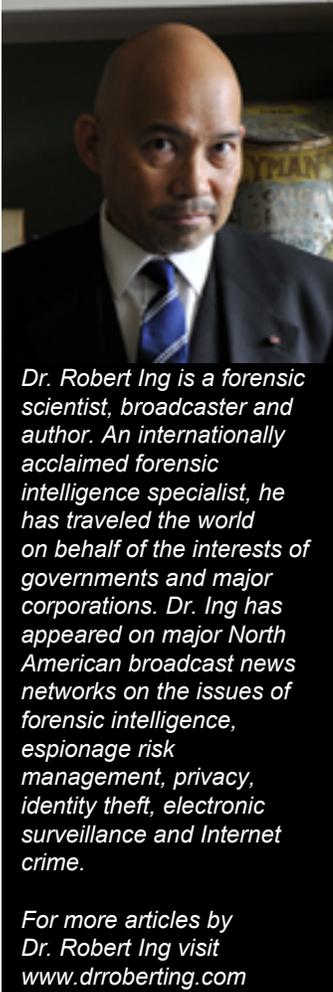




## Caring for Your Wind-Up Mechanical Watch By Robert Ing, DSc, DLitt, FAPSc

### Mechanical Watch 101

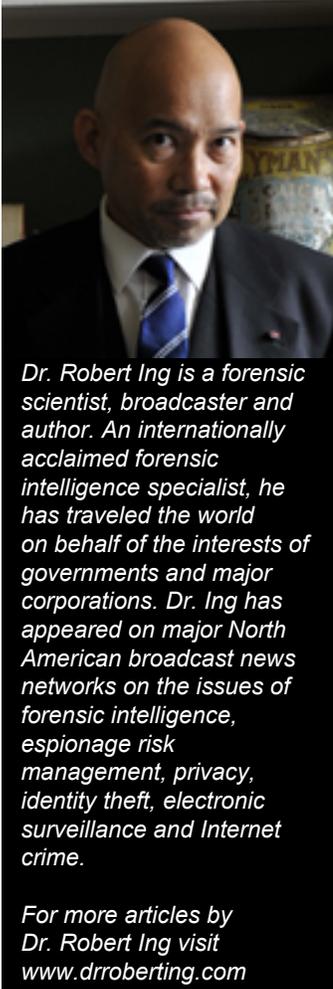
Here's a very basic article on the care and maintenance of a mechanical pocket watch or wristwatch. While the majority of new watches for sale are quartz, there are still several new mechanical models available ranging in price from \$5.00 to well over \$2500.00. As well, there are some individuals who prefer to purchase older antique or vintage mechanical watches, or may have inherited a family mechanical watch that they intend to use and care for. A mechanical watch is a testament to the quality of the watchmakers' craft of centuries past. In our 21st century, one would have a very difficult time finding any item that would still be mechanically functional, accurate and useful one hundred or more years later. However, if you visit a pawnshop, antiques dealer, or vintage estate jeweller in a major city you can easily find a mechanical pocket watch made in the 1800's that runs and keeps time as if it just came from the watchmaker! Unlike quartz watches, mechanical watches require a little more care which over time builds a greater sense of personal connection and ownership with this prodigy of past master craftsmanship.



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The very first watches, specifically pocket watches or portable clock-watches as they were originally called were mechanical and made their first appearance in the late 16th century. All mechanical watches up to close to the mid 19th century were not assembly line produced but rather individually assembled by a watchmaker using individual components typically obtained from geographically dispersed sources. It wasn't until the late 19th century that a new innovation, the mechanical wrist watch made its debut and by the mid 20th century would overshadow the pocket watch in both popularity and fashion. As well, the mid 20th century heralded in the creation of the electric and quartz movements, that would become the very hearts of many 21st century wristwatches and pocket watches. A movement in watchmaker terms, refers to the inner workings of a watch and clock, the very thing that literally makes it 'tick.' An electric and quartz movement will have a small electronic circuit, battery and gears. A mechanical movement will have gears and a spring or two. Basic electric and quartz movements have fewer moving parts than basic mechanical movements. A very basic mechanical movement will have no less than 202 individual components excluding case, crystal (watch glass) and watchband or watch chain.



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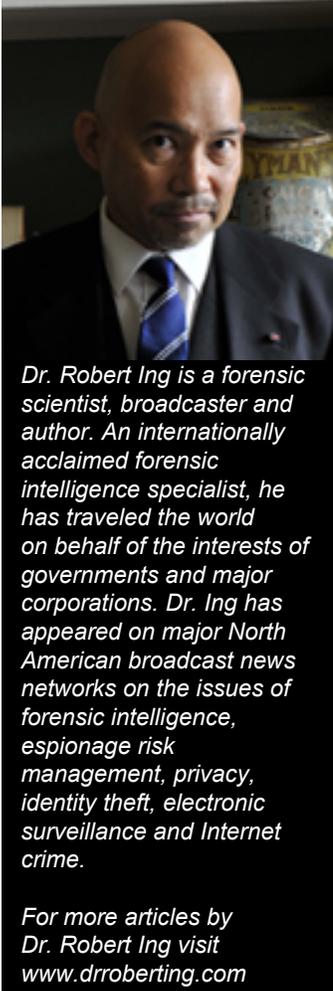
Mechanical watches differ from quartz watches in several ways. Mechanical watches use energy from a spring to power them, whereas electric or quartz watches use small button batteries. The spring in the mechanical watch requires you wind the watch on a daily basis to keep the spring 'charged' where a quartz watch does not require this, but does need you to replace its battery every one to three years. Some mechanical watches, known as automatic watches do not require the owner to wind them as the watch winds itself 'automatically' with the movement of the users' arm if a wrist watch, or every time the watch is handled or jostled about due to body movement such as walking in the case of a pocket watch.

If you happen to look at watches in a jewellery store window or glance at the wrist watch of a friend, you can readily identify if the watch you are looking at is a mechanical or quartz model. First, the word 'QUARTZ' may be printed on the lower half of the dial. Second, the second hand of the watch will click in steps if it is quartz. In the case of a mechanical watch the second hand will sweep or float around the dial. As a way to directly verify if any watch is mechanical or quartz, especially if you are asking someone who has very little knowledge of watches, is to ask if the watch uses a battery. If it does, then it is definitely quartz or an older electric model. Electric watches use a small energized electro-mechanical motor movement and gears in order to keep the watch working. The widespread manufacture of electric watches ceased around the mid-1960's when quartz movements predominated production. Quartz movements utilize a micro-sized synthesized quartz crystal and electronic circuitry that cause the crystal to oscillate at a specific frequency in order to mark time. Mechanical movements use a series of gears and cogs to regulate the movement and positioning of the hands of the watch around the dial.

### **Why Mechanical Watches Are Still Popular**

When it comes to accuracy in time keeping, there is no argument, quartz movement is the best readily available and affordable method for split second accuracy. The only disadvantage in this regard for the quartz movement is that it requires a battery and when that battery is on its final phase just prior to replacement, the inexpensive quartz watch may lose its accuracy, or on the more expensive quartz watch, could very well shut down altogether. The next issue is finding the correct size watch battery, and finding a shop where the battery can be changed properly without damage to the watch. Although the battery may only need replacing once every year or three, it is a given that this event will most likely occur at the most inconvenient time.

A mechanical watch, depending on its quality of manufacture may lose or gain from 3 to 18 seconds per day, obviously not the accuracy of a quartz movement. As well, the mechanical watch will require its owner to wind it once a day in order to keep it running.



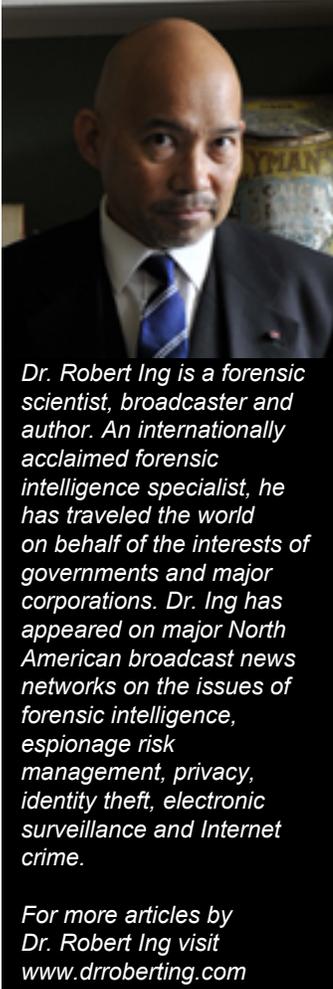
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Usually, it is during this 'daily wind' that the watch will be checked against another reliable time source and set accordingly. Despite these minor inconveniences, a well maintained mechanical movement can be relied upon to function without fail; anyplace, anytime in total self-sufficiency. Many mechanical watches made in the 19th century, well over 100 years ago, are still running and keeping time! It is this fact alone that has made a mechanical timepiece the personal choice of many modern day professional adventurers, soldiers and emergency responders. In extremely cold temperatures, or in areas where test equipment emit or are affected by electro-magnetic fields; quartz watches may not function correctly or could adversely affect the accuracy of sensitive electronic instruments. Mechanical watches are not affected by temperature extremes, by electro-magnetic waves emitted by laboratory/medical instruments nor do they emit electro-magnetic waves that could interfere with the accuracy of sensitive electronic test equipment. As well, although not medically or scientifically validated, the health issue of wearing a quartz watch providing long-term exposure to a quartz oscillated electro-magnetic induction field over human body tissue has raised some concerns in holistic medical circles. Mechanical watches unlike quartz watches, will function in the aftermath of a nuclear incident. Mechanicals are also the best choice for the environment as unlike quartz watches, individual 'recyclable' metal parts may be replaced when the watch requires repair versus the replacement and disposal of a complete quartz movement or at the very least a battery, with both of these containing toxic chemicals that would end up in a landfill. Statistically, the useful lifespan of a mechanical watch is far greater than that of a quartz watch.

### **Mechanical Watch Problems**

A mechanical watch is a precision time keeping instrument that uses extremely small parts with microscopic tolerances in order to function correctly. A single speck of dust that may not be seen with the naked eye, the size of the point of a fine needle could easily damage a mechanical movement over time, or stop it altogether. However, dust is only one factor. Here are the most common mechanical watch problems.



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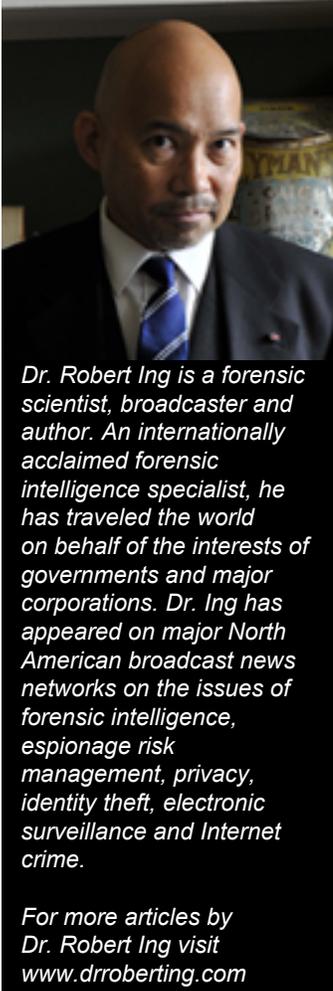
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## 1) Cleaning & Lubrication

As with all things mechanical, the single most common reason a mechanical watch stops working is because it requires cleaning and lubrication. While people with very little mechanical watch experience will readily offer many different reasonable sounding conditions why a mechanical watch stopped working, nine times out of ten, it is just a matter the movement needs to be cleaned and lubricated. Depending on the mechanical movement, your mechanical watch will need to be cleaned and lubricated every three to five years. Just like an automobile requiring an oil change, where dirty engine oil must be replaced as the result of wear and friction of the engine's moving parts, the same must be done in the form of the cleaning and lubrication of the watch movement. Otherwise the mechanical movement will stop or critical moving parts of the watch may have to be replaced due to extreme wear.

## 2) Water & Moisture

Water and moisture are a mechanical watch movement's worst enemies. Once water or moisture gets inside the watchcase, it will slowly deteriorate the smooth, near frictionless finish of the metal contact points for critical moving components. As well, moisture inside the watch may settle on the stationary components of the movement where it may cause rust or fungus to develop which will irreparably destroy the movement. In order to guard against water and moisture getting inside your watch, you must do your best to ensure that your watch is not exposed to water or moisture. This means removing your mechanical wristwatch when you wash your hands, go swimming, take a shower, do the dishes, bathe the dog or take a sauna. For pocket watch owners this means keeping the watch inside an inside pocket or under a jacket/rain coat when venturing out in the rain or snow. Whether you own a wristwatch or pocket watch, if you come in from the cold, let your watch warm up with your natural body heat and the ambient temperature of the room, do not apply artificial heat from a blow dryer or place your cold watch in a window to warm in the sun or on a heater/radiator. Your watch should never be exposed to any temperature extremes whether hot or cold such as in your vehicle glove box nor stored in any damp or moist area such as a basement, attic or garage. Temperature extremes can lead to moisture build-up within your watch. A watch is considered a 'personal wear item' and 'personal wear items' are at their best when they are used and stored at temperatures that are comfortable for their owners. If it is too hot, too cold, too wet or too damp for you, then it is definitely too much for your watch! Never completely trust the claim that a watch older than two years is waterproof, water resistant or splash proof – never try to put this to the test! If you see condensation inside the glass crystal of your watch dial, you have moisture inside your watch and it is best to take it to a qualified watchmaker to have it cleaned, lubricated and repaired if required.



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### 3) Movement Seizure

A mechanical watch needs to be kept moving in order for its precision movement not to seize up over time. A mechanical watch kept in a drawer or in a clear display case but seldom wound is one whose intricate inner-workings may be seizing up making it completely non-functional as the timepiece it was crafted to be. A dormant mechanical movement causes the oil that covers the surface of its once mobile parts to settle and over time to become a thick film that will seize the movement from moving freely. A mechanical watch must be wound once daily or at the very least once weekly in order to prevent the movement from seizure. Most mechanical watch movements will run from 28 to 36 hours on a full wind without having to be re-wound. It is recommended that if you wear your watch everyday, you wind it once a day, and when you do, verify the time of the watch and adjust it as required. A common myth is that you can 'over wind' a mechanical movement and that this is the most common reason why such a movement stops working.

Technically, it is impossible to 'over wind' a mechanical watch, as the internal workings of the movement will not allow it to be over wound. When winding any mechanical movement, it should be wound with the fingertips, only to the point where a resistance is felt that does not allow it to be wound further. Mechanical movements are designed to be fully wound to finger resistance and it is just by coincidence that upon fully winding a watch that mechanical failure due to an unassociated condition is observed. On another note, with regard to maintaining the accuracy of your watch and reducing stress on movement parts; wristwatches when not worn should be placed flat on their backs, never resting on their side, nor especially resting on the crown ('winder'). Pocket watches should be hung suspended using their bow (loop at the top of their case) using a pocket watch stand, jewellery tree or from a simple hook attached to the wall or inside a drawer. A temporary alternative for pocket watches is to place them back down (face up) on a soft surface (table with a handkerchief or towel on it) with the bow (loop at the top of their case) tucked under the crown towards the table.

### 4) Exploration Damage

The case of a mechanical watch should never be opened with the exception of doing so in order to clean & lubricate or repair the movement. However, some owner's cannot help but be curious or may accidentally have the case open inadvertently. As previously pointed out, the mechanical movement is made to microscopic tolerances and the individual parts of the movement are extremely small, and easily damaged. Dust particles no thicker than a human hair and no larger in mass than the point of a fine needle can stop or permanently damage the movement. This is the main reason for not opening the watchcase. However, should you find yourself looking at your watch with its case open, extreme care must be exercised to handle the watch only by its edges and avoid the temptation to touch the movement, or the hands and dial of the watch.



Naturally occurring oil/acidic perspiration found on skin and microscopic particles even on washed hands can deposit themselves on movement components and may lead to deterioration. As well, the simple act of lightly touching a spring or the hands of the watch could bend them microscopically, causing them not to work within the tolerance required for trouble-free functionality. The time must be set on your watch using the crown, never move the hands on the dial of the watch with your fingers or by any other means to set the time as you will damage or break them off. A mechanical movement is a thing of precision, micro-engineering, art and craftsmanship. Regardless of the cost of your mechanical watch it is a precision instrument and this must be kept in mind.

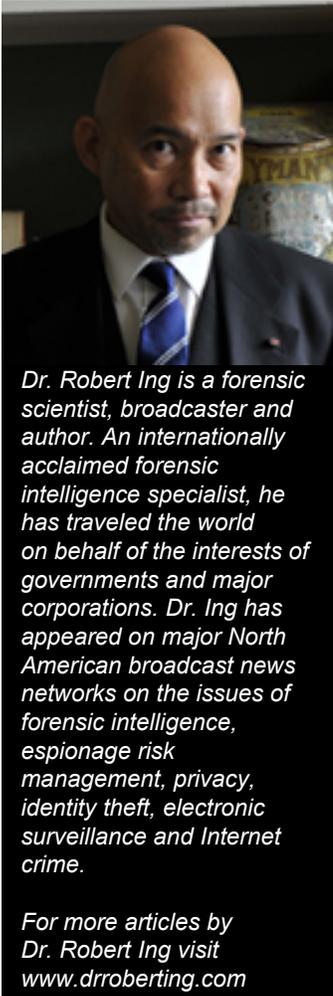
### **Taking Care of Your Mechanical Watch**

1) Wind your watch daily at around the same time each day. Using only your fingers wind the watch only to the point where a resistance is felt that does not allow it to be wound further. After winding your watch, verify the time on your watch with a reliable source such as your local radio or television news station, or the network time displayed on your mobile telephone.

2) At the end of the day, place your wristwatch flat on its back, not on its side or place your pocket watch to hang from its bow in a pocket watch or jewellery stand, or on a secure hook on a wall or inside a drawer. If these are not available, keep the pocket watch safely in the pocket you typically carry it in during the day.

3) Use a watch chain or lanyard for your pocket watch. A pocket watch must always be attached to a watch chain or lanyard; securely attached to a buttonhole, button or belt at one end that is of a length that will not allow the watch to hit the ground should it accidentally fall from your pocket or hand. Avoid carrying your pocket watch, especially one larger than size 16s (1.7" / 43.18 mm diameter) or vintage watch on your belt in a pouch as the risk of damage is greater than if you carried it in a jacket or vest pocket. A pocket watch carried in a pocket or pouch should have its crystal (watch glass) facing your body to prevent it from being cracked or shattered as a result of external impact (i.e.. falls, fights, physical mishaps, etc.). As well, the pocket watch should be the only 'hard' item carried in its pocket and should not be loose in the pocket where it will swing or bounce with body movement such as walking; in this way the risk of scratches or damage to the watch will be greatly reduced.

4) Examine your watch for signs of wear and tear on a weekly basis. Wristwatch owners should check their watchband to ensure that it is securely attached to the watchcase and that the band has not deteriorated or cracked. Pocket watch owners should inspect the bow (the ring part the watch chain is attached to on their watch) and the watch chain or lanyard to ensure it is secure and undamaged.



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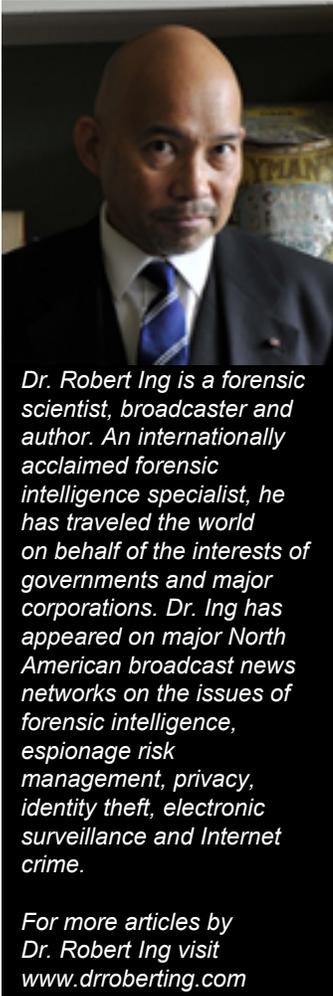
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All watch owners should examine the watchcase and crystal (watch glass) to ensure there are no cracks that could allow water, moisture or dirt to enter the watch.

5) Clean your watch on a monthly basis by wiping the case and crystal (watch glass) with an ammonia and alcohol free glass cleaning solution sprayed on a clean, soft, lint-free cloth; not sprayed directly onto the watch! CAUTION, if you have a plastic crystal (watch glass) ammonia or alcohol solutions may permanently damage your crystal by discolouring or fogging it up - DO NOT USE THIS. The best soft lint free cloths available at most department stores and stationers at an affordable price are those intended for laptop computer screens. After cleaning your watch with the ammonia and alcohol free glass cleaning solution you may polish your watch by using a soft jewellery polishing cloth available from most retail jewellers. Cleaning perspiration, and body oil (like fingerprints, etc.) from the case of your watch and polishing the case will reduce deterioration of the case and its finish, and lengthen its life by as much as 25%. Have your mechanical watch cleaned & lubricated professionally by a watchmaker every 3 to 5 years.

6) If your watch is not going to be worn or used on a daily basis but is more of an heirloom or display piece, it still must be wound at least once a week to keep its movement in running order. For display purposes, the watch should be placed under a glass dome or cover with a good solid base, making an even seal to reduce dust and moisture in the air from settling on the timepiece. If you have an 'automatic' mechanical watch, you may purchase an electronic automatic watch winder which will not only display your watch but also keep it wound with very little effort on your part. Glass display cases containing any item of value or rarity must never be positioned in direct sunlight, as the glass will magnify the heat and intensity of the sunlight causing temperature damage and fading of the article within. Pocket watches should be hung by their bow and wristwatches left flat on their case back. If the watch is not going to be displayed but kept in a drawer, a small velveteen lined jewellery or wristwatch box may be used for wristwatches if the watch can be placed flat on its back. For pocket watches, the best way to store them is standing up with their bow uppermost. The best makeshift solution to accomplish this is to obtain a padded drawstring mobile telephone pouch and fasten it to the inside of a drawer or other small box. In order to reduce moisture exposure to a stored or displayed watch it is helpful to place a small silica packet in the bottom of the watch display case or storage box, but care must be taken not to let the watch directly touch the silica packet as this may discolour the finish of the watch. Silica packets come in the form of little pillows or small canisters, and can easily be found in the packaging of many electronic items and over-the-counter tablet medicines. For small items I have on display, I use the small silica canisters from old medicine containers as they can be discretely placed in the bottom corner of a display case.



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By taking care of your mechanical watch, you are not only protecting your investment but also ensuring that it will provide years of reliable service. Who knows, perhaps your watch will still be keeping accurate time one hundred years from now!

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