How Accurate Should Your Mechanical Watch Be?

January 23, 2020 by Matthew Catellier — 18 Comments

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expect your mechanical watch to be? I'm about to break things down for you, so you can know what to expect.

Minuscule Parts

The first, most obvious thing to consider is that mechanical watch movements are composed of minuscule parts. The screws and gears are so tiny that watchmakers need special precision tools just to work on them. The springs can be as small in diameter of a human hair. Given this small size, it's remarkable that mechanical watches are even accurate to the hour, much less to the minute.

To understand why this is the case, consider the amount of precision required to manufacture a quality timepiece. Suppose your watch is 99.9 percent accurate. That sounds pretty good, right?

Not right at all. A 99.9 percent accurate watch would be off by 1 minute and 27 seconds per day. A 99.99 percent accurate watch will be off by at least 1 second per day. When you think about it that way, it puts things in perspective.

Variables to Consider

first 4 positions, and so forth. The more positions the watch has been adjusted for, the more accurate it will be.

Temperature is another complicating variable. As temperatures rise and fall, all of those tiny watch components will expand and shrink accordingly. And since different materials expand and contract at different rates, this will invariably throw off your accuracy.

Magnetic interference can also throw off your watch's accuracy. This is particularly true if your hairspring coils inadvertently get magnetized. If your mechanical watch is suddenly off by 20 or

Finally, your watch may have some mechanical defects. Admittedly, this is rare if you're buying from a quality manufacturer. But even the best watchmakers sometimes produce a dud. If your accuracy is off by more than the manufacturer's rating, your best bet is to contact a customer service representative and get a replacement. Prominent manufacturers care about their reputations, so they'll be willing to work with you.

Realistic Expectations

To find an accurate watch, look for one that's certified by the Contrôle Officiel Suisse des Chronomètres (COSC). A certified watch will be accurate to a bare minimum of +6/-4 seconds per day, and will generally be accurate to +/-3 seconds per day. A non-certified watch, meanwhile, will typically be accurate to about +/-5 seconds per day. Even +/-10 seconds per day is typically considered acceptable, although in that case you'll want to set your watch about once a week.

Regular Maintenance

To keep your watch as accurate as possible, make sure that it's been properly regulated. This is done by turning a tiny screw, which adjusts the tension on the spring. A good watchmaker with the right equipment can accomplish this task in just a few minutes.

It's also important to make sure that your watch is properly adjusted. Adjustment, as opposed to regulation, means ensuring that the balance wheel is properly balanced. This can also be done by a qualified watchmaker. However, it takes a few hours rather than a few minutes, so expect to pay handsomely for the service.

Finally, it's important to make sure that your watch is properly lubricated. Over time, lubricating oils in your watch will break down, which means their performance will suffer. Depending on the quality

About Matthew Catellier

Matt is the Founder and Executive editor of The Watch Review Blog. For Matt, watches represent self-expression, art and freedom, and his ideal watch combines functionality with intriguing history behind it. Follow him on Instagram @watchreviewblog.

Comments

Adam Barnes says
December 5, 2021 at 7:54 pm

My westclox wrist ben is usually about 10 minutes fast by the end of the day, it was made between 1939-1942

Reply

a das says
June 23, 2022 at 12:30 pm

you can use regulator on balance wheel to set time more accurately. You can take reference of a quartz.

April 13, 2022 at 1:05 pm

All things considered i think i will stick with modern accurate Quartz technology. + or – just a couple of seconds a month.

After all its the 2020s not the 1920s.

Reply

Chuck says
June 19, 2022 at 2:41 am

Yep. Same here. Quartz analog or digital, but digital for me for the last 40 years. Mechanical watches are great for looks and when you do NOT need to rely on accurate time.

Reply

Tom says
August 31, 2022 at 12:29 pm

My new Seiko 4R36 is one second plus for 3 days and nights now.

Reply

John says
February 6, 2023 at 12:06 pm

Same. It's about +14 seconds per day for me.

Reply

Barry says
October 14, 2022 at 11:19 pm

Hi Mathew,

I just got my Bulova automatic watch today. It is the stainless steel band with black dial and gold tone markers, minute/second hand and around the skeletal moving part. My sterling silver onyx ring looks great with it. Did this colour combo come out later that the other two colour combos. I like this colour combo best as you can see the hour/minute hand much clearer. Also these colours are very rich looking, not in a pretentious way. I'm just an average mature person. How long do I have to wear it until it will keep moving for 40 hrs after I take it off. I really don't mind winding it back to the right time each day. I like that it is a sapphire jewel casing (if that is the correct terminology). What is your opinion of this colour combo and of wearing it as a casual watch with jeans and a polo shirt or button up

I don't think that could be measured the time you need to wear your watch so it could be powered for 40 hours that is, I wear my Zodiac sea wolf 53 every day but after wearing it for one day the taking it off it be lasting 40 running but I don't mind winding it I also don't mind synchronizing it every day to my phone because every 24 hours it be +4 seconds so an automatic watch can be very accurate as long as one synchronizes it every day

Reply

Chris says
October 17, 2022 at 9:35 am

I think that even a 99.99% accurate watch will be off by more than 8 seconds per day (60 s/min x 60 min/hr x 24 hr/day x 0.0001 = 8.64 s/day).

Reply

Darren says
February 17, 2023 at 1:21 am

I have several Sturmanskie Traveller 24h watches with the 2431 movements. My one is within 2s every 3 days (-2s), comparing to an Atomic quartz watch I have (Casio, which

the 24h movement is better (?) than many 12h ones?

It amazes me how good these CAN be, with proper adjustments; the 2431 is a 21,600vph movement (6Hz), so average for beats. But I am extremely impressed. I hope that the watch continues to perform so well. 🙂

So assuming within +/-2s/day variance, which is close to what I am getting currently, that puts the watch at:

-2.0/86400 = -2.31e-5 = -23.1ppm = -0.00231% = 99.997% accurate!

Good enough for me, and better than some quartz models!
Reply

Daniel says
October 24, 2022 at 2:55 pm

Hi!

I've been looking at an Omega Speedmaster(3511.50)from 1991. The daily difference is +61 seconds/day. Price: around 2200 euro.

Would you say that the watch need service/be adjusted?

I have a Swiss Art auto and it is only off by 1 min a month. Setting it once a month is no big deal for me.

Reply

Rene says
March 14, 2023 at 10:22 pm

My Bliger with NH35A (Seiko movement US$75) arrived magnetized +66 seconds too fast per day.

After demagnetization it, 27 seconds per day too fast. Much better.

In both test cases the watch was in a rest state, face down, for 24 hours at a room temperature of 21 to 23C.

Wearing the watch is expected to reduce the +27secs down to hypothetically +10 seconds.

Not tomorrow when it will be +37C in the classroom without air conditioning.

Perhaps demagnetization is sometimes overlooked as a method to improve watch accuracy.

Hence my contribution here.

Reply

Reply

Charles R. Couch says
August 6, 2023 at 9:44 pm

Hi, just discovered this site and just purchased a Swiss-made mechanical watch last month. My humble comments are probably general knowledge:

I measured/recorded the daily error of my watch over a three week period and determined the average error to be +3.3 seconds/day or 21 seconds/week.

Every Monday morning I re-set the watch so that it is 10 seconds slow. During the following week, as the watch gains time each day, the error diminishes to zero in mid-week and then gains time so that the following Monday it is 10 seconds fast.

Following this procedure the maximum error in any given week is 10 seconds.

Cheers –

Reply

Craig says
September 30, 2023 at 6:42 pm

Then I found that the watch just stopped suddenly a couple times, because the crown would pop out on its own. (I don't think it was doing it because the crown was making contact with my arm, as had happened with a very thin watch I previously had.) So this allowed me to send it in for a warranty repair. When I got it back, the order said "New battery, new movement." To my shock, it now keeps more accurate time than any mechanical watch I've ever had. It's barely lost or gained a fraction of a second in two weeks!

Reply

J Morris says
October 9, 2023 at 12:26 pm

Comparing A Quartz Movement to a Mechanical Movement as to Accuracy, Is a No-brainer. The Cheapest Quartz Movement will Run circles around Any Mechanical Movement, On up til the Battery Dies.... or An EMP or Simply something in the Circuit Board goes kaput. A Good Quality Mechanical Movement/Watches, When Properly Maintained can Outlast 3 Generations, 200yrs or more and We Have Many Examples of this. In a $#it -Hit the Fan Scenario, I'll Take A Mechanical Movement over A Quartz Movement, Any Day.

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