



BASELWORLD 2016 | OYSTER PERPETUAL

CALIBRE 3235

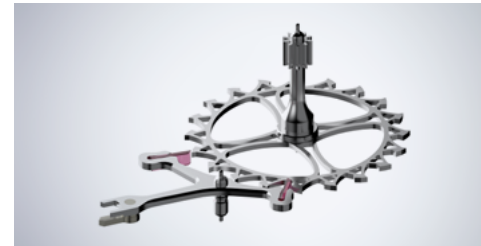


ROLEX IS INTRODUCING

C A L I B R E 3 2 3 5

A new-generation mechanical movement with 14 patents that embodies the brand's new standards of performance with its precision, power reserve, reliability, resistance to shocks and magnetism, as well as the ease and convenience of its adjustment.

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CALIBRE 3235

NEW - GENERATION ROLEX MOVEMENTS

NEW STANDARD OF
CHRONOMETRIC PERFORMANCE

- CALIBRE 3235'S CRITERIA FOR PRECISION IN EVERYDAY WEAR ARE TWICE AS EXACTING AS THOSE FOR AN OFFICIALLY CERTIFIED CHRONOMETER
- THE POWER RESERVE EXTENDS TO THREE DAYS (APPROXIMATELY 70 HOURS), WHICH MEANS THAT THE WATCH WILL EASILY CONTINUE TO RUN OVER A WEEKEND WITHOUT NEEDING TO BE REWOUND
- THE MOVEMENT IS IMPERVIOUS TO MAGNETIC INTERFERENCE BEYOND THE VALUES ENCOUNTERED IN EVERYDAY LIFE
- ITS RESISTANCE TO SHOCKS AND ITS RELIABILITY HAVE BEEN OPTIMIZED THROUGH CHANGES TO ITS OVERALL ARCHITECTURE AS WELL AS ITS INDIVIDUAL COMPONENTS
- CALIBRE 3235 OFFERS ENHANCED CONVENIENCE - FASTER AND MORE EFFICIENT SELF-WINDING, DISTINCT EASY-TO-SENSE POSITIONS ON THE WINDING STEM, UNRESTRICTED CALENDAR CORRECTION AT ANY TIME AND VERY PRECISE TIME SETTING



CALIBRE 3235

*A compelling example of
avant-garde Rolex technology.*

FOURTEEN PATENTS

A compelling example of avant-garde watchmaking technology, this self-winding mechanical movement is entirely developed and manufactured by Rolex. It is backed by 14 patents and a number of innovative technological solutions relating not only to component design but also to processes involving new technologies that push back the limits of existing production methods. More than 90 per cent of the movement parts have been redesigned and optimized, from those that produce and store energy (self-winding module and mainspring) to the regulating organ responsible for precision (oscillator), the gear train and the escapement. The escapement, which transmits the impulses required to maintain the oscillator's steady beat, is enhanced by a major innovation patented by Rolex under the name Chronergy.



KEY FIGURES

Precision

2 × that required of an
official chronometer

Autonomy

Approximately 70 hours
(+50%)

**Chronergy
escapement efficiency**
+15%

Patents

14

New components

> 90%



CALIBRE 3235

*The Chronergy escapement is
15 per cent more efficient than the
Swiss watchmaking standard.*

NEW CHRONERGY ESCAPEMENT

Rolex engineers devised and patented a new escapement that optimizes the efficiency of the Swiss lever escapement, the standard technical solution in Swiss watchmaking, but which has seen only limited evolution over the last 50 years. While favoured by watchmakers for its great reliability, the Swiss lever escapement has always suffered from low efficiency, relaying to the oscillator barely more than a third of the energy it receives from the mainspring via the gear train.

The result of extensive research, the geometry of the new Rolex Chronergy escapement improves the efficiency of this key component by 15 per cent. Almost half of calibre 3235's increased power reserve can be ascribed to the escapement itself. Made of nickel-phosphorus, the Chronergy escapement is, furthermore, insensitive to magnetic interference.



SUPERLATIVE CHRONOMETER CERTIFICATION

Like all Rolex watches, the models equipped with calibre 3235 benefit from the Superlative Chronometer certification redefined by Rolex in 2015. This exclusive designation testifies that they have successfully undergone a series of tests conducted in the brand's own laboratories according to its own criteria, which are more stringent than watchmaking norms and standards. These tests are carried out on each fully assembled watch, after casing the movement, in order to guarantee superlative performance on the wrist.

The precision of every movement – officially certified as a chronometer by COSC (Swiss Official Chronometer Testing Institute) – is tested a second time by Rolex after being cased, to ensure that it meets criteria for precision that are far more exacting than those for an official chronometer. The tolerance for the average rate of a Rolex Superlative Chronometer after casing is of the order of $-2/+2$ seconds per day. Its precision is tested by Rolex using an exclusive

methodology that simulates the conditions in which a watch is actually worn and is much more representative of real-life experience. The certification testing is carried out using state-of-the-art equipment specially developed by Rolex. The entirely automated series of tests also checks the waterproofness, the self-winding capacity and the power reserve of every Rolex watch. These tests systematically complement the qualification testing upstream during development and production that ensures the watches' reliability, robustness, and resistance to magnetism and shocks.

The unique way in which Rolex watches are designed, manufactured and tested, together with the exclusive innovations from which they benefit, push back the limits of performance for mechanical watches and make Rolex the benchmark for watchmaking excellence. The Superlative Chronometer status is symbolized by the green seal that comes with every Rolex watch and is coupled with an international five-year guarantee.

CALIBRE 3235

*Through high-precision machining,
the thickness of the walls of the barrel
has been reduced by 50 per cent
for a more than 10-hour gain
in autonomy.*

AN INDUSTRIAL CHALLENGE

The exceptional performance of calibre 3235 is the result of years of research and development on horological components by Rolex engineers. It is also made possible by the *Manufacture's* in-house expertise, covering all the processes involved in movement production. This know-how has pushed back the boundaries of production methods in terms of precision and tolerances, leading to enhanced component quality and performance. For example, through high-precision machining, the thickness of the walls of the barrel has been reduced by 50 per cent, resulting in a more than 10-hour gain in autonomy. The synthetic ruby pallet stones on the new Chronergy escapement's pallet fork measure a mere 125 microns, half the size of the previous generation's. Precision manufacturing ensures a threefold enhancement in the poise of the oscillator balance wheel. High-technology manufacturing processes are also used, such as LiGA (micro-manufacturing by electroforming) to produce the paramagnetic pallet fork and escape wheel of the new Chronergy escapement.

AESTHETIC HERITAGE

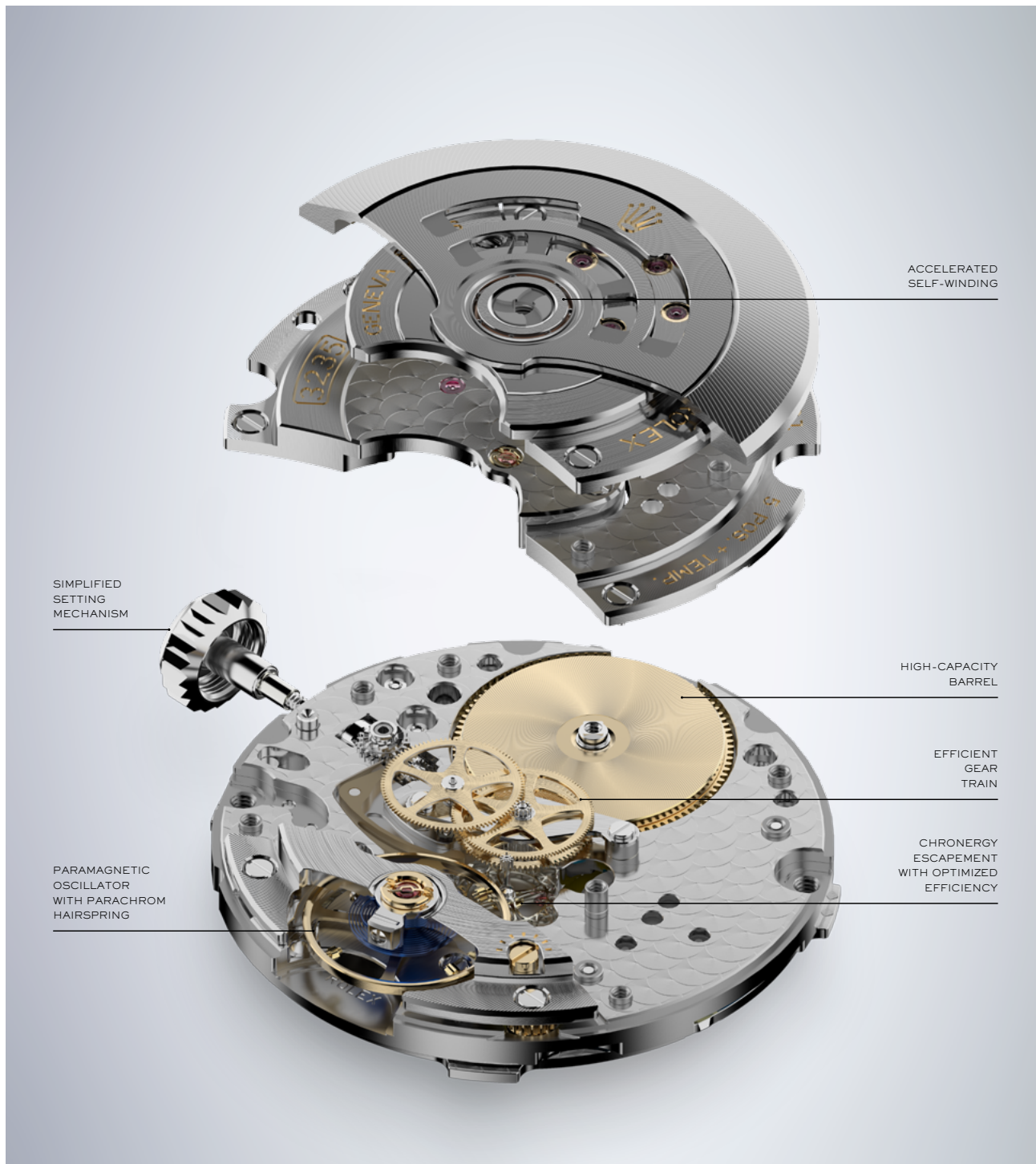
Calibre 3235 benefits from new, updated aesthetics, both in the shape and arrangement of the bridges as well as in their meticulous, traditional decoration. The aesthetics have evolved while preserving the characteristic features of Rolex Perpetual movements, such as the red reversing wheels of the self-winding module, the golden yellow sinks, and the traversing balance bridge. Calibre 3235 consequently remains firmly in the aesthetic lineage of Oyster watch movements.

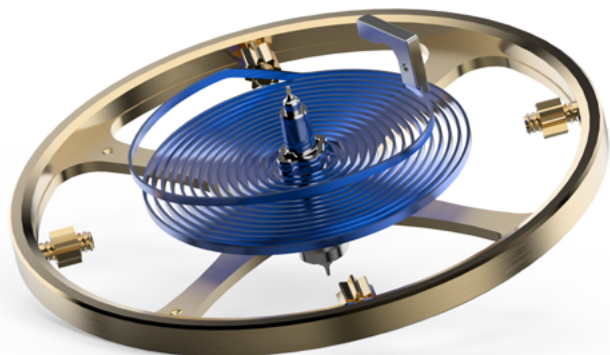


KEY COMPONENTS OF CALIBRE 3235

INNOVATION

THE ENTIRE MECHANISM OF THE 3235 MOVEMENT HAS BEEN OPTIMIZED, FROM THE OSCILLATOR - THE GUARDIAN OF PRECISION - TO THE SELF-WINDING MODULE THAT SUPPLIES ITS ENERGY.





PARAMAGNETIC OSCILLATOR WITH PARACHROM HAIRSPRING

PRECISION

INNOVATIONS

- ROLEX OVERCOIL TO COMPENSATE FOR THE INFLUENCE OF GRAVITY
- NEW HIGH-PRECISION-MACHINED BALANCE WHEEL FOR IMPROVED POISE
- NEW PATENTED BALANCE STAFF FOR ENHANCED RESISTANCE TO MAGNETISM

UNDERSTANDING THE OSCILLATOR

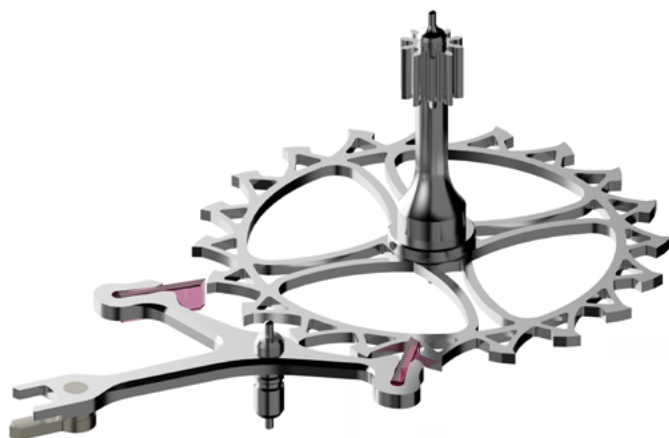
The oscillator is the heart of a mechanical movement. Comprising a hairspring and a balance wheel, this regulating organ determines the precision of the watch by the regularity of its oscillations. The oscillator in a Rolex watch beats eight times per second, or more than 250 million times per year. For an oscillator to maintain its regularity, it must be able to resist external factors that can disrupt its performance, such as temperature variations, shocks, magnetic fields and the influence of gravity in different positions.

THE OSCILLATOR OF CALIBRE 3235

The oscillator of calibre 3235 is fitted with a blue Parachrom hairspring, patented and manufactured by Rolex in an exclusive alloy of niobium, zirconium and oxygen. Insensitive to magnetic fields, the Parachrom hairspring offers great stability in the face of temperature variations and remains up to 10 times more precise than a traditional hairspring in case of shocks. It is equipped with an optimized Rolex overcoil ensuring excellent isochronism of the oscillations in any position.

The large balance wheel with variable inertia is fitted with four gold Microstella nuts enabling extremely precise regulating. Its redesigned geometry and high-precision machining have enhanced the poise threefold.

The oscillator is attached to a new balance staff with exclusive geometry offering increased resistance to magnetic interference. It is fitted on high-performance Paraflex shock absorbers developed and patented by Rolex for increased resistance to shocks. The oscillator is held firmly in place by a traversing bridge, further reinforcing shock resistance. The balance bridge features an optimized height-adjustment system and new integrated protection for the balance wheel.



CHRONERGY ESCAPEMENT WITH OPTIMIZED EFFICIENCY

AUTONOMY

INNOVATIONS

- NEW GEOMETRY FOR 15% IMPROVED ENERGY EFFICIENCY
- PARAMAGNETIC COMPONENTS IN NICKEL-PHOSPHORUS
- HIGH-PRECISION MANUFACTURING VIA LIGA (MICROMANUFACTURING THROUGH ELECTROFORMING)

UNDERSTANDING THE ESCAPEMENT

The escapement plays a major role in how the movement functions. Its alternating beats produce the familiar “tick-tock” of mechanical watches. Positioned between the gear train and the oscillator, it is the “key to time”.

The escape wheel receives raw energy from the mainspring through the gears and transmits it to the oscillator via impulses from the pallet fork. The oscillator's regular back-and-forth motion determines the division of time, which the escapement in turn transmits to the hands via the gear train.

This crucial system must function reliably so as not to hinder the movement rate. Its alternating movement and the friction generated between parts occasion considerable energy loss. For this reason, the escapement is one of the parts with the greatest potential for improvement in a mechanical watch.

THE ESCAPEMENT OF CALIBRE 3235

The Chronergy escapement of calibre 3235, developed and patented by Rolex, is an optimized version of the Swiss lever escapement, the standard escapement used in mechanical watches. The Chronergy escapement enhances the Swiss lever escapement's energy efficiency while preserving the reliability for which it is renowned.

In order to develop greater efficiency, Rolex engineers analysed the functioning of the Swiss lever escapement using cutting-edge observation methods and numerical modelling. The solution they arrived at was to reverse the length ratios between the escape wheel teeth and the pallet stones (see box). Furthermore, the escapement system is no longer in alignment but slightly offset, affording greater distance between the pivots of the pallet fork and the balance wheel, thus multiplying the lever effect.

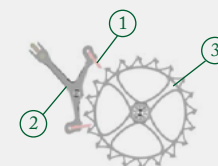
The pallet fork and escape wheel are made in nickel-phosphorus, to be insensitive to magnetic interference. The pallet stones are synthetic rubies, as in a conventional escapement. The escape wheel has a cut-out design to make it lighter and reduce its inertia.

Together, these modifications to the geometry have increased the efficiency of the escapement by 15 per cent, contributing to almost half of the gain in calibre 3235's power reserve.

The new Chronergy escapement patented by Rolex optimizes the efficiency of the traditional Swiss lever escapement.



Swiss lever escapement



New Chronergy escapement

① The thickness of the pallet stones has been reduced by half while the contact surfaces of the escape wheel teeth have been doubled.

② The escapement system is no longer in alignment but slightly offset, thus multiplying the lever effect.

③ The escape wheel has a cut-out design to make it lighter and reduce its inertia.

EFFICIENT GEAR TRAIN

RELIABILITY

INNOVATIONS

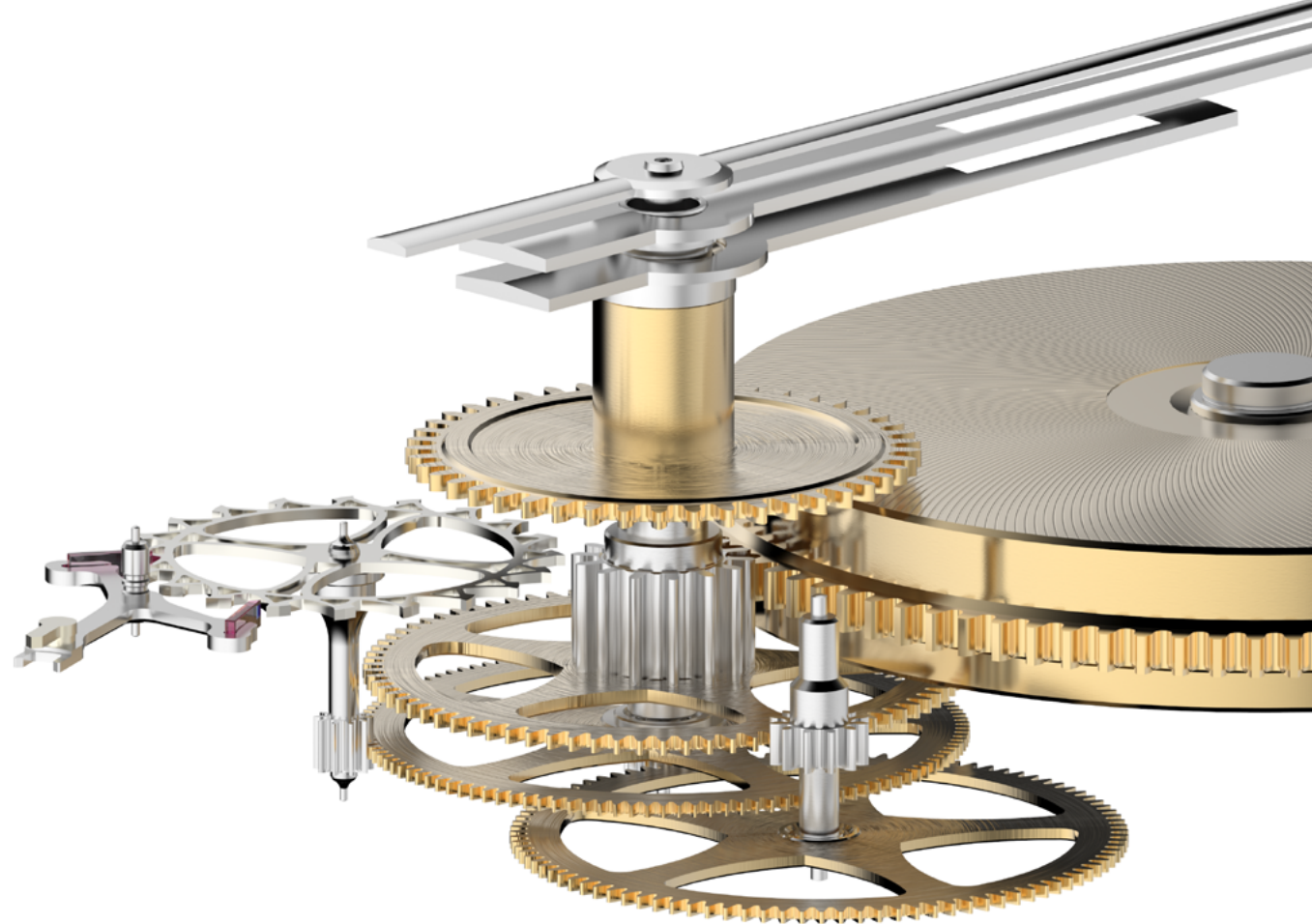
- OPTIMIZED GEAR TRAIN
- HIGH-PERFORMANCE LUBRICANTS SYNTHESIZED BY ROLEX

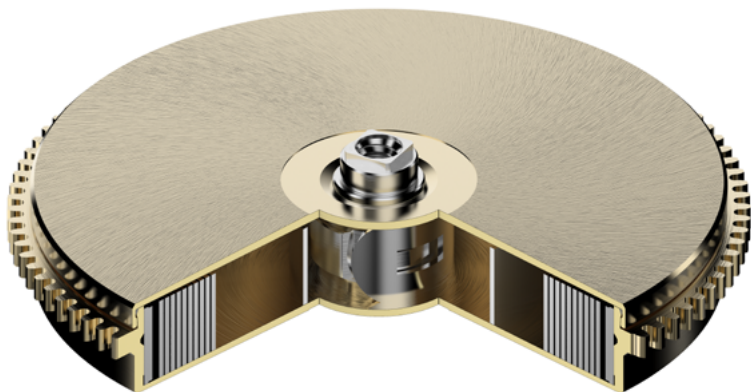
UNDERSTANDING THE GEAR TRAIN

The gear train is the series of cogwheels that transmits energy from the barrel to the escapement. Through its different wheel sizes and gear ratios, it transforms the beats of the oscillator into the seconds, minutes and hours displayed by the hands. Correct lubrication of this mechanical assembly, and high-quality lubricants are essential to ensure the proper functioning of the movement and its continued reliability over many years.

THE GEAR TRAIN OF CALIBRE 3235

The efficiency of the gear train has been optimized. Rolex has also developed, and synthesizes in-house, exclusive new high-performance lubricants with a considerably longer useful life and greater stability over time. Rolex is the only independent watch manufacturer to develop and synthesize its own lubricants.





HIGH-CAPACITY BARREL

AUTONOMY

INNOVATIONS

- A THIN-WALLED BARREL ACCOMMODATES A LARGER MAINSPRING FOR INCREASED AUTONOMY

UNDERSTANDING THE BARREL

The barrel supplies energy to the movement. It contains the mainspring, whose powerful coils store the energy produced when the movement is wound, either manually or through a self-winding system. As the mainspring uncoils, it releases a continuous flow of energy, which is controlled by the alternating beats of the escapement. Energy from the mainspring is transmitted to the escapement and the oscillator through the gear train. The movement's autonomy or power reserve between windings depends, therefore, on how much energy the mainspring can store and on the energy efficiency of the gear train and the escapement-oscillator assembly. If the power reserve is to be increased, it means either improving the escapement's efficiency or enlarging the mainspring – or both, as Rolex has done with calibre 3235.

THE BARREL OF CALIBRE 3235

Space is at a premium inside a watch movement. To increase the capacity of the mainspring in calibre 3235 without increasing the size of the barrel housing it, Rolex decided to optimize the space inside the barrel by halving the thickness of its walls. This solution represented a considerable challenge both for machining and for the production process, pushing back the boundaries of current production methods. The resulting gain in space allowed for the accommodation of a mainspring with greater capacity, thereby increasing the movement's autonomy by more than 10 hours.

ACCELERATED SELF-WINDING

AUTONOMY

INNOVATIONS

- NEW CUT-OUT MONOBLOC OSCILLATING WEIGHT ON A BALL BEARING
- NEW REVERSING WHEELS FOR FASTER, MORE EFFICIENT BIDIRECTIONAL WINDING

UNDERSTANDING SELF-WINDING

Energy stored by the mainspring must be regularly renewed, otherwise the movement would stop once it had used up its power reserve. Traditionally, mainsprings were hand wound, via the winding crown. In 1931, Rolex played a pioneering role in developing a self-winding system for a wristwatch, which it patented at the time and named the Perpetual rotor. This mechanism, with its half-moon-shaped oscillating weight, continually winds the mainspring using nothing more than natural wrist movements. As a result, it supplies the movement with a steady and “perpetual” source of energy for as long as the watch is being worn.

THE SELF-WINDING MODULE OF CALIBRE 3235

Calibre 3235 is equipped with a self-winding module with a new-generation Perpetual rotor, for more rapid winding of the new high-capacity mainspring. The reversing wheel system enables winding in both directions of the weight rotation. This system has been optimized to reinforce its efficiency whatever the activity of the wearer. The now monobloc oscillating weight has been cut out to absorb shocks. It is fitted on a ball bearing and is held at its centre by a single screw, thereby facilitating assembly.



SIMPLIFIED SETTING MECHANISM

ERGONOMICS

INNOVATIONS

- CLEARLY DEFINED, EASILY LOCATED SETTING POSITIONS
- FASTER ADJUSTMENT
- CORRECTION OF THE CALENDAR AT ANY TIME
- VERY PRECISE TIME SETTING

UNDERSTANDING THE SETTING MECHANISM

The winding crown is the main interface between the watch movement and the wearer, who uses it to manually wind the movement or to set the time and functions. A sophisticated mechanism inside the movement activates the settings that correspond to the various positions of the winding stem.

THE SETTING MECHANISM OF CALIBRE 3235

The setting interface of calibre 3235 is more ergonomic and user-friendly. The stops marking the positions of the winding crown are distinct and easily sensed. The setting system has been optimized, making for faster day and date adjustment. Time setting is very precise with no play. The calendar can be corrected at any time, without restriction, thanks to retractable fingers inside the mechanism.

