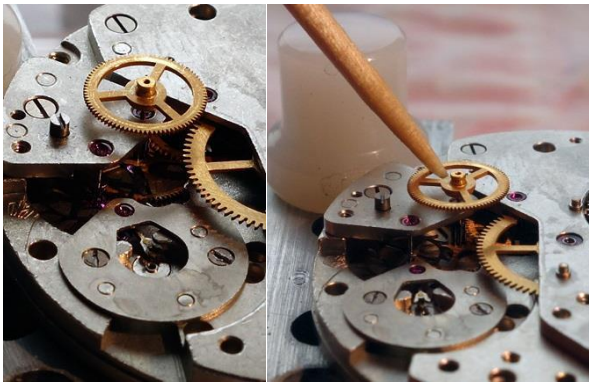



Note: when dismantling the movement, it's easy to overlook the ring (see arrow).

Step 10

415: Ratchet wheel
420: Crown wheel
423: Crown wheel core
Ring (inside crown wheel)
Oil: Moebius D5

Add the ratchet wheel, add the ring, then the crown wheel and screw the crown wheel core on top of it (2 screws).

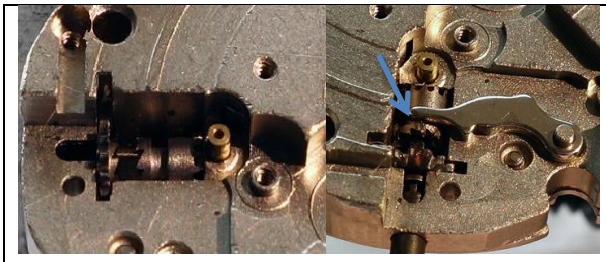


Step 11

710: Jewelled pallet fork
Pallet fork bridge
Oil: Moebius 9010, 9415

Oil the jewels for the pallet fork with 9010.
Oil the pallet stones with 9415 (best) or 9010 (see arrows).
Put the pallet fork in place, gently add the pallet fork bridge.
If you gently move the driving or centre wheel, the pallet fork should move smoothly too.

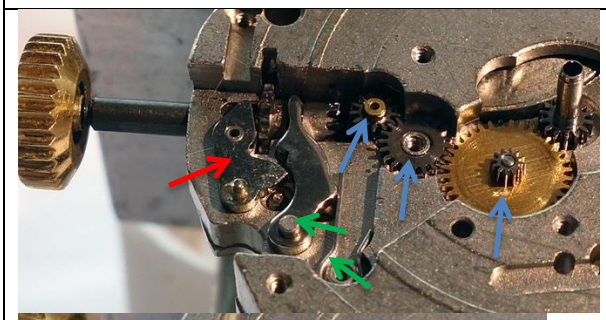
The little hole under the end of the pallet fork is the jewel which we already oiled (see step 4). Don't oil it again or the balance will go to fast.

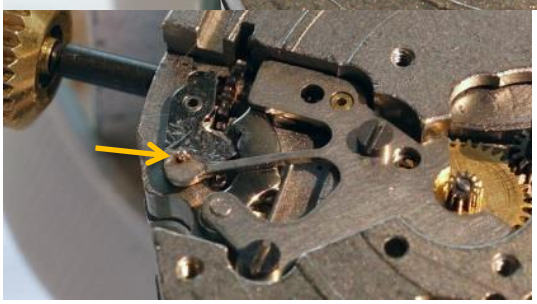


Step 12 (adding the keyless work)

401: Winding stem (and crown)
407: Clutch wheel
410: Winding pinion
435: Clutch lever
Oil: Bergeon KT-22, Moebius D5

Put the clutch wheel and winding pinion in place, add the winding stem. Put a little KT-22 on it.
Oil the hole of the yoke with D5 and put the yoke in place. The end of the clutch lever falls into the groove of the clutch wheel (see blue arrow).

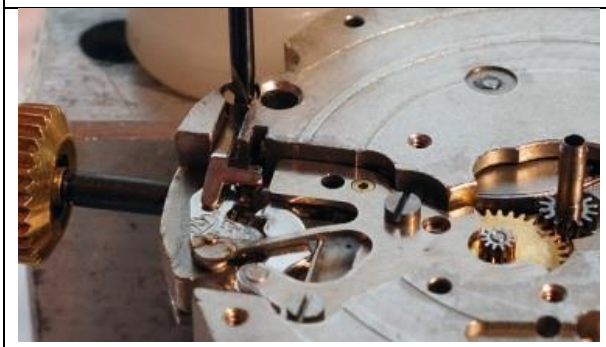




Step 13

260: Minute wheel
435: yoke
440: yoke spring
443: Setting lever
445: Setting lever spring (AKA cover plate with spring)
450: Setting wheel
453: Additional setting wheel
Oil: Bergeon KT-22, Moebius D5

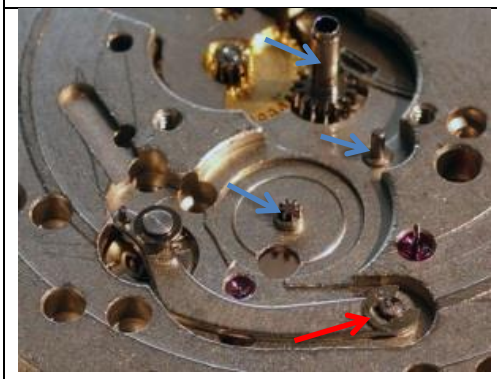
Put a little KT-22 under the 3 wheels and put them in place. First the minute wheel, then additional setting wheel and setting wheel (see blue arrows). Put the setting lever in place (see red arrow). Put the yoke and yoke spring in place (see green arrows). Put the setting lever spring in place (2 screws). Check the position of the spring (see orange arrow)



Step 14

Setting lever spring 2

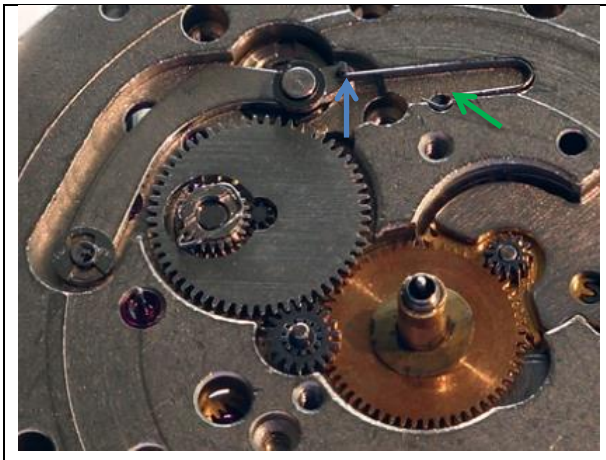
Put the setting lever spring 2 in place.
Test the keyless work by pulling the crown out and wind it to see if the wheels move smoothly. Pull the crown in again.
If you turn the movement you see the stem unreleased button. If you push it down, you can remove the winding stem.



Step 15

255: Hour wheel
2556: Date indicator driving wheel (big)
2576: Date Jumper
2575: Date jumper spring
Date indicator driving wheel (small)
Oil: Moebius D5

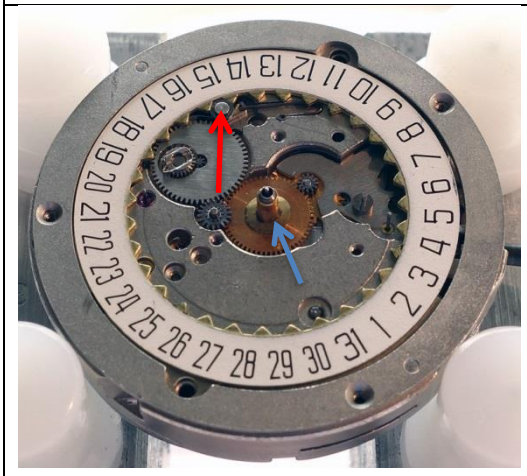
Put a little D5 where the date jumper is added at the plate. Then put the date jumper in place and mount it with the clamp (see red arrow).



Put a little D5 where you see the 3 blue arrows.
First put the hour wheel over Cannon pinion, then put the date indicator driving wheels (big and small) in place.

Now put the date jumper spring in place (see green arrow). Put your finger on it when you do so. Check if the spring keeps the date jumper in place (see blue arrow).

Note: it's not easy to see, but the date indicator driving wheel has 8 different positions. Only 1 position is good for a correct a good working quick date set. The wrong position can even causes a broken spring (the one on top of this wheel).

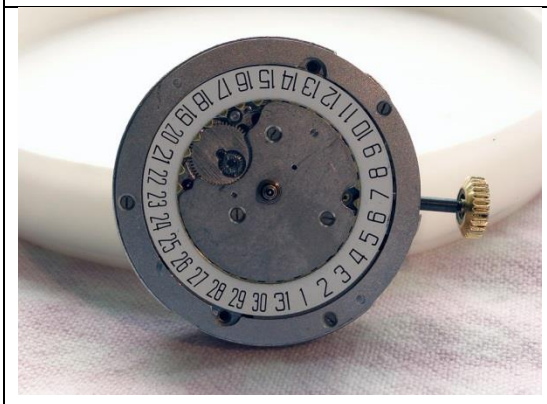


Step 16

2557: Date wheel
Thin slip ring

Add the date wheel. The end of the date jumper should fall in a notch of the date wheel. Be careful that the date jumper spring stays in the correct position.

Don't forget the thin slip ring (blue arrow).



Step 17

2535: Date indicator Guard (plate)

Put the date indicator guard (plate) in position and add it with the 3 screws.

Pull out the crown and turn till you see the date jumping to the next number. Go back 3 or 4 turns and then forward again to see if the quick date setting works properly. Also see note at step 15.

Step 18

Complete balance (121: balance cock, 721: hair spring, 723: balance staff, 730: roller)
8080: Coupling clutch
8320: Coupling clutch spring

Add the balance wheel on the balance cock and put the whole balance very carefully back in place.
Wind the mainspring a bit and check if the watch works. In fact the basis of the movement is ready.

If you have a Time Grapher, use it now to do some checks. The angle is 51^0. Bate rate is 21600.
The amplitude should be between 275 and 315 degrees. The

beat error zero or at least close to zero.

Note: An alternative is an App for your tablet like “Watch Tuner”.

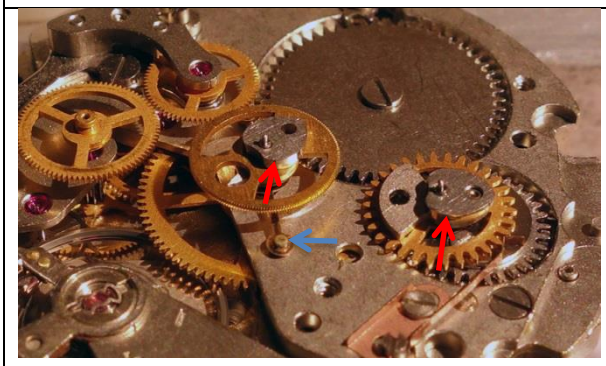
Put the coupling clutch and coupling clutch spring in place. Check if the screw head is on the spring (see blue arrow).

Step 19

8020: Minute recording wheel
8270: Minute recording jumper
Oil: Moebius 9020

Put 9020 on the pivot of the minute recording wheel and put the wheel and jumper in place. Be careful with the jumper, it’s very fragile. We shall adjust it later.

When dismantling the movement, it’s better to let it stay where it is. If you use a cleaning machines, be sure nothing can tough the jumper. It breaks of very easy.



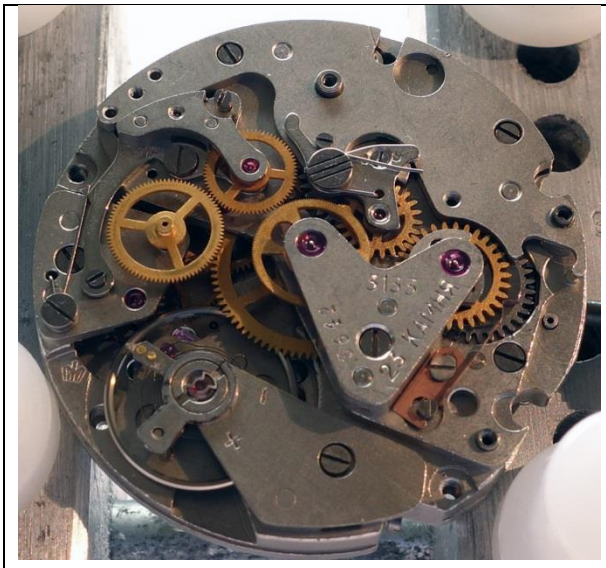
Step 20

8000: Seconds recording wheel
: Minutes recording wheel
8290: Friction spring
8500: Chronograph bridge
Oil: Moebius 9020, D5

Put 9020 on the pivot of the seconds recording wheel. Put the friction spring in position (see blue arrow). Then put the seconds- and minutes recording wheels in place.

Put a little D5 on the edges of the heart-shaped parts of both wheels (see red arrows).

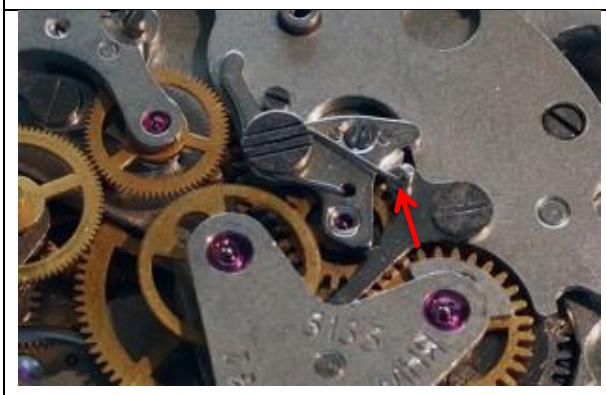
Put the chronograph bridge in place.



Step 21

8281: Chronograph plate
8100: Sliding gear
8335: Blocking lever spring

Add the chronograph plate (2 screws).
Put the sliding gear in place and add the blocking lever spring. This is a counter clock wise screw (see 3 strips on the head of the screw).



Step 22

8200: Blocking lever

Put the blocking lever in place and set blocking lever spring in the correct position (see arrow).

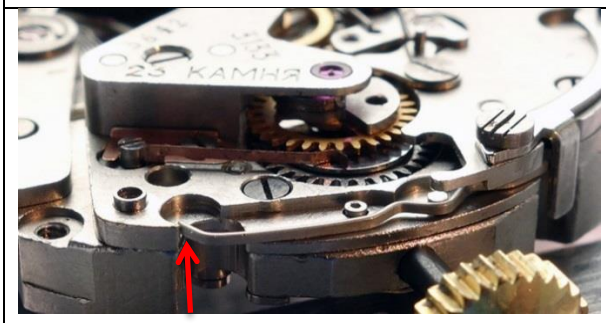
If you stop the chronograph, this lever blocks the seconds recording wheel.

Step 23

8180: Fly-back lever

Add the fly-back lever. The screw goes counter-clock wise when tighten it (see 3 strips on the head of the screw).

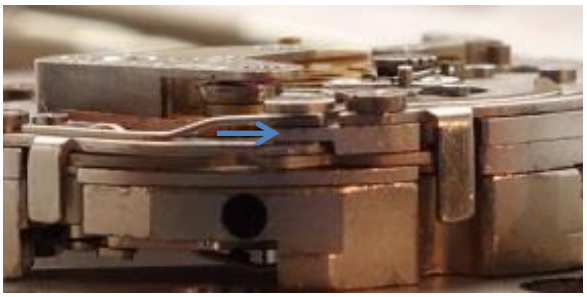
This lever hits the hammer (when in stop position) and resets the chronograph.



Step 24

8335: Operating and fly-back lever spring

Put the spring in position. Be careful, the left side of the spring only hits the barrel bridge minimal.



Step 25

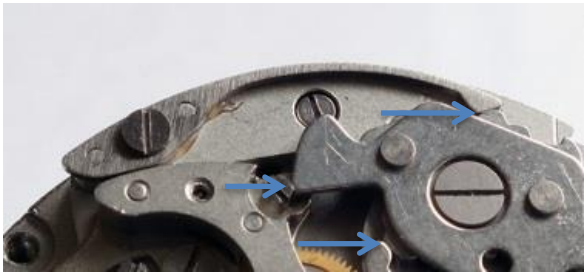
8140: Operating lever

This spring should be lifted above the rivet for easier installation.
Add the operating lever. Check the position (see blue arrow). The hinge should look like picture 1. The moving parts are on one level, not on top of each other as is the case in picture 2.

Picture 1

Picture 2

This lever hits the hammer to start or stop the chronograph.

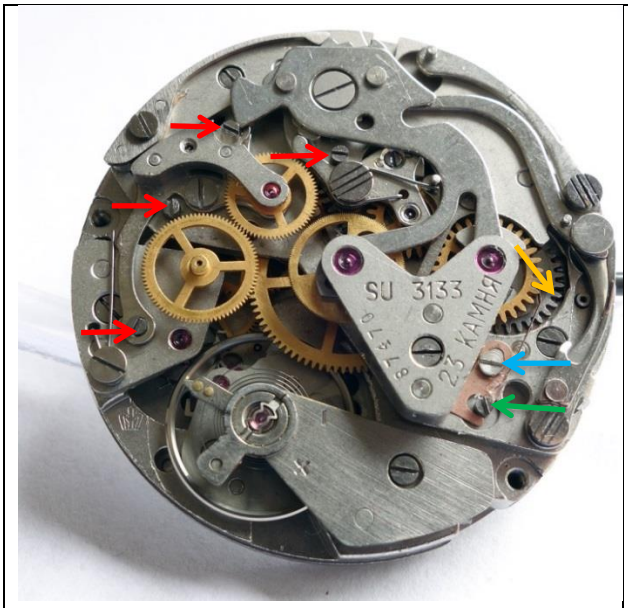


Step 26

8220: Hammer
8356: Hammer cam jumper

For ease of fitting, install the reset hammer in the run position.

Add the hammer cam jumper and the hammer. When you add the hammer you need to move 3 parts a little bit to put the hammer in the correct position (see blue arrows).



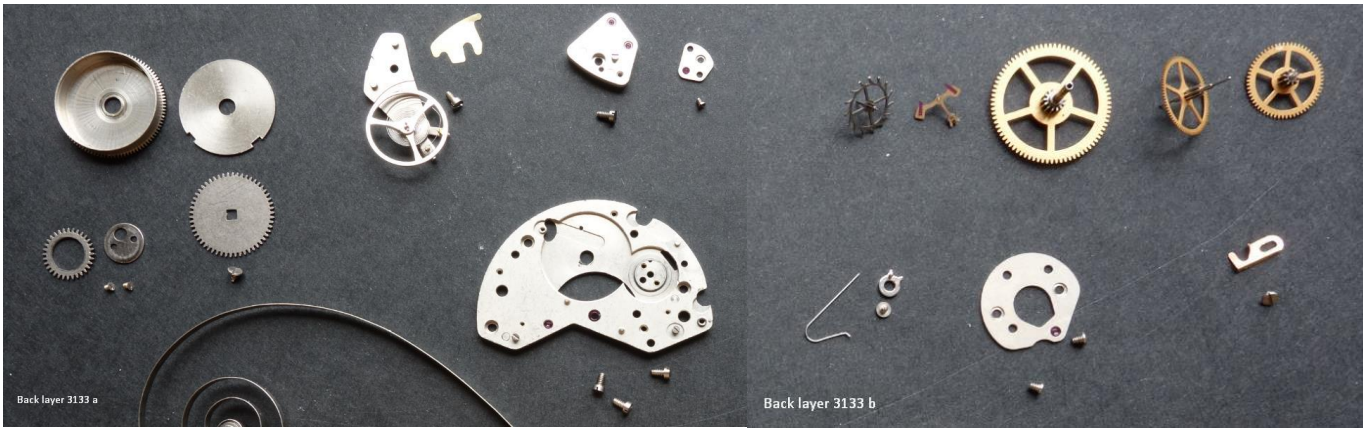
Step 27 (adjust chronograph)

Now it's also time to adjust the minute recording jumper. Turn the screw with blue arrow one turn left. Turn the eccentric screw with the green arrow carefully left or right so that the end of the jumper falls in a notch of the gear (orange arrow).
By turning the eccentric screw the minute recording jumper goes a bit up and down.

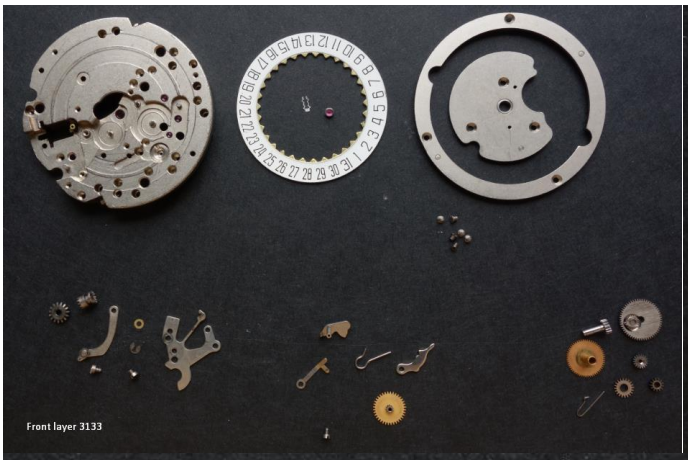
The following is not a simple task; adjusting the chronograph. Turning a screw may cause in adjusting one of the other screws.

1. Adjust clockwise the 4 eccentric screws (red arrows). The 1st screw is to adjust how deep the coupling clutch wheel hits the driving wheel. It needs a little space between those wheels otherwise they stop running.
2. The 2nd screw determines how deep the coupling clutch wheel hits the seconds recording wheel. If the hammer is in normal position, those wheels are apart from each other. If the hammer is in the "chronograph running" position, both wheels hits each other. Again they should hit each other minimal.
3. The 3th screw should be adjusted in a way that the hammer works smoothly (start running, stop and reset). If this is not working smoothly, maybe the position of the whole coupling clutch is too high. Adjust this part with screw 1.
4. The last screw determines the depth of the sliding gear against the seconds recording wheel. It should be adjusted in a way that the seconds recording wheel hits one sprocket in a minimal way so that the sliding gear turns the minute recording wheel just one turn. An adjustment which is to deep causes a "hard" hit. The minute recording wheel turns directly when starting the chronograph and turns twice or even more.

Back Layer



Front Layer


Front layer 3133


Front layer 3133 a


Front layer 3133 b
Front layer 3133 c

Chronograph Layer

Data:
14 lignes
D 31 mm, H 7.35 mm
23 jewels
21,600 A/h
Power reserve 51 Hours

The 23 jewels are in the following positions:
Balance staff bearings: 4
Impulse jewel: 1
Pallet pivot bearings: 2
Pallet entry and exit jewels: 2
Escape wheel pivot bearings: 2
4th wheel pivot bearings: 2
3rd wheel pivot bearings: 2
2nd wheel pivot bearings: 2
Chronograph second counter wheel, rear bearing: 1
Chronograph minute counter wheel, rear bearing: 1
Minute counter intermediate wheel pivot bearings: 2
Coupling wheel pivot bearings: 2

Poljot Sturmanskie Chronograph

These watches where the official watches for military pilots and till 1983 not available to the public. It is not easy to determine the age of these watches but Watchuseek forum-member Polmax did a great job by putting all known information together on his own website.

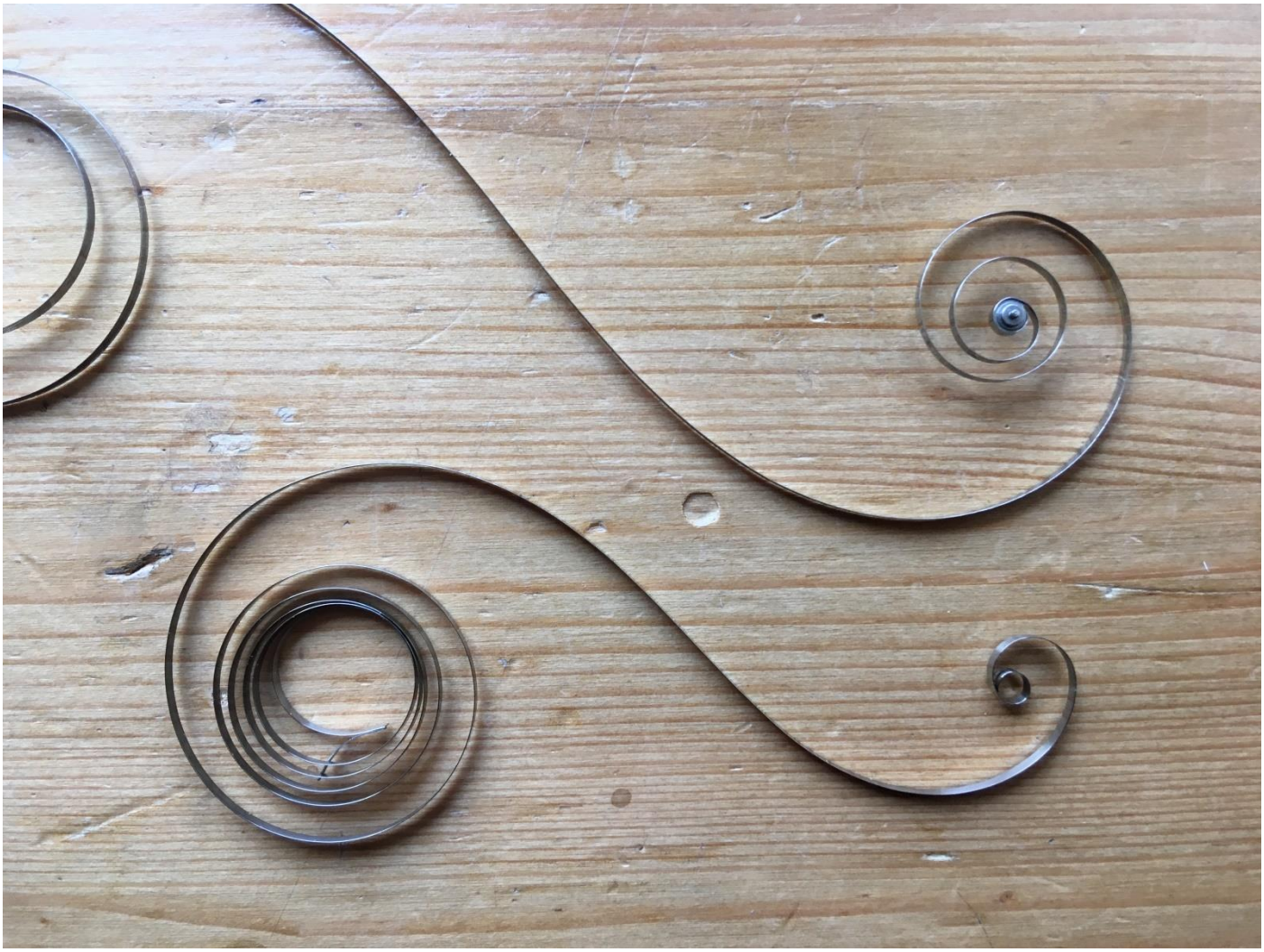
Here is a summary of details of the dial and movement which gives you information about the age of the watch, although you need to keep in mind that parts can be changed during a service.
The detail are:

- Stem release button was was replaced with a hollow one +/- 1980.
- Before 1981 Poljot logo's are stamped on the chrono bridge (3 different styles, only minor changes), since 1981 on the main plate.
- The chrono wheels changed from metal colour to brass colour +/- 1982.
- The reset lever changed from a 2-piece to a 1 piece lever in the 2nd quarter of 1986.
- The Sans Serif font for the date ring was changed by a Gothic-style font in 1988.
- The chrono bridge shows a 5-digit serial number from 1975 till 1978. From 1979 it was 4-digits and in 1989 again 5-digits.
- As of 1990 marking 3133 on chrono bridge changed to SU 3133
- As of 1997 marking becomes P3133 with made in Russia
- The colour of the balance wheel changed from brass to silver in 1992.
- Change on the bridge from Cyrillic 23 камня to Latin 23 jewels in 1997.
- 2005, poljot logo on mainbridge has been replaced by the Maktime logo.

Old glass (domed)
Width: 36.6mm
Dept (inside): 2.8mm
Dept (outside): 4.2mm

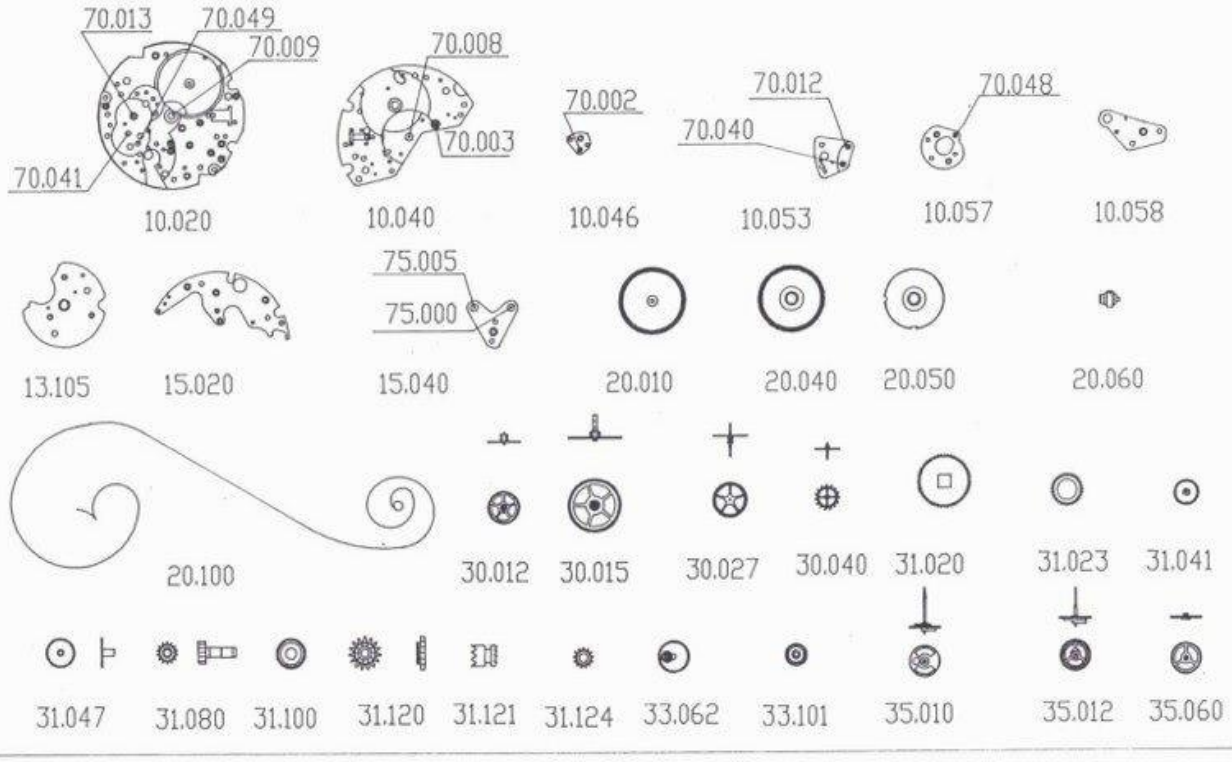
Seperate ring for old glass
Height: 0.5mm
Width (inside): 34.2mm
Width (outside): 36.4mm

Standard glass (flat)
width: 36.6mm



3133 POLJOT

1



3133 POLJOT

2