

Dr. Raymer Watch Restoration



Background

This is a short “story” of the restoration process of your watch. A watch of this vintage often requires full disassembly, and both deep polishing and cleaning. The deep polishing removes years of scratches, dings and dents, while the deep cleaning removes years of oils and dead skin that is stuck in the crevasses of the watch, as well as the old oil that is used in the movement.

Special note

This watch is an heirloom, and special care was taken to not damage parts that could not be replaced (even though the author has the means to make these parts). One item of special note is the band. The metal bracelet was not original to the watch and so a replacement leather band was made by hand. Making a band is typically reserved for the author’s bespoke timepieces, but this watch restoration and its owner is a special case.

Time

While watch restorations may appear straightforward, often vintage watch parts are broken or missing. In this case the o-rings for the crown, winding stem and case-back had completely deteriorated and replacements were specially ordered from London, UK, adding a two month delay. Similarly, the band uses a special top-grade leather from a Texas tannery, and the special order takes six weeks to fill. Finally, a small screw, used to retain the movement to the case of the watch, was broken. This was suitably repaired, and the broken screw returned to the owner.

Initial inspection

Several things were found upon initial inspection:

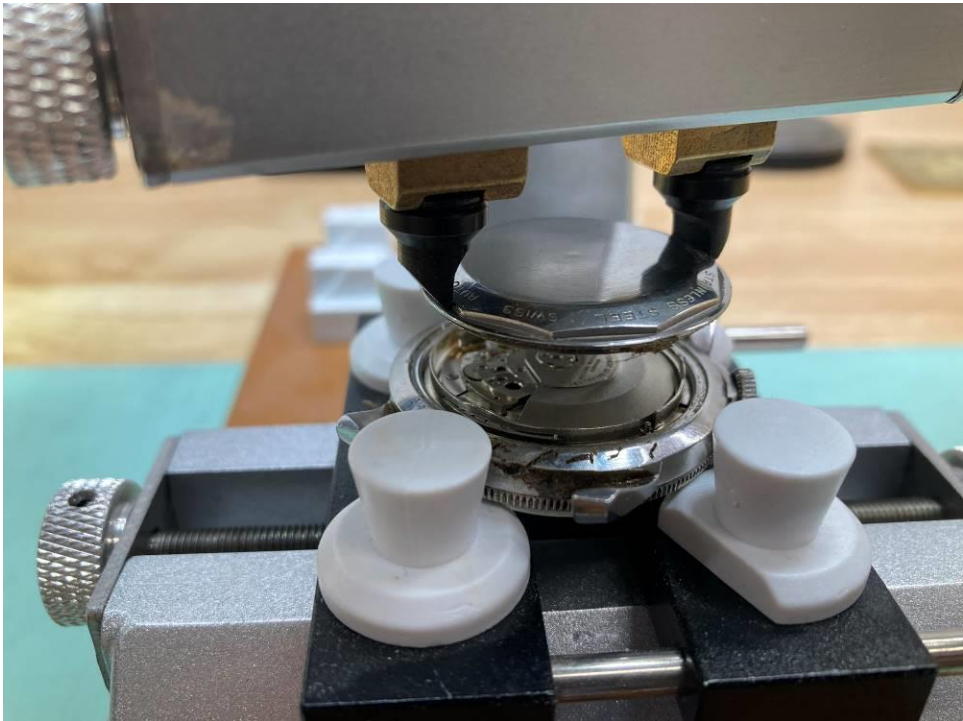
- The case, bracelet, and crystal were badly scratched and pitted, the dial had signs of rust and debris from the hands that had oxidized.
- The bracelet was not original and was sized incorrectly by the last watchmaker.
- The movement had oxidation, and the lubrication oil in the jewels had decomposed to sticky or hard tar.
- The o-rings previously mentioned had deteriorated to a black tar.

Not to worry! All of these things are normal for a watch of this vintage, and as you will see, every item was fixed and restored.

Watch as delivered.



Removing the case-back



Notice the grime around the seal of the case-back and in the lugs for the band.



A first look inside...



Note the "makers mark" from the prior watchmaker cleaning and adjustment of the watch. This is common for watchmakers to note the type of service and the date.



The case is polished using several polishing wheels and different grades of rouge. This method can actually move or push the steel back into the cracks and pits. The result is a near mirror finish (notice the reflection of the awl). The bezel is then “straight grained” to restore the “two tone” finish.



Polishing the crystal:

- Kapton tape (in yellow) is applied to the case to protect it from scratches.
- Sandpaper is used to remove the scratches on the crystal using grits of 400, 800, 1200, 4000, 8000, and 12000.
- Then a 1 micron diamond paste is used with a cloth polishing wheel.



Before and after polishing the crystal and case. Notice that each crevasse is cleaned of debris, in particular every "tooth" of the bezel and crown is individually cleaned of debris. Unfortunately the author was not able to remove the bezel, so the polishing at the bezel/lug interface is not perfect and some minor scratches remain.



Disassembling the movement.

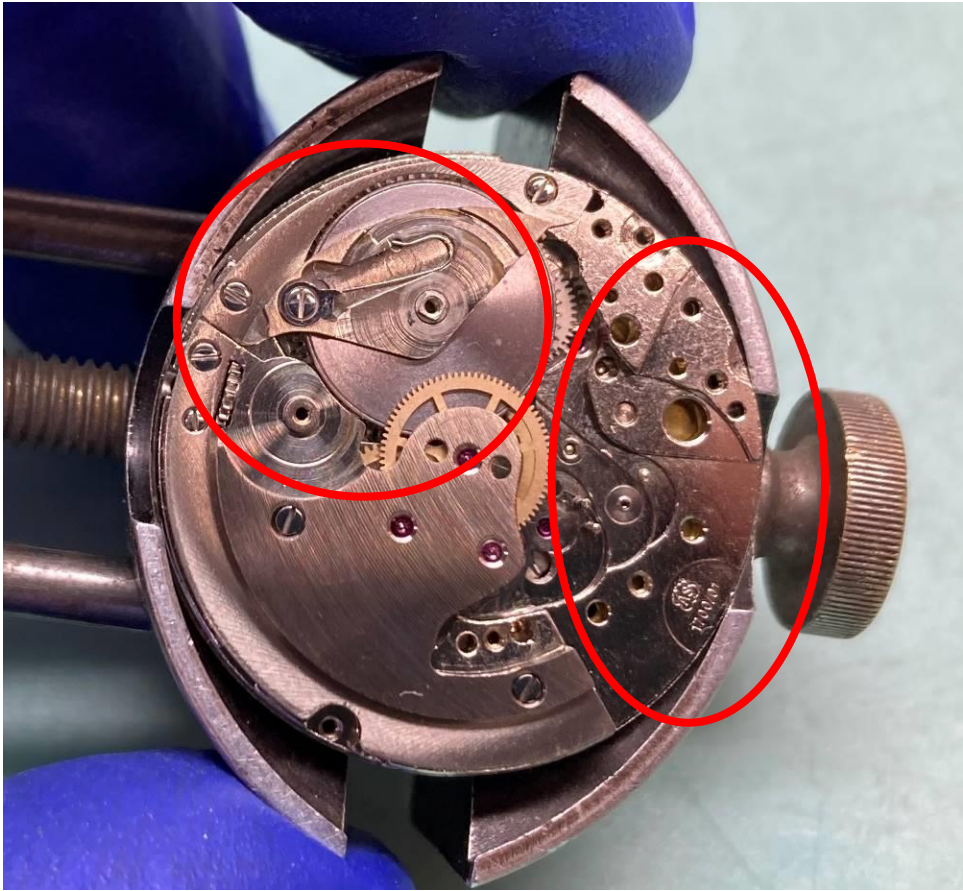
Movement removed from the case.



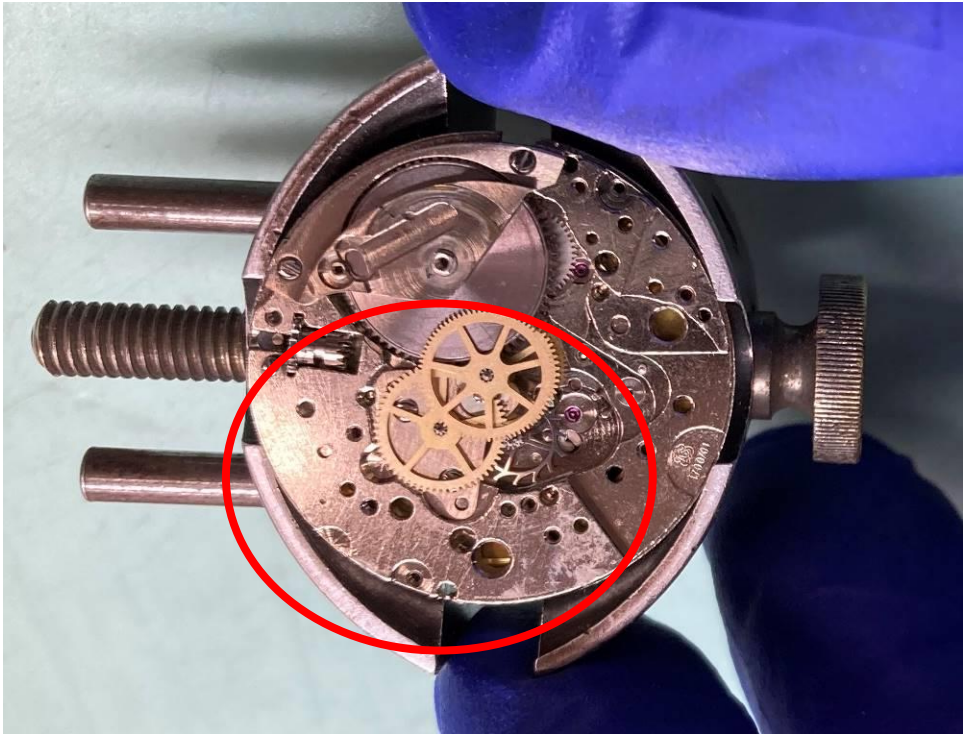
Automatic winding mechanism removed



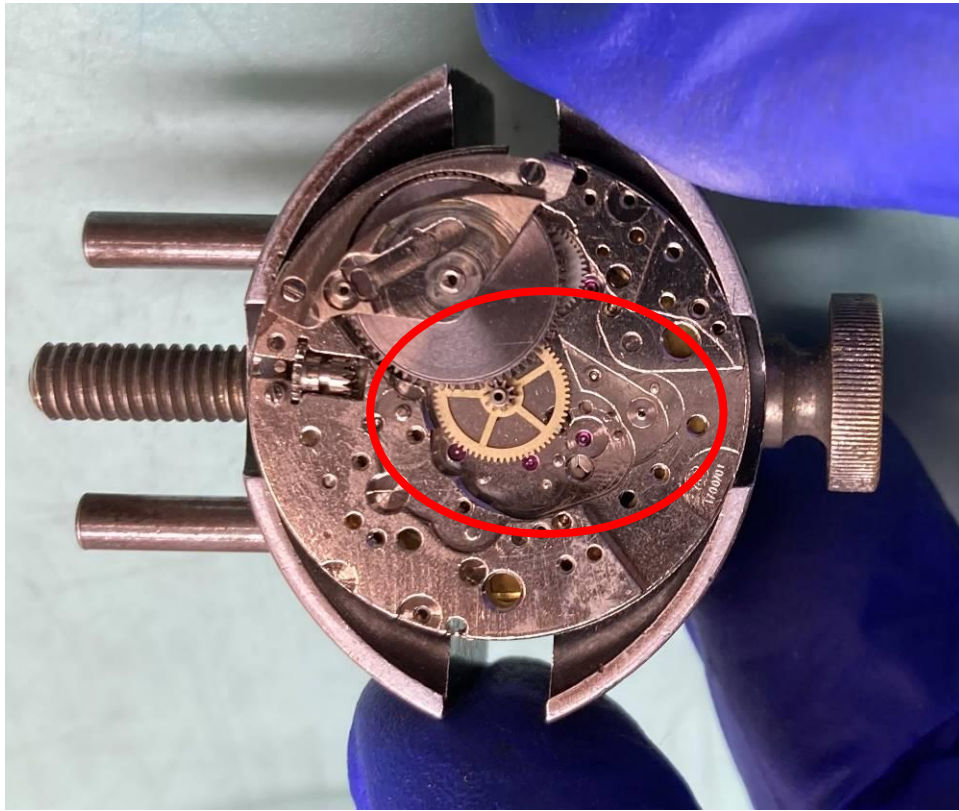
Balance and pallet fork removed as well as winding train (gears)



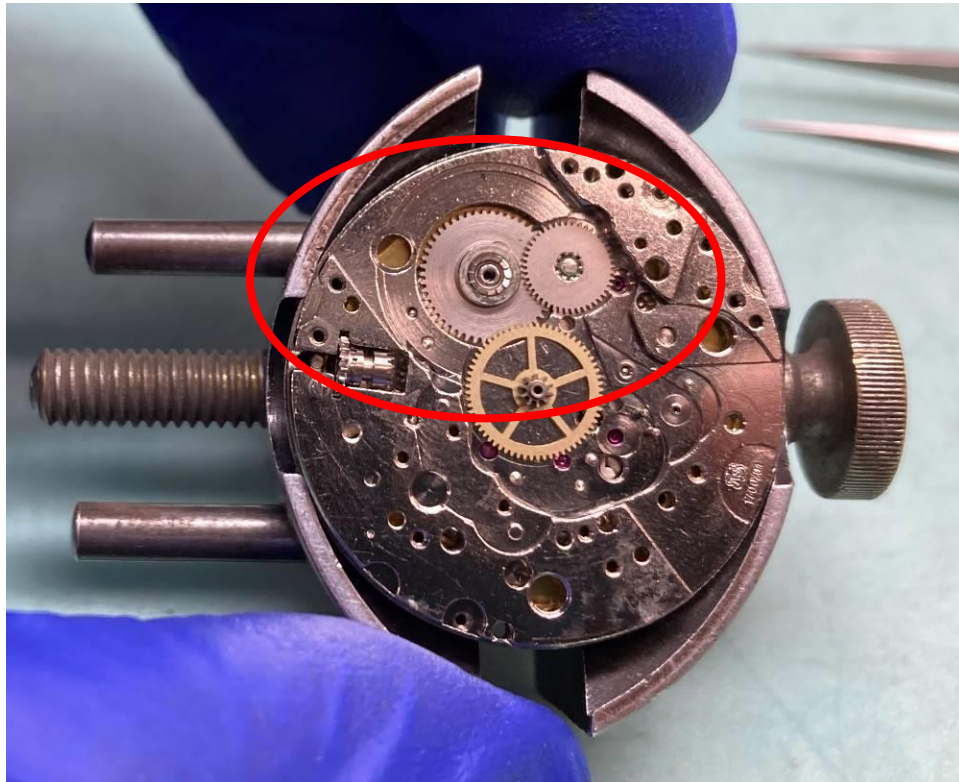
Train bridge removed



Power train removed



Winding train bridge removed and main spring barrel removed



Removing the calendar mechanism



Setting bridge removed



Calendar wheel removed



Setting mechanism removed



Parts separated and ready for ultrasonic cleaning, then hand cleaning and polishing.



Movement reassembled and oiled using specific oil for each wheel/pinion as well as springs, cams, and escapement.



Finally, the dial and hands were cleaned, and the hands were lightly polished to remove the oxidation and return them to a near mirror polish.

A time-grapher is used to adjust the gain/loss per day. A watch of this vintage and quality will gain/lose 1-2 minutes per day. The author was able to adjust it to within $+13/-3$ seconds per day (though this will eventually drift with use). Keeping a watch running correctly requires routine maintenance, just like a car, however a watch should be cleaned and adjusted every 5-10 years. Without regular maintenance, permanent damage will result and the ruby jewels and pivots must be replaced (or made).



With the movement removed, the case is reassembled with the new o-rings on the case-back and crown and the case is pressure tested. This test demonstrates that this watch will be fine for showers, but swimming and diving are forbidden.



This picture depicts the tools and materials necessary for making bands.



First the leather is cut to size and shape



The middle layers are bonded



Then clamped and the edges are sanded to make them even.



The edge of the top layer is taper-cut to make the next step easier



The top layer is then bonded to the middle layers, and the sides are folded over the edge and bonded.



The stitch line is marked



Then the holes for the stitches are made with a sharp prick and hammer



The stitches are made wherein each stitch has thread from the top and bottom, effectively making a knot at each stitch.



The final stitch, like the first stitch, is doubled, the thread is cut, and the ends of the thread are bonded into the hole. Then each stitch is inspected and individually adjusted to make sure they are straight. Finally the stitches are “crushed” using a hammer to ensure the stitches are permanently “set”.



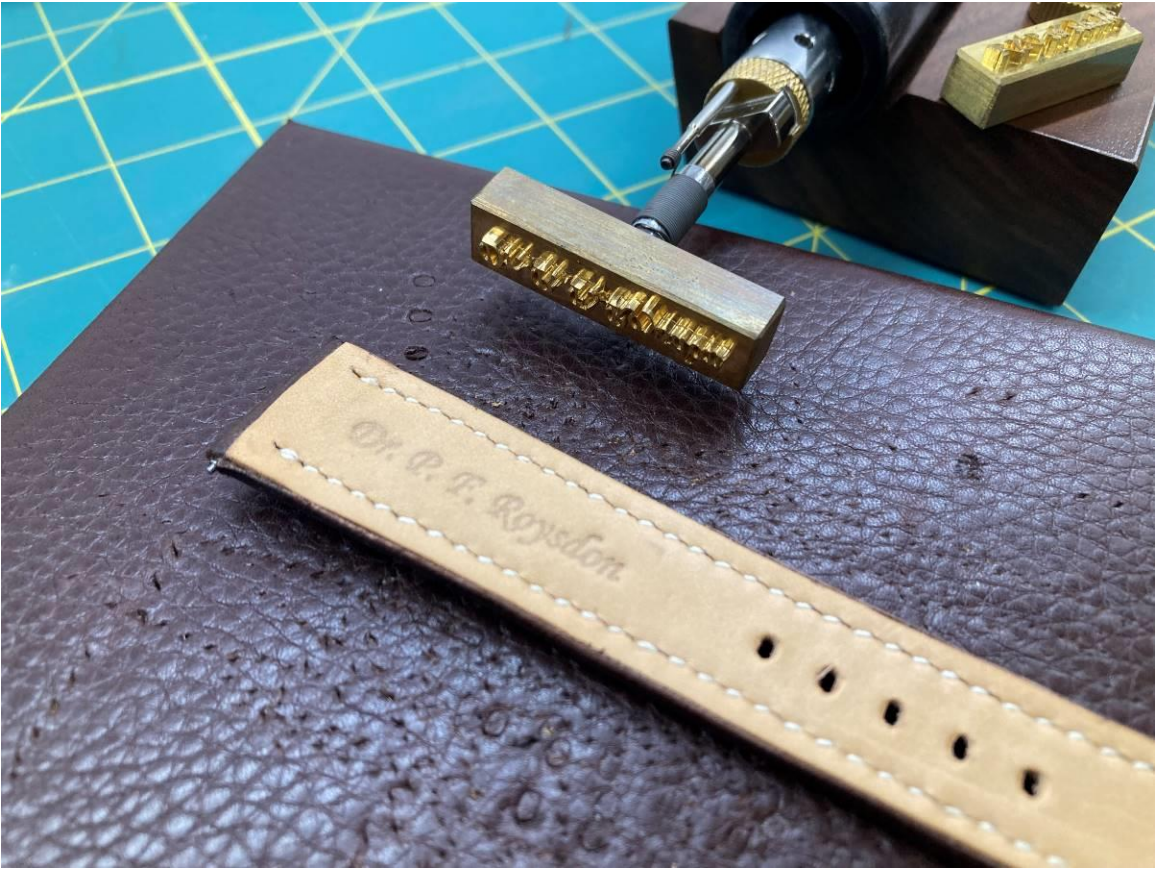
A “creasing iron” is used to apply a nice crease along the edge, and burnish the underside where the leather on the sides meet the leather on the bottom, effectively sealing the seam.



The holes for the buckle tongue are applied with a special tool and a mallet.



Finally a brand is applied to the inside with “Dr. P. F. Roysdon” on one side, and “Made in USA” on the other.



Touch-up paint is applied on the edge of the leather at the spring pins.



The same process (but much more complex) is repeated for the buckle side of the band.

The band is complete with soft Nubuck leather on the inside, and top-grain leather on the outside.



The final photo prior to shipping.



I hope you enjoyed seeing the process to return this fine timepiece back to near-new condition.