Gear box designing

The gearbox design includes a large number of requirements that we need to keep an eye on. This analysis ensures its proper operation and directly affects the effectiveness and effectiveness of speed reduction. How does targeted performance affect gearbox design? Below we will address each of these factors in depth. Performance requirements in the design of the gearboxI speaking of performance requirements, we mean the parameters used to characterize specific gearbox operations. Here you can remember: The range of speed and power at which the motor is satisfactory. This may interest you: Strength and moment: what are they and what is their difference? Speaking of Torque, we mean the rotational power of gear motor outputs, so we have to ask ourselves, what is the necessary load point? Depending on the minimum service life, we will have to choose a particular material. In addition, the treatments they undergo will be very different. Measuring the engine's ability to operate for a period of time in our app is key to preventing our gearbox from eschewing too quickly. On the other hand, another major aspect for consideration in the design of the gearbox is the affordable budget. Many variants of material, material and surface processing change and condition the total cost of the product. What performance do different gearbox materials offer? This is a very common material used for the production of gears, pinions and shafts. Precision gears can be produced by processing steel, offering great capabilities and low noise levels. Processed metal-lifting steel in order to increase its carrying capacity and reduce gear sizes. It is zinc, aluminum, magnesium and copper alloy. It is cheaper than steel, and also has mechanical properties that surpass plastic. On the other hand, this material can be cast and undergo further treatment to strengthen its properties. Compared to steel, plastic has only 10% carrying capacity. However, for some applications, the use of gearboxes made in cast plastic can offer significant savings compared to steel. Bronze is commonly used in helix gear, but is not a common material. It offers little versatility due to some performance requirements. Another, newer option – powder metallurgy – an interesting way to work metal by sealing powder. This technique allows you to rehog complex high-quality parts at a lower cost than machine steel. Do not miss this interesting article: 5 tips before designing gearboxesHow does the location and size affect the design? The size and location of the program we intend to develop are very important factors to consider, based, for example, on characteristics such as operating temperature and Taking into account that the operating temperature will lead to less problems in the process. But, what should be the test? It is advisable to check the temperature when the engine is operating in normal conditions, and cross-reference this data with the temperature it reaches when in extreme conditions that the machine can be exposed to. If the gearbox should work in humid environments, for example, certain waterproofing measures should be taken. On the other hand, when working in dirty environments, such as those observed in the field of livestock breeding, it is necessary to carefully consider dust levels, since the accumulation of particles in certain parts of the gearbox can interfere with its operation and promote premature wear and tear. Available space is a factor that is considered fundamental in developing a speed gearbox. Its importance lies in the need to meet a particular area and offer proper transmission without its performance adversely affecting. In conclusion, the gearbox design must take into account and meet the requirements of each of these factors to reduce speed to suggest the right operation. Following these advice to prevent premature disruptions and risks for individuals and machines. CLR: The technology and quality in gearbox design and productionCLR has the technology and expertise that is needed to design not only gearboxes, but also each of their components. Experienced in various industries, CLR offers its clients a large team of engineers working to achieve excellence on each project, combining innovation and expertise. Are you working on the design of a high-speed destructor? Do you have any doubts about how to approach such developments? We invite you to download our e-book concerning the criteria for choosing an engine gearbox. After reading this book, you will learn how to identify the characteristics of the movement you want to perform. The gearbox, often referred to as a transmission, is a unit that uses gears and gears to provide speed and convert moment from a rotating power source to another device. Gearboxes are used to convert input from high-speed power sources to low speed (e.g. Elevator, cranes and crushing machine) or into many speeds (tokate, milling machine and cars). The gearbox, which converts high-speed entry into one way out, is called a single-stage gearbox. It usually has two gears and a heft. The gearbox, which converts high-speed input to a number of different exit speeds, is called a multi-eastern gearbox. The multi-speed gearbox has more than two gears and shafts. A multi-part gearbox reduces speed at different stages. The video below shows how the gearbox works (from YouTube, owned by www.learnengineering.org)Geometric progression is used to get a series of speeds from the gearbox. With geometric progression, the speed decreases at different stages. Geometric Geometric Also known as geometric consistency, there is a sequence of numbers where each term after the first is by multiplying the previous one by a fixed, nonzero number called the total ratio (called the progression rate or the ratio of steps in the gearbox design). In the gearbox design, a set of the desired ratio of steps or desired numbers is used to produce a series of output speed gearboxes. The desired pitch ratio is referred to as the base series, named as R5, R10, R20, R40 and R80. Each baseline has a specific step ratio. R in the base series is added in honor of engineer Charles Renard, who introduced the use of the desired numbers. Structural formulas, as assuming 'n' speed must be derived from a single input, it is not possible to mesh 'n' a pair of gears in two shafts to get the required speed. The maximum speed that can be obtained from two shafts is three. From here it is necessary to use intermediate shafts between the input shaft and the output shaft. The structural formula helps to arrive at the number of steps and the necessary gears to obtain the desired speeds. The following table shows the original number of speeds required by the structural formula and stages. Kinematic layout - a pictorial representation of the gearbox, describing the location of the gearbox. It provides information such as the number of stages, the number of shafts used, the number of gear pairs and its location. The next scheme is the kinematic arrangement of the box of high-speed equipment 12. A ray chart is a representation of a structural formula. It provides information such as speed at each stage, transmission coefficient at each stage, total speeds and its value. The next scheme - the scheme of rays 12-speed transmission. Sliding grid gearboxConstand grid gearboxSynchrome articles are sorted by RELEVANCE. Sort by date.1 Understanding the flow of liquid to improve lubrication efficiency (January/February 2004)Excess lubricant in gear contributes to the loss of electricity due to whipping, as well as the requirements of the lubrication system itself. Typically, a much larger amount of oil than required is used for cooling because so much of it is ejected by centrifugal force. To reduce the amount of lubricant you need to reduce these losses, you need to find the ideal location of the attachment supplied. 2 High power transmission with hardened gear housing and internal power branching (January/February 1985)In the field of large power transmission units for the heavy machine industry, the following two development trends were very influential: the use of hull-hardened gears and branching the flow of power in two or more ways. 3 Impact of start-up load conditions on gearbox performance and analysis of life failures, with auxiliary (June 2009)If the gear system runs continuously for a long period of time- or if the initial loads are very low and within normal limits spectrum — the effect of launch conditions can often be insignificant in determining the life of the gearbox. Conversely, if the starting load is much higher than any of the normal operating conditions, and the gear system is often launched and stopped, the loading load can, depending on its size and frequency, actually be prevailing, limiting the condition of the structure. 4 Involving metal debris in Gear Mesh (September/October 2010)A series of experiments were conducted on the bench to determine the effects of dragging metal debris through the mesh teeth. For these tests, a test installation was used, which is commonly used to conduct experiments on contact fatigue. Several size drilling material, shem stock and pieces of gear teeth were introduced and then drove through the mesh area. The level of the moment required for the travel chip through the gearbox was measured. From the collected data, you can determine the size of the chip sufficient to jam the mechanism. 5 Romax Technology launches Gearbox and Driveline Design Software Package (November/December 2012) Romax Technology, gearbox, bearing and drive engineering specialist, has launched a new design software package that will increase speed, quality, creativity and innovation when developing gearboxes and drives. Called Concept, the new product provides Romax's vision for natogo optimization, planning to produce a process with open, easy-to-use software solutions. It was developed in close cooperation with engineers in the largest ground vehicles, wind and industrial equipment companies around the world. 6 Reliability, life and safety factors (March/April 2018)Discussion of ISO and AGMA standards for gears, shafts and bearings, as well as the art of designing a gearbox that meets your requirements. 7 Design and optimization of planetary gears taking into account all relevant impacts (November/December 2013)Easy construction and consideration of available resources lead to gearbox designs with high load capacity and power density. At the same time, expectations for the reliability of transmissions are high. In addition, there is a variety of planetary gear for various applications. 8 Whodunnit in waiver gearboxes (November / December 2008)Forensics are not just for tough talk, crime-busting scientists - most commonly found on your television; tactics also hold the key to successful gearbox design and production. 9 Comparison of current AGMA, ISO and Gear API assessment methods (July 2018)There are many different gear rating methods used today and they can yield substantially different results for any given set of gears. This paper will make it easy to understand the choice and impact of the choice on the gearbox design. Eight standards included - AGMA 2001; AGMA 6011; AGMA 6013; ISO 6336; 613; API 617; API 672; та API API (Click here for an add-on for this article.) 10 As a bearing design improves gearbox performance (September 2012)Gearbox performance, reliability, total ownership value (energy cost), overall environmental impact, and expectations of additional future regulations are the most pressing issues in the industry. Optimization of the load-bearing set can significantly improve the performance of the gearbox. 11 Understanding the Program: The Key to Economic Gearbox Purchases (November/December 2004)On the Highway, a compact pickup truck tries to tow a 30-foot boat to a steep class. Inside the pickup truck, the owner curses himself. He saved money by renting a smaller truck, but now sees that he really needs a bigger, more valuable vehicle that fits the job. 12 Design Formulas for assessing contact stress in generalized gear pairs (May/June 2001)A very important parameter when developing a pair of gears is the maximum surface contact stress that exists between two gear teeth in the grid, as it affects surface fatigue (namely, pitching and wear) along with transmission grid losses. Much attention has been paid to determining the maximum stress of contact between teeth gear into the mesh, resulting in many different formulas. In addition, each of these formulas is applied to a certain class of gear (e.g., hypoid, worm, spiroid, spiroid, spiral mucous or cylindrical - spur and spiral). More recently, FEM (a finishing element method) has been introduced to assess contact stress between teeth gear. Below is a single methodology for assessing the maximum contact stress that exists between the teeth of the gearbox teeth in the mesh. The approach does not depend on the geometry of the gearbox tooth (involuntary or cycloid) and is valid for any type of transmission (i.e. hypoid, worm, spiroid, skirt and cylindrical). 13 Practical guide to forming better plastic gear transmissions (May/June 2000)Plastic gears and transmissions require a different constructive approach than metal transmissions. Various tools are available to the designer of the plastic transmission to optimize its gear product, and for inspection and testing there are different requirements. This article will introduce some new technologies available to custom plastic gear including design, mold construction, review, and testing of plastic gear and transmissions. 14 Designing and Testing Low Noise Marine Gear (May/June 2000)This article provides an overview of the practical design of marine gear for combined diesel or gas turbine propulsion (CODOG type). Vibrational transmission performance is tested in the reverse test. The presented transmission is a low noise level for the Royal Dutch Navy's LCF frigate. Constructive aspects for working with low noise levels were included in the design of the gear system. Therefore, special attention was paid to all parameters that could affect the noise and vibration of the gearbox. These design designs for example, dental correction, teeth loading, gearbox, balance, lubrication and elastic fastening. 15 Modular approach to calculating spiral gearboxes and coupling curves (May/June 2000)In general, salivary gears and lush couplings are completely different elements. Tilt gearboxes rotate to a non-intercessive axing with a ratio based on the number of teeth. Clutch curves work like a clutch (Fig. 1). 16 Mathematics of non-screwed gear (July / August 2000)Noncirculare transmission is not new. There are well-documented articles covering standard and elliptical high-order gears, sinusoidtining gears, logarithmic spiral gears and circular gears installed eccentrically. What these designs have in common is a step curve defined by mathematical function. This article will cover non-rounded gear with free-form step curves, which of course includes all of the above functions. This article also goes into generating teeth on a step curve that doesn't usually apply to technical literature. Needless to say, all this is possible only with the help of a computer. 17 Evaluation of Carburetors & Ground Face Gears (September / October 2000)Designers are constantly looking for ways to reduce the weight of the rotorcraft drive system. Reduced weight can increase payload, performance or power density of current and future systems. One example of helicopter weight loss was initiated as part of the U.S. Army Advanced Rotorcraft Transmission program. This program uses split-point, face-to-gear configuration concept (Ref. 1). compared to the usual design with spiral-withering gears, split-moment, face-gear design showed significant advantages of weight saving. Also, the use of face gear allows a wide range of possible configurations with technical and economic benefits (Ref. 2). 18 Design against fractured tooth interior fatigue (November/December 2000)In a modern truck, gear teeth are among the most stressful details. Failure of the tooth will seriously damage the transmission. Over the years, the experience of designing gear teeth has been gained and assembled into standards such as DIN (Ref. 1) or AGMA (Ref. 2). Traditionally, the design of the gears considered two types of failures: fatigue from bending the root of the tooth, as well as contact fatigue. Requirements for lighter and silent transmissions gave birth to new types of failures. One new type of failure, fractured tooth fatigue (TIFF), has previously been described by MackAldener and Olsson (Refs. 3 & 4) and is further studied in this paper. 19 Fundamentals of Spiral Bevel Gears (January/February 2001)This article also appears as Chapter 1 in the publication of Gleason Advanced Technology Bevel Gear Corporation. Gear principles in cylindrical and straight gearbox gearboxes The purpose of transmission is the transfer of movement and the moment from one shaft to another. This transmission is usually with a constant ratio, the lowest possible violations and the highest possible efficiency. The profile of the tooth, length and shape come from these requirements. 20 Calculation of optimum surface carbon content for hardened gear cases (March/April 2001)For high-quality carburetor, hardened enclosures, carbon control in a cramped enclosure is essential. While tight carbon control is possible, vies on the fact that optimal carbon levels to target may be wider than tolerance. 21 Load distribution in planetary gearboxes (May/June 2001)Two-layer planetary gear drives are power branching transmissions that lead to power from the entrance to the output shaft in several parallel ways. Part of the power is transmitted without loss as clutch power. This leads to high efficiency and high power density. These advantages can be used optimally only if the uniform distribution of the load to individual branches of government is ensured. Static excessive constraints, production deviations, and internal dynamics of these transmission gears hinder the balance of load. With the help of complex syming programs today, you can predict the dynamic behavior of such programs. The results of these studies consolidate the equation of approximation to calculate load factors... 22 Material properties and performance considerations for high-speed steel gear cutting tools (July/August 2001)Users of gear cutting tools probably don't often consciously consider the raw material from which these broths, broths or razor are made. However, rudimentary awareness of different classes and their properties can allow tool users to improve the performance or life of their tools or solve tool mistakes. High-speed steel from which the tool is made is certainly not the only factor influencing tool performance, but as a raw material, steel may be the first place to start. 23 Low vibration design on Helical Gear Pair (January/February 2000)Helical gear pairs with narrow face width are theoretically classified into three categories above the domain of the contact diet, on whose abscission is a transverse contact diet and whose ordination is an overlapping contact factor. There is a direct link between the magnitude of the vibration and the deviation of shaft parallelism. To clarify the effect of tooth deviation types on the vibrational behavior of helious pairs, performance circuits are introduced on vibrations. pair acceleration levels are shown contour lines on the contact factor domain. Finally, the performance of gears with biased and biased modifications is discussed taking into account the effect of deviation of shaft parallelism using the developed simulator naxlial gearbox. It becomes clear that there is an asymmetrical feature regarding between the vibrational value of the gear steam and the direction of each deviation. 24 What Lightness Shows Bevel and Hypoid Gears (September/October 2001)The configuration of the correction of the flank on the underpass is subject to relatively narrow restrictions. As for the set of gears, the requirement is the maximum possible collision zone to minimize the compression of the flanks. However, it is necessary to have sufficient reserves in the depth of the tooth and longitudinal direction to shift contact with teeth. From the machine - and especially from the tool - point of view, there are limits to the type and magnitude of the wedding that can be implemented. The wedding is a circular correction. Different types of wedding differ in their direction. The length of the wedding, for example, is a circular (or 2nd order) removal of the material, starting from the control point and expanding into the length of the tooth or the width of the face. 25 Face Gears: An interesting alternative for special applications - Calculation, production and use (September/October 2001) Crown gear is not a new type of gear system. On the contrary, they have been in use since very early times for various tasks. Their oldest form is that of an asterisk drive found in ancient Roman watermills or Dutch windmills. The first principles of gear geometry and simple production methods (skater cutting) were developed in the 1940s. In the 1950s, however, the importance of crown gear declined. Their tasks were, for example, taken over by slime gear, which were easier to manufacture and could transmit greater power. The current subject literature respectively contains very little information about crown gears, aimed mainly at specifying their limitations (ref. 1). 26 Changing the profile in the outer parallel axis of Cylindrical involute Gears (November/December 2001) At the beginning of the practice of involute gear, virtually all transmissions were made with teeth in standard connection with the reference circle of the pitch. This has the advantages that any two gears of one step, angle and angle of pressure can work together, and that geometry calculations are relatively simple. It was soon implemented, however, that there are greater benefits to be gained by changing the bond of the teeth with the benchmark pitch circle. Changes are called profile offset. 27 Taking into account the moving load of the tooth in Gear Crack Propagation Predictions (January / February 2002)Effective gear designs balance strength, durability, reliability, size, weight and cost. Even efficient designs, however, may be able to switch cracks due to fatigue. In addition, truly reliable designs consider not only the initiation of cracks, but also the trajectory of crack spread. As an example, crack trajectories that spread through the gearbox tooth are a better failure mode compared to spreading through the gear rim. The failure of the 3D will lead to catastrophic events and should be avoided. Analysis tools that provide for ways to spread cracks can be valuable to prevent such catastrophic disruptions. 28 3-D end-of-element analysis of long-fiber reinforced composite Spur Gears (March/April 2002)This article describes a method and computer program that were designed for 3-D end-of-element analysis of long-fiber reinforced composite jerk gears in which long fibers are arranged along dental profiles. For this design, the gear consists of two areas; namely long fiber reinforced and crushed fiber reinforced regions. 29 Increase the load capacity of worm gear by optimizing the bronze worm wheel (May/June 2002)The service life of worm gear typically deciphers bronze worm wheels. Below are some optimized cast bronzes that lead to a doubling of wear resistance. 30 Optimize the geometry of plastic gears: Induction to gear optimization (May / June 2002)There are numerous engineering estimates needed to design gear sets for optimal performance regarding the power of the moment, noise, size and cost. How much cost savings and added gear performance are available through optimization? Cost savings of 10% to 30% and 100% of the added capacity are not unusual. The contrast is more pronounced if the original design was prone to failure and not suitable for function. 31 Gear Surface Durability Development to increase transmission power density (July/August 2002)Gear pitting is one of the main failure modes of car transmission gearboxes. In recent years, many alternatives have been designed to improve their durability of surface gear. However, due to the nature of developing the new process, it takes a long time and collaborative effort between the development team and suppliers to investigate and test each new approach. 32 Direct Gear Design for Spur and Helical Involute Gears (September/October 2002) Modern gear design is usually done against standard tools. This makes the gear design quite simple (almost like a selection of fasteners), economical and accessible to all, reducing the cost of toolkit and inventory. At the same time, it is well-known that universal standard tools provide transmission with less optimal performance and - in some cases - do not allow you to find acceptable gear solutions. The application indicates, including low noise and vibration, high power transfer density (lighter weight, smaller size) and others, require transmissions with non-standard parameters. That's why, for example, aviation gear transmissions use tool profiles with custom proportions such as pressure angle, app and whole depth. The following considerations make the use of non-standard gears suitable and cost effective: 33 Predicting the reaction to the thermal treatment of helical gear (November / December DANTE software, finium simulation was developed and executed to study the response of carburetor steel 5120 helium equipment to quench in molten salt. Computer Computer included warm-ups, chasing, transferring and immersing them in a molten salt bath, quenching and cooling the air. The results of the simulation included carbon distribution phases, resizing, hardness and residual stress throughout the process. The projected results were compared with measured results for hardness, measurements and stress residues. The excellent agreement between forecasts and measured values for this 5120 carburetor steel gearbox provides the basis for assessing different process parameters and their corresponding value in the characteristics of not only these heat treatment parts, but also other compositions and shapes. 34 Engineered Gear Steels: Review (November/December 2002)Choosing the right steel for this gear application depends on many factors. This work discusses many aspects related to material, design, production and variable applications. The results of several studies on optimization of the structure of the alloy for processing and inspection of gas and plasma carburetors. 35 Impact of material defects on Gear Perfomance – Example study (March/April 2000)The quality of material used for highly loaded critical gear is of utmost importance in achieving their full potential. Unfortunately, the role played by material defects is clearly not clear to many gear designers. The mechanism by which disruptions occur due to material defects is often sage and not easily obvious. Overall, however, the failures associated with material defects show characteristics that indicate the source of the underlying problem, the mechanism by which the glitch was initiated, and the manner in which it progressed to a component failure. 36 Reverse engineering of pure involution cylindrical gears using conventional measuring instruments (January/February 2000)Gearbox design involves significant efforts in determining geometry that meets the requirements of carrying capacity, reliability, durability, size, etc. When the goal is to develop a new set of gears, there are many alternatives to design, and the designer has the agency among them. Reverse engineering implies an even bigger challenge to the designer, because the problem involves already manufactured gears, the geometry of which is usually unknown. In this case, the designer needs to know the exact geometry of the actual gears in order to have a link to the design. 37 Experimental research of gear teeth bending fatigue (January/February 2003)The effort described in this paper concerns the desire in the gearbox to increase power density and reduce gearing costs. To achieve these goals, new materials and production processes used in the production of gears are evaluated. In these efforts, the primary task is to compare the performance of use of current materials and processes. However, once this priority is met, it quickly turns into a requirement of accurate design data to use these new materials and processes. This paper describes efforts to address one aspect of this design data requirement. 38 Impact of gear design on gearbox Radiated noise (January / February 1998)The main source of noise of the helicopter cockpit (which was measured at the sound pressure level of 100 decibels) is the gearbox. Reducing this noise is the goal of NASA and the U.S. Army. The requirement for the Army/NASA Advanced Rotorcraft Transmission project was to reduce noise by 10 dB compared to current designs. 39 Basics of Hobby Part II (November/December 1993)This is Part II of the two-part series with the basics of a hobby gearbox. The part I discussed was the selection of the correct type of hobbling operation, the design features of the plates and the accuracy of the plate. This part will cover sharpening errors and finish the plate design recommendations. 40 Designing hardened and terrestrial spur gears to work with minimal noise (May/June 1994)When developing hardened and terrestrial gear spurs to work with minimal noise, what parameters should be considered? should be apply a tip and/or root relief on both wheel and pinion or only one member? When the pinions are enlarged and it reduces the wheel, should the tip be applied? What is the effect on strength, wear and tear and noise? For given coefficients with enlarged pins and reduced wheels, how can you check or adjust the gearbox size to ensure the best combination is achieved? 41 Minimizing the backlash at Spur Gears (May/June 1994) simplified equations for the backlash and roll of the distance test centre. Investigate unknown errors in the size of the tooth. Master gear design is outlined, and an alternative to the master method of gear is described. Re-erration defects in the test radius method. Procedures for calculating backlash and preventing significant errors in measurement are presented. 42 How many mice are needed to develop gear (January/February 1995)Gear design has long been a black art. Modern alchemists of the gear store are often achievable to solve problems with the combination of knowledge, experience and good luck. In many cases, trial and error are the only effective way to design gears. While years of experience produced standard gearboxes that work well for most situations, today's requirements for quieter, more accurate and durable gears often force manufacturers to look for alternative designs. 43 Impact Web &Thickness Flange's non-metatal transmission performance (November/December 1995)Gears are produced with thin discs for several reasons. Steel gearboxes are made with thin rims and likenesses, where low weight is important. Non-metallic gears made by injection molding are designed with thin discs as part of design rules to maintain uniform thickness even post-mold cooling. When finely edified gear fails, the fracture is considered the root of the gear, as shown in Fig. 2. 1b. 44 Structural implications for Sheiter cutter (July /August 1996)The gear cutter is actually a gear with freed cutting edges and an enlarged application to provide clearance at the root of the cut gears. The maximum outer diameter of such a cutter is limited to the diameter at which the teeth become pointed. The minimum diameter occurs when the outer diameter of the cutter and the base circle are the same. These theoretical extremes, combined with lateral clearance, which typically is 2 degrees for rough crocuses at 1.5 degrees for cutters approximately 24-step and thinner, will determine the theoretical width of the cutter's face. 45 Plastic Gear Design Basics (July/August 1996)Plastic gears are serious alternatives to traditional metal gear in a wide variety of applications. The use of plastic gear has expanded from low power, the accuracy of traffic transmission to more demanding power transmission programs. As designers push the limits of acceptable applications of plastic gear, they will learn more about the behavior of plastics in gear and how to take advantage of their unique characteristics. 46 Tooth modification and Spur Gear tooth strain (September/October 1996)The main source of helicopter cockpit noise (which was measured at sound pressure levels in more than 100 decibels) is the gearbox. Reducing this noise is the goal of NASA and the U.S. Army. 47 Powder Metal Gear Design and Inspection (September/October 1996)Powder metallurgy (P/M) is a precision metal formation technology for making parts into a clean or almost clean shape, and it is particularly good for gear production. Spurs, smog and helium gears can all be done by powder processing metallurgy. 48 Kish Method for Dermination of Hunting Mesh (May/June 1997)When designing a gearbox, engineers usually want gear teeth (Ng) and pinion (Np) in a hunting net. Such a mesh or combination is defined as one in which pinion and gear do not have a common divisor on the primer. If the grid is hunting, the pinion should make Np x Ng revolutions before the same pinion tooth nets with the same gear space. It is often easy to determine whether the mesh hunts, first determining whether both pinion and gear teeth will be divided into 2,3,5,7, etc. (simple numbers). However, in this era of computerization, how is one computer program to test hunting teeth? A simple algorithm is shown below. 49 Gear teeth with bytes (January/February 1998)Computers everywhere. He got so that it's hard to find an employee who doesn't use it during his day - whether it's a CEO or a salesman, an engineer or a machinist. Wherever you look, you'll find acquaintances bright glowing screens. And despite the traditional reluctance of the gear industry to embrace new technology, more and more of what you'll find on these screens is gear. 50 Cast Iron: Solid Choice to Reduce Gear Noise (September /October 1999)The choice of material could play an important role in the ongoing battle to reduce gear noise. Specifying tighter overall tolerances or redesign gears are the most common approaches design engineers take to minimize noise, but any approach can add cost to the finished part and strain the relationship between the engine store and the end user. A third, but often overlooked, alternative is to use material that has high noise dampering capabilities. One of these materials is cast iron. 51 Impact of planetary transmission coefficient on average lifespan (July/August 1998)Planetary transmission gears are compact, high-speed speed gearboxes that use parallel load paths. The range of possible reduction coefficients is limited from the bottom and above the limits on the relative size of the planet's transmissions. For a single-car transmission, the planet's gear is not the size of a sun and a ring. What ratio is best for planetary contraction can be solved by studying a number of optimal designs. In this series, each design is obtained by maximizing the life of a planetary transmission with a fixed size, gear ratio, input speed, force and materials. The lifespan of the planetary gearbox is modeled as a function of two-dimensional distributed service life bearings and gears in contraction. The planet carrying life greatly affects the optimal reduction in life, indicating the optimal planetary ratio of contraction in the region of four to five. 52 Designing reliability in industrial gear drives (September / October 1998)The main goal in the development of reliable gearboxes is to avoid failure. Avoiding failure is just as important for the manufacturer and designer as it is for the end user. Many aspects should be taken into account in order to maximize the potential reliability and performance of the installed gear. 53 ISO 6336-5: Strength and quality of materials (January /February 1999)This is the fourth and final article in the series studying the new standard of rating of transmission ISO 6336 and its calculation methods. The opinions expressed in this are the opinions of the author as a person. They do not represent the opinions of any organization of which he is a member. 54 Metallurgical aspects to be considered in Gear and Shaft Design (March/April 1999)In his Gear Design Handbook (Ref.1), Dudley argues (or understates): The best gears of people around the world are now coming to the realization that metallurgical quality is just as important as geometric quality. Geometric accuracy without metallurgical integrity in any heavily underlined gear or shaft will result in to wasted efforts for all stakeholders - gear builder, gearboxes, and the customer - as the life cycle of the component will be prematurely shortened. A car gearbox or shaft with improper surface hardness, case depth or core hardness may not even complete its main warranty period before completely failing at great expense and loss of prestige for the manufacturer and customer. An unexpected early failure of a large industrial gear or shaft in a coal mine or mill can lead to lost production and revenue, while the machine is down because spare components may not be available. Fortunately, this scenario is not common. The most reputable manufacturers of gear and shafts around the world would never neglect the metallurgical quality of their products. 55 Fatigue Aspects of the case hardened gears (March / April 1999)Efficient and reliable transmission of mechanical power continues, as always, to be a central area of concern and study in mechanical engineering. The transfer of power involves the interaction of forces that are transmitted by specially designed components. These components should, in turn, withstand the complex and powerful stresses developed by the forces involved. Teeth pass the load through a complex process of positive slipping, rolling and negative sliding of contact surfaces. This contact is responsible for the development of stress bending at the root of the teeth of the teeth of the gear teeth, and the contact emphasizes the contact flanks. 56 Specifying custom gear (May/June 1999) Gear design and specification is not the same. They are the first two steps in making gears. The designer sits down and mathematically identifies the gear tooth, working with the basic gear pitch, the angle of pressure he wants to use, the number of teeth he wants, the lead, the thickness of the tooth, and the outside, shape and diameters of the root. With this data, the designer can create a mathematical model of gear. At this point, it will also decide whether the gear will be made from existing cutting tools or whether new tools will be needed, what materials it will use, and whether it will have the termia of gear processed and finished. 57 Tips for Increasing Power Density in Gear Trains (May/June 1999) Gear designers today are constantly challenged to provide more power in a smaller space and improve gear performance. The following article discusses some of the most common ways to increase capacity density or improve train gearbox performance. The author will also take a deep look at the body of a steel worm mating with plastic helic gear, and is exploring ways to optimize this increasingly common configuration. 58 Gear Technology Development and Gearing Theory (July/August 1999)I must admit that after fingers through pages of this relatively compact volume (113 pages, 8.5 x 11 format), I read its three chapters (gear theory, and technology, and from back to front. This will become apparent later in this debate why I encourage most gear engineers to adopt the same reading sequence! 59 Vectors at Gear Design (July/August 1999)Friction weighs heavily on loads that auxiliary gearbox logs must withstand. Not only does grid friction, especially in worm gear drives, affect log loading, but the friction in the log is reflected in the loads required for the grid itself. 60 Design for Silence: New Concepts and Methods of Industrial Gear (September/October 1999)For a long time relatively high noise levels have been common for industrial gearboxes in the 10-100 kW power range. However, due to a change in environmental awareness - both at and around industrial sites - customer expectations have moved dramatically toward low noise as a key differentiating factor. 61 Cutting hardened gears (November/December 2002)The need to improve gears that use gears and gearboxes with smaller dimensions and with less noise generation has left manufacturing engineers looking for different gear handling techniques. This search led to the demand for hardened gear. 62 Alignment of high-speed gear (January / February 2003)This paper considers the need for detailed specification, design and production to achieve the necessary results in the service. Accurate determination of the duty rating and careful understanding of environmental conditions, whether in marine or industrial application, is necessary to predict the reliable performance of the gearbox through its service life. An example relating to sophisticated maritime gearboxes and other general practice is presented to review the techniques used by Allen Gears to design and develop a gearbox that integrates with the requirements of the entire installation of the technique. Allen Gears has extensive experience in developing various industrial and marine gear (Ref. 1.2). 63 Basics of Hobby Part I (September/October 1993)The hobbling process The hobbling process involves a slab that threads with lead and rotates in conjunction with gears empty in a ratio dependent on the number of teeth to be cut. One 40-tooth cut carving will make 40 spins for each gear revolution. The cutting effect in the hobby is continuous, and teeth are formed in one passage from the pig through the workpiece. Figure of a typical plate with a common nomenclature, see. 64 2017 Gear Expo: Gears, Machinery and more (August 2017)There is much more to the Gear Expo than the gears or machines that make them. This is because it takes much, much more to make a ready-made transmission than even the most sophisticated machine. And it is exhibitors who are part of the many, many, more that are addressed in this article. 65 Rules of optimal basic design Gears (May 2016)Bevel Gear Technology Chapter 6 66 Gear Backlash Analysis of unloaded transmission pairs (June 2016)Best practice in gear design is to limit the amount of backlash to the minimum value required to accommodate production tolerances, mixes and deflections to prevent the unmanageable side of teeth to make contact and rattle. Industry standards such as ANSI/AGMA 2002 and DIN3967 provide benchmark values of minimal backlash for use in gearbox design. However, increased customer expectations in vehicle noise have pushed the backlash and permissible production tolerances to even lower limits. This is especially true in the truck market, where engines are quieter because they run at lower speeds to improve fuel economy, but they often work at high levels of vibration. In addition, gearboxes and dumps in gearboxes have become more sophisticated due to increased speeds and improved efficiency. Determining the minimum amount of backlash is quite a challenge. This paper presents a study of the minimum values of the backlash of the teeth of the subtoro teeth applied to the lightweight transmission of the pickup truck. The analytical model was designed to calculate the backlash of each pair of gears' limitations when no load is transmitted, and is thus sensitive to rattle noise generation, through different transmission routes. The statistical approach (Monte Carlo) has been used because a significant number of factors affect the backlash, such as changing the thickness of the tooth; change of distance in the center; lead; variations of running and pitch; bearing gaps; spline gaps; deflections of shafts and skews. The analytical results identified a critical pair of gears and a forceful path that was experimentally confirmed on the transmission. The approach presented in this paper can be useful for designing gear pairs with a minimum amount of backlash, to prevent double contact with the flank and to reduce rattle noise to the lowest levels. 67 Hybrid Hercian and FE-based Helical Gear-Loaded Tooth Contact Analysis and Comparison with FE (July 2016)Analysis of dental contacts loaded with teeth is an important tool for designing and analyzing gear performance in transmission and drive systems. Methods of calculating the conditions of tooth contact have been discussed in the literature for many years. Perhaps the method you used underestimates the transmission error in helix gears. That's why. 68 Helical Gear Systems (August 2016)In terms of tooth thickness, should I use the wording regarding a normal or transverse coordinate system? When normalizing this thickness in order to normalize the backlash (backlash parameter), it should be divided into a circular step. Thus, when normalized, if this circular step is defined in the normal or traverse coordinate system, depending on what formulation was Is the parameter of backlash in relation to the tangential plane or normal plane for helium gear always determined? 69 Innovative steel design and machining of advanced engineering steels (August 2016)Growing requirements in the automotive industry for weight loss, fuel efficiency and carbon footprint reduction must be addressed urgently. Until now, widely used conventional steel has met expectations. However, with tougher emissions standards, material requirements are increasing. It is expected that the materials will be performed better, which will lead to the need for increased fatigue. The ability to increase the moment on current generations without design changes can be achieved by selecting appropriate materials. 70 Analysis and optimization of the contact ratio of asymmetric transmissions (March/April 2017)This article presents an analysis of asymmetric tooth gears taking into account the effective coefficient of contact, which is also affected by the bending and deflections of the contact tooth. The goal is to find the best solution for highly efficient gear drives that would combine high load capacity and efficiency, as well as low transmission error (affecting gear noise and vibration). 71 Gear Design Reconstructed (May 2017)How difficult is it to design gear? It depends on whom you ask. 72 Gear teeth as bearing surfaces (May 2017)The reader wonders about gears where the tops of the teeth are a bearing surface as used in jerk gearshifts. Do they require any special design or finish? 73 Calculation of bending strength based on gears inclusion (May 2017)Reduced component weight and ever-increasing power density require transmission design on the material capacity boundary area. In order to use the potential offered by modern building materials, methods for calculating the strength of components must rely on a deeper understanding of fracture and material mechanics as opposed to empirical and analytical approaches. 74 Designing very strong teeth with high pressure angles (June 2017)The purpose of this work is to present the method of designing and defining teeth teeth of teeth of teeth with much higher bending and strength of contact with the surface (reducing the level of bending and stress of contact with the surface). This article will show calculation procedures, mathematical solutions and theoretical background equations for this. 75 FE-based approaches for tip relief design (August 2017)Deformation of teeth teeth gear due to load conditions can lead to premature mesh of teeth. This irregular tooth contact causes increased stress on the side of the tooth. These adverse effects can be avoided with defined modifications on the flank developed through FE-based dental contact analysis. 76 Non-involving gear, and production compared to installed gear designs (January / February 2015)Introduction of standard profile form in cylindrical transmissions is involutionary. Involution generated trapezoidal stand is the basis for light and production-resistant manufacturing (fig. 1). 77 Gear Expo 2017 and ASM Heat Treat 2017 Booth Previews (September/October 2017)The latest technology on display in Columbus, Ohio. October 24-26. 78 Helping Software Developers Help You (November/December 2017)A key part of gear design software development is customer feedback. With the right feedback, you can get the software developer to work to provide the most supporting features. 79 Plastic Gear Design remains in the process (July 2018)Despite the development and availability of a number of new engineering, durable materials designed to apply plastic gear, some engineers/designers continue to believe that the metal is better. 80 Growth in Australian regenerative load tests (January/February 2019)Historically, manufacturers of original gearbox equipment (OEMs) and repair organisations tend to offer their customers load-free, full speed (spin) tests as a standard performance test. If a load test was specified, the supplier would likely offer a blocked simulated load test, requiring extensive investment in the toolki to connect swathes of test and slave gearboxes. 81 Knowing the system (June 2019)More than ever it is important to understand the full system into which your individual components go. Here's the latest in how software developers help you do it. 82 Optimizing bevel Gears' operational behavior through a tolerance-based approach (August 2019)Authors use data analysis to determine which tolerances have the greatest impact on a transmission error, allowing them to make adjustments and reduce production costs. 83 Design Options for spline connections (September/October 2019)This article provides recommendations for choosing the appropriate standard due to the type of spline to be developed and manufactured. Some basic formulas have been explained, along with a strategy on how to find a standard tooling by calculating the corresponding profile change factor for the spline to be developed. 84 Bevel Gear Generators Get Better with Age (January/February 2020)The Economic Modernization Program gives the tried and true Gleason No 102 Coniflex generators a new lease on life for fast, reliable production of smaller precision straight gearboxes in front. 85 Analysis of bevel Gear damage forecasting over service life (March/April 2020)FVA software offers simulation and calculation of transmission systems. 86 Optimal design of polymer gear: Metal to plastic conversion (May 2020)Currently, progress in polymeric materials and treatment of injection molding allowed to dramatically increase the use of plastic gear. They not only for lightly loaded traffic gear, but also in moderately loaded power drives in automotive, agriculture, medical, robotics and many others 87 Idler Gears (May 2016)What's the point of using two retrievers in a gearbox? 88 Production of directly designed gears with symmetrical and asymmetrical teeth (November/December 2014)Compared to the traditional approach to gear design - based on pre-selected, usually standard rack generation parameters - direct Gear Design's alternative method provides certain benefits for non-standard, highly effective gear drives. 89 Design reliability and its impact on transmission error and other design parameters (March/April 2003) Transmission errors, axial locking forces, and friction lead to load-bearing forces that serve as the main excitations of gear noise. This article will use these factors as well as stress gear and triblogic factors to assist in getting optimal gear designs. 90 Gear Gods help those helping themselves (January/February 2013)Gear Train is a new section of Gear Technology dedicated to learning and education in gear. For the first installment, we focused on AGMA's online and video training programs. 91 Determination and optimization of the contact model of the worm mechanism (March/April 2003)The load capacity of the worm gear is mainly affected by the size and position of the contact pattern. 92 Large estimates and radial cracks on hardened gears (May/June 2003)In the last couple of years, many research projects have dealt with determining load limits for cylindrical worm gear. These projects were primarily focused on the load capacity of the worm wheel, while the worm was abandoned. This contribution presents research on losses such as large estimates and radial cracks on the flanks of hardened worms. 93 The design of the high contact coefficient Spur Gears Cut with standard tools (July/August 2003)In high accuracy and heavily loaded spur gears, the effect of the gear error is negligible, so periodic change in tooth stiffness is the main cause of noise and vibration. High contact jerks for the diet of contacts can be used to exclude or reduce changes in tooth stiffness. 94 Direct Gear Design: Bending Stress Minimisation (September/October 2003)The stress bending assessment in modern gear design is usually based on Lewis's more than a hundred-year equation. 95 Local 3-D flak form optimization for Bevel Gears (September/October 2003)Optimizing the running behavior of spids and hypoid gears means improving both noise behavior and lifting capacity. Since the deflection of the load changes the relative position of the pin and the ring transmission, the position of the contact pattern will depend on the moment. Different contact positions require local optimization of the 3-D form flank to improve the set of gears. 96 Solid model of generation of involution cylindrical gears (September /October 2003)This paper presents approximate precise methods of generating solid models of involution cylindrical gears using Autodesk Inventor 3-D CAD CAD 97 Stress planet Gears with thin discs (March / April 1994)This article examines the relationship between the load on the fillet on the thin rim of the planet gears, the radial clearance between the gear rim and the gearbox, the load of the tooth, the thickness of the rim, the radius of the curvaceous central line of the rim, the width of the face and the module. 98 Profile change (August 2012)Three experts decide on a profile change in the edition of this issue Ask an Expert. 99 How to minimize power losses in transmissions, bridges and steering systems (September 2012)Increasing the number of gears and transmission-coefficient spread, the engine will work with better fuel efficiency and without losing driving dynamics. The very efficiency of transmission can be achieved with the help of: the use of fuel and economy transmission oil; optimization of lubricants and pumps; improvement of gear offset and optimization strategies; and optimization of bearings and seals/gaskets. 100 Central Distance Variations for Internal Gears (October 2012)Although external involution gears are very tolerant of central distance variations, what are the central distance limits for internal gears? 101 DFM Crucial for Gear Industry Success (March/April 2013)Manufacturability Design (DFM) is an established practice necessary to implement the successful transformation of concepts into mass transmissions and motion control devices. And yet, too often the issues that could have been avoided were determined very late in the process, affecting production costs and schedules. This suggests that key DFM principles are often under-caused in practice and do not apply consistently - or as appropriately - to avoid these negative outcomes. 102 Small-Module Gear Design (November/December 2014)Gears with a diameter height of 20 or more, or module 1.25 millimeters and below, are called thin increments or low-brown gears. The design of these gears has its own specificity. 103 Angle of working pressure (May 2013)What is the difference between the angle of pressure and the angle of working pressure? 104 Gear design optimization for low contact temperature of high-speed, non-lubricated Spur Gear Pair (May 2013)The approach of optimizing gear design to reduce tooth contact temperature and noise of high-speed jerk pairing of gears operating without lubricant is applied. The optimal search for gear design was done using the Run Many Cases program. Thirty-one of the more than 480,000 possible gear designs were ranked, based on low contact temperature and low transmission error. The best design of the gear was chosen taking into account its manufacturability. 105 New methods for calculating the load capacity of beveled and hypoid gears (June/July 2013)Breakdown on the flank is common in a number of cylindrical and skirting gear applications. This article introduces a suitable, physically based calculation method to assess the risk of flak breakdown risk of pitching. root design This new method is demonstrably shown by testing. 106 Root Tooth Optimization of Powder Metal Gear – Reducing Stress From Bending and Transitive Loads (June/July 2013)This article will provide examples of stress levels from conventional root design using a stove and stress levels, using an optimized root design that is now possible in making PM. The paper will also explore how PM can reduce stress at the root from transitive loads generated by abusive driving. 107 Automotive Transmission Design using full powder metal potential (August 2013)To replace metal with powder metal (PM) car transmission, pm gear design differs from its cove counterpart. Indeed, a complete reconstructive and reconstructive design is required to better understand and document solid fuel performance parameters against PM gears. Presented here is a reconstructed (rebuilding 6-speed manual gearbox for the 4-cylinder Opel Insignia, a turbocharged 2-liter 2-liter engine with a capacity of 220 hp/320 N-m), showing that replacing another microgeometry of PM gearshift teeth - combined with Young's lower module - theoretically increases performance compared to solid 108 Lightweight Design for Gear Planetary Gear Gear (September 2013)There is a great need for future powertrains in automotive and industrial applications to improve their efficiency and power density, reduce weight and inertia. It is accepted that planetary transmissions have a number of advantages over conventional transmissions, such as high power density due to power separation using multiple planetary gears. This paper presents planetary gear transfers optimized in terms of efficiency, weight and volume. 109 Innovative Concepts for Grinding Wind Power Gears (June 2009)This article shows the latest developments to reduce overall cycle time in grinding wind power gear, including the use of both profile grinding and threaded wheel grinding. 110 Planet Carrier Design (January/February 2014)With all the benefits of building a float into a planetary gear system, what are the advantages of using media in the first place, not just with your planets floating in the system? 111 Gear Ratio Epicyclic Drives Analysis (June 2014)It has been documented that epicyclic gear stages provide high load capacity and gearbox compactness. This article will focus on the analysis and design of epicyclic gear mechanisms that provide extremely high gear ratios. Indeed, a special, bi-dream planetary solution can use a gear ratio of more than a hundred thousand to one. This article is an analysis of such unusual drive transmission mechanisms and defines their basic parameters, and transmission of the ratio of maximization of approaches. It also demonstrates numerical examples, existing designs and potential potential 112 Application and improvement of determination of face load factor based on AGMA 927 (May 2014)Face load ratio is one of the most important parameters for the rating of gear strength. Current standards offer formulas for the face load factor, but they are not always accurate. AGMA 927 offers a simpler and faster algorithm that does not require calculating contact analysis. This paper explains how this algorithm can be applied for gear evaluation procedures. 113 Maximum service life Spiral tilt reduction design (September/October 1993)Optimization is applied to the spiral tilt gearbox design for maximum life at a given size. The modified algorithm for finding stronger directions allows for a wide variety of limitations of inequality and precise design requirements that must be met with low sensitivity to the original values. The strength of bending the gearbox tooth and the minimum diet of contact under load are included in the active restrictions. The optimal design of the spiral gearbox from the slope includes the choice of bearings and shaft proportions in addition to the gear mesh parameters. The life of the system is maximized with a fixed distance of the rear cone of the spiral gearbox set for a given ratio of speed, angle of the wall, input torque and power. Significant parameters in the design are the spiral angle, pressure angle, the number of teeth on the stiletto and gear, as well as the location and size of the four supporting bearings. Interpolation mnogans extend discrete bearing properties and proportions into continuous variables to optimize gradients. Finding continuous optimality, the designer can analyze almost optimal designs for comparison and choice. Examples of the design show the impact of bearing life on the parameters of the gear in optimal configurations. For fixed distance rear cones optimal designs with larger angles of shaft have a longer service life. 114 European Rack Offset Ratio 'X' for Americans (July/August 1993)The use of dimensionless factors to describe the geometry of gear teeth seems to have a strong appeal for gear engineers. The stressors that me and J, for example, have proven well established in agma literature. Using the rack offset coefficient x to describe nonstandard gear ratios is common in Europe, but is not often used in the United States. When found in European literature or in manuals for the exploitation of imported machines, it can be a source of confusion with an American engineer. 115 Contact analysis of gears using combined end element and surface integral method (July/August 1993)The complete and accurate solution to the problem of 3D transmission contact has been, over the past few decades, one of the most albeit elusive goals in the engineering community. Even arriving on stage in the mid-seventies fin-off elements techniques failed to produce solutions for either, but the most problems with the gear contact. 116 Innovative way of designing Gear hobbing processes (May 2012)In today's production environment, shorter and more efficient product development has become the norm. Therefore, it is important to take into account every detail of the development process, with a special emphasis on design. For green gear processing, the most productive and important process is hobbing. In order to analyze the design of the process for this work, a production simulation was developed, which is able to calculate the geometry of chips and technological forces based on different models. As an important tool for technology engineers, economic technology and economic analysis is also being implemented. The purpose of this article is to show how an effective process design can be developed as well as an effective process. 117 New developments in TCA and Loaded TCA (May 2007)How the latest techniques and software allow faster spiral and hypoid design and development. 118 Low Loss Gears (June 2007)In most transmission systems, one of the main sources of power loss is the loaded gear grid. This article shows the effect of gear geometry settings on power loss, gear efficiency, load power, and arousal. 119 Non-standard proportions of teeth (June 2007)With the correct choice of non-standard tooth proportions of the tool, standard tools can be used to increase the power of the set of gears with a significant increase in cost compared to the use of special tools. 120 Experience with large high-speed load gearboxes (July 2007)The main theme of this article is the power, high-speed lifting gears in the gear range from 35 MW to 100 MW for generators and turbo compressors controlled by gas or steam turbines. 121 Bits of Software

(January/February 2004)The latest software for designing, designing and producing gears. 122 Hob Tool Life Technology Update (March/April 2009)The method of cutting teeth on cylindrical transmission by the capture process has been around since the late 1800s. Advances have been made over the years in both machines and cutting tools used in the process. This work will examine the life of the cooker tool and many variables that affect it. The paper will cover state-of-the-art cutting materials and coatings, tool design characteristics for the plate, process speed and channels, plate change strategies, wear characteristics, etc. The paper will also discuss the use of a common denominator method to assess the life support of the tool plate in terms of meters (or inches) per tooth plate as an alternative to the instrument of life expressed in parts on sharpening. 123 Calculation of flexibility of the tooth Spur Gear using a comprehensive method of potential (September/October 1985) Calculation of tooth gear flexibility is of interest for two reasons: (a) controls, at least partially, the vibrational properties of the transmission system, hence resistance to fatigue and noise: noise: noise: it controls the distribution of load in contact with several teeth. 124 Longitudinal load distribution coefficient Helical Gears (July/August 1985)The collision lines of the pair of helium gears move diagonally on the faces of the tooth and their length, as a result, varies depending on the rotation of the gears. 125 Dynamic analysis of the direct and involution shape of the tooth (July/August 1985)The effect of the load rate on straight and involuting teeth shapes is studied using several end models of elements. 126 Design and manufacture of plastic gear Part II (July / August 1985)Advances in the processing and installation of thermoplastic transmission techniques together with new design data led to an increase in the use of polymeric materials. information on the state of artistic methods of plastic gear manufacturing is presented and the importance of proper backlash during installation is discussed. In controlled conditions, cast nylon transmissions show 8-14 dBA. lower noise than the three other gear materials tested. 127 Gear Tooth Scoring Design Considerations for Spur and Helical Gearing (May/June 1985)High-speed transmission, powered by low viscosity lubricants, is prone to a failure regime called scoring. Unlike classic opt-out, pitching and breakdown modes, which tend to take time to develop, scoring occurs early in gearbox work and can be a limiting factor in power gear capabilities. 128 Full measurement of gearbox components (July 2018)In today's production environment, many different measuring instruments are used to assess the quality and accuracy of parts. These devices include CMMs, gears, form testers, roughness testers and many others. This requires high machine investment and high processing efforts - especially if a full end-of-line measurement is needed. One approach to reducing quality costs is to incorporate all measurements into one single machine that is suitable and reliable enough to use in production. 129 Design and manufacture of plastic gear (May/June 1985)The use of plastic gear is steadily increasing in new products. This is partly due to the presence of the latest design data. Fatigue from the stress of plastic gears as a function of diametric pitch, pressure angle, step line speed, lubrication and life cycles are described on the basis of test information. The procedures for designing plastic gear are presented. 130 Impact of flexible components on durability, whale, rattle and efficiency of the transaxle gearbox automotive system (November/December 2009)Gear engineers have long recognized the importance of considering systemic factors when analyzing a single pair of gears into the grid. These factors include important considerations, such as load distribution in multi-1000 gearboxes and load-bearing gaps, in addition to flexible components such as enclosures, gear blanks, dumps and carriers for planetary gearboxes. Reducers. in recent years, transmission systems have become increasingly sophisticated - with more gears and components - while quality and expectation requirements in terms of durability, jagging whining, rattle and efficiency have increased accordingly. 131 Analysis of gear tooth stress as a function tooth contact pattern shape and position (January/February 1985)Developing a new computer program strength gear based on the end element method, provides the best way to calculate stress in mous and hypoid teeth gear. The software includes the geometry of the tooth surface and data on the deviation of the bridge to establish a direct link between the stress of bending fillets, stress of the prop slope and the applied moment of transmission. The use of existing software links to other gear analysis programs allows the gear engineer to evaluate the performance of existing and new gear designs as a function of the shape, position and characteristics of the deflection of the tooth bridge. This approach provides a better understanding of how gears respond when loading on subtle changes in appearance without loading the tooth of the contact pattern. 132 True Bending Stress in Spur Gears (August 2007)This paper did an accurate analysis of FEM true stress at the root of tooth spur gears in the gear geometry function. The results confirm the importance of these differences. 133 Effects of Bending Teeth in Plastic Spur Gears (September/October 2007)This paper describes the study of steel-plastic gear transfer and presents a new hypothesis about the guiding mechanism when wearing plastic gear. 134 High-speed gears (September/October 2007)First of all, transmission is not just a mechanical transmission, but is developed in a system that meets several requirements, such as clutch integration, selected output speeds, and managing the highest electronic standards. This article shows the basics for high-speed gear design and a selection of numerous applications in detailed design and operational needs. 135 Design Unit Evaluation of new software from SMT (January/February 2007)MASTA 4.5.1 models are full gear and includes 3-D stress analysis. 136 Face Gears: Geometry and Strength (January/February 2007)There are three different types of gear in angular drives. Most often used disks of smoulations and worms. The sticking gear drives are the third alternative. 137 Application of gears with asymmetrical teeth in the turboprop gearbox (January/February 2008)This paper describes the study and development of the first serial gearbox with asymmetrical teeth profiles for the TV7-117S turboprop engine. The article also presents numerical design data related to the development of this gearbox. 138 Proposal to modify help tips for reducing noise and sensitivity to mesh conditions at Spur Gears (March/April 2006) This article explains a new modification of the tip relief profile for presented gears. The topography offered here is a classic linear modification of the parabolic profile. 139 Three Rs gearbox repairs: repairs, repairs, replacements (August 2018)If it's not broken, don't fix it, goes hoary bromide. But what if the time comes - and it certainly will be - that in fact it broke down? Do you fix it or replace it? And when do maintenance and repair gearboxes arrive at the point of diminishing profits and buying a new one is the answer? 140 Determining maximum loads for drive components in thrust using flexible multi-command system models (August 2017)The use of modern tractors allows you to combine drive and ship stuble functions in one unit, which are separated by conventional ship power systems. The horizontally oriented propeller is supported in a vertically rotated propeller mounted under the ship's hull. The screw can directly or indirectly drive an electric motor or combustion engine. Direct drive requires the installation of a low-saturated electric car in the national glass. This current paper concentrates on indirect actuators, where the drive torque is carried by the stages of tilt gear and shafts from the engine to the screw. 141 Generation of interchangeable 20-degree gear sets with round fillets to increase carrying capacity (July / August 2006)This article presents a new design of a 20-degree gearbox that works interchangeably with the standard 20-degree system and achieves increased flexing strength and therefore load capacity. 142 It's Not the American Dream: Pratt & Whitney GTF engine is now a reality... Video by December 2011 In the August 2008 release of Gear Technology, we ran a story (Speed reducer helps fan technology for Greener Jet Fuel Efficiency) on the then current, extremely complex and protracted development of the Pratt & Jet Turbocharger Whitney (GTF). 143 Model pumping action between the teeth of high-speed spurs and helical Gears (May/June 2004)For high-speed transmission, part of the power loss is caused by the grid. Global assessment is not possible and an analytical approach is needed with estimates of three different origins of electricity losses: friction when contacting the grid, gearshifting and the effect of pumping between teeth. 144 Gearbox Speed Reducer helps fan technology for Greener Jet Fuel Efficiency (August 2008)Today, the ever-evolving global economic engine is, in many ways, a great phenomenon; you know- the upward tide-rise-all-boats, the trickle-down theory of economics is dynamic at work. 145 Wind turbine pitch and Yaw Drive Manufacturers breathe as market slows (January/February 2010)Global wind energy market has seen average growth rate of 28 percent over the past 10 years, according to the Global Wind Energy Council (GWEC), the main problems for supply industry. GWEC also forecasts an average growth rate of 22 per cent over the next five years which, if implemented, will continue to put pressure on turbine component suppliers. 146 Tapping into the wind farm supply chain (January/February 2010)Although commonly considered a late bloom in the call for wind energy weapons, the United States is currently the world's number one wind producer with more than 25,000 MW installed by the end of 2008, according to the Global Wind Energy Council in January 2009. 147 Wind Standard Closer to Completion (March/April 2011)Faithful Gear Technology readers may recall that our July 2009 release contained an update on discussions provided by Bill Bradley. Now, nearly two years later, there is an ISO/IEC wind turbine gearbox standard for the international standard voting project (ballot closes 2011-05-17). 148 Micropiting large gearboxes: Impact of flank modification and surface roughness (May 2011)Most micropitting research is done on small-sized transmissions. This article discusses whether these results also apply to larger gears. 149 Wind turbines: Clean energy but energy efficient (June/July 2011)We talked about energy efficiency with some major players in the field of lubricants, but with a focus on the impact of their products on energy efficiency gears and gearboxes in wind turbines. 150 Comparing test installation results and measuring fields on wind turbine gearboxes (October 2011)This article describes some of the most important tests for prototypes conducted at Winergy AG during product development. This will demonstrate that the results of measurements on the testing facility for load distribution will depart according to the measurements of the turbine. 151 Breakdown on the flank on gears for Energy Systems (November/December 2011)The section on the gear flank can be observed on gearboxes tempered by the zone. This occurs, for example, on symog transmissions for water turbines, on spur gearboxes for wind energy converters and on single- and two-use transmissions for other industrial applications. 152 Gear density Gear density (November/December 2011)This paper presents an approach that provides optimization of both the kinematic location of the gearbox and the geometry of the gear tooth to achieve high-density gearboxes. It introduces dimensionless gearbox volume features that can be minimized by internal gear factor optimization. Different gearbox mechanisms are analyzed to determine the minimum volume functions. It also considers the use of asymmetric tooth profiles of teeth for maximum power density. 153 Full-load tests of large gearboxes using circulation with a lock (September/October 1991)This method of testing large transmission boxes or, indeed, any element of electricity transmission, had numerous advantages and offers the possibility of great saving time, energy and plant if the overall situation to its use. Usually to do this, you need to test several such units, and that they can be conveniently connected to each other in such a way as to form a train with a lock-loop. The power sink is not required, and the drive input system should only get the loss of electricity. The level of circulating power is controlled by the moment, which is applied statically during rotation, and the speed of the drive. The principles, preferences and limitations are described, together with recent experience in the only known wide-ranging use of this technique in Australia. 154 The right tool to work with (August 2017)When the gearbox remanufactoner tries to decide whether to register or replace the transmission, any number of factors can work through their head. Here are some processes of remanufactoryists on how they reach conclusions, what they do, and why you should listen to them. 155 Our experts discuss electronic gearboxes, plus backlash and what to do about it (September/October 1994)Question: In the January/February issue of your magazine, we stumbled upon the term electronic transmission. We've seen this term used elsewhere as well. We understand that this EGB eliminates the change of gears in the transmission line, but not how exactly it is done. Could you explain in more detail? 156 Developing a common productive maintenance system (May/June 1995)There's a reason they call it a catastrophic gearing glest: For example, if a line goes down on a large aluminum rolling mill because the gears kit goes badly, the cost can run to a whopping $200,000 a week. Even with smaller operations, the numbers alone (not to mention all the other problems) can be the plant manager's worst nightmare. 157 New guidelines for wind turbine gearboxes (May/June 1998)The wind turbine industry has suffered from gearbox failures that cause repair costs, legal fees, lost energy production and pollution. 158 Parallel Gear Polishing: &; Theory Application (November / December 2000)The purpose of the transmission drive design is to transit power and traffic at a constant angular speed. Current trends in gear drive design require greater carrying capacity and increased lifespan in smaller, quieter, more efficient gearboxes. Typically, these goals are too long, specifying more accurate transmissions. This combined with the availability of convenient equipment for grinding gears with CNC increased the use of ground gear. 159 Turbine Gearbox Inspection - Stable operation in the shaky wind market (August 2013)Having experienced a worldwide Great Recession, the Global Wind Energy Council (GWEC) predicts continued wind power growth, i.e. an increase in global capacity to 460,000 MW by 2015. 160 How to check the gearbox (September 2013)Although comprehensive on-site gearboxes are desirable in many situations, there may be restrictions that limit the degree of verification, such as cost, time, time, qualified personnel. This article describes the hardware and methods required to perform in-place gearbox checks. 161 Understanding Oil Analysis: How It Can Improve The Reliability of Wind Turbine Gearboxes (November/December 2013)Historically, wind turbine gearbox failures have plagued the industry. However, an effective oil analysis program will increase the reliability and availability of your equipment, while minimizing maintenance costs associated with oil changes, labor, repairs and downway. Here are practical actions to improve reliability. 162 High-speed gearbox thermal behavior (January/February 2016)This paper develops a thermal network model to simulate the thermal behavior of a high-speed single-engine gearbox that is reactively lubricated. 163 Evaluation and optimization of worm gear efficiency (June 2016)This paper describes a comparison of the effectiveness for worm gearboxes with a central distance of 28 - 150 mm, which have a one-time decrease from 5 to 100:1. Performance is calculated according to several standards (AGMA, ISO, DIN, BS) or methods defined in other bibliographic references. It also talks about measuring the moment and temperature at the testing facility — necessary to calibrate the analytical model to predict the effectiveness and temperature of the worm box. Finally, there are examples of experimental activity (measuring wear and friction on blockon-ring tribometer and dynamic viscosity measurements) regarding performance improvement efforts for worm gear drivers, adding fullerene-shaped nanoparticles to the standard PEG 164 Wind Turbine Gearbox Reliability lubricant (June 2017)A large number of wind turbine gearboxes do not meet the expected life of the design, despite the project criteria of the current bearing, standards and certifications of the wind turbine industry. 165 Detailed gearbox computer model reduces design time (March/April 2006)LMS International helped a Fiat subsidiary develop a new dynamic fibro-acoustic forecasting method to reduce design time and engineering costs through accurate transmission noise forecasting during the design phase. 166 Reliable transmission design by automated optimization of virtual prototypes (January/February 2005)Romax Technology automates the design iteration process so that companies quickly appear with the highest quality, most reliable gearboxes. 167 Optimism in wind abounds (January/February 2009)Big gear and wind turbines go together like bees and honey, peas and carrots, bread and butter and - well, you get the idea. The wind is not just big now, it is huge. Wind power means huge things to the energy-dependent world in which we live, and especially great things for gear manufacturers and other American industries. 168 splines (September/October 1990) Engineering design requires different types of gears and splines. Although these components are quite expensive, subject to direct wear and tear, and difficult to replace, gear transmissions and splines are needed for two very simple reasons: 1) Motors have an unfavorable (unfavorable) ratio of the moment to the number of revs. 2) Power usually needs to be transferred along the shaft. 169 The predicted impact of the dynamic load on the life of pitching fatigue for low-computer Spur Gears (March/April 1989)How dynamic load affects the lifespan of fatigue of external spur gears, predicted using NASA's TELSGE computer program. TELSGE has been modified to include an improved gear tooth stiffness model, a rigidity-dynamic load iteration scheme and an analysis of fatigue forecasting for grid gears. The analysis used nasa's gear life model developed by Coy, probability techniques and statistics and dynamic loads of gear teeth to predict life. In general, predictions of life gear based on dynamic loads differed significantly from those based on static loads, with forecasts strongly affected by maximum dynamic load during contact. 170 The diameter of the shape of the gears (May/June 1989)One of the most commonly neglected sections of the gearbox is the definition of shape diameter. The diameter of the shape is that of the diameter that determines the point of transition between the mandatory involinium profile and the fillet of the tooth. Determining this point is important to prevent interference to the tip of the teeth of the viscous gear and ensure proper pre-treatment when the transfer is finished with shaving surgery. 171 New method of designing worm gears (July/August 1989)The first part of this article describes the analytical design method developed by the author to assess the load capacity of the worm gear. The second part provides a brief description of the experimental program and test resources used in CETIM to test the basic assumptions of the analytical method; and determine on the gears and test wheels the limits of the endurance of surface pressure materials that can be used for worm gears. The end of the article compares the results given by direct application of the method and test results. 172 On internal gearing intervention (July/August 1989)As size and efficiency are increasingly important considerations in modern technology, the trend is to use planetary gear instead of worm gear and multistage gearboxes. Internal transmission is an important part of most planetary transmission nodes. In external gears, if the gears are standard (without changing the adsenda), interventions rarely occur. But with internal gear, especially in some new types of planetary gear, such as planetary KHV, planetary Y, etc., (1) different types of obstacles may occur. Therefore, avoidance of obstacles is important for internal gears. 173 173 The approach to designing plastic spurs and helical Gears (November/December 1989)Plastic gears are increasingly used in applications such as printers, cameras, small appliances, small power tools, tools, timers, meters and various other products. Through many variables, an engineer who designs gearboxes on a random basis can find a design process that will be somewhat overwhelming. This article outlines a systematic approach to the development of injectable molded plastic spurs and helium gears. Using a computer software to design plastic gear is introduced as an invaluable design tool to solve complex gear equations. 174 Compter-Aided Spur Gear Tooth Design: Application Guided Approach (November/December 1989)This article discusses the application of a driven approach to computer-sized gearcrews. Methodology of the basis of the index of loading teeth and the environment of the application of gears. He uses the knowledge of the handbook and empirical information to facilitate the process of designing a beginner. The results show that the approach is aligning with the textbook data. However, this technique requires less expert knowledge to come to a conclusion. The methodology was successfully implemented as a module of the size of the tooth of the parallel axis of the gearbox of the expert system. 175 Shaper Cutters-Design & Application Part 1 (March / April 1990)Gear formation is one of the most popular production options in the production of gear. While the gear formation process is indeed the most versatile of all gear manufacturing methods and can reduce a wide range of gears, some types of gear can only be reduced by this process. These are gears closely adjacent to the shoulders; gear adjacent to other gears, for example, on counter-boards; internal gears, open or blind have ended; crown or facial gears; Christmas tree gearbox of strong configuration with a small central groove; racks; parts with filled spaces or teeth, for example, are used in some clutches. 176 Asymmetric gears: Option selection approach (June/July 2012)In many transmissions, the toothed load per flank is much higher and applied for longer periods of time than for the opposite; The asymmetrical shape of the tooth reflects this functional difference. This paper describes an approach that rationalizes the degree of choice of asymmetry (or asymmetry of factor K) to meet different operating conditions and requirements for custom gear drives. 177 Geometric design of internal gear pairs (May/June 1990)The article describes the design procedure for internal gear pairs, which is a generalized form of a long and short adendum system. The procedure includes checking for obstacles, impediments to tip, malnutrition, tip interference during cutting and rubbing during cutting. 178 for skaters - Design and Application - Part 2 (May /June/June Sharpening sharpening of the cutter is very important both during the manufacture and subsequently with repeated coziness after dingying. This process not only affects the quality of the cutter above the cutting edge and the cutting quality of the workpiece, but can also affect the way in which the flow of chips occurs on the face of the cutter if the surface is finished too rough or ripped. 179 Involute Helicoid and Universal Transmission (November/December 1990)Universal transmission is generated by a common rack on the cylindrical, tapered or planar surface, and whose teeth can be targeted parallel to or skewed, centered or sheared, in relation to its axes. Viscous gear axes can be parallel or crossed, do not intersect or intersect, skewed or parallel, and can have any angular orientation (see Fig.1) The paper is a universal transmission. It provides unique geometric properties and a number of applications unmatched by any other element of motion transfer. (See Fig.2) Conical gearboxes can be manufactured by any rail-type tool generator or hobbling machine that has a means of rubbing cutters or working axis and/or coordinating simultaneous traverse and bad movements. 180 Defining the profile of a gear tooth from an arbitrary geometry rack (November/December 1988)This article describes how to obtain jagging gear profiles from the geometry rack (or plate) used to generate gears. This method works for arbitrary rack geometry, including a case where only a numerical description of the rack is available. Described examples of a simple rack, racks with protuberances and broth with root bevel. It also describes the use of this technique to generate boundary elements of the mesh to calculate the strength of the gear tooth and generate end models of elements for frictional analysis of contacts of gear pairs. 181 Lubrication of gears - Part 1 (March/April 1991)This is a three-part article explaining the principles of jagging lubrication. It examines current knowledge in tribology gearbox and is designed for both gear designers and gearboxes. Part 1 classifies gear teeth failures in five modes and explains the factors that the designer and gear operator must consider to avoid gear failures. It defines the nomenclature and provides a list of links for those interested in further research. It also contains an in-depth discussion of tooth failure modes, which are influenced by lubrication and provides methods to prevent failures of the gear teeth. 182 Lubrication of gears - Part II (May/June 1991) This is followed by Part 2 of a three-part article covering the principles of jagging lubrication. Part 2 gives an equation to calculate the thickness of the lubricant film, which determines whether the gears work in the mode of boundary, elastohydrodynamic or full-film lubrication. Equation for the flash temperature of the unit used for is also provided. 183 Lubrication of gears - Part III (July/August 1991)This is the final part of the three-part series on the basics of jagging lubrication. It covers the choice of types of lubricants and viscosities, the use of lubricants and the history of cases 184 Basic Gear Generation Designing the Teeth (September/October 1991)A ready-made gear engineer, a person who is ready for all emergencies, must first of all know the basic design principles. Next, it should be well versed in all sorts of calculations that go under the heading of uninterested trigonometry. 185 Rational procedure for designing minimum-weight transmissions (November/December 1991)A simple closed-form procedure is presented for the design of minimum-weight spurs and ferocious gearboxes. The procedure includes methods to optimize the modification of the application for maximum resistance to pitching and wear, bending strength or scuffing. 186 Constructive recommendations for high-power Bevel Gear systems (January/February 1992)The design of any gear system is a complex, multifaceted process. When the system includes a sivel gearbox, the process is further complicated by the complex nature of the simulators themselves. In most cases, the design is based on an assessment of the ratio required for a set of gears, the total geometry of the envelope, and the calculation of bending and contact stress for the set of gears to determine its carrying capacity. There are, however, many other parameters that need to be addressed if the resulting gear system is truly optimal. A significant amount of data related to the optimal design of the bevel gearbox was developed by the aerospace transmission community as a whole and the helicopter community in particular. This article provides a summary of only a few design recommendations based on this data to provide some guidance on how to design a skirt to get the maximum capacity. The following factors, which normally cannot be addressed in conventional design practices, are presented and discussed in contour form: Integrated gear systems/shaft/bearing The impact of ododa thickness on the tooth resonates with the response of the 187 International Wind Turbine Standard Gearbox Standard (July 2009)Industrial gear standards have been used to maintain reliability through the specification of design, production and inspection requirements. The consensus development of an international wind turbine gearbox standard is an example of when gears can be used in reliable mechanical systems today. This was achieved through progressive changes in gear technology, gear design methods and continuous development and improvement of gearbox standards. 188 Application Analysis (January/February 1993)Question: I heard the timing of the security factor, service factor and application factor used when discussing gear design. what are these factors different from each other? Why are they important? 189 High-tech plates (January/February 1993)Today's high-tech plates are visible different from their predecessors. Gear plates have assumed a different appearance and function with modern technology and tools and material development. This article shows the new products on offer today and the reasons for researching their potential for use in modern gearboxes where they want lower costs and improve productivity. 190 Initial gear design using an artificial neural network (May/June 1993)Many CAD (Computer Aided Design) systems were designed and implemented to produce excellent design quality and improve design performance in the gearbox industry. In general, it is true that most of the design tasks can be performed by CAD systems currently available. However, they can only address the computational aspects of gear design that usually require decision-making as well. In most industrial gear design practices, the initial design is a critical task that significantly affects deliverables. However, the decision to evaluate or change the gear size parameters should be made by a gear design expert. 191 Design of internal helical Gears (March/April 1989)Basically, the design of the inner teeth of helium teeth gear is the same as for external helium gears. Any of the main forms of rack used for external helix gears can be applied to internal helious gears. Internal drive gear, however, has several limitations; not only those that apply to external gears, but also several others that are inherent in internal transmissions. As with the outer gears, in order to ensure the effective action of the tooth, obstacles must be avoided. Possible obstacles on the inner gearbox are as follows: 1. Involution interference. To avoid this, the entire working profile of the inner tooth must be moted shaped. 192 Involutometry Illustrations (November/December 1988)In our final issue of the label in the drawings illustrating The Involutometry of Harlan Van Herpan and S. Kent Riche, were inadvertently missed. For your convenience, we have recreated the corrected illustrations here. We regret any inconvenience this may have caused to our readers. 193 A new approach to computerized design by Spur and Helical Gears (January/February 2005)The application of Dynamic Block Contours allows the designer to predict the quality of gears at the earliest stage of the design process. 194 Involute Gear teeth design (October/November 1984)When developing teeth teeth of teeth, that cannot be clearly understood, the main properties of the curve. An overview of the Fundamental Laws of the Involinium Curve found in the latter issue will help in this regard. It has previously been shown that the involute curve has its origins on the base circle. length, however, can be anything zero at the starting point or starting point to infinity. The problem, therefore, in the development of gear teeth, is to choose this part of the involvation that will best meet all the requirements. 195 Optimal gear tooth microtopography (July 2008)Graphic procedure for choosing optimal combinations of profile and lead modifications. 196 Involute Gears Habitat (January/February 2010)This paper presents a unique approach and methodology for determining the selection limits for gear settings. The area within these limits is called the area of existence of involvation gear (Ref. 1). This work presents the definition and construction of habitats of both external and internal transmissions. Fixed isograms of constant angles of working pressure, contact coefficients and maximum mesh efficiency (minimum slip) isograms, as well as obstacle isograms and other parameters. Habitat allows the location of gear pairs with certain characteristics. Its practical purpose is to determine the parameters of the steam gearbox, which meet specific performance requirements before detailed design and calculations. The scope of the gear with asymmetrical teeth is also considered. 197 Permissible contact stress in Jacking Gear units used in the offshore industry (May 2010)Offshore jackr rig is the barge on which the drilling platform is located. The barge has legs that can be lowered to the sea coast to support the installation. Then the barge can be errant from the water, providing a stable working platform from which oil and gas are drilled. Jack-up drilling rigs were first introduced in the late 1950s. Soon after, rack-and-pinion-type connector was introduced and has dominated the industry ever since. 198 Coronation Technology in Aerospace Actuation Gearing (August 2010)One of the most effective methods in solving the problem of loading the edge through excess displacement and deflection in aerospace transmission is the localization of dental contact by crowning teeth. Regardless of applied load, if the skew and/or deflection is large enough to reduce the contact area to zero, stress becomes large enough to cause failure. Loading the edge can cause teeth or pits to rupture, but too much wedding can also cause teeth to pit due to concentrated load. This paper presents the proposed method of localization of the contact bearing area and calculation of contact stress with the crowning is presented and demonstrated on some real examples in aerospace actuation systems. 199 Performance Experts (September/October 2010)Bradley University and Winzeler Gear collaborate on the design and development of an urban light vehicle. 200 Measurements of directly designed gears with symmetrical and asymmetrical teeth (January/February 2011)Compared to approach to gear design on the basis of Typically, standard rack generating parameters, the Direct Gear Design method provides certain advantages for custom high-efficiency gear drives, which include: increased load capacity, efficiency and service life; reduced size, weight, noise, vibrations, cost, etc. However, the manufacture of such directly designed gears requires not only non-standard instrumentation, but also the adjustment of the methodology for measuring gears. This work presents definitions of the main measurements and parameters of inspection for directly developed spurs and helix, external and internal gears with symmetrical and asymmetrical teeth. 201 Optimal modifications of Gear tooth surfaces (March/April 2011)This paper presents a new method of introducing optimal modifications on the surface of the gearbox teeth - based on optimal profile corrections and head cutter diameter, as well as the optimal variation of the machine's settings for foaming and gear treatment. The purpose of these modifications of teeth is to achieve a more favorable distribution of load and reduce transmission error. The method is applied to the face milled and the face of captured hypoid gear. 202 Desktop Gear Engineering (May 2011)Update on the latest gear design software from multiple vendors, as well as what gear design engineers can expect next. 203 Gear Design (May/June 1984)Transmission can be defined as a jaggy wheel, which when shed by another notched wheel with a similar configuration will transmit rotation from one shaft to another. Depending on the desired type and accuracy of movement, gears and profiles of gear teeth can be almost any shape. 204 Determination of gear ratios (August/September 1984)The choice of the number of teeth for each gearbox in such a way that the output to the input angular speed ratio is a given value is a problem considered by relatively few published gear design robots. 205 Design and selection of plates (March/April 1986)Below is a general overview of some of the various factors that lead to a specific design. and choosing the right tool for this hobnobbing application. 206 Basic Spur Gear Design (November/December 1988)Primitive gears were known and used more than 2,000 years ago, and the gears took their place as one of the main machine mechanisms; however, our knowledge and understanding of the principles of gear are in no way complete. We see the development of a faster and more reliable assessment of gear quality and new, more productive transmission production in higher states of materials hardness. We've also seen improvements in gear applications and design, lubricants, coolers, handling and noise and vibration controls. All these achievements push development towards smaller, leaner applications, better use of the material and improved silence, smoothness and the transfers of life. At the same time, we are trying to improve production of the use of very repetitive and effective methods of making gears. 207 Logical procedure for determining the initial gear size (November/December 1986)When the set of gears is developed for new application, the desired gears are of the minimum size with the required power. These gears must be capable of meeting the requirements of power, speed, ratio, service life and reliability. 208 Gear Design Options (May/June 1987)When determining the full gear design, the bumbly designer faces an overwhelmingly and often confusing group of options to be listed. This array of specs ranges from quite vague to very specific. 209 KHV Planetary Transmission (November/December 1987)Traditionally, a worm or multistup gearbox has been used when a large speed ratio is required. However, such boxes will become obsolete as size and efficiency become increasingly important considerations for modern transmission. The single-eyed worm gearbox has a maximum speed ratio of just 40 to 60. Its effectiveness is only 30 to 60 percent. The need to use bronze for worm gear and grinding nitochal steel for worms drives up material and production costs. 210 Describing custom gears - An alternative to the rack shear factor (January/February 1988)The use of dimensionless factors to describe the geometry of the gear teeth seems to have a strong appeal for gear engineers. The stressors that me and J, for example, have proven well established in agma literature. Using the rack offset coefficient x to describe nonstandard gear ratios is common in Europe, but is not often used in the United States. When found in European literature or in manuals for the exploitation of imported machines, it can be a source of confusion with an American engineer. 211 Using boundary elements to determine agma geometry ratio (January/February 1988)The geometry ratio, which is a fundamental part of agma's gear strength rating, is currently calculated using Lewis's parabola, allowing lewis form factor to be calculated. (1) The geometry ratio is derived from this Lewis factor and load distribution coefficient. This method, which originally required graphical construction methods and has most recently been computerized, works well enough for external gears with thick disks. (2-6) However, when thin discs occur or when assessing the strength of internal gears, the AGMA method cannot be used. 212 KHV Planetary Gear Transmission - Part II (January/February 1988)Consists only of a ring transmission b grid with one or two planets a, carrier H and equal speed mechanism V, KHV gear (Fig. 1) compact in structure, small in size and able to provide a large ratio of For one stage, its speed factor can reach up to 200, and its size is approximately 1/4, which is the usual multi-sector gearbox. 213 213 Gear Math Formulas and Examples (May/June 1988)The next passage from the revised gear design guide, Section III, covering spiral and spiral gear. This section on helix math gear shows detailed solutions to many common transmission problems. In each case, a certain example was developed to illustrate the decision. All equations are located in the most effective form for use on a computer or computing machine. 214 Helical Gear Mathematics, Formulas and Examples Part II (July/August 1988)The next passage from the revised gear design guide, Section III, covering spiral and spiral transmissions. This section on helix math gear shows detailed solutions to many common transmission problems. In each case, a certain example was developed to illustrate the decision. All equations are located in the most effective form for use on a computer or computing machine. 215 Involutometry (September/October 1988) Involution bases of the curve. Over the years, many different curves have been examined for tooth gear profile. Today, almost every tooth gear uses as an involution profile. The involute curve can be described as a curve generated by the end of the string, which is drawn from the cylinder. (See Fig. 1) The circumference of the cylinder is called the base circle. 216 Calculation of optimal dental flank corrections for helical Gears (September/October 1988)The behavior of lifting gears is strongly influenced by local stress concentrations at the root of the tooth and herziana pressure peaks in the dental flanks produced by geometric deviations associated with the processes of manufacturing, folding and deformation. The dynamic effects inside the grid are essentially determined by shock interaction, permetric excitation, and deviant tooth geometry. 217 Elementary theory of permanent direction synthesis indicating chariot (or rotation neutralizers) (November/December 1988)Southern chariot exhibited at the Smithsonian Institution, Washington, D.C., (cir buenos 2600 BC) is shown in Fig. 2600. Although the mechanism is ancient, it is in no way primitive nor simplified. Pin-tooth gears lead to a complex system in which the monk on the top of the wheel continues to point in a given direction, regardless of which direction the vehicle was moving, without sliding wheels. (1) 218 Gear Teeth Strength Study (November/December 1992)For mechanical engineers, the strength of the gear teeth is a matter of constant relapse, and although the problem to be solved is quite elementary in nature, it probably cannot be raised any other issue on which there is such a diversity of thought, and in support of which such an array of rules and authorities can be cited. In 1879, Mr. John H. Cooper, author of the acclaimed work on The Belt, examination of the subject and found that then there were about forty-eight well-established rules of horsepower and manpower, sanctioned by some twenty-four authorities, and differed from each other in extreme reasons 500%. A number of new rules have since been added, but since no rules have been given that take into account the actual shapes of the teeth in general use, and since no attempt has been made to include in any formula the working stress on the material so that the engineer can see immediately on which assumption this result is based , I hope I can be pardoned for suggesting that further investigation is necessary or desirable. News About Gearbox Design1 FVA Offers Basics of Gearbox Design Online Workshop (July 27, 2020)FVA GmbH Presents Live Online Workshop at Gearbox Design Basics: Requirements, Concept and Design, November 13, 2020 f... Read News2 Romax releases gearbox Design Package (October 26, 2012)Romax Technology, gearbox, bearing and drive engineering specialist, has launched a new design software package that will increase... Read News News