

Introduction

A tachymeter scale is a scale sometimes inscribed around the rim of an analog watch. It can be used to compute a speed based on travel time or measure distance based on speed. The spacings between the marks on the tachymeter dial are therefore proportional to $1/t$ where t is the elapsed time.

The function performed by a tachymeter is independent of the unit of distance (e.g. statute miles, nautical miles, kilometres, metres etc.) as long as the same unit of length is used for all calculations. It can also be used to measure an industrial production process in units per hour. A tachymeter is simply a means of converting elapsed time (in seconds per unit) to speed (in units per hour).

Credit: https://en.wikipedia.org/wiki/Tachymeter_%28watch%29

Instructions

To use a tachymeter-equipped watch for measuring speed, start the chronograph at a starting marker of a known distance.[1] At the next marker, the point on the scale adjacent to the second hand indicates the speed (in distance between markers per hour) of travel between the two. The typical tachymeter scale on a watch converts between the number of seconds it takes for an event to happen and the number of times that event will occur in one hour. The formula used to create this type of tachymeter scale is. $T = 3600 / t$ where **T is the tachymeter scale value; t is the time in seconds that it takes for the event to occur; and 3600 is the number of seconds in an hour.**

Sample Calculation

If it takes 35 seconds to travel one mile, then the average speed is 103 miles/hour. On the watch, 35 seconds gives scale value 103. Similarly, if one kilometre takes 35 seconds then the average speed would be 103 km/hour.

Note: The tachymeter scale only calculates the average speed. As a second example, if it takes 20 seconds to travel one unit of distance, then the average speed on the watch used for the purpose of the picture only is 180 units of distance per hour (examine the picture of the watch which is here to simplify the idea, actual tachymeters may vary slightly).

Tachymeter



For Very Quick or Very Slow Events

For events that happen either very quickly or slowly, one can adjust the sixty-second tachymeter scale commonly found on watches. Smaller fractional units can be used for slower objects, like runners, turtles and snails, but the same X/hour function remains constant. The scale on a watch is only valid for things that happen in 60 seconds or fewer, and the scale is also difficult to resolve for events that take fewer than 10 seconds or so to occur. As an example, if it takes 100 seconds to eat an apple, cutting that number in half allows one to say that it takes 50 seconds to eat half an apple. Using the tachymeter scale one can calculate that 72 half apples (36 whole apples) could be eaten in one hour. Some watches, not common, have 'wraparound' or 'scroll' scales, which extend the readings to lower speeds, typically 45 units.

Measuring Distance

A tachymeter-equipped watch can be used to measure distance by timing the travel over the distance while the speed is held constant. The tachymeter scale is rotated to align with the second hand at the start of the length to be measured. When the second hand reaches the point on the scale where the speed indicated equals the speed of the vehicle, one unit of distance (miles if speed is miles per hour, kilometres if kilometres per hour, etc.) has been covered. For example, if you travel at a constant 80 mph (or at 80 km/h), then the distance travelled while the second hand sweeps to "80" (45 seconds) will be exactly 1 mile (or 1 kilometre at 80 km/h)..

Rotating Scale

Some tachymeter scales are on a rotating, indexed bezel. This allows two additional modes of use: The tachymeter bezel can be aligned with a free running second hand, and, more subtly, can be used to find the average speed over longer times/distances. Set the rotary bezel index opposite the position of the minute hand, note the mileage. Glance at the tachymeter scale 60 units later, and average speed will be indicated. A little mental maths allows interim averages, easiest at 1/4 (15 unit) and other integer values..

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Page 2 of 2.

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