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Turning circle diameter calculation pdf

The circle in turn gives an indication of the space required to convert a particular vehicle. Thus, the higher the radius of the circle, the higher the space you need to turn the car completely and vice versa. This parameter is closely related to the steering and suspension engineering of the vehicle under consideration. The effectiveness of these specifications for the car is clearly visible during maneuvering in a crunchy parking space. Technically, it is the radius (or diameter) of the circuit made by the exterior wheels of the car while making a full turn. Of course, the turning circle of each type of vehicle varies. Legally, manufacturers must determine a radius or diameter shift. Hence, it appears in the specification sheet of each car. How is the radius of rotation measured? Measuring the rotation radius in an experimental determination to shift the radius or diameter, the car must take a turn either in the left or right direction in full condition or lock any extreme position of the steering wheel. Suppose such a car takes a turn towards the right side. In such a case, the wheels on the left side will be the external wheels. Thus, the radius of the circuit followed by these wheels gives the car's turning radius. Alternatively, it is also possible to calculate the turning radius based on the wheelbase and other suspension engineering parameters. Thus, the biggest value turning radius, the bigger is the space you need for a car to take a turn. Generally, vehicles equipped with electric power steering have a lower turning radius compared to those of regular vehicles. The standards or requirements of the vehicle shift circuit are specific in various technical standards that are generally a wise advanced country. Indian requirements are specified in the Indian standard IS 12222.2011. Read more: What is a wheelbase in a car? Last edited: March 14th, 2019 CarBike Technology Related Resources: Vehicle Calculators Transform the Circuit Design Equations, Energy Transmission Design Calculators, Engineering Engineering and Vehicle Design Applications Transform the Design Circuit, Engineering Equations and Calculators. When the car is in the corner, each wheel describes a turning circle. The outer circle of rotation, or radius, is the main topic of interest. The calculation is not accurate because when the car is in the vertical corner through the centers of all wheels does not intersect at the center point of the curve (Ackermann case). In addition, while the vehicle moving dynamic forces will arise that will affect maneuvering turns. However, the following formulas can be used for estimation purposes: preview calculator: vehicle shiftcircuit equations and calculators the distance between the orientation axis j = s- 2rO the oriote value of the external steering angle cotBa0 = cotβi + j / Ikt Deflection Angle BF = Ba-Ba0 Turning Radius Rs = Ikt / sinBa0 + rO-50 · BF where: J = distance between steering axles (mm) Ikt = center wheelbase to center (mm) s = track or whele to view the center of the wheels (mm) ro = radius rubbing (mm) the distance in the front view between the axis of the king pin and the center of the patch in terms of both theoretically will touch the road. βi = internal steering angle βa = external steering angle rs = turning radius (mm) βF = steering deviation (deg) 'a0 = another value for external upholstery angle © copyright 2000 - 2021, by edge engineers, LLC www.engineersedge.com all rights reserved disclaimer | | | notes Advertising contact date/time: ollirg/iStock/Getty Images turning radius is one of those terms that has taken a sort of on-life of its own, mostly through public misunderstanding. Technically, the radius is a full circle radius; Most magazines have long abandoned the use of a spin radius in the colloquial sense in favor of a rotation altogether to describe the space the car needs to do a U cycle. Find a flat car park with plenty of open space, and park the door next to the passenger near the edge of the lot. Rely on the need for 50 feet or so from open space to the left. Your assistant ticks the floor with chalk about an inch to the right of the place where the right front tire touches the ground. This bit of extra removal is necessary, because the side wall of the frame usually bulges out past the tread. Start the engine, turn your steering wheel all the way to the left, as far as you will go. Put the car in the drive, very gently, very slowly let your foot off the brakes. Continue in a circle at idle speed. Stop before you reach halfway around the circle - call it 170 out of 180 degrees. Your assistant ticks the floor next to your front right frame. Go ahead another six inches or so, and your assistant will mark another. Continue to stop and mark the floor every six inches or so until you are pointed back towards the edge of the parking lot. Move and park the car. Measure from the first bookmark, where you started, beyond your other reference marks. The distance from the first mark to the furthest mark is your circle of rotation, or the space your car needs to do the U cycle without hitting a brake. Divide this measurement on two to get a turning radius. This information is almost useless in the real world, but it is nice to tell you that. Turning radius account introduction this article describes the car or bicycle turn around radius account. This area depends on two things: - wheelbase w, namely the distance between the front and the rear wheel - the angle of the front wheel we That only the front wheel is able to run. See figure below: The upper view side view calculates the front wheel and rear tracking circle with the same center. At all times, the trend is perpendicular to the radius. See the figure below: The front wheel radius movement is R, and the rear wheel r. from the figure above we deduce: also cars, trucks and even bicycles have each radius turning. The rotation altogether is the space that a space the vehicle needs to play a particular role, usually on the road. When new streets are designed or transport routes are planned it is necessary that one keep in mind the turning radius of the vehicles that will use this street. In the past turning molds that were used by traffic engineers, these templates will be placed on top of the drawing to test whether the design has enough space. In modern days the computer is used to calculate the exact turning radius of a particular car or truck. For this purpose, AutoTURN was developed. With a program like AutoTURN you can add vehicles to your designs, so you can check the radius of the shift. As you can imagine, one of the most important factors is having the right compounds available. The radius of the rotation depends heavily on your vehicle's specifications such as vehicle size, axle size, steering and wheelbase. Many countries have their own car specifications so cars, trucks, buses, ambulances, fire trucks and other design vehicles used when calculating a turning radius, should be very specific. Instead, some programs offer you the option of creating your own custom car and calculating the radius of your custom car turning. If you are looking at a turnaround radius account of a car, you may want to start with downloading a free demo from AutoTURN. This way you can easily test compatibility with your CAD platform and take a look at the vehicle libraries available in the program. If you don't have a CAD platform for mayor, or in case you just need to check the car turning radius rarely and looking for a cheaper solution, you can also use an existing cloud solution that doesn't require a specific CAD platform to calculate the car's turning radius. In this case you can use AutoTURN online. Below you can find two detailed videos that describe the possibilities and give you more insights into how you can calculate the car's turning radius either in AutoTURN Online or the standard CAD-based AUTOTURN program: turning radius calculation method, utility and parking utility employing a radius conversion method calculation, turning radius calculation Program, register medium published number US200602478341 US200602478341 US10/558,051 US55805105A US20062478 34A US 20060247834 A1 US20060247834 A1 US 20060247834A1 US 55805105 A US55805 A US 5 5805105A US 20062447834 A1 US2006247834 A1 US 2006247834A1 USA Pre-turn art cornering car pre-art history Legal status (legal status is an assumption, not a legal conclusion. Google has not conducted a legal analysis and does not provide any representation on the accuracy of the listed case.) 2004-04-26 prioritized JP2004130056A Critical Patent Priority/JP4438499B2/en 2004-04-26 Priority to JP2004-130056 Priority 2005-03-23 A Request from Toyota Critical Industries Company Industries 2005-03-23 2005-03-23 Priority to PCT/JP2005/006003 Patent Priority/WO200510282A1/en 2005-11-22 dedicated to KABUSHIKI KIKI TOYOTA JIDOSHOKKI reset KABUSH JIDOSKI from the interest of the bewildered (see document for details for details to obtain). Assignors: SHIMAZAKI, KAZUNORI 2006-11-02 Publication of US20060247834A1 publication Critical patent/US20060247834A1/en 2010-04-27 Publication of US7706943B2 publication Critical patent/US7706943B2/en 238000004364 calculation methods Methods 0.000 title claims abstract description 30 230000014509 gene expression Effects 0.000 claims abstract description 62 230000000875 corresponding Effects 0.000 claims abstract description 45 235000020127 ayran Nutrition 0.000 description 5 238000004458 analytical methods Methods 0.000 description 3 239000011135 tin Substances 0.000 description 3 238000002940 Newton-Raphson method Methods 0.000 description 2 238000010586 diagrams Methods 0.000 description 1 230000005389 magnetism Effects 0.000 description 1 230000001264 neutralization Effects 0.000 description 1 230000003287 optical Effects 0.000 description 1 239000004065 semiconductors Substances 0.000 description 1 B—PERFORMING OPERATIONS; TransportvehicleB62-Land for otherwise travel on B62D rails - motor vehicles; TRAILERS B62D15/00 — otherwise not provided for B62D15/02 — steering position indicators; Positioning guidance; B62D15/021 steering aid - Steering angle identification B62D15/024 - Other means of determining steering angle without directly measuring it, for example, deriving from wheel speeds on different sides of the B-PERFORM vehicle OPERATIONS; Transport b62-Land for otherwise travel on B62D rails - motor vehicles; TRAILERS B62D15/00 — otherwise not provided for B62D15/02 — steering position indicators; Positioning guidance; B62D15/021 Aid Steering - Setting the Angle of Steering B - Operations Execution; Transporting B62-Land vehicles for otherwise travel on B62D-motorized rails; TRAILERS B62D15/00 — otherwise not provided for guidance for B62D15/02 — steering position indicators; Position Identification Guidance; AIDS Guidance B62D15/021 - Steering Angle Identification B62D15/0225 - Determining the angle of steering by measuring the steering equipment element, for example on the B-rack bar; transporting B62-Land vehicles for otherwise travel on B62D rails - motor vehicles; TRAILERS62D15/00 — steering otherwise provided for B62D15/02 position indicators; The government's positioning guidelines are based on the same objectives as the one-time AIDS, for example, instructions mean B62D15/0275 — means of parking, for example, means of instruction by overlaying the vehicle's route based on the current steering angle above an image without processing that image is a method of calculating the radius of rotation including: the expression of the steering system model by relational expressions that have a steering angle and rotation angles from external and internal frames as variables including known parameters and parameters; The calculation of the unknown parameter of relational expressions corresponding to the state of zero orientation and relational expressions corresponding to the full routing state; calculating the rotational angles of the external and internal frames respectively corresponding to the multiplicity of steering angles between the zero orientation state and the full orientation state using relational expressions where data calculated on the parameters is entered unknown; calculating corresponding radial shifting angles calculated from external and internal frames; and calculating the approximate steering function for half-angle shifting on the basis of the contrast angle of the steering angle and the reary. The technical field to which the invention belongs is related to the method of calculating the vehicle's rotation radius from a steering angle, a steering assist and a parking utility that uses this method, and the spin radius calculation program that caused the computer to implement this method, and a recording device. The previous art traditionally shown in, for example, JP 2002-251632 A, has been developed as a driving assist device that helps the driving process by displaying on the screen an actual background image of a car picked up by a CCD camera and displayed on the screen in the form of overlapping the location of the car during its backward movement according, for example, information about the angle of steering detected by a sensor. The driving assist device as described above allows the driver to perform, for example, side parking of a car in the parking lot by driving the car while viewing the expected place on the screen. Problems to be solved by INVENTION to draw an expected place while moving backwards of the car in this way, a car is required to shift the radius corresponding to the angle of arbitrary steering. Traditionally, having made the car turn by a few different steering angles, both the car beam shift is actually measured and the data is obtained and therefore is updated or otherwise processed to get the radius shifted from the car. However, the actual measurement of the rotation altogether radius must be done from a number of times corresponding to the multiplicity of different steering angles. This causes a very disturbing problem. Moreover, if an attempt is made to install a driving assist device in several vehicles It is required to find the characteristics of the car of each car model by actual measurement, which is a laborious process. This invention has been taken into account the traditional problems mentioned above. It is an object of this invention to provide a radius conversion method of calculation capable of easily obtaining a car that shifts its radius corresponding to the angle of arbitrary steering without implementing the actual measurement. Moreover, another object of this invention is to provide a router and a driving assist using such a radius turning method of calculation. Moreover, it is still another object of this invention to provide a turning radius account program causing a computer to perform a radius conversion method calculation, and a recording mode. Means of problem solving turning the radius of the calculation method according to the first side of this invention includes steps of: the expression of the steering system model by relational expressions having a steering angle and turning the corners of external and internal frames and variables including known parameters and unknown parameters; Request for data entry on known parameters based on design data; calculation of unknown parameters of relational expressions corresponding to zero routing and relational expressions corresponding to full routing status after data entry into known parameters; calculation of rotational angles of external and internal frames respectively corresponding to the multiplicity of steering angles obtained by dividing a range between the direction zero state and the full state using relational expressions where data calculated on the parameters are entered unknown; From the outer and inner frames; By entering data on known parameters based on vehicle design data, unknown parameters are calculated from relational expressions corresponding to zero routing status and relational expressions corresponding to a full steering state. The shift angles of the opposite external and internal frames are calculated for the multiplicity of steering angles respectively using relational expressions. Anderi is calculated turning straight from the turning angles of the external and internal tires, and is getting a rough function to turn the radius to the steering angle. The router assist according to the second aspect of this invention relates to the router assist which displays the monitor in the form of an overlay image of the rear car displayed during the backward movement of the car and summary the movement backwards of the vehicle opposite the steering angle, which is displayed in the rear position of the car on Monitor based on the turning radius calculated from a steering angle by turning the radius of the calculation method mentioned above. Furthermore, a parking utility device according to the third aspect of this invention relates to a parking assist device that provides guidance on the parking process at the target parking place, where guidance on the operation of the car parking is provided on the basis of a turning radius calculated from a steering angle by turning the radius of the calculation method mentioned above. The rotational radius calculation program according to the fourth side of this invention leads to a computer to implement the steps of expressing the steering system model by relational expressions having a steering angle and turning the corners of external and internal frames and variables including known parameters and unknown parameters; The government's policy of protecting the environment is a major concern for the government. To convert the radius to the steering angle based on the multiplicity of steering angles and radial indos. Moreover, the means of recording according to the fifth aspect of this invention relates to the computer reading the recording method in which the account radius conversion program is registered above. A brief description of fig. 1 graphics is a flow chart showing the method of calculating the radius of the rotation according to the embodiment of this invention, FIG. 2 is a display showing the model of the steering system used in the embodiment, FIG. 3 is a conceptual display showing a way to calculate a vehicle radius from turning outer and internal frames. 4 is a graph showing the expression of a radius function shifting to a steering angle obtained in the embodiment, FIG. 5 is a conceptual view showing another method of calculating a circle The car's turning radius from turning corners of the exterior and interior tires, FIG. 6 is a block chart showing the configuration of a parking assist device according to the embodiment, and FIGS. 7 and 8 are views that show each car's rear image displayed on a parking monitor. The embodiment mode of the implementation of the invention will be described as the embodiment of this invention below based on the accompanying graphics. 1 tin. A streamlined diagram of turning radius shows a method of calculation according to the embodiment. First of all in step The steering system model is organized using predetermined pieces of vehicle design data. This embodiment handles the routing system model as shown in FIG. 2. Referring to FIG. 2, AB shows a rocker's arm turning around point A (kingpin) along with tires, de shows a rocker's arm turning around the D point (kingpin) along with tires, CF shows a rack moving late according to steering wheel, BC shows a tie connected to the rocker's arm and rack, EF indicates a tie rod connected to the rock arm and rack, H shows the position of the rocker arm, J shows the length of the rocker arm, K indicates the The length of the tie rod, 2L indicates the length of the shelf, 2M indicates a distance between the kingpins, the S indicates a stroke rack (it corresponds to the steering angle of the steering wheel), indicates the angle of the rocker arm, α indicates the angle of turning in the outer frame, and indicates β to the corner of the turning of the inner frame. It is clear here from FIG. 2 that the square of the distance between B and C is equal to the K length square for the tie rod, and that the space square between E and F is equal to the K-length square for the tie rod. Therefore, the following relational expressions (1) and (2) are obtained. [{M−J cos (α)}-L+S)[2][J sin(α)][H] 2 = K 2 (1) [{& M+J Cos (φ-β)}-(−L+S)2+[J Sin]β−1= K 2 (2) and then in Step S2, the operator is required to enter, based on design data, and pieces of data For known parameters including k length of tie rod, 2L length of shelf, 2m distance between kingpins, maximum stroke of the rack, αm maximum turning angle of the outer frame, and the maximum αm turning angle of the internal tires. It is not entirely necessary to ask the operator to enter parts of the data for known parameters. Pre-prepared data can also be read automatically or through an operator's process. When parts of the data are entered on the known parameters in Step S2, the following expressions are obtained from the zero route state (neutral position) and the full routing state in step S3. First of all, when the amount of steering is zero, α = β = 0 and S = 0. Thus, the following expression (3) is obtained from the expressions (1) and (2). [{M−J cos=L] 2 + J sin (φ)−H] 2 = K 2 (3) Moreover, when the amount of routing is at its maximum, α = αm, β = αm, and S=Sm. Therefore, the expressions (1) and (2) are expressed as the following expressions (4) and (5) respectively. The government's continued support for the government's work in the area of security and the use of force in the country are also being met. [2][J sin(gob−βm)−H] 2 = K 2 (5) now, using a numerical analysis method such as Newton-Ravenson, the expressions (3), (4) and (5) are resolved as specified J, H, and φ. If solutions obtained from unknown parameters J, H, and code for expressions (1) and (2) are set, these expressions (1) And (2) includes the angle of rotation α the outer frame, the rotation angle β Internal tire, Stroke S of shelf and variables. Thus, in Step S4, the sn value (n = 0 to 10, S0= 0, S10 = Sm) obtained by dividing a range, for example, S=0 to S=Sm into ten equal parts of the S stroke of the rack, and expressions (1) and (2) based on A and P are solved by a digital analysis method such as Newton-Raphson. In this way, it is possible to get βn corresponding to N. Because the S stroke of the rack fits with the steering angle of the steering wheel and the full steering angle φm known as vehicle design data, it is possible to calculate the φn corresponding to sn. As a result, a large number of pairs are obtained from the αn turning angle of the outer frame and the αn turning angle of the internal tires to the predetermined steering angle φn of the steering wheel. The φ steering angle of the steering wheel is defined only as a positive value representing a degree of steering on one side. Then in step S5, the rotation altogether is calculated for the center of the rear axle of the car from the αn rotation angle of the outer frame and the αn rotation angle of the internal tires. If the intersection of the extensions of the right and left front axle axles (steering wheel wheels) is located along a rear axle (i.e., in the case of Ackerman engineering), the rotation radius can be calculated with relative supposition. However, there is no intersection of extensions of the front-right and/or front left axles generally along the rear axle axis as shown in 3. In this embodiment, therefore, the rotation radius is calculated on the assumption that the center point between the intersection of the right front axle axis and the rear wheel axis, the intersection point of the left front axle axis and the rear axle axis represent a turning point. In reference to FIG. 3, the Rcin distance from the center of the rear axle to the intersection of the internal tire axis and the rear wheel axis is expressed as follows. Rcin = WB/tan (βn)+M (6) Rcon distance from the center of the rear axle to the intersection of the outer frame axis and rear axle is expressed as follows. Rcon = WB/tan (αn)−M (7) Accordingly, the Rcn rotation radius is expressed as follows. Rcn = (Rcin + Rcon) / 2 = Wb [{1/ Tan (α n) } + {1/ Tan (β N) } } 2 (8) It should be noted here that the World Bank indicates the base of the wheel of the car, and that M indicates half the distance between kings. Thus, the rcn turning radius is calculated corresponding to a predetermined αn turning angle from the outer frame and a predetermined αn turning angle from the internal frames. As shown in step S4, the αn turning angle was obtained from the outer frame and the αn turning angle from the inner frames to the predetermined φn steering angle, which means that the radius of the Rcn turning opposite to the The steering angle has been calculated in it. Furthermore, the Rm shift radius of Rcn is obtained by performing the following calculation. Rmn={=Rcn+M)2 + WB 2}1/2 +IK It should be noted here that Rmn indicates a radius shifting from the outer front wheel (i.e., the steering wheel is located on the outside of the rotation), and that IK indicates a distance between the center of the tires from the front wheel and the kingpin and is expressed as follows. IK=(TRF-2M)/2 It should be noted here that TRF indicates the front tread. Based on the multiplicity of pairs of the φn steering angle and the rmn rotation radius calculated in step S5, the R (φ) approximate function of the Rmn rotation radius is calculated to the angle of the guidance φn in step S6. For example, the approximate function R (φ) is rounded by an energy function and defined as the following expression (9) including unknown transactions A and B. R =A· (φ) B (9) The following expression (10) can result for this approximate r (φ) function from multiple parts of the data obtained in Step S5 as well as to the angle of guidance φn and radius of the Rm. Rmn = A· (τn) B +Dn (for example, n= 0 to 10) (10) and then, coefficients A and B are calculated to a minimum of the sum of five difference boxes Dn, i.e. V= Φ (Dn)2. For example, a digital analysis method, such as a simple method, can be used as a method of calculation. By applying calculated coefficients A and B to expression (9), the Expression Of The R (φ) is obtained for a radius shifting to a mandatory steering angle. The rotational radius relationship to the steering angle of the R (φ) expression is obtained, for example, as shown in FIG. 4. In calculating the R (φ) approximate function in step S6, instead of using each, for example, 10 pairs of steering angle in the rmn rotation radius, an appropriate number of data pairs can be selected for use by a larger routing (which is close to a full routing state), where a function can be obtained approaching more accurately on the larger steering side. Thus, it is possible to provide more precise foci for the rear movements of the car and more accurate parking steering in the help of steering or parking. The Approximate R (φ) function can also be calculated with data on, for example, 10 pairs of steering angle and radius of the Rmn rotation weight heavier as the steering quantity increases. Furthermore, the R(φ) function may also be rounded by a function other than the energy function. As shown in 5 of the fashion code, assuming that a two-wheel model is used and that φcal indicates a virtual turning angle for the front wheel, for example, the following expression is obtained (11). R (φ=][WB 2+) (Rc+M)2]1/2+IK (11) in the expression above, Rc= WB/Tan (φcal) and φcal=Cτ2+D+E. Transactions C, D, and E reduce the total difference between rmn rotation radius and the value obtained from the expression (11) by selecting the appropriate number of pairs The data is calculated from the larger steering side (which is close to the entire routing state). By applying calculated coefficients C, D, and E to expression (11), the R (φ) function expression is obtained to get the rotation altogether radius of a random routing angle. Although J, H, and φ are used as unknown parameters in the embodiment, this should not be interpreted straight. For example, it is also possible to use H as a known parameter instead of K and find solutions for unknown parameters J, K, and φ. other combinations are also possible. It is enough that solutions can be found on unknown parameters using actually a well-known parameter. R (φ) coefficients are calculated by obtaining a radius turning Rcn to multiple angles of the guidance φn in the embodiment. On the contrary, however, it is also possible to calculate r (φ) approximate function coefficients by calculating the angle of guidance φn for the radi r shift multiplicity. As the method of calculating the turning radius of the αn turning angle of the outer frame and the αn turning angle of the internal tires, the method of calculating the balance of the sliding forces of the front wheels can also be used instead of performing the calculation assuming that the center point between the intersection of the right front axle axis and the rear axle axis and the intersection of the left front axle and the rear axle axis represents the center of the shift. If it is assumed that Φn refers to the angular difference between the actual travel direction of the outer frame and the actual angle of the outer frame and that βn indicates an angular difference between the actual travel direction of the internal frame and the actual angle of the internal frame, fo and Fi inflection forces are applied to the external and internal frames in vertical directions, respectively. The turn power can be rounded as a value commensurate with angular difference and speed. Moreover, the speed of the right and left wheels is proportional to the rotational beam of the right and left wheels respectively. In other words, the power of the Fo or Fi turn matches the angular difference and turns the radius of each of the tires. Accordingly, the following expressions are obtained. In ∝WBi·Φβn/sin (βn+Φβn) Fo∝WBo·Φαn/sin (αn-Φαn) it should be noted here that WBi indicates a distance between the front and rear wheels inside, and that WBo indicates a distance between the front and rear wheels on the outside. Since no deviation of turning circle is observed, regarding the ruined forces applied to the right and left front wheels, their elements are personally balanced in the radial direction of the rotation circle with each other. Therefore, the following expression is obtained. Fi·cos =Fo·cos (Φαn) and therefore, the following expression (12). The government has also taken a number of additional provisions to ensure that the government's work is to be taken into account. The following expression (13) is obtained from the relationship of difference in the radius shift between the right and left wheels. WBo/sin (αn-Φα)−WBi/sin (αn+Φβn)=2M (13) after Φαn and Φβn are calculated from the expressions (12) and (13), the rotational radius of the following expression can be calculated. Rmn= WBo/sin (αn-Φαn) instead of balancing the force of turns with each other in normal directions as described above, different relational expressions can be set depending on the rounding method and the way the coordinate system is placed. Because of relational expressions as such, the radius of rotation can be calculated according to different methods. In any case, the turning radius is calculated on the basis of turning the corners of the car's steering wheels exterior and interior. Although the Rm spin radius of the steering wheel on the outside of the wheel of the cycle is calculated in the embodiment, it is also possible, for example, to calculate the Rc rotation radius or the radius of the rotation of the other wheel. However, since high resolution is guaranteed in rounding if the Rm rotation radius is calculated, it is also possible to calculate the Rm radius and then convert it into a radius shifting Rc or other turning radius. The method of turning radius according to the above embodiment can be recorded in a medium recording readable computer as a radius shift program account. The recording method can transfer the contents described in the program to a computer reading unit by causing changes in physical quantity such as magnetism, light, electricity, or the like. For example, a magnetic disk, optical disk, CD, semi-conductive memory, or the like are used as a means of recording. It is also possible to calculate the rotation radius corresponding to an arbitrary steering angle according to the method of calculating the radius of the rotation mentioned above, and to provide the driver with a shop that the vehicle can follow while moving backwards or steering on parking on the basis of the calculated radius of the rotation. 6 shows 6 forming a parking assist device in which the radius conversion method is applied according to this invention. The Steering Angle 2 sensor is connected to the steering angle of the steering wheel and the Yao 3 rate sensor to detect the vehicle's angular speed in the direction of the Yao angle with controller 1. A horizontal parking mode switch 4 to inform controller 1 that the car is for side parking performance and parallel parking mode switch 5 to inform controller 1 that the car is for parallel parking performance also connected to controller 1. In addition, the 6 speaker is connected to provide the driver with information about the driving process to console 1. Furthermore, the 7 camera is connected to take a rear view of the car and screen 8 to display the image sent from camera 7 to 1. Parking side mode switch 4, parallel parking mode switch 5, screen 8 is eliminated in the driver's seat. The 7 camera is attached to, for example, the roof of the car. Controller 1 is equipped with the CPU (not shown), the ROM in which the control program is stored and ram work. The CPU works on the basis of the control program stored in ROM. Pre-defined shift while maintaining the steering angle detected by the steering angle sensor 2. At this moment, the radius of the shift corresponding to the arbitrary steering angle is calculated according to the shift radius calculation program stored in ROM, and the expected backward movement is set up 9 using a calculated rotation radius. FIG. 7 shows the rear bumper 10 of the driver's car captured in the rear view image and the 11 th expected place followed by the car in moving directly backwards. Furthermore, Controller 1 calculates the vehicle's yaw angle from the vehicle's angular velocity input from the Yao 3 rate sensor, calculates the vehicle's shift angle, and causes guidance information on operating methods and operating timing in the relevant steps during the parking process to be displayed on screen 8 or being acoustically ejected from Speaker 6. According to this guiding information, the driver can easily and accurately perform the parking process at the target parking place. In the parallel parking lot also, as shown in FIG. 8, the expected backward movement locus 12 of the car is displayed opposite to the steering angle and the car mark 13 indicates the intended position is displayed on screen 8. Thus, the driver helps to stop the car. In the parking utility shown here as an example, the display on the screen changes according to the amount of the steering, making it possible to determine whether the routing amount is appropriate at that moment. However, the parking assist is not limited to this configuration. Parking assistdevices can also be designed to assign a suitable location or vehicle mark on the screen by means of the cursor or the like, and to set the radius of the rotation obtained from that expression mentioned above (9) or (11), and to obtain an appropriate routing amount. In any case, obtaining a relational expression between an arbitrary steering angle and its corresponding radius is indispensable in the construction of a parking assistance device. Turning the method of calculation according to this invention also applies to a steering assist device that helps the driver steer a car backwards by displaying the expected backward movement position monitor during the vehicle's backward movement without providing parking guidelines and allowing the driver to consider the expected backward movement position. In the radius conversion method of calculating this invention, as described above, the mere data entry on known predetermined parameters based on design data makes it possible to calculate the approximate function of converting the radius to the steering angle without making the actual measurement. Thus, the application of this radius shift method calculation achieves steering or auxiliary parking device capable of being easily installed in several vehicle models despite the commonity in the chassis. This invention makes it possible to easily obtain a car that shifts a radius corresponding to an arbitrary steering angle without actual measurement execution. 1. Shift the radius of a calculation method consisting of the following steps: the formulation of relational expressions having a steering angle and turning the corners of external and internal frames and variables, including known parameters and unknown parameters by building a steering system model; It applies the values of variables identical to the full routing state to relational expressions; An approximate function calculation will convert the radius to the steering angle based on the multiplicity of steering angles and the corresponding beam shift to the multi-angle steering. 2. The method of calculating the turning radius is included according to claim 1, where the stroke of the rack moving in the direction of the side of the car is included according to steering the steering wheel in relational expressions as a variable corresponding to the steering angle. 3. Shift the radius of the calculation method according to claim 1, where the corresponding shift beam is calculated for the corners of the turning of the external and internal tires by taking the center of the center turning point between the axis intersection point of the right front wheel and the rear wheel axis and the axis intersection point Left front wheel and rear axle. 4. The radius conversion is calculated according to claim 1, where the corresponding turning beam is calculated for the turning angles of the external and internal tires by taking the center turning center of the turning circle which is set to balance the sliding forces applied to the right and left front wheels in a radial direction of the turning circle. 5. Turning the radius of the calculation method according to claim 1, where the approximate function of turning radius is the power function. 6. Turning radius calculation method according to claim 1, where the approximate function of turning radius is the function of calculating the radius shifting from the angle turning the tires from the two wheel model, the angle of turning the tires from the two wheel model being expressed as a function of the steering angle with two or more arrangement. 7. Turning the radius of the calculation method according to claim 5, where the radius of the turning radius is a radius turning the steering vehicle wheel on the outside of the bend. 8. A steering assistant displays on a projector in a way that overlaps the rear view of the vehicle during the rear movement of the vehicle and the rear movement of the vehicle opposite the steering angle, where the rear position of the vehicle is displayed on the screen based on the calculated radius of the steering angle by means of calculating the radius of the rotation according to claim 1. 9. The parking utility provide guidance on the parking process at the target parking place, where guidance on the operation of the car parking is provided on the basis of a turning radius calculated from the steering angle by turning the radius of the calculation method according to claim 1. 10. Turning the radius of a computational program consisting of relational expressions formulated from the steering system model, relational expressions having a steering angle and shifting the corners of external and internal frames and variables including known parameters and unknown parameters, and the program causes the computer to implement the following steps: read data on known parameters based on design data on a vehicle; calculate the values of unknown parameters of conditional expressions obtained through the application of zero-routing value suppositioning variables on relational expressions and from the conditional expressions that are known to the objects of the parameters. Obtained by applying the values of variables identical to the full routing state to relational expressions; calculating the multiplicity of steering angles and rotation angles of the corresponding external and internal frames for the multiplicity of steering angles between the zero steering state and the full steering state, respectively, using relational expressions that apply the values of unknown parameters; And calculating a approximate function The radius of the steering angle based on the multiplicity of steering angles and the radial breakout corresponding to the multi-angle orientation. 11. The program calculates the radius of the rotation according to claim 10, where the stroke of the rack moving in the direction of the side of the car is included according to the steering wheel in relational expressions as a variable corresponding to the steering angle. 12. The program calculates the turning radius according to claim 10, where the corresponding shift beam is calculated for the turning angles of the external and internal tires by taking the center of the center shift point between the intersection point of the axis of the right front wheel and the rear axle axis and the axis point of the left front wheel and the rear wheel axis. 13. Turning the program calculation radius according to claim 10, where the radial shift is calculated corresponding to the turning angles of the external and internal tires by taking the center turning center center of the turning circle which is set to balance the sliding forces applied to the right and left front wheels in a radial direction of the turning circle. 14. Register a way the computer can be read in a program converting a radius account according to the claim 10 is registered. Check in.

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