



ROLEX

CALIBRE 3255

BASELWORLD 2015



— *Calibre 3255* —

THE
NEW-GENERATION
ROLEX MOVEMENT



Calibre 3255

NEW STANDARDS OF PERFORMANCE

AT BASELWORLD 2015, ROLEX IS INTRODUCING CALIBRE 3255, A NEW-GENERATION MECHANICAL MOVEMENT THAT SETS NEW STANDARDS OF PERFORMANCE FOR THE CORE CHARACTERISTICS OF A WATCH MOVEMENT: PRECISION, POWER RESERVE, RELIABILITY, RESISTANCE TO SHOCKS AND MAGNETISM, AS WELL AS THE EASE AND CONVENIENCE OF ITS ADJUSTMENT.



CALIBRE 3255 KEY FIGURES

PRECISION

Twice as great as that of an official chronometer

AUTONOMY

Approximately 70 hours (+50%)

CHRONERGY ESCAPEMENT EFFICIENCY

+15%

PATENTS

14

NEW COMPONENTS

>90%

Calibre 3255's criteria for precision in everyday wear are twice as exacting as those for an officially certified chronometer. Its superlative accuracy is tested by Rolex after the movement has been cased, using high-technology equipment and an exclusive methodology that simulates the conditions in which a watch is actually worn.

Its power reserve extends to three days (approximately 70 hours), representing an increase of 24 hours (or 50 per cent) compared to that of the previous generation. This means that the watch will easily continue to run over a weekend without needing to be rewound.

Calibre 3255 is impervious to magnetic interferences beyond the values encountered in daily life.

The movement's resistance to shocks and its reliability have been optimized at the level of its overall architecture as well as its individual components, and through the use of high-performance lubricants developed and synthesized in-house.

Calibre 3255 offers enhanced convenience of adjustment and winding – 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.

FOURTEEN PATENTS

A compelling example of avant-garde watch-making 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 current 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.



NEW CHRONERGY ESCAPEMENT

Rolex engineers devised and patented a new escapement that optimizes the efficiency of the Swiss lever escapement, the standard in Swiss watchmaking, but which has seen only limited technical 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 the increased power reserve of calibre 3255 can be ascribed to the escapement itself. Made of nickel-phosphorus, the Chronergy escapement is, furthermore, insensitive to magnetic interferences.

EXCLUSIVE ROLEX SUPERLATIVE CHRONOMETER TESTS

With this new-generation movement, Rolex

sets a new level of chronometric precision with criteria surpassing those of COSC (the Swiss Official Chronometer Testing Institute). Rolex has developed a new methodology and high-technology equipment to test the precision of its Superlative Chronometers with tolerances that are twice as exacting as those for official certification, and under conditions that simulate the wearer's real-life experience. These exclusive chronometer tests complement the official COSC certification, to which all Rolex movements continue to be submitted systematically, and are carried out not on the movements alone, but on the assembled watches after the movements have been cased.

A specific test protocol was designed by Rolex following large-scale statistical studies to determine the actual conditions of daily wear. As a result, the Rolex chronometers equipped with movements tested according to this new methodology demonstrate superlative precision on the wrist.



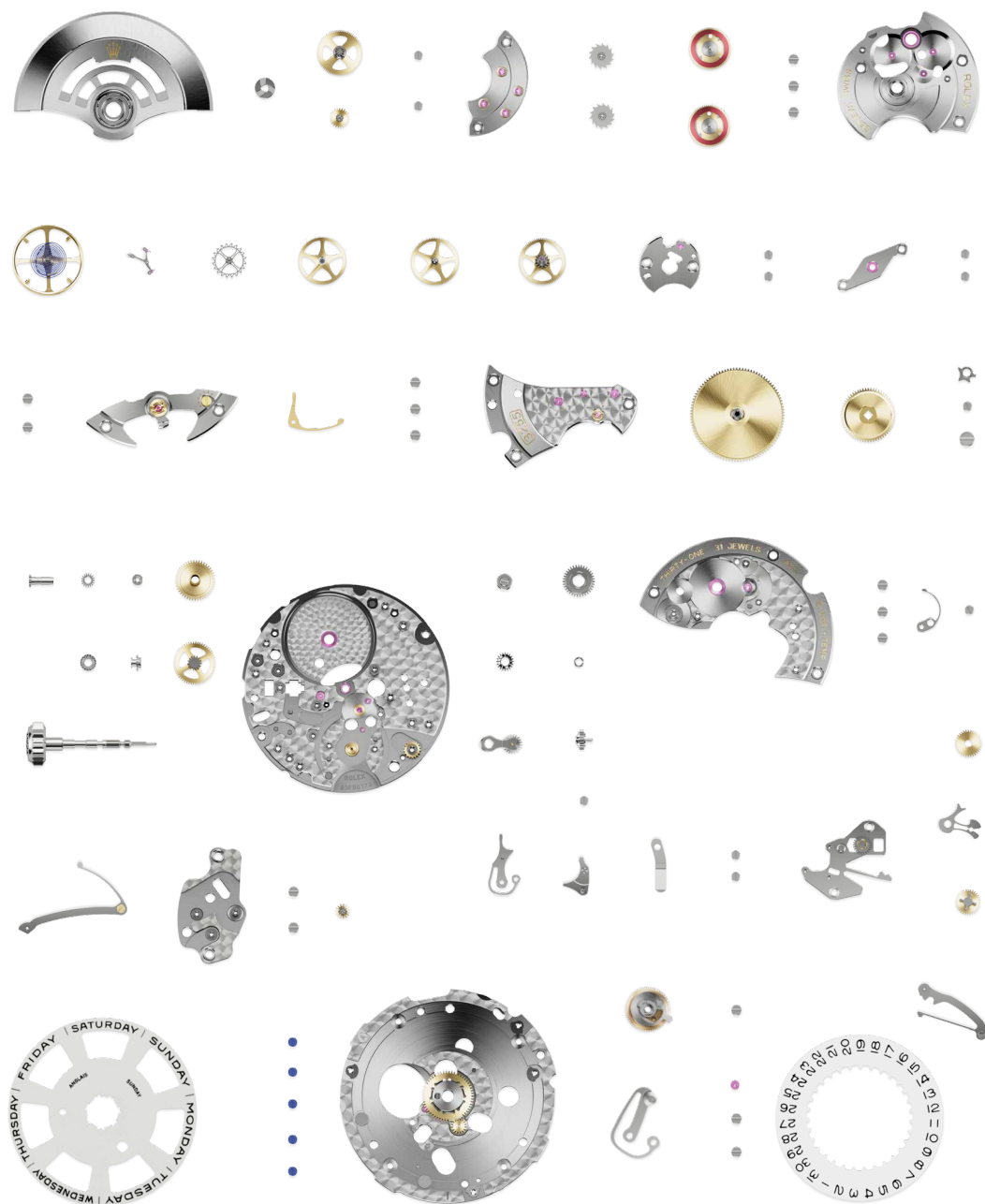
AN INDUSTRIAL CHALLENGE

The exceptional performance of calibre 3255 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 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, 50 per cent less than those of the previous generation. A threefold enhancement in the poise of the oscillator balance wheel was

made possible thanks to precision manufacturing. High-technology processes are also used, such as LiGA (micromanufacturing by electroforming) to produce the paramagnetic pallet fork and escape wheel of the new Chronergy escapement.

AESTHETIC HERITAGE

Calibre 3255 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 3255 consequently remains firmly in the aesthetic lineage of Oyster watch movements.



THE CONSTITUENT PARTS OF CALIBRE 3255 – ACTUAL SIZE.



Calibre 3255

KEY COMPONENTS OF CALIBRE 3255

THE ENTIRE MECHANISM OF THE 3255 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

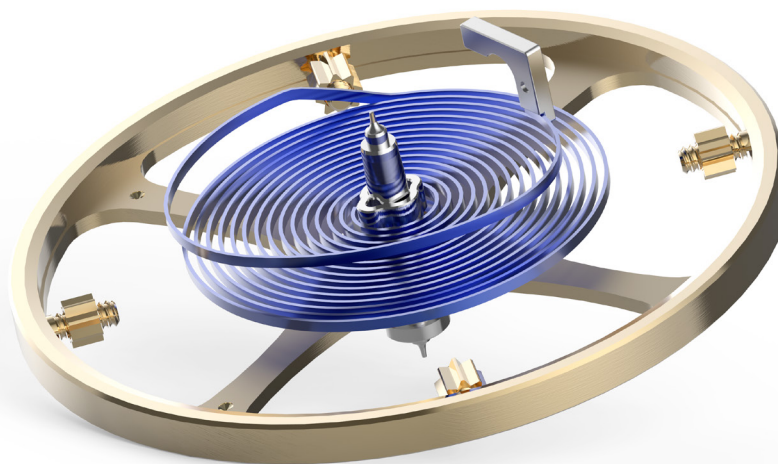
PRECISION

INNOVATIONS

Optimized Breguet overcoil

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 varying influence of gravity in different positions.

THE OSCILLATOR OF CALIBRE 3255

The oscillator of calibre 3255 is fitted with a blue Parachrom hairspring, patented and manufactured by Rolex in an exclusive alloy of niobium and zirconium. 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 Breguet overcoil, enhancing the 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 the 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 interferences. 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 balance 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

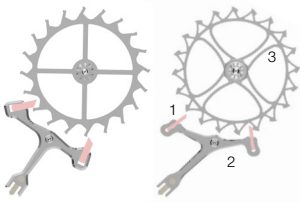
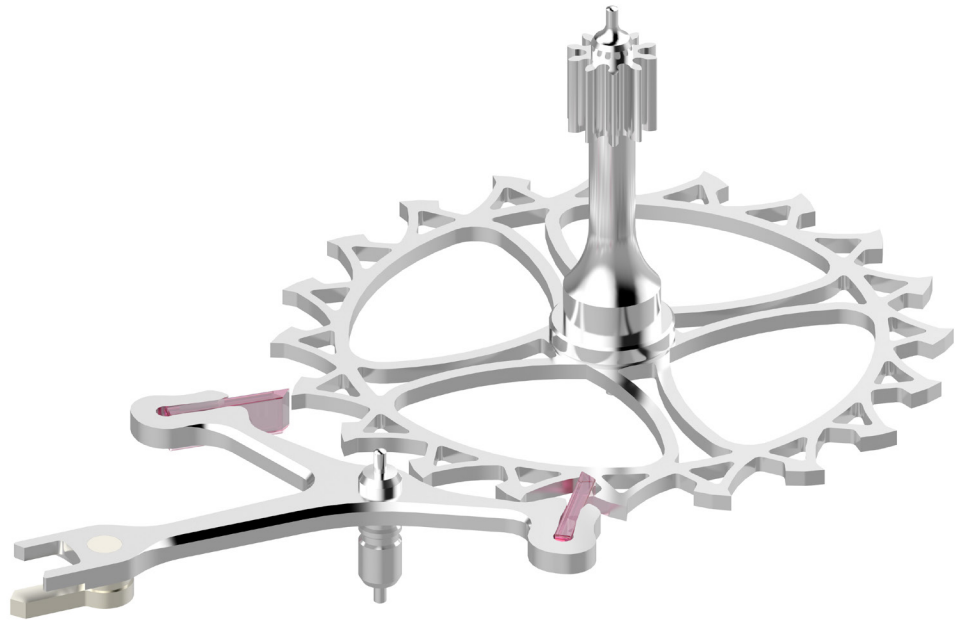
AUTONOMY

INNOVATIONS

New geometry offering a 15% improvement in energy efficiency

Paramagnetic components in nickel-phosphorus

High-precision manufacturing via LiGA (micromanufacturing through electroforming)



The new Chronergy escapement patented by Rolex (right) optimizes the efficiency of the traditional Swiss lever escapement (left).

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

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

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

UNDERSTANDING THE ESCAPEMENT

The escapement plays a major role in how the movement functions. Its alternating beats produce the familiar “tick-tocks” 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 3255

The Chronergy escapement of calibre 3255, 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 to isolate the parameters that needed modification. Surprisingly, the solution they arrived at ran counter to prevailing horological thinking: the length ratios between the escape wheel teeth and the pallet stones were reversed. While the thickness of the pallet stones has been reduced by half, the contact surfaces of the escape wheel teeth have been doubled. Moreover, the escapement system is no longer in alignment but slightly offset, affording greater distance between the pallet fork and the balance wheel, thus multiplying the lever effect. The pallet fork and escape wheel are made of nickel-phosphorus to be insensitive to magnetic interferences. 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 3255’s power reserve.

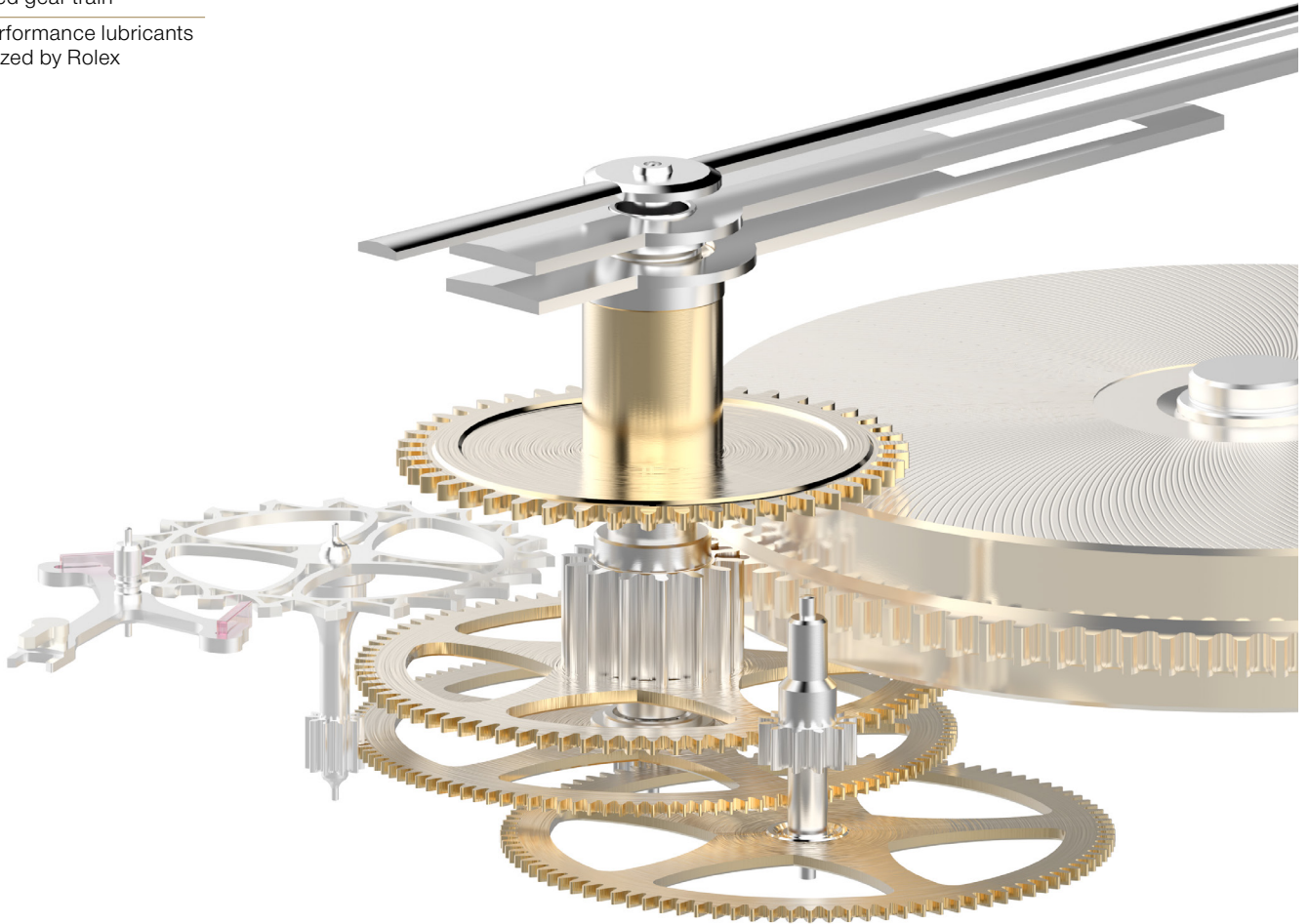
EFFICIENT GEAR TRAIN

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 3255

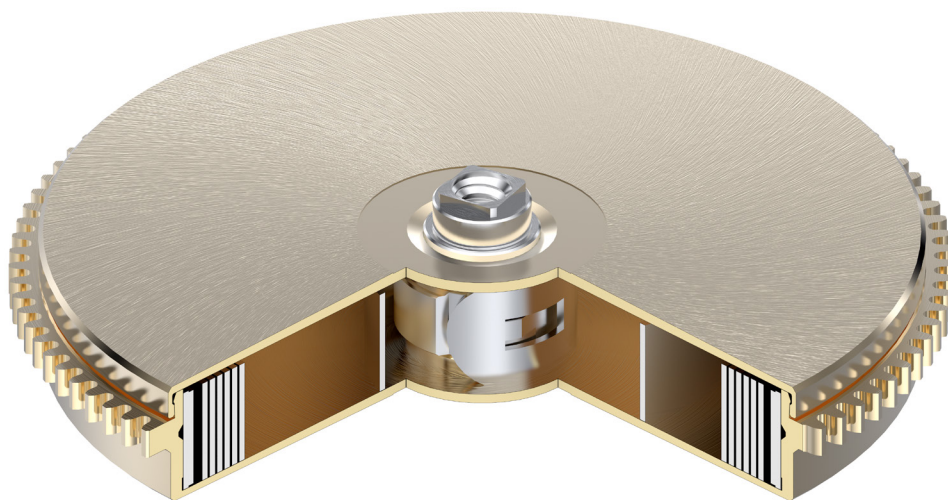
The efficiency of the gear train has been optimized. Rolex has also developed, and synthesizes in-house, exclusive new high-performance lubricants with a considerably longer useful life and greater stability over time. Rolex is the only independent watch manufacturer to develop and synthesize its own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

HIGH-CAPACITY BARREL

AUTONOMY

INNOVATIONS

A thin-walled barrel to accommodate 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 that is 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. Increasing the power reserve means either improving the escapement's efficiency

or enlarging the mainspring – or both, as Rolex has done with calibre 3255.

THE BARREL OF CALIBRE 3255

Space is at a premium inside a watch movement. To increase the capacity of the mainspring in calibre 3255 without increasing the size of the barrel housing it, Rolex decided to optimize the space inside the barrel by reducing the thickness of its walls by half. 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 when it developed a self-winding system for a wristwatch, which it patented as the Perpetual rotor. This mechanism, with its half-moon-shaped oscillating weight, continually winds the mainspring using nothing more than natural wrist movements. This way 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 3255

Calibre 3255 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 either direction 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

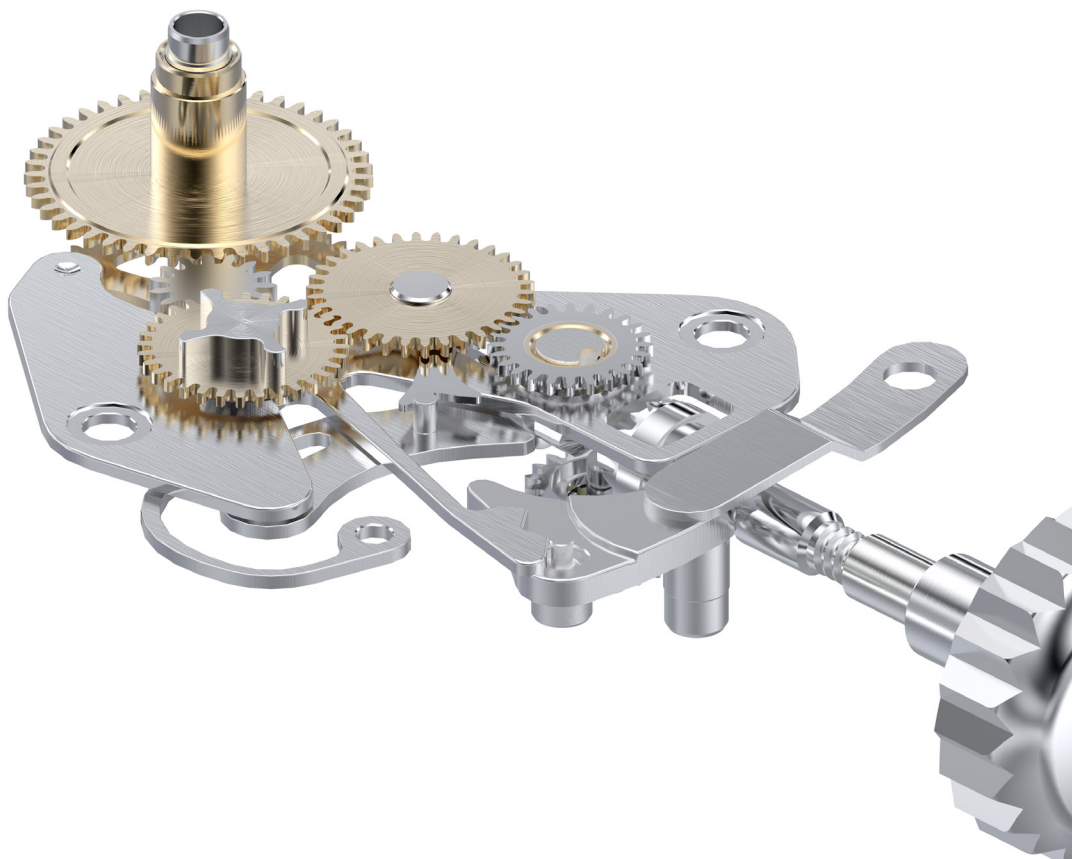
INNOVATIONS

Clearly defined, easily
located setting positions

Optimized adjustment
speeds

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 3255

The setting interface of calibre 3255 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 with no restrictions, thanks to retractable fingers inside the mechanism.

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