

BALL Owner's Manual

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Welcome

We congratulate you on the purchase of your BALL watch. You will soon be wearing on your wrist an excellent tribute to American railroad history. All BALL watches are completely Swiss-made and rigorously built in mind for you - an explorer. Our mission: On the wrist of every direct, no nonsense life adventurer in search of his or her destiny. We are single-minded in our commitment to this vision.

At BALL Watch Company, we are focused on building the mightiest, superior watches that endure adverse conditions. Indeed, it has been our love and tradition since 1891. In the process, we faithfully create a family enterprise that genuinely fosters our humanity and have fun in all our endeavors.

Thank you for your trust and confidence in us.

Faithfully yours,
Ball Watch Co. Management.

Brand Spirit

Freedom. Represents what humans live for: Free will and the chance to pursue their dreams.

The American Railroads brought freedom to the country, the opportunity to travel and explore the new frontiers. The powerful locomotives sparked the spirit of adventure in the American people, while the men of the railroads were the heroes of the machine age. Ball Watch Company proudly served the men of the railroads then, just as we support the world-class explorers of today.

Early History

To a large extent, the development of the watch industry in America can be attributed to the appearance and subsequent development of American railroads.

Prior to the advent of trains as a means of transporting people and goods, there was no real need for precise timekeeping or even for uniform time. Even after the railroad system in the United States had reached significant proportions following the Civil War, communities continued to maintain their local times.

By the end of 1883, the railroads had agreed, at least among themselves, to divide the nation into four time zones and had adopted Standard Time. The public soon followed suit, although it is interesting to note that Congress did not officially sanction the concept until 1918.

BALL'S TIME

In 1996, Cleveland, Ohio celebrated the bicentennial of the founding of the city on the lake. Throughout this celebration, many individuals were remembered and recognized as Cleveland's favorite sons, and their accomplishments were viewed. One Clevelander honored, not only for his civic contributions, but also for his place in horology, and whose accomplishments reached international acclaim, was Webster Clay Ball.

Webb C. Ball was born in Fredericktown, Ohio on October 6, 1847. In the early years, Webb C. Ball was recognized as having an interest in accurate time, so when Standard Time was adopted in 1883 and the service of the Naval Observatory in Washington became available, Mr. Ball was the first Cleveland jeweler to use the time signals sent from the Naval Observatory in Washington DC, bringing accurate time to Cleveland. He was also the first in Cleveland to purchase and display a chronometer. For many years, as people walked past his store, they would pull out their watches and set the time. The phrase, "BALL'S TIME", came to mean the absolute correct time all over Northern Ohio.

The Kipton Disaster

On April 19, 1891 the Fast Mail train known as *No. 14* was coming west on the Lake Shore & Michigan Southern Railroad in Kipton, Ohio. At Elyria, 25 miles from Cleveland, the Engineer and the Conductor of the *Accommodation* were given orders to let the Fast Mail train pass them at Kipton, a small station located west of Oberlin, the university town.

From the time the train left Elyria until it collided with the Fast Mail at Kipton, the Conductor, as he admitted afterward, did not take his watch out of his pocket. He said that he supposed the Engineer would look out for *No. 14*. But the Engineer's watch stopped for four minutes and then began running again, a little matter of life and death of which he was unconscious.

There were several stations between Elyria and Kipton, but the Engineer pounded slowly along in the belief that he had time to spare. Leaving Oberlin, he supposed he had seven minutes in which to reach the meeting point. Of course he had only three minutes. Had the Conductor looked at his own watch he could have prevented the accident. The trains came together at Kipton, the Fast Mail at full speed and the *Accommodation* under brakes, because it was nearing the station. The Engineers of both trains were killed, and the dead bodies of nine clerks were taken from the kindling wood and broken iron of the postal cars.

This accident prompted the Lake Shore officials to enlist Webb C. Ball to investigate Time and Watch conditions throughout the Lake Shore Lines and develop an inspection system for their implementation.

Watch Inspection System

On July 19, 1891, P.P. Wright, General Superintendent of The Lake Shore Lines, appointed Webb C. Ball as Chief Inspector for The Lake Shore Lines. He also issued Circular #1, dated September 3, 1891, which instructed all Conductors, Engineers and Yard Masters to have their watches inspected.

Early evidence of Ball's system is found in his papers which spell out the requirements for watch examiners, and carry the date of June 18, 1888, designating Webb C. Ball as the Chief Examiner of Watches for The Cleveland and Pittsburgh Division of the Pennsylvania Co. These papers of 1888 and his Lake Shore Line inspection system represent the beginning of the vast Ball network that would eventually encompass 75% of the railroads throughout the country and cover at least 175,000 miles of railroads, also extending into Mexico and Canada.

The Railroad Standard Watch

Webb C. Ball was instrumental in establishing watch standards and the inspection system that required all watches and clocks used on the railroads to be checked by competent watchmakers. The inspection system kept records of the performance of timepieces under standard forms and uniform rules and regulations; and in general, carefully supervised railroad time service. Under his system, there were four standard watches on every passenger or freight train, carried by the Conductor, Engineer, Fireman, and Rear Brakeman.

To provide for reliable watches, an initial list of approved timepieces was submitted to the men, from which they could select their timepieces. After the watch was selected and certified, it had to be submitted every two weeks for comparison with standard Washington time. A variation of more than 30 seconds meant it had to be regulated; and if repairs were necessary, a standard watch equal in grade was loaned to the employee to carry. Twice a year, each watch went through a complete inspection. The general time office carefully reviewed the results of all bimonthly comparisons for any possible irregularities. Each inspector was required to have a standard chronometer and to receive standard time daily from the Washington Observatory. The Time Service also regulated the train dispatcher, the men who gave the signal for the starting of trains. These offices also had to be equipped with a standard clock regulated from the Washington Observatory.

Ball's Place in History

Under Webb C. Ball's direction, this time inspection system was designed and monitored to make travel, for both the public and railroad employees, safe as far as time was concerned. It is important to recognize and applaud Webb C. Ball for inventing the first successful system to be accepted on a broad scale. It was his system that set the standards for the railroads; it was his system that helped establish accuracy and uniformity in timekeeping. It was his system that resulted in railroad time and railroad watches being recognized as STANDARD, whenever accuracy in time was required.

In general, it became accepted that when the average person asks a railroad man the time, he is assured of an accurate answer.

For further information, view the Ball History or Museum pages at ballwatch.com.

Performance

The U.S. Department of Defense has issued a Military Specification (MIL-W-46374F) regulating wristwatches for general use. This specification dictates some requirements such as sturdier and non-reflective cases, luminous hands, numerals and graduations, anti-magnetic, withstanding vibrations, and operating at very low/high temperature.

At BALL Watch Company, all watches are made to exceed the U.S. Military standard. Our motto: *Since 1891, accuracy under adverse conditions.*

- **Case:** The case material used in our collections ranges from high technology glass fiber to superior quality, high-grade stainless steel or titanium. BALL Engineer series automatic watches are constructed with corrosion-resistant ferrite stainless steel materials and are specially equipped with an anti-magnetic soft iron inner jacket consisting of a back plate, a ring surrounding the movement and the dial.
- **Crystal:** The crystal is made of anti-glare sapphire (AL₂O₃) with Moths hardness 9. Knoop hardness, parallel to C-axis, 1,670 to 2,000 kgf/mm². Heat conductivity at 100°C is 0.06 cal/cm sec°C. Its dielectric strength is at 20,800 kg/cm².
- **Shock-resistant:** All BALL watches are constructed to withstand at least 5,000Gs impact test, which is carried out on a machine to simulate the effect of a free fall onto a hard wooden floor for a height of one meter. The Engineer Hydrocarbon series undergoes a more rigorous 7,500Gs impact test, to ensure its impeccable shock resistance.
- **Movement:** BALL has worked with top Swiss movement manufacturers to build its precise and dependable movement under the most rigorous conditions. BALL movements are then adjusted and modified to Ball Standard.
- **Illumination:** It is the self-powered micro gas light (3H) that gives the watch excellent legibility even in the dark and adverse conditions. This light source on all BALL watches does not require batteries or re-exposure, and lasts for more than 25 years. For the Engineer Hydrocarbon series, the markings on the bezel are filled with luminous paint, which does need light exposure for illumination.
- **Water-resistant:** The water resistance of BALL watches ranges from 30m to 1000m, depending on the model chosen. The test is conducted by immersing the watch completely in distilled water containing a wetting agent of 1% by weight and at the relevant testing pressure for at least 5 minutes. The watch must show no evidence of leakage in order to pass the test. The water resistance of a timepiece will be impaired if the crown is not properly screwed-in. The patented crown protection system of the Engineer Hydrocarbon ensures the crown returns to its proper position.

Magnetism

The Greeks first observed the phenomenon of magnetism around 600 B.C. The natural magnet Fe_3O_4 , a black ferrous oxide, was discovered in the province of Magnesia in Turkey.

Magnetic fields produced by natural magnets are generally too weak to disturb the accuracy of a mechanical watch. The same is not true, however, of man-made magnetic fields. So where are we at risk to enter magnetic fields in daily life? Near televisions, stereo systems and radios in our living room. In the countless small electric motors used throughout our households. In the automatic doors of cars, refrigerators or cabinets. In the telephone or computer monitor on your office desk. And in locomotives. Even brief contact with these items is enough to magnetize a mechanical watch.

BALL watches are equipped with superb antimagnetic cases constructed with corrosion-resistant ferric stainless steel materials. Furthermore, the inner workings of the watch are protected by a soft iron inner jacket consisting of a back plate, a ring surrounding the movement and the dial. This special alloy, reinforced by the shape of the case, prevents magnetic fields from penetrating as far as the movement and having an adverse effect on its accuracy.

What does the term "antimagnetic" actually mean? The existing standard is defined thusly: If a mechanical watch does not stop when exposed to a magnetic field of 4,800 A/m and subsequently does not deviate by more than 30 seconds per day, it can be called "antimagnetic." BALL watches certainly surpass this standard, particularly the Hydrocarbon series with standard protection of 12,000 A/m.

Swiss Night Reading Technology

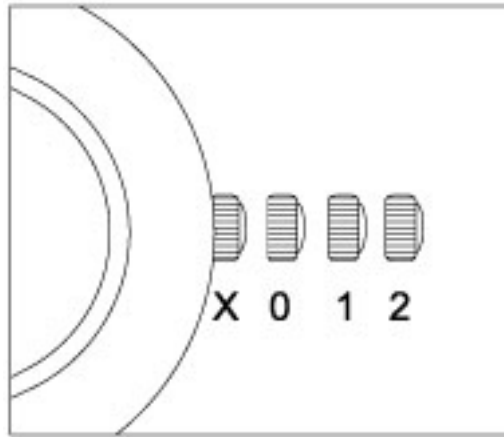
How to read time from watches in dark environments has been a topic of much research in the watch industry. Applying luminous paints to dial and hands - activated first by radium, then by tritium - has been standard practice since the First World War but did not really satisfy the manufacturers. After a quarter-century in research and development work, BALL Watch is proud to present an innovative Swiss laser technology that is considered the best alternative available today. It is the self-powered micro gas light known as (3H) that gives the watch its excellent dark reading capability in any adverse conditions. They provide superior night reading capability that is 100 times brighter than the current tritium-based luminous paints. 3H gas lights do not require batteries, recharging by an outside light source, or the use of a press-button, and glow continuously for over 25 years. You can read off time from the watch quickly and safely in brightest daylight or deepest night without adapting your eyes to the ambient light.

The Swiss technology, 3H, captures tritium safely in a very stable form, as a pure gas sealed in a hollow body of mineral glass. Its exterior walls are coated with a luminescent material, which gives off cold light when activated by electrons emitted by the tritium. Light production is the same as in a TV tube, when the electrons of the cathode ray beam hit the screen. The small, precise, lightweight 3H can now be efficiently produced by means of a CO₂ laser. Their attachment to hands and the dial can be accomplished in way that precludes any risk of breakage.

Operating Instructions

1. Automatic Watch

X = normal position
0 = winding position
1 = date adjustment
2 = setting the time



- **Manual Winding:** If the watch has not been worn for a long period of time, wind the movement before setting the time. Unscrew the crown to position 0, then turn the crown clockwise 20 to 30 times.
- **Time Setting:** To set the time, unscrew the crown and pull out to position 2. Push the crown back into position X when the correct time is reached. When setting the time, please ensure that the date display is also set correctly. It should advance at midnight. If it advances at noon, you will need to turn the hands forward 12 hours.
- **Date Setting:** After months with less than 31 days, you need to set the date to the first day of the next month. To do so, unscrew the crown and pull it out to position 1. Turn the crown clockwise to set date. On watches with Day function, turn the crown counterclockwise to set the Day. To prevent damage to the date-switching mechanism, we advise not to manually reset the date between 9pm and 3am.
- **Always remember to screw down the crown after adjustment, to ensure water resistance and prevent possible damage to the movement.**

Remarks: Automatic watches acquire their energy from an oscillating weight which is activated in response to the movements of your wrist. Depending on the model, the power reserve ranges from 36 to 48 hours. Manual winding is only necessary if the watch has not been worn for a long period of time, or if it has stopped.

Depending on the type of movement, the accuracy of a mechanical movement may vary one to two minutes per week. Accuracy is strongly influenced by the way the watch is worn.

2. Automatic Chronograph

The crown has 3 positions:

Position 1: Running position and manual winding

Position 2: Correction of date and day

Position 3: Time setting with stop-second

2 Push-buttons:

Push-button at 2 o'clock: Start-stop of chronograph

Push-button at 4 o'clock: Return to zero of chronograph



Chronograph function: First ensure that the crown is in position 1 and that the chronograph hands are reset to zero.

- **P1.** Upper start/stop control push-button This push-button enables you to start and stop the chronograph function. Pressing once starts the central second hand. As soon as the second hand has revolved once around the dial the minute hand is set into action. Pressing again stops these hands and a third push sets the chronograph function working again.
- **P2.** Lower return-to-zero push-button After stopping the chronograph by pressing the upper control push-button P1, press the lower push-button P2 to reset the counters to zero. This push-button only functions when the counters are stopped.
- **Running second hand:** Most Ball chronographs feature running seconds in the subdial at 9 o'clock. The **Trainmaster Cannonball** features running seconds at the unusual 3 o'clock position.
- **Chronograph second hand:** Start and stop by pressing the upper push-button P1. Reset to zero by pressing lower push-button P2.
- **Minute counter:** Indicates the minutes elapsed from the start time by moving forward one unit for each complete revolution of the second hand. Reset to zero by pressing push-button P2.
- **Hour counter:** Indicates the hours elapsed from the start time by moving forward one unit for each two complete revolutions of the minute counter. Reset to zero by pressing push-button P2.

3. **Single-button Chronograph**

See instructions for automatic chronograph, with the following changes.

Push-button at 2 o'clock: Start-stop & Reset of chronograph

P1. Upper start/stop/reset control push-button

This push-button enables you to control all chronograph functions. Pressing once starts the central second hand. Pressing again stops the hand and a third push resets the chronograph hand to zero again.

Models using the Ball Single-button Chronograph are the **Trainmaster Pulsemeter Pro** and the limited edition **Trainmaster Doctor's Chronograph**.

4. **Pulsemeter Scale**

The pulsemeter function measures human respiration or pulse rate. The wearer can simply read off the correct respiration / pulse per minute by counting the time needed for the listed number of pulsations.

Description of Operation

The **Trainmaster Pulsemeter** can measure time accumulated to 12 hours, with the minute counter beneath 12 o'clock position and the hour counter at 6 o'clock position.

Please refer to the automatic chronograph operating instruction to reset the chronograph counter to zero position.

At the beginning of a pulsation, the operator starts the chronograph counter by pressing push button P1. It is pressed again when the proper number of pulsations/respirations has been reached. The proper number of pulsations is indicated on the dial by the mark 'Graduated For 30 Pulsations', which means for your Pulsemeter, the proper number is 30 pulsations. If after the 30th pulse, the operator stops the chronograph counter at 30 seconds, reading from the stopped second hand on the pulsemeter scale will result in a pulsation rate of 60 beats per minute.

The **Trainmaster Pulsemeter Pro** and limited edition **Trainmaster Doctor's Chronograph** are configured for measurement of 15 Pulsations only. Combined with the single-button chronograph to allow for quicker measurement of pulse and respiration rates, the 15-pulse scale also minimizes human error due to reaction time to ensure a more accurate reading.

5. Tachymeter Scale

To compute the speed of a car over a certain distance, reset the chronograph second hand to zero position, then press the top chronograph button P1 to start timing. At the end of the fixed distance, press the button again. If the time elapsed is 45 seconds, the second hand should point to the figure 80 on the Tachymeter scale. If the fixed distance is a kilometer then the car is traveling 80 kilometers per hour. If the distance covered is a mile, then the speed is indicated in miles per hour, in this example 80 MPH.

The inner spiral of the **Trainmaster Pulsemeter** is a tachymetric scale capable of measuring elapsed time of up to 3 minutes. If for example, the time elapsed is 1 minute 30 seconds, the second hand will point to the figure 40 on the 2nd ring of the Tachymeter scale. Over a distance of 1 mile, the car is thus traveling at 40MPH.

The limited edition **Fireman Skylab** has a tachymeter scale on the outer bezel for measurement of elapsed times up to 1 minute.

6. Telemeter Scale

The telemetric scale can easily measure the distance between the observer and a situation that is both visually and audibly observable (like lightning and thunder) based on the speed of sound through air (approximately 340 meters per second).

Description of Operation

The **Engineer Master II Telemeter** can measure time accumulated to 30 minutes with the minute counter beneath the 12 o'clock position. The push- buttons P1 and P2 are screw-in type; they have to be unscrewed in order to function.

Please refer to the automatic chronograph operating instructions to reset the chronograph counter to zero position.

Start the chronograph by pressing push-button P1 on an optical signal (a flash of lightning) and then stop the counter by pressing the same button when the audio signal (thunder) is heard. The distance will be indicated on the telemetric scale in kilometers, pointed by the position of the chronograph second hand.

7. GMT



Position 1

- **Date Setting:** Unscrew the crown and pull it out to position 1. Turn the crown backwards to set date. To prevent damage to the date-switching mechanism, we advise not to manually reset the date between 9pm and 3am. Ensure that the date change takes place at midnight and not at noon.
- **Set the time of the second time zone:** Turn the crown forwards until the correct time zone appears on the dial.

On the Engineer Master II GMT II, the 2nd time zone will move forward in one-hour increments in the red window at 9 o'clock. On all other Ball GMTs, the 2nd time zone is displayed as a red GMT hand.

Position 2

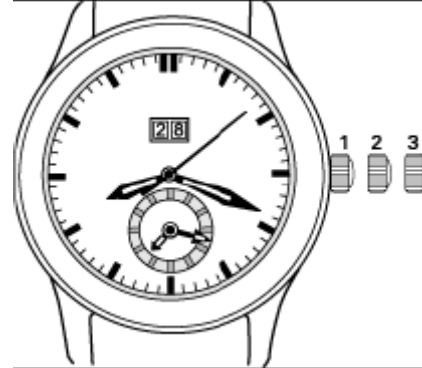
- **Set the local time:** Turn the crown forwards or backwards.

8. Dual Time

For the **Trainmaster Big Date Dual Time** model, the big date aperture is shown under the 12 o'clock position, while the second time zone indicator is located at 6 o'clock.

Position 1:

- **Manual Winding:** If the watch has not been worn for a long period of time, wind the movement before setting the time. Unscrew the crown to position 0, then turn the crown clockwise 20 to 30 times.



Position 2:

- **Date setting:** Turn the crown backwards until the correct date is displayed in the date aperture, then push the crown back to position 1. It is necessary to correct the date after every month with less than 31 days.

Position 3:

- **Time setting:** At position 3, the second hand is stopped. To set the time for the *Second Time Zone*, turn the crown forwards until the correct time is shown; both hour and minute hands of local and second time zone will move when the crown is turned forward. Then, to set the *Local Time*, turn the crown backwards. The second time zone hour hand will be locked at the set time, only the minute hand will move to synchronize the time setting of the local time zone. Push the crown back to position 1 after setting.

9. UTC Indication

The **Trainmaster Cleveland Express Dual Time** and **Fireman Night Train** share a new UTC (Universal Time Coordinated) indicator at 11 o'clock. The UTC indication is tied to the main time zone and thus shows 24-hour military time.

The white or red-colored triangle below the UTC indicator is the Ball Date Warning System.

10. Date Warning System

Beneath the UTC indicator of the **Trainmaster Cleveland Express Dual Time** and **Fireman Night Train**, the BALL Date Warning System helps the wearer to avoid damage to the movement.

Between the hours of 9pm and 3am, the date function of an automatic wristwatch is engaged and manually setting the date at these hours can damage the mechanism. The triangular window of the Ball Date Warning System will turn red from 9 to 3 to visually warn the wearer.

11. Triple Date

The Triple Date function may also be known as the Month, Day, Date feature. The **Trainmaster Racer** and limited edition **Trainmaster Doctor's Chronograph** boast a new Ball in-house development, the linear Triple Date function. This feature shows the Month, Day and Date in a row at the 3 o'clock position for ease of use.

To set the functions, unscrew the crown and pull it out to position 1. Turn the crown clockwise to set Date. To set the Day function, turn the crown counterclockwise.

The Month function is set in the same manner as the Date. By rotating the Date through all 31 days, the Month wheel will move forward to the next Month.

To prevent damage to the date-switching mechanism, we advise not to manually reset the Triple Date between 9pm and 3am.

12. Chronometer Certificate

A Chronometer is an extremely accurate watch. It takes its name from the Greek words *chronos* + *metron* meaning "to measure time". A BALL chronometer is a highly accurate, mechanical watch whose precision has been tested and verified by The Swiss Official Chronometer Control (*Contrôle Officiel Suisse des Chronomètres*, or COSC, in French).

Before issuing the certificate, COSC conducts elaborate precision tests on each BALL movement using cameras and computers and analyzes the data. COSC performs seven different tests. Failure to meet the minimum standard in any one of the tests means that a movement is rejected. Here is a brief summary of the testing procedures:

Test 1:	Mean Daily Rate: After 10 days of tests, the mean daily rate of the movement must be within the range of -4 to +6 seconds per day. COSC determines the mean daily rate by subtracting the time indicated by the movement 24 hours earlier from the time indicated on the day of observation.
Test 2:	Mean Variation in Rates: COSC observes the movement rate in five different positions (two horizontal, three vertical) each day over 10 days for a total of 50 rates. The mean variation in rates can be no more than 2 seconds.
Test 3:	Greatest Variation in Rates: The greatest of the five variations in rates in the five positions can be no more than 5 seconds per day.
Test 4:	Horizontal and Vertical Difference: COSC subtracts the average of the rates in the vertical position (on the first and second days) from the average of the rates in the horizontal position (on the ninth and tenth days). The difference must be no more than -6 to +8 seconds.
Test 5:	Greatest Deviation in Rates: The difference between the greatest daily rate and the mean daily test rate can be no more than 10 seconds per day.
Test 6:	Rate Variation Due to Temperature: COSC tests the movement's rate at 8 degrees Celsius (46 degrees Fahrenheit) and at 38 degrees C (100 degrees F). It subtracts the cold temperature rate from the hot temperature rate and divides by 30. The variation must be no more than 0.6 seconds per day.
Test 7:	Resumption of the rate: This is obtained by subtracting the average mean daily rate of the first two days of testing from the mean daily rate of the last test day. The resumption of rate can be no more than 5 seconds.

13. Power Reserve

The counter at 6 o'clock position is the power reserve indicator. It shows the remaining power reserve in the watch in hours. If the watch is not worn, or during periods of low activity, the hand of power reserve indicator will wind down.

On the **Trainmaster Power Glow**, the linear power reserve indicator will move slowly to the left, disappearing completely when the watch stops. During manual winding or when the watch is worn, the reserve indicator will move toward the right.

On the limited edition **Trainmaster** or **Conductor GMT Power Reserve**, the power reserve hand will move slowly anti-clockwise. During manual winding or when the watch is worn, the hand of the indicator will move clockwise.

The natural movements of your arms wind the watch up automatically and the energy will be stored up as power reserve. Manual winding is only necessary if you stop wearing your watch for several days or it is stopped.

Remarks: Do not overwind the watch. Manual winding should be stopped when the red hand of the power reserve indicator reaches the end of the scale. Continued winding could damage the movement.

14. Moon Phase

The **Engineer Master II Moon Phase** is the first moon phase watch illuminated with the stunning 3H micro gas lights. The moon phase wheel is activated by a 59-tooth gear, which shows the changes of the Moon's phases as it goes through two of its 29.5-day cycles. The moon phase disc is easily set via Position 1 of the crown.

	2007	DATE	2008	DATE	2009	DATE	2010	DATE
Jan	☾ 3 ☾ 19		☾ 8 ☾ 22		☾ 11 ☾ 26		☾ 15 ☾ 30	
Feb	☾ 2 ☾ 17		☾ 7 ☾ 21		☾ 9 ☾ 25		☾ 14 ☾ 28	
Mar	☾ 3 ☾ 19		☾ 7 ☾ 21		☾ 11 ☾ 26		☾ 15 ☾ 30	
Apr	☾ 2 ☾ 17		☾ 6 ☾ 20		☾ 9 ☾ 25		☾ 14 ☾ 28	
May	☾ 2 ☾ 16		☾ 5 ☾ 20		☾ 9 ☾ 24		☾ 14 ☾ 27	
Jun	☾ 1, 30 ☾ 15		☾ 3 ☾ 18		☾ 7 ☾ 22		☾ 12 ☾ 26	
Jul	☾ 14 ☾ 30		☾ 3 ☾ 18		☾ 7 ☾ 22		☾ 11 ☾ 26	
Aug	☾ 12 ☾ 28		☾ 1, 30 ☾ 16		☾ 6 ☾ 20		☾ 10 ☾ 24	
Sep	☾ 11 ☾ 26		☾ 15 ☾ 29		☾ 4 ☾ 18		☾ 8 ☾ 23	
Oct	☾ 11 ☾ 26		☾ 14 ☾ 28		☾ 4 ☾ 18		☾ 7 ☾ 23	
Nov	☾ 9 ☾ 24		☾ 13 ☾ 27		☾ 2 ☾ 16		☾ 6 ☾ 21	
Dec	☾ 9 ☾ 24		☾ 12 ☾ 27		☾ 2, 31 ☾ 16		☾ 5 ☾ 21	

☾ New moon ● Full moon

Kindly note that the Ball Moon Phase is only calibrated for the Northern Hemisphere.

15. TMT

The Ball TMT watches can measure temperature from negative 35°C to positive 40°C with the indicator at 6 o'clock. The temperature recorded by the TMT is precise and instantaneous but it records the temperature inside the watchcase, which is inevitably affected by the temperature of the wearer's wrist. To reveal the actual environmental temperature, the watch should be taken off for about 10 minutes until the inside of the watch reaches the ambient temperature. When worn over a wetsuit or parka, the TMT should immediately display ambient temperature without any distortion due to body heat.

The temperature scale in degrees Celsius [°C] can be easily converted into Fahrenheit scale following this simple formula: $^{\circ}\text{F} = ^{\circ}\text{C} \times 9/5 + 32$. The temperature conversion scale can be found on the caseback of the TMT models.

16. Rotating Bezel

The **Engineer Hydrocarbon** series features a unidirectional rotating outer bezel incorporated with LumiNova for night reading. The bezel is painted with 60 minutes elapsed time notation. The 60 minutes bezel can be used for timing events by setting the zero dot at the current minute.

The bidirectional rotating outer bezel of the **Engineer Hydrocarbon GMT** models is painted with 24-hour GMT notation. To use the GMT bezel, simply twist the bezel until the local hour matches the red GMT hand.

The **Engineer Master II Diver** models feature another Ball breakthrough, the first inner divers' bezel incorporated with 3H micro gas lights. After unscrewing the upper crown, the inner bezel rotates bidirectionally to measure duration. To ensure optimal water resistance, the crown must then be screwed down before diving.

17. Patented Crown Protection System

A special crown protection system was designed for the **Engineer Hydrocarbon** series to guarantee its exceptional water resistance. A protective plate is placed around the crown, which ensures the crown must be screwed back to its original secured position after time adjustment.

To unlock the crown protector, depress the button and rotate the bar counterclockwise. The crown can then be unscrewed for adjustment or winding.

After screwing down the crown, move the crown protector into place by pushing down firmly until it locks.

Caring for your BALL watch

Like a car engine, we recommend that you have your mechanical BALL Watch checked, cleaned and lubricated by us or authorized BALL service center every three to five years. This regular maintenance will prevent movement wear due to the drying of lubricating oils.

Your BALL Watch requires a certain amount of care. A few basic recommendations will help you to ensure its reliability and keep it looking new.

- **Magnetic Fields:** The Ball Engineer, Engineer Master & Engineer Hydrocarbon collections are all equipped with soft iron inner antimagnetic case for improved resistance. Nevertheless, please avoid placing your watch on refrigerators or loudspeakers as they generate powerful magnetic fields.
- **Cleaning:** Be sure to rinse your watch regularly with fresh water, especially after it has been in salt water. This will help preserve its appearance and running condition.
- **Shocks:** Although your BALL Watch has been built to withstand shock according to the highest standard in the industry, extreme impact against this precision instrument should still be avoided. A strong impact on the winding crown or the crystal can impair the water resistance.
- **Strap:** Our straps are made of finest calf, crocodile or alligator leather and are protected against humidity. To prolong the life of your leather strap, please avoid contact with water and dampness to prevent discoloration and deformation. Should the strap be immersed in salt water, we suggest that you rinse it with fresh water to prevent further damage. Please also avoid contact with greasy substances and cosmetic products, as leather is permeable.

Optimum Safety

Man has always been exposed to natural radiation arising from the earth as well as from outer space. The radiation we receive from outer space is called cosmic radiation or cosmic rays. On average, our radiation exposure due to all natural sources amounts to about 2.4 mSv a year - though this figure can vary widely, depending on the geographical location. Even in homes and buildings, there are also radioactive elements in the air.

The wearer of an intact BALL Watch is never exposed to any radiation. Even the hypothetical and unlikely accident entailing the simultaneous release of all tritium contained in 3H gas tubes would present a very minor internal irradiation. In that case, the wearer is exposed to a dose 30,000 times lower than the one due to average background radiation as stated above. It is evident that it does not make sense to speak of a risk at all for such minor exposure.

Disposal and After-Sales Service

For environmental protection, we recommend you to send your BALL watch to your local service center or our Swiss factory for disposal. If there is a defect with one of the lights or a part containing a light source, the watch should be returned for repair either to our factory or to the designated service center.

BALL International Warranty

Built to exceed traditional Swiss watchmaking standards, your BALL watch is warranted by Ball Watch Company, Inc for a period of twenty-four months from the date of purchase under the terms and conditions of this warranty. You are cordially invited to register at our web site www.ballwatch.com during the initial 24-month period after purchase for free extended twelve months warranty to effectively cover your BALL watch by a total of thirty-six months warranty period. The international warranty covers material and manufacturing defects. The warranty will only be valid when the warranty card is dated, fully and correctly completed and stamped by a BALL Authorized Dealer.

During the warranty period and by presenting the valid warranty card, you are entitled to have any manufacturing defect repaired free of charge. In the event that repairs are unable to restore the normal conditions, Ball Watch Company, Inc guarantees its replacement by a BALL watch of identical or similar characteristics. The warranty for the replacement watch ends twenty-four months after the date of replacement of the replaced watch.

The international warranty does not extend to the bracelet or glass nor does it cover any damage done to the watch and the movement by humidity entering the watch because of a handling error. The normal wear and tear and aging of the watch will not be covered under this warranty. We reserve the right to relinquish all responsibilities under this guarantee for repair if the watch is tampered with or damaged by unauthorized persons other than BALL Authorized Service Centers.

International Service Centers

Ball Watch Service Centers are authorized to perform maintenance and repairs on Ball watches. To find the nearest Service Center, kindly visit www.ballwatch.com.

If you have any further inquiries on your Ball Watch, please use our [Enquiry Form](#) or send e-mail to info@ballwatch.com.