Subject: Re: Long service box
Posted by thesnark17 on Thu, 13 May 2021 23:20:47 GMT
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Small watch gives its own warning:

All wrist watches have relatively comparable amounts of friction on the train when clean. The mainspring is designed to deliver a reasonable amount of energy to overcome this load on the train (which includes pivot friction, the balance action, and dirt as it accumulates). The mainspring can only be a certain size to fit into the movement, so there is an upper limit on how much power it can provide. For wrist watches, it isn't much.

As dirt gets into the movement, the friction will increase. As it does, the amount of mainspring power delivered to the balance will decrease, causing the balance amplitude to decrease (remember, power and amplitude are linearly related). This will result in the watch keeping more erratic time due to low amplitude. Once the train is inhibited enough, the watch will stop before reaching the 24 hour rewind point. Since the mainspring did not have much force to begin with, you will find this effect quite noticeable once it begins.

This is particularly noticeable if the friction increases because the oil gums up. Whale oil was used from c.1840 to c.1960 for watches, and it has some interesting properties. First, it is more "oily" and far more effective at preventing pressure-based wear, compared to modern synthetic oils. Second, it does not significantly alter its properties over its working lifespan - it is stable (and highly protective against wear) as long as it is liquid. Third, as it ages out, it becomes "gummy". This rapidly increases the friction on the train and is sufficient to stop a small watch movement all by itself.

So, if you are following Gruen's advice, and using whale oil in your watch:
- If the watch gets dirty, it will stop or run irregularly, and you will know it needs service. If at that point, you get it serviced, it will not have run long with dirt in it and there will be no damage.
- If the watch lubricants begin to age out, the watch will stop or run irregularly, and you will know it needs service. &c no damage.
- If the watch is running without issue, you know that neither of the above cases is true, and you can be confident that your watch is still clean and that the oil is protecting against wear.

The problem comes when you don't use whale oil! (which of course has not been available for more than 50 years, since you have to kill whales to get it - don't use it!) Modern lubricants don't behave the way whale oil does, and it's quite possible to run a wristwatch past the point where the lubricants are protecting against wear, without noticing a change in timekeeping. So Gruen's rules don't work any more.

Also, as Gruen themselves point out, pocket watches have much higher power in their mainsprings, so can push through dirt buildup and oil breakdown - possibly so well that the user would not immediately notice the degradation in the timekeeping that would result (this is aided as well by the fact that a pocket watch doesn't move around as much - nor is it usually in so many positions - as a wristwatch, over the course of a day). And after the point where the lubricants stop working, the pocket watch just keeps grinding itself to death until the user notices the drop in performance, by which time it is far too late to do anything about it without extensive work (and

maybe not even then). Thus the warning.