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The license may not give you all of the permissions necessary for your intended use. For example, other rights such as publicity, privacy, or moral rights may limit how you use the material. Skip to content Chainsaw maintenance is important for both performance and safety. The life expectancy of a chainsaw chain depends on its use and maintenance, rather than a predetermined timeline. Under normal circumstances, a chainsaw chain can last for hundreds of hours of use. For frequent users, a chain can last for five years or more, while for occasional users, it could last for decades.Chainsaw chains can last for years, or even decades, depending on usage and maintenance The type of wood being cut, the type of chain, the duration of cuts, and the level of maintenance will all impact the lifespan of a chainsaw chain. For example, cutting hardwood will wear out a chain faster than cutting softwood. Similarly, a full-chisel chain is more aggressive and will not last as long as a semi-chisel chain. Light cutting tasks, such as small tree pruning, will cause less wear and tear. Ensuring proper lubrication is also essential for extending the life of a chainsaw chain.To maximise the lifespan of a chainsaw chain, it is important to regularly sharpen it. The number of times a chainsaw chain can be sharpened is not a specific number or rating from the manufacturer, but rather depends on the amount of wear or damage the chain incurs and the amount of metal that is removed during sharpening. It is recommended to sharpen the chain every time you fuel up, giving it 1-2 swipes with a file guide. If the chain is noticeably dull, additional swipes may be necessary.In addition to regular sharpening, proper storage is crucial for preventing rust, which can quickly ruin a chainsaw chain. Before storing, it is important to clean the bar and chain, apply bar and chain oil, and cover the bar and chain with a scabbard.By following these maintenance and storage guidelines, users can maximise the lifespan of their chainsaw chains, potentially allowing them to last for years or even decades.Chainsaw teeth will dull over time, requiring regular sharpening Dull cutters will create a fine sawdust rather than wood chips, and the saw will cut less efficiently. The cutting teeth will also begin to dull with wear, requiring regular sharpening to maintain their effectiveness. If the teeth are not sharpened, the saw will begin to throw out finer and finer chips, and cutting will take longer. The user may also need to apply more force while cutting.The cutters on a chainsaw chain are made of steel, similar to a knife. Just as a knife needs to be sharpened regularly, so too does a chainsaw chain. However, unlike a knife, the cutters on a chainsaw chain are constantly spinning at high speeds, creating a large amount of friction, which causes the cutters to wear down more quickly.In addition to regular sharpening, it is important to inspect the teeth for any damage. Hitting a hard object, such as a rock or a nail, can damage the teeth. If the damage is significant, the chain may need to be replaced. It is also important to keep the chain well-oiled to prevent premature wear. A chainsaw is a powerful tool that requires proper maintenance to ensure optimal performance and safety. One crucial aspect of chainsaw maintenance is knowing when to replace the chain. While a well-maintained chainsaw chain can last for several hundred hours of use, there are instances where it may need to be replaced sooner.One key indicator that it's time to replace your chainsaw chain is when it reaches the safety lines stamped into the teeth. These lines, also known as wear markers, indicate the maximum amount of metal that can be removed through sharpening. Once the chain is sharpened past these lines, it poses a safety risk as it may fall apart or fly off the chainsaw during use. Therefore, it is essential to replace the chain when it reaches this point to maintain the performance and safety of your chainsaw.In addition to reaching the safety lines, there are other signs that suggest it's time to replace your chainsaw chain. For example, if the chain becomes damaged, dented, or chipped due to hitting rocks, dirt, or other hard objects, it may need to be replaced. Additionally, if the chain teeth are missing or broken, it is crucial to replace the chain to ensure safe operation.It is also important to consider the type of wood being cut, the duration of cutting tasks, and the level of maintenance provided to the chain. Hardwood, for instance, will wear out a chain faster than softwood. Frequent cutting and improper lubrication can also contribute to increased wear and tear on the chain, necessitating replacement sooner.In summary, a chainsaw chain should be replaced when it reaches the safety lines stamped into the teeth, as this indicates that further sharpening could compromise the integrity of the chain. Additionally, damage to the chain, missing or broken teeth, and the type of use and maintenance can all impact the lifespan of the chain and may require replacement sooner rather than later. By staying vigilant and proactive with chainsaw chain maintenance, you can ensure optimal performance and safety while using this powerful tool.A rattling or bouncing sensation when set against wood is a sign that the chain needs replacing A rattling or bouncing sensation when set against wood is a clear sign that your chainsaw chain needs replacing. This is a safety concern, so it's important to act as soon as possible.A well-maintained chainsaw should sit stably against a piece of wood. If the chain is past its best, you'll experience a rattling or bouncing sensation. This is due to the friction created when the chain is powered at an incredible speed of around 50 rotations per second. Over time, this speed takes its toll on the chain, even with diligent care and maintenance.The teeth of the chain, responsible for cutting, will become dull with use and need to be sharpened or replaced. If you're experiencing a rattling sensation, it could be that your teeth are damaged or worn unevenly. This can happen if you hit a hard object like a rock or a nail embedded in the wood. If the teeth are compromised, it's best to stop using the chainsaw and replace the chain.In addition to safety concerns, a rattling or bouncing chainsaw can also affect the precision of your work. A chainsaw is designed to be relatively effortless to use, requiring a steady hand rather than a forceful one. If your chainsaw is rattling or bouncing, it may be a sign that the chain has lost its ability to draw itself into the wood, requiring you to manually compress the chainsaw to keep it stable.To summarise, if you're experiencing a rattling or bouncing sensation when using your chainsaw, it's a sign that the chain needs to be replaced. This is important for both safety and precision in your work.If your chainsaw is smoking, this could be a sign that the chain is reaching the end of its life The chain is dull:A sharp chainsaw chain will cut out large chips of wood and cut smoothly. A blunt chain will generate friction against the wood, causing the chain and the wood to heat up and smoke.Lack of lubrication:If the chain is not getting enough lubrication, it will create friction and heat up. This can be due to a lack of bar oil, or the oil may not be reaching the chain.Chain tension:If the chain is too tight, it can cause increased friction and overheating.Fuel issues:If the smoke is coming from the engine, it could be due to contaminated or improperly mixed fuel. Chainsaw fuel is a mix of gasoline and oil, and using the wrong ratio can cause the engine to smoke.If your chainsaw is smoking, it is important to identify the source of the smoke and address the issue. This may involve sharpening or replacing the chain, checking the fuel mixture, or ensuring proper lubrication and chain tension.Frequently asked questions A chainsaw blade can last for 5+ years with frequent use. For occasional users, a blade could last for decades. The life expectancy of a chainsaw blade is determined by its use and maintenance. If your chainsaw is in good shape, it should remain stable when set against a piece of wood. If your blade is in need of replacement, you may experience a bouncing or rattling sensation. Other signs include the chainsaw not pulling itself into the wood, the blade smoking during use, and missing or damaged teeth. For every gallon of gas used, you should be resharpening the blade. Additionally, it is recommended to give the chain 1-2 swipes with a file guide every time you fuel up. The life expectancy of a chainsaw blade depends on the type of wood being cut, the type of chain being used, the duration of the cut, and how well the blade is maintained. To extend the life of your chainsaw blade, ensure proper maintenance and storage. This includes cleaning the bar and chain, applying bar and chain oil, and using a scabbard to cover the bar and chain before storing. Chainsaws are indispensable tools for anyone involved in wood cutting, forestry, landscaping, or even general property maintenance. However, like any tool, they require regular maintenance and, at times, part replacements to ensure they operate efficiently and safely. One of the most critical components that need periodic replacement is the chainsaw chain. Knowing when to replace your chainsaw chain is essential for keeping your cutting tasks effective and safe. Here are key indicators and tips drawn from extensive experience and practical insights. The lifespan of a chainsaw chain can vary significantly based on several factors, including the type of wood you're cutting, the conditions under which you're cutting (e.g., winter vs. summer), and whether the wood has been contaminated with materials like mud or rocks. For example, cutting wood that has rocks embedded in its bark will dull a chain much faster than cutting clean, green wood. An experienced woodcutter might go through 15 to 20 chains a year, indicating just how variable chain life can be. It's also worth noting that different cutting conditions, such as tall grass or deep snow, can increase the risk of chain damage. The clearest indication that your chainsaw chain needs replacement is noticeably worn-down teeth. Designed for efficiency, chainsaw chains feature sharp, defined teeth for optimal cutting. Once these teeth are reduced to mere nubs, your chain's ability to effectively engage and cut through wood diminishes, leading to decreased productivity and increased effort. Frequent sharpening can lead to uneven tooth lengths across the chain. When you observe a significant variance, with some teeth considerably shorter than others, this uneven wear not only compromises the chain's cutting performance but also signals the need for a replacement. Uniform tooth length is critical for balanced, effective cutting. An optimal chain will seamlessly draw itself into the wood, facilitating a smooth cutting process. If cutting becomes laborious, requiring extra force to push the chainsaw through the material, or if the saw generates more fine sawdust than larger wood chips, it's a sign your chain may be dull or overly worn. This inefficiency can slow down your work and increase the physical strain on both the operator and the chainsaw. Encountering hard materials such as rocks, metal, or even dirt can severely damage your chain, leading to worn, bent, or broken teeth and compromised chain links. Such damage not only affects the chain's functionality but also poses a safety risk. In most cases, replacing a damaged chain is more economical and safer than attempting repairs, ensuring your chainsaw operates reliably and efficiently. With regular use, a chainsaw chain can stretch due to the mechanical stress of cutting and the heat generated from operation. A telltale sign of an overstretched chain is its inability to be properly tensioned using the chainsaw's built-in adjustment features. If the chain hangs loosely on the bar or slips easily, indicating it has reached its tension limit, a replacement is due to maintain optimal performance and safety. Integrating environmental responsibility into the lifecycle of a chainsaw chain not only addresses the practical aspects of maintenance and replacement but also aligns with a growing commitment to sustainability among readers. As chainsaw chains are primarily made of metal, it's paramount to avoid disposing of them in regular household waste to prevent environmental contamination and the squandering of valuable resources. Recycling becomes a crucial step in this process, where old chains can be taken to local recycling centers to ensure the metal is repurposed, reducing landfill waste and supporting the circular economy. Additionally, some chainsaw manufacturers may offer take-back programs, rewarding customers for recycling old chains with discounts on future purchases, thereby promoting a cycle of responsible consumption and waste management. For the creatively inclined, repurposing or 'upcycling' old chainsaw chains into art, tools, or jewelry presents an innovative way to extend the life of these materials beyond their intended use. This not only diverts waste from landfills but also adds value through new creations. Community initiatives, such as organized clean-up events, can further reinforce the importance of recycling and responsible disposal, fostering a collective effort toward environmental stewardship. Highlighting the negative impact of improper metal disposal, such as soil and water pollution, underscores the broader environmental implications of our choices and can motivate readers to adopt more sustainable practices. By addressing these environmental considerations, the article transcends its immediate subject, framing chainsaw chain replacement within a larger narrative of ecological responsibility and sustainable living. The key to optimal chainsaw performance begins with choosing the correct chain. It's imperative to match the chain to your saw's specific requirements, including gauge, pitch, and the exact number of drive links. Incorrectly matched chains not only hinder performance but can also pose significant safety risks. Refer to your saw's manual or consult with a professional to ensure you're making the right choice. Consistent inspection of your chainsaw chain is crucial for identifying wear, damage, or stretching at early stages. By catching these issues promptly, you can mitigate further damage to your chainsaw, ensuring that it remains a reliable and efficient tool for your cutting needs. This proactive approach to maintenance helps extend the lifespan of both your chain and the chainsaw itself. Regular sharpening is essential to maintain your chain's cutting edge, literally. With proper technique, a chain can be sharpened between six to ten times before it requires replacement. Sharpening must be done with precision to prevent uneven wear, which can diminish the chain's effectiveness. Investing time in learning the correct sharpening methods will pay dividends in the longevity and performance of your chainsaw chain. The durability of your chainsaw chain can greatly vary based on the materials you're cutting and the environmental conditions. For instance, cutting clean, softwood under ideal circumstances puts less strain on the chain compared to working with dirty, hardwood or operating in challenging conditions. Adjust your maintenance and replacement schedule according to the demands of your cutting tasks to optimize chain lifespan. When it comes time to replace your chainsaw chain, safety should be your foremost concern. Always wear protective gloves to guard against the chain's sharp edges. Before performing any maintenance or replacement tasks, ensure that the chainsaw is completely powered off and has had time to cool down. This preventive measure safeguards against accidental starts and potential burns from a hot engine, ensuring a safe maintenance environment. Replacing your chainsaw chain at the right time is crucial for maintaining the efficiency, effectiveness, and safety of your cutting tasks. By paying attention to the key indicators of wear and following the tips for replacement, you can ensure that your chainsaw remains a valuable asset in your tool arsenal. Remember, a well-maintained chainsaw is not only more efficient but also safer to use. Can I use any chain brand on my chainsaw, or should it be specific to the chainsaw brand?While many chains can be cross-compatible across different chainsaw brands, it's crucial to select a chain that matches your saw's specific requirements for gauge, pitch, and length. Using the wrong chain can lead to poor performance, increased wear on the chainsaw, or dangerous situations. It's often best to consult your chainsaw's manual or a professional to ensure compatibility. How can I tell if my chainsaw chain is stretched beyond usable limits?A stretched chain will sag or hang loose on the guide bar, and you won't be able to tighten it using the chainsaw's adjustment mechanism. Additionally, a stretched chain may skip or come off the bar during operation, which can be dangerous. Is it better to sharpen my chainsaw chain or just replace it when it becomes dull?Sharpening your chainsaw chain is cost-effective and can extend its life, provided that the teeth are not too worn or damaged. Generally, a chain can be sharpened multiple times before it needs to be replaced. However, if the chain is severely damaged, excessively worn, or has uneven tooth wear, replacing it is the better option. How often should I replace my chainsaw chain?The frequency of chain replacement depends on how often and under what conditions you use your chainsaw. Heavy users cutting in dirty conditions may need to replace their chains several times a year, while occasional users might only need to replace their chains every few years. Monitor your chain's condition and performance regularly to determine when a replacement is needed. Can hitting a single rock really ruin my chainsaw chain?Yes, hitting a rock, metal, or other hard materials can cause immediate damage to the teeth of your chainsaw chain, making it dull or even breaking the teeth. While some damage can be repaired with sharpening, severe damage often necessitates chain replacement. How do I dispose of an old chainsaw chain responsibly?Since chainsaw chains are made of metal, they can be recycled at a local metal recycling facility. Avoid throwing them in the trash due to their potential to harm wildlife and the environment. Some chainsaw retailers or repair shops also offer recycling programs. Can a new chainsaw chain affect the performance of my chainsaw?Absolutely! Installing a new chain can significantly improve your chainsaw's cutting efficiency, reduce the effort required to cut through wood, and enhance the overall safety of your cutting operations. A new chain ensures that your chainsaw operates at its peak performance. Is there a way to extend the life of my chainsaw chain?Yes, proper maintenance can extend the life of your chain. This includes regular sharpening, ensuring your chainsaw has the correct tension, using the chainsaw for appropriate tasks (avoiding dirt and rocks), and storing the chain and saw properly when not in use. Additionally, flipping your guide bar at regular intervals can promote even wear, further extending the life of your chain. We hope this guide has armed you with the knowledge you need to keep your chainsaw in top-notch condition. But we know that real wisdom often comes from shared experiences. Have you encountered any telltale signs it was time to change your chain? Maybe you've got a tip or two on maintaining your chainsaw chain we didn't cover. Whatever your story or question, we'd love to hear from you! Drop us a comment below, share your thoughts, and let's keep the conversation going. Sharing is caring, and your insights might just be the nugget of wisdom someone else needs. Don't forget to share this article with fellow chainsaw enthusiasts – let's spread the knowledge and keep our cutting tools in their best shape, together! Forestry Author I'm David Murry, a forestry equipment specialist with a focus on chainsaw operation. With over 13 years of experience, I've honed my skills in operating and maintaining a wide range of machinery, from chainsaws to log splitters. My passion for the outdoors and commitment to sustainable forestry drive my work, which emphasizes safety, efficiency, and staying updated with industry advancements. Additionally, I'm dedicated to sharing my expertise and promoting environmental awareness within the forestry community. Chainsaws, the stalwarts of yard work and woodcutting, are reliable tools. Yet, even the most robust chainsaw experiences wear and tear, especially its vital component – the chainsaw chain. Recognizing the signs indicating when to replace a chainsaw chain is crucial for both safety and performance. In this comprehensive guide, we'll explore additional aspects of chainsaw maintenance and delve into the intricacies of choosing, installing, and caring for a new chainsaw chain. Before we jump into when to replace a chainsaw chain, let's take a moment to understand its role in the grand scheme of chainsaw functionality. The chainsaw chain, comprised of cutting teeth, links, and a guide bar, is the workhorse responsible for slicing through wood. As with any hardworking tool, the chainsaw chain undergoes natural wear and tear over time, impacting its efficiency. Replace a Chainsaw Chain Picture this: you're in the midst of trimming branches or cutting firewood, and you notice the chainsaw struggling to make clean, efficient cuts. If this sounds familiar, it's likely your chainsaw chain has dulled. Dullness hampers performance, making your tasks more laborious than necessary. A chainsaw chain that frequently jumps off the guide bar is not only frustrating but also hazardous. This occurrence signals wear and tear, demanding your attention to avoid potential accidents. If you find yourself wrestling with a chain that refuses to stay put, it might be time for a replacement. The precision of your cuts is a direct reflection of the health of your chainsaw chain. When you start noticing uneven or tapered cuts, it's a clear indication that the teeth on the chain have lost their uniform sharpness. This issue not only affects the quality of your work but also poses safety concerns. A smoothly running chainsaw is a joy to use, but excessive vibration can turn the experience into a shaky, uncomfortable affair. If your chainsaw vibrates more than usual during operation, it's a sign that the chain is unevenly worn or damaged. Replacing the chain can restore balance and reduce unwanted vibrations. Now that we've explored signs of a worn-out chainsaw chain, let's delve into proactive maintenance tips to enhance the longevity and efficiency of your chainsaw. Routine checks are your first line of defense against unexpected breakdowns. Regularly inspect your chainsaw chain for damaged or missing teeth, and promptly address any issues. This proactive approach ensures your chainsaw is always ready for action. Maintaining the right tension in your chainsaw chain is akin to tuning a musical instrument – it ensures optimal performance. A loosely tensioned chain risks jumping off the bar, while an overly tight one leads to increased wear. Follow the manufacturer's guidelines for proper tensioning to strike the right chord. Friction is the enemy of any moving part, and your chainsaw chain is no exception. Regularly lubricate the chain with a high-quality chainsaw oil to reduce friction and prevent premature wear. This simple step goes a long way in ensuring smooth operation. Sharp teeth are the heartbeat of a chainsaw chain. Keep them in top condition by regularly sharpening the chain. Whether you opt for a traditional chainsaw file or an electric sharpener, the goal is to maintain uniform sharpness across all teeth. This practice significantly extends the life of your chain. Imagine wearing shoes that wear down unevenly – it's uncomfortable and affects your gait. Similarly, uneven wear on your chainsaw bar can impact the longevity of your chain. Periodically rotate the bar or consider flipping it if your chainsaw allows. This simple adjustment promotes even wear and prolongs the life of your chain. When the time comes to replace your chainsaw chain, it's essential to choose the right type for your specific chainsaw model. Consider factors such as pitch, gauge, and the number of drive links to guarantee compatibility. A compatible replacement ensures seamless operation and longevity. In a market flooded with options, quality matters. While budget-friendly chains may seem appealing, they often compromise on durability and safety. Invest in a high-quality replacement chain from a reputable brand to ensure long-term performance and peace of mind. Installing a new chainsaw chain might seem straightforward, but precision matters. Follow the manufacturer's guidelines meticulously to ensure proper alignment and tension. Incorrect installation can lead to premature wear and safety hazards. (See Also: Stihl Chainsaw Spark Plugs: A Definitive Guide to Replacement and Maintenance) Think of a new chainsaw chain like a pair of new shoes – they need a break-in period. Run the chainsaw at a lower speed for a short duration when you install a new chain. This helps the chain adjust to the bar properly, ensuring optimal performance from the get-go. When it comes to maintaining your chainsaw chain, a proactive approach can significantly impact its longevity and performance. Let's explore some expert tips that go beyond the basics, ensuring your chainsaw remains a reliable companion for all your cutting tasks. When to Replace a Chainsaw Chain Extreme temperatures can affect the performance of your chainsaw chain. In colder climates, consider using winter-grade bar oil to prevent thickening, while in hotter weather, opt for a lighter oil to maintain proper lubrication. Achieving the right chain tension is crucial, but precision is key. Invest in a quality chainsaw tensioning tool to ensure accurate adjustments, preventing issues like chain slippage or accelerated wear. Regularly check and maintain the depth gauges on your chainsaw chain. Properly adjusted depth gauges contribute to safer and more efficient cutting by controlling the size of wood chips produced. Filing your chainsaw chain requires finesse. Learn the correct filing technique to maintain consistent tooth length and angle, optimizing cutting efficiency and prolonging the life of your chain. The chain brake is a safety feature, but it can also impact chain longevity. Avoid engaging it unnecessarily, as frequent use can contribute to increased wear and reduce overall chain lifespan. Different wood types affect chainsaw chains differently. Be mindful of the wood you're cutting; hardwoods may dull the chain faster than softwoods. Adjust your maintenance routine based on the wood you frequently encounter. A clean chainsaw chain performs better. Regularly clean debris, resin, and sawdust from the chain to prevent friction and ensure smooth operation. A clean chain also allows for more accurate inspection of its condition. Pay attention to the bar rails – the groove where the chain sits. Keep them clean and free of burrs, as rough rails can accelerate wear on the chain, impacting both performance and safety. Ensure the replacement chain matches the pitch specified by your chainsaw's manufacturer. Using the correct pitch is vital for proper engagement with the drive sprocket, preventing unnecessary stress on the chain. When not in use, store your chainsaw properly. Keep it in a cool, dry place, and consider using a chainsaw case to protect it from dust and potential damage. Proper storage extends the life of not just the chain but the entire chainsaw. Schedule periodic professional inspections for your chainsaw. A certified technician can identify issues that might go unnoticed during routine maintenance, ensuring your chainsaw is in top condition. (See Also: Are Chainsaws 2 Cycle? Understanding Two-Stroke Engine Basics) Perfect your chain tensioning skills. Consistent and correct tensioning is a fine art; practice ensures you strike the right balance, preventing premature wear and optimizing cutting efficiency. Kickback is a safety concern and can also impact chain longevity. Understand and implement proper cutting techniques to minimize kickback, protecting both yourself and your chainsaw. Extend the life of your chainsaw chain by regularly flipping the bar. This simple practice ensures even wear on both sides, promoting balanced performance and preventing premature replacement. Periodically rotate your chainsaw chain strategically. If your chainsaw allows, switch between multiple chains, promoting even wear and extending the overall life of each chain. By incorporating these expert tips into your chainsaw maintenance routine, you'll not only enhance the longevity and performance of your chainsaw chain but also ensure a safer and more efficient cutting experience. Remember, a well-maintained chainsaw is a reliable tool that makes every cutting task more manageable and enjoyable. Chainsaw chain replacement can be a perplexing topic, and it's natural to have questions. Whether you're a seasoned chainsaw user or a beginner, these frequently asked questions will shed light on when to replace a chainsaw chain and how to ensure optimal performance. Intro: The frequency of chainsaw chain replacement depends on usage. For heavy use, consider replacement every 20-25 hours of operation. For occasional users, a visual inspection and monitoring cutting performance can guide replacement timing. Intro: Signs include decreased cutting efficiency, frequent chain jumping, uneven or tapered cuts, and excessive vibration. Regularly inspect your chain for these indicators to determine if replacement is necessary. Intro: Yes, you can sharpen a dull chainsaw chain. However, it's essential to know when to replace it. Sharpening is a maintenance task, but if the chain has significant wear, replacement is the better option for optimal performance. Intro: Consider factors such as pitch, gauge, and the number of drive links specified by your chainsaw's manufacturer. Consult your chainsaw manual or seek guidance from a professional to ensure compatibility. Intro: Using an incompatible chain can lead to poor cutting performance, increased wear, and safety hazards. Always use the chain recommended by your chainsaw's manufacturer to avoid complications. Intro: Absolutely. Regular maintenance, including proper tensioning, lubrication, and sharpening, can significantly extend the life of your chainsaw chain. Adopting good chainsaw care practices goes a long way. Intro: Yes, some initial stretching is normal during the break-in period. However, excessive stretching may indicate improper tensioning or a low-quality chain. Monitor tension during the break-in to ensure optimal performance. Intro: The right tension allows the chain to move freely but without sagging. A chain that's too tight can overheat and wear quickly, while a loose chain can jump off the bar. Follow the manufacturer's guidelines for precise tensioning. (See Also: Can a Chainsaw Cut Through Bone? Unveiling the Truth About Chainsaw Capabilities) Intro: Chainsaw chains are typically sold as complete units. While it's possible to replace individual components in some cases, it's often more practical and cost-effective to replace the entire chain for optimal performance. Intro: Chainsaw chains vary based on factors like chain pitch, gauge, and design. Different chains serve different purposes, from general cutting to specialized tasks like carving or ripping. Choose a chain that suits your specific cutting needs. Intro: It's generally advisable to remove the chain when storing your chainsaw. This prevents unnecessary stress on the chain and the bar and ensures a longer lifespan for both components. Intro: Proper cutting techniques, including maintaining a secure grip, avoiding overreach, and using a low kickback chain, can minimize kickback risks. Regular maintenance also plays a role in preventing kickback incidents. Intro: Skip-tooth chains have fewer teeth and are suitable for softer wood, offering faster cutting speeds. Full-chisel chains, with more teeth, excel in hardwoods but require more power. Choose based on your cutting needs and the type of wood you commonly encounter. Intro: While some people use vegetable oil as an alternative, it's not recommended. Vegetable oil lacks the necessary additives found in bar oil, leading to increased friction, wear, and potential damage to your chainsaw. Professional services often include chain sharpening, bar maintenance, and overall chainsaw inspection. Schedule regular visits to certified technicians for comprehensive checks to keep your chainsaw in top condition. Feel free to refer to these FAQs whenever you have questions about chainsaw chain replacement and maintenance. Keeping your chainsaw in prime condition ensures safe and efficient cutting for all your outdoor tasks. In conclusion, knowing when to replace a chainsaw chain is only one aspect of ensuring a reliable and efficient tool. Adopting proactive maintenance practices, choosing the right replacement chain, and installing it correctly all contribute to the overall longevity and performance of your chainsaw. Remember, a well-maintained chainsaw not only enhances safety but also makes your tasks more manageable and enjoyable. By incorporating these tips into your chainsaw care routine, you'll not only prolong the life of your chainsaw chain but also elevate your overall chainsaw experience. Happy cutting! Chainsaw maintenance is crucial for ensuring the tool's efficiency and longevity. Regularly replacing the chainsaw chain is an important part of this upkeep. How often you should replace a chainsaw chain mainly depends on usage and operating conditions. Heavy use in dirty environments can necessitate frequent replacements, even several times yearly. In contrast, occasional use might require changing the chain every few years. Keeping the chain sharp and properly maintained can extend its life significantly. Understanding when to replace the chainsaw chain involves looking for key indicators like poor cutting performance, difficulty in sharpening, and visible damage. A well-maintained chainsaw chain performs accurately and safely, whereas a worn-out chain can be inefficient and dangerous. Investing time in regular inspection and maintenance allows users to make informed decisions about when to purchase new replacement chainsaw blades, ensuring optimal performance. Visiting reputable online stores such as those offering chainsaw chains and guide bars can provide a variety of options tailored to different needs. Properly maintaining and replacing a chainsaw chain not only promotes safety but also contributes to the overall effectiveness of the chainsaw, making these practices essential for both novice and seasoned users. Key Takeaways Frequency of chain replacement varies by usage. Look for signs of poor performance or damage. Regular inspection helps maintain chainsaw efficiency. Determining the Need for Replacement Determining when to replace a chainsaw chain involves identifying signs of damage, examining chain tension and condition, and evaluating cutting performance. Regular checks ensure efficient and safe operation, optimizing the lifespan of both the chain and the tool itself. Identifying Signs of Wear A few key indicators suggest it's time to replace the chainsaw chain. Damaged teeth—cracked, chipped, or broken—significantly impair its cutting ability, posing safety risks. Wear markers, designed into chains, provide a visual cue when maximum wear is reached. These markers help users judge when the chain is too worn. Additionally, frequent occurrences of smoke while cutting suggest excessive wear or a dull chainsaw chain. Taking action before severe damage occurs can prevent further complications. Assessing Chain Tension and Condition Proper chain tension is crucial for efficient operation and safety. A loose chain can slip off the bar, while an overly tight chain might cause additional wear or damage to the chainsaw. Regular checks on the drive links can reveal excessive stretching. Evaluate the chain's gauge and depth gauge for signs of misalignment or excessive wear. Consistently ensuring the right tension and checking for these issues can prevent failures and extend chain life while maintaining optimal performance. Evaluating Cutting Performance Performance during cutting tasks is another indicator of a chain's condition. A dull chainsaw chain tends to cut unevenly, often pulling to one side, which slows down the work. If the chainsaw requires more force than usual to cut, the chain might be blunt. Regularly check for difficulty in achieving clean cuts. Users should also watch for vibrations indicating uneven teeth wear. Understanding these performance cues allows for timely adjustments, or replacements, to maintain the chainsaw's efficiency and effectiveness. Performing Chain Replacement and Maintenance Ensuring the chain's optimal performance requires selecting the right replacement and following a clear replacement procedure, along with consistent maintenance to prevent issues. Selecting the Correct Replacement Chain Choosing the right replacement chain is crucial for effective cutting tasks. One must consider the pitch, gauge, and number of drive links. The pitch refers to the distance between the chain's drive links, which should match the guide bar and sprocket. Common pitches include 3/8″ and .325″. The gauge is the chain's width and should fit snugly within the guide bar groove. An incorrect gauge can cause issues like crooked cuts or increase wear. Additionally, consider the type of wood and usage level. For hardwoods or frequent cutting, a low-profile or full-complement chain might be suitable. Consulting the chainsaw manual or local dealer can ensure compatibility with the existing chainsaw model. Step-by-Step Chain Replacement Procedure Before beginning, disconnect the power source or remove the spark plug for safety. Tools Needed: Wrench, screwdriver, and protective gloves are essential. Remove the guide bar cover: Use a wrench to loosen the nuts and detach the cover. Take off the old chain: Slide it out carefully from the guide bar. Note the direction of the teeth for proper replacement. Install the new chain: Place it around the sprocket and guide bar, ensuring correct teeth direction. Tighten the tension: Ensure the chain fits snugly but can still move easily around the bar. Reattach the bar cover: Secure it with nuts but avoid over-tightening as adjustments may still be needed. After replacement, perform a quick run to check for secure installation. Maintaining Optimal Chain Condition Regular maintenance helps prolong the chain's life and ensures efficient operation. Sharpening should be done when cutting becomes slow or produces fine sawdust. Using a round file, sharpen the teeth evenly. Chain lubrication is also vital. Ensure adequate bar and chain oil levels to reduce friction and wear. Inspect regularly for signs like vibration or smoke, which may indicate the need for adjustment or cleaning. A properly maintained chain reduces stress on the engine and prevents issues such as crooked cuts and premature wear. Conclusion Replacing a chainsaw chain regularly ensures cutting efficiency and safety. Factors to Consider: Usage Frequency: Light users need less frequent changes than heavy users. Operating Conditions: Chainsaw chains wear faster in dirty or rough conditions. Maintenance Tips: Sharpness Check: Keep the chain sharp to extend its life. Debris Removal: Clean after each use to prevent premature wear. A chainsaw chain should be replaced when its performance declines noticeably, ensuring optimal cutting results. Chainsaw, equipament, maintenance, safety Proper maintenance is key to ensuring your chainsaw performs efficiently and safely. One crucial aspect of this maintenance is knowing when to replace your chainsaw chain. It is recommended to replace your chainsaw chain when you notice excessive wear, kinks, or damaged links to maintain optimal cutting performance. This not only helps in achieving the best results but also prevents potential hazards. Different essentials, such as types of chainsaw chains from Jono & Johno, may exhibit varying lifespans, largely influenced by the frequency and intensity of use. Regular lubrication and proper tension adjustment can prolong the chain's life, but eventually, every chain will need to be replaced to avoid compromising the chainsaw's functionality. Routine inspection and adhering to these guidelines will ensure your chainsaw operates smoothly. Investing in high-quality chains ensures longevity and efficiency, making tasks easier and safer. Key Takeaways Replace chains showing excessive wear Regular inspection and maintenance extend chain life Use high-quality chains for optimal performance Understanding Chainsaw Chain Replacement Proper chainsaw chain replacements help maintain optimal cutting performance and ensure safety. Key points include recognizing dullness indicators, understanding maintenance factors, focusing on safety, and following expert advice for replacement timing. Indicators of a Dull Chain A dull chainsaw chain makes uneven cuts and produces fine sawdust instead of larger chips. The chain may also show signs of wear and tear, including missing teeth or broken teeth. Users might experience excessive vibration during operation, indicating potential chain issues. Visual inspection is crucial. Look for damage to cutting teeth and drive links. Regularly check the chain for elongation, which can cause chain slippage. Paying attention to these signs ensures timely replacement before major problems arise. Maintenance and Lifespan Factors Maintenance practices significantly impact a chain's lifespan. Regular sharpening keeps the chain's cutting teeth effective, while proper lubrication minimizes friction and wear. Keeping the chain clean prevents debris buildup, which can damage the chain and reduce its longevity. Maintaining the right tension is critical. Improperly tensioned chains can lead to reduced performance and increased wear. Following manufacturer's guidelines for tensioning and cleaning helps extend the life expectancy of the chainsaw chain. Safety and Efficiency Measures Maintaining a sharp, well-tensioned chain is vital for both safety and efficiency. A dull chain increases the risk of kickback and chain slippage, posing significant safety risks. Additionally, a well-maintained chain reduces strain on the chainsaw's motor, enhancing its efficiency. Using high-quality chains, like full chisel chains for hardwoods or semi chisel chains for softwoods, can optimize performance. Implementing regular maintenance practices, such as inspecting the chain brake and tensioning mechanisms, ensures the chainsaw operates safely and effectively. Expert Advice for Replacement Timing Experts recommend replacing a chainsaw chain after several sharpenings or when it shows substantial wear. Keeping track of each sharpening cycle and inspecting the chain for damage can help determine the appropriate replacement time. Professional loggers often replace chains more frequently due to constant heavy use. Specific chains may have different life spans depending on usage and maintenance practices. Regularly consulting the chainsaw's manual and seeking professional advice can aid in deciding the best time for replacement. Following these guidelines ensures that the chainsaw operates at peak performance, remains safe to use, and minimizes maintenance costs. Optimizing Chainsaw Performance Extending the life and ensuring the efficiency of a chainsaw chain requires proper tensioning, regular cleaning and lubrication, knowing when to sharpen versus replace, and stringent safety measures. Proper Chainsaw Chain Tensioning Maintaining correct chain tension is crucial for performance and safety. A chain that is too tight can cause excessive wear on the bar and motor, while a loose chain may slip off the bar, causing dangerous chain slippage. To check the tension, lift the chain midway along the bar; it should snap back into place but still have some play. Temperature changes can affect chain tension. Regularly inspect and adjust the tension as cutting tasks progress. Chainsaws used in colder environments might require periodic checks to ensure consistent performance. Effective Chain Cleaning & Lubrication Cleanliness of the chain contributes significantly to longevity. Dirt and debris can get trapped, causing the chain to wear quicker and reducing cutting efficiency. Use a wire brush to clean the chain after each use and ensure the drive link and other components are free from wood chips and residue. Proper lubrication minimizes friction and rust. Use high-quality bar oil and make sure the oil reservoir is full before operating the chainsaw. A well-lubricated chain runs smoother and reduces wear and tear, extending the life of the chain and the chainsaw itself. Recognizing When to Sharpen Vs. Replace Regular sharpening is essential for maintaining cutting performance. A chain can typically be sharpened 5-10 times before replacement is necessary. Check for uneven wear on the cutting teeth and ensure the sharpness of the blades. If the teeth are too worn down or damaged, it may be time to replace the chain. Evaluate chains by looking at safety lines marked on the chain. If multiple teeth are missing or the chain shows significant damage such as chipping or denting from metal or other tough materials, it should be replaced. Recognizing these signs keeps tasks safe and efficient. Ensuring Chainsaw Safety Safety is paramount in chainsaw operation. Worn chains can lead to unsafe conditions like kickback, which increases the risk of accidents. Always check the condition of the chain before use and look for signs of wear or damage. Keep safety equipment such as helmets, gloves, and protective clothing up-to-date. When the chain reaches the safety lines, indicating excessive wear, replace it promptly. Following strict safety precautions helps prevent accidents and maintains the performance of the chainsaw. Proper storage in a dry, clean environment also protects the chainsaw from unnecessary wear and rust, ensuring it is always ready for use. Conclusion To maintain optimal cutting performance, it is essential to replace a chainsaw chain when it shows signs of wear, elongation, or damage. Regular maintenance such as lubrication and proper tension can extend the chain's life. Ignoring these indicators can compromise safety and efficiency. Ensuring timely replacement keeps the chainsaw in peak condition and enhances its longevity. , the free encyclopedia that anyone can edit. 117,922 active editors 6,999,759 articles in English The first UK Phantom on a test flight in 1968 From 1968 to 1992, the United Kingdom used the McDonnell Douglas F-4 Phantom II as one of its principal combat aircraft. The Phantom was procured to serve in both the Royal Navy's Fleet Air Arm and the Royal Air Force (RAF) in several different roles. Most Phantoms operated by the UK were built as a special batch containing a significant amount of British technology. Two variants were initially built: the F-4K was a carrier-based air-defence interceptor for the Fleet Air Arm, while the F-4M was initially used by the RAF for tactical strike and reconnaissance, before transitioning to an air defence role

siege by the Spanish during the Portuguese Restoration War. December 8 (December 18 New Style) – As Christina comes of age, she is made ruling queen of Sweden. December – Bubonic plague breaks out in Edinburgh (Scotland). A Spanish officer is murdered in St. Dominic's Church, Macau during mass by colonists loyal to Portugal during the Portuguese Restoration War. Sigismund's Column is erected in Warsaw to commemorate King Sigismund III Vasa, who moved the capital of Poland from Kraków to Warsaw in 1596. Philosopher René Descartes publishes Principia Philosophiae (Principles of Philosophy) in Amsterdam. The opera Ormindo is first performed in Venice (music by Francesco Cavalli, and libretto by Giovanni Faustini). The West India Company[which?] displays greater interest in profit than in colonization.[vague] Thomas Britton Veit Hans Schnorr von Carolsfeld Otto Mencke Henry Winstanley Henrietta of England January 9 – Robert Gibbes, English-born landgrave in South Carolina (d. 1715) January 10 Louis François, duc de Boufflers, Marshal of France (d. 1711) Celestino Sfondrati, Italian Catholic cardinal (d. 1696) January 11 – Hayashi Hōkō, Japanese philosopher (d. 1732) January 14 – Thomas Britton, English concert promoter (d. 1714) January 18 – John Partridge, English astrologer (d. 1708) January 23 – Jonas Budde, Norwegian army officer (d. 1710) January 25 – Antoine Thomas, Jesuit missionary priest and astronomer (d. 1709)[9] January 26 – Thomas Boylston, American colonial doctor (d. 1695) February 2 Isaac Chayyim Cantarini, Italian rabbi (d. 1723) Johannes Hancke, German writer (d. 1713) February 7 – Nils Bielke, member of the High Council of Sweden (d. 1716) February 8 – Pierre de La Broue, American bishop (d. 1720) February 12 – Jakob Ammann, Swiss founder of the Amish sect (d. 1712) February 24 – Maria Elisabeth Lämmerhirt, German mother of Johann Sebastian Bach (d. 1694) March 1 – Simon Foucher, French polemicist (d. 1696) March 15 – Veit Hans Schnorr von Carolsfeld, German iron and cobalt magnate (d. 1715) March 21 – Sir Walter Bagot, 3rd Baronet, English politician (d. 1704) March 22 Otto Mencke, German philosopher and scientist (d. 1707) Sir James Rushout, 1st Baronet, English politician (d. 1698) March 25 – Heinrich von Cocceji, German jurist from Bremen (d. 1719) March 31 – Henry Winstanley, English engineer (d. 1703) April 6 – António Luís de Sousa, 2nd Marquis of Minas, Portuguese general, governor-general of Brazil (d. 1721) April 7 Nathaniel Johnson, American politician (d. 1713) François de Neufville, duc de Villeroy, French soldier (d. 1730) April 11 – Marie Jeanne Baptiste of Savoy-Nemours, Duchess of Savoy (d. 1724) April 17 – Abraham Storck, Dutch painter (d. 1708) April 21 – Conrad von Reventlow, Danish statesman, first Grand Chancellor of Denmark (d. 1708) May 2 – Robert Cotton, English politician (d. 1717) May 4 – Juan Caballero y Ocio, Spanish priest remarkable for lavish gifts to the Catholic Church and charity (d. 1707) May 5 – Sir Richard Newdigate, 2nd Baronet, English landowner (d. 1710) May 26 – Michael Ettmüller, German physician (d. 1683) June 2 – William Salmon, English medical writer (d. 1713) June 7 – Johann Christoph Volkamer, German botanist (d. 1720) June 16 – Henrietta Anne Stuart, Princess of Scotland, England and Ireland and Duchess of Orléans (d. 1670)[10] June 17 – Johann Wolfgang Franck, German baroque composer (d. 1710) July 2 – Abraham a Sancta Clara, German Augustinian friar (d. 1709) July 4 – Josceline Percy, 11th Earl of Northumberland, English noble (d. 1670) July 7 – Joan Geelvinck, Dutch politician (d. 1707) July 10 – Miguel Bayot, Spanish Catholic prelate, Bishop of Cebu (from 1697) (d. 1700) July 22 – Peter Drelincourt, Irish chaplain (d. 1722) August 6 Christian Ernst, Margrave of Brandenburg-Bayreuth (1655–1712) (d. 1712) Louise de La Vallière, French mistress of Louis XIV of France (d. 1710)[11] August 12 – Heinrich Ignaz Franz Biber, Bohemian composer and violinist (d. 1704) August 28 (bapt.) – Gilles Schey, Dutch admiral (d. 1703) August 29 – Anne Bourdon, nun in New France (d. 1711) August 30 – Thomas Tufton, 6th Earl of Thanet, English politician (d. 1729) September 3 – Richard Newport, 2nd Earl of Bradford, English politician (d. 1723) September 6 – Juan Bautista Cabanilles, Spanish composer (d. 1712) September 11 – Jacob Rotius, Dutch painter (d. 1681) September 22 – Jacques Échard, French Dominican, historian of the Order (d. 1724) September 25 – Ole Rømer, Danish astronomer (d. 1710) October 1 – Jean Rousseau, French viol player (d. 1699) October 2 – François-Timoléon de Choisy, French abbé, author and cross-dresser (d. 1724) October 3 – Adriaen Frans Boudewijns, landscape painter (d. 1719) October 12 – Christopher Sandius, Dutch Arian writer (d. 1680) October 13 – Sipihr Shikoh, Mughal Emperor (d. 1708) October 14 – William Penn, English Quaker and founder of Pennsylvania (d. 1718) October 26 – Mathias Steuchius, Swedish archbishop (d. 1730) November 23 (bapt.) – Cornelia van der Gon, Dutch art collector (d. 1701) December 8 – Maria d'Este, Italian noble (d. 1684) December 9 – Robert Kirk, Scottish folklorist, Bible translator, Gaelic scholar (d. 1692) December 23 – Tomás de Torrejón y Velasco, Spanish composer, musician and organist (d. 1728) December 25 – Walter Scott, Earl of Tarras, Scottish nobleman (d. 1693) December 29 – Philips van Almonde, Dutch Lieutenant Admiral (d. 1711) Matsuo Bashō, Japanese poet (d. 1694) Pietro Erardi, Maltese chaplain and painter (d. 1727)[12] Antonio Stradivari, Italian violin maker (d. 1737)[13] Pope Urban VIII Johannes Wtenbogaert January 20 – Stefano Amadei, Italian painter (b. 1580) January 30 – William Chillingworth, controversial English churchman (b. 1602) January 31 – Georg II of Fleckenstein-Dagstuhl, German nobleman (b. 1588) February 28 – Guru Har Gobind, the Sixth Sikh Guru (b. 1595) March 15 – Countess Louise Juliana of Nassau, Regent of Bohemia (b. 1576) March 24 – Cecilia Renata of Austria, Queen of Poland (b. 1611) March 29 – Lord John Stewart, Scottish aristocrat, Royalist commander in the English Civil War (b. 1621) April 2 – Diego Salcedo, Spanish bishop (b. 1575) April 10 – Reverend William Brewster, English Pilgrim leader (b. 1567) April 25 – Chongzhen, last Ming Emperor of China (suicide) (b. 1611) April 28 – Zsófia Bosnyák, Hungarian noblewoman (b. 1609) May 26 – Alfonso III d'Este, Duke of Modena, Italian noble (b. 1591) June 17 Anne de Montafié, Countess of Clermont-en-Beauvaisis, French countess (b. 1577) John of St. Thomas, Portuguese philosopher (b. 1589) July 4 – Brian Twyne, English archivist (b. 1581) July 7 – Hedwig of Hesse-Kassel, countess consort of Schaumburg (b. 1569) July 16 – Giovanni Biliverti, Italian painter (b. 1585) July 25 – Amar Singh Rathore, Rajput nobleman affiliated with the royal house of Marwar (b. 1613) July 29 – Pope Urban VIII (b. 1568)[14] August 25 – Johann Heinrich Alting, German Lutheran theologian (b. 1583) September 4 – Johannes Wtenbogaert, Dutch leader of the Remonstrants (b. 1557) September 7 Guido Bentivoglio, Italian statesman and historian (b. 1579)[15] Ralph Corbie, Irish Jesuit (b. 1598) September 8 John Coke, English politician (b. 1563)[16] Francis Quarles, English poet (b. 1592)[17] October 6 – Elisabeth of France, queen of Philip IV of Spain (b. 1602) October 19 – Johann Friedrich, Count Palatine of Sulzbach-Hilpoltstein (b. 1587) October 30 – Jorge de Cárdenas y Manrique de Lara, Spanish noble (b. 1584) November 6 – Thomas Roe, English diplomat (b. c. 1581) November 10 – Luis Vélez de Guevara, Spanish writer (b. 1579) November 20 – Nathaniel Foote, American colonist (b. 1592) November 24 – Deodat del Monte, Flemish painter, architect (b. 1582) December 20 – Albert IV, Duke of Saxe-Eisenach (from 1640) (b. 1599) December 23 – Sir Alexander Carew, 2nd Baronet, English politician (b. 1609) December 28 – John Bankes, Attorney General and Chief Justice to King Charles I of England (b. 1589) December 30 – Jan Baptist van Helmont, Flemish chemist (b. 1577) ^ Braddick, Michael J. 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Please help improve this article by adding citations to reliable sources. Unsourced material may be challenged and removed.Find sources: "16th century" – news · newspapers · books · scholar · JSTOR (September 2022) (Learn how and when to remove this message) Millennia 2nd millennium Centuries 15th century 16th century 17th century Timelines 15th century 16th century 17th century State leaders 15th century 16th century 17th century Decades 1500s 1510s 1520s 1530s 1540s 1550s 1560s 1570s 1580s 1590s Categories: Births – Deaths Establishments – Disestablishments vte The world map by the Italian Amerigo Vespucci (from whose name the word America is derived) and Belgian Gerardus Mercator shows (besides the classical continents Europe, Africa, and Asia) the Americas as America sive India Nova', New Guinea, and other islands of Southeast Asia, as well as a hypothetical Arctic continent and a yet undetermined Terra Australis.[1]The 16th century began with the Julian year 1501 (represented by the Roman numerals MDI) and ended with either the Julian or the Gregorian year 1600 (MDC), depending on the reckoning used (the Gregorian calendar introduced a lapse of 10 days in October 1582).[1] The Renaissance in Italy and Europe saw the emergence of important artists, authors and scientists, and led to the foundation of important subjects which include accounting and political science. Copernicus proposed the heliocentric universe, which was met with strong resistance, and Tycho Brahe refuted the theory of celestial spheres through observational measurement of the 1572 appearance of a Milky Way supernova. These events directly challenged the long-held notion of an immutable universe supported by Ptolemy and Aristotle, and led to major revolutions in astronomy and science. Galileo Galilei became a champion of the new sciences, invented the first thermometer and made substantial contributions in the fields of physics and astronomy, becoming a major figure in the Scientific Revolution in Europe. Spain and Portugal colonized large parts of Central and South America, followed by France and England in Northern America and the Lesser Antilles. The Portuguese became the masters of trade between Brazil, the coasts of Africa, and their possessions in the Indies, whereas the Spanish came to dominate the Greater Antilles, Mexico, Peru, and opened trade across the Pacific Ocean, linking the Americas with the Indies. English and French privateers began to practice persistent theft of Spanish and Portuguese treasures. This era of colonialism established mercantilism as the leading school of economic thought, where the economic system was viewed as a zero-sum game in which any gain by one party required a loss by another. The mercantilist doctrine encouraged the many intra-European wars of the period and arguably fueled European expansion and imperialism throughout the world until the 19th century or early 20th century. The Reformation in central and northern Europe gave a major blow to the authority of the papacy and the Catholic Church. In England, the British-Italian Alberico Gentili wrote the first book on public international law and divided secularism from canon law and Catholic theology. European politics became dominated by religious conflicts, with the groundwork for the epochal Thirty Years' War being laid towards the end of the century. In the Middle East, the Ottoman Empire continued to expand, with the sultan taking the title of caliph, while dealing with a resurgent Persia. Iran and Iraq were caught by a major popularity of the Shia sect of Islam under the rule of the Safavid dynasty of warrior-mystics, providing grounds for a Persia independent of the majority-Sunni Muslim world.[2] In the Indian subcontinent, following the defeat of the Delhi Sultanate and Vijayanagara Empire, new powers emerged, the Sur Empire founded by Sher Shah Suri, Deccan sultanates, Rajput states, and the Mughal Empire[3] by Emperor Babur, a direct descendant of Timur and Genghis Khan.[4] His successors Humayun and Akbar, enlarged the empire to include most of South Asia. Japan suffered a severe civil war at this time, known as the Sengoku period, and emerged from it as a unified nation under Toyotomi Hideyoshi. China was ruled by the Ming dynasty, which was becoming increasingly isolationist, coming into conflict with Japan over the control of Korea as well as Japanese pirates. In Africa, Christianity had begun to spread in Central Africa and Southern Africa. Until the Scramble for Africa in the late 19th century, most of Africa was left uncolonized. For timelines of earlier events, see 15th century and Timeline of the Middle Ages. Mona Lisa, by Leonardo da Vinci, c. 1503–1506, one of the world's best-known paintings 1501: Michelangelo returns to his native Florence to begin work on the statue David. 1501: Safavid dynasty reunifies Iran and rules over it until 1736. Safavids adopt a Shia branch of Islam.[5] 1501: First Battle of Cannanore between the Third Portuguese Armada and Kingdom of Cochin under João da Nova and Zamorin of Kozhikode's navy marks the beginning of Portuguese conflicts in the Indian Ocean. 1502: First reported African slaves in the New World 1502: The Crimean Khanate sacks Sarai in the Golden Horde, ending its existence. 1503: Spain defeats France at the Battle of Cerignola. Considered to be the first battle in history won by gunpowder small arms. 1503: Leonardo da Vinci begins painting the Mona Lisa and completes it three years later. 1503: Nostradamus is born on either December 14 or December 21. 1504: A period of drought, with famine in all of Spain. 1504: Death of Isabella I of Castile; Joanna of Castile becomes the Queen. 1504: Foundation of the Sultanate of Sennar by Amara Dunqas, in what is modern Sudan 1505: Zhengde Emperor ascends the throne of Ming dynasty. 1505: Martin Luther enters St. Augustine's Monastery at Erfurt, Germany, on 17 July and begins his journey to instigating the Reformation. 1505: Sultan Trenggono builds the first Muslim kingdom in Java, called Demak, in Indonesia. Many other small kingdoms were established in other islands to fight against Portuguese. Each kingdom introduced local language as a way of communication and unity. 1506: Leonardo da Vinci completes the Mona Lisa. 1506: King Afonso I of Kongo wins the battle of Mbanza Kongo, resulting in Catholicism becoming Kongo's state religion.Battle of Cerignola: El Gran Capitan finds the corpse of Louis d'Armagnac, Duke of Nemours 1506: At least two thousand converted Jews are massacred in a Lisbon riot, Portugal. 1506: Christopher Columbus dies in Valladolid, Spain. 1506: Poland is invaded by Tatars from the Crimean Khanate. 1507: The first recorded epidemic of smallpox in the New World on the island of Hispaniola. It devastates the native Taíno population.[6] 1507: Afonso de Albuquerque conquered Hormuz and Muscat, among other bases in the Persian Gulf, taking control of the region at the entrance of the Gulf. 1508: The Christian-Islamic power struggle in Europe and West Asia spills over into the Indian Ocean as Battle of Chaul during the Portuguese-Mamluk War 1508–1512: Michelangelo paints the Sistine Chapel ceiling. 1509: The defeat of joint fleet of the Sultan of Gujarat, the Mamlûk Burji Sultanate of Egypt, and the Zamorin of Calicut with support of the Republic of Venice and the Ottoman Empire in Battle of Diu marks the beginning of Portuguese dominance of the Spice trade and the Indian Ocean. 1509: The Portuguese king sends Diogo Lopes de Sequeira to find Malacca, the eastern terminus of Asian trade. After initially receiving Sequeira, Sultan Mahmud Shah captures and/or kills several of his men and attempts an assault on the four Portuguese ships, which escape.[7] The Javanese fleet is also destroyed in Malacca. 1509: Krishnadevaraya ascends the throne of Vijayanagara Empire. Afonso de Albuquerque 1509–1510: The 'great plague' in various parts of Tudor England.[8] 1510: Afonso de Albuquerque of Portugal conquers Goa in India. 1511: Afonso de Albuquerque of Portugal conquers Malacca, the capital of the Sultanate of Malacca in present-day Malaysia. 1512: Copernicus writes Commentariolus, and proclaims the Sun the center of the Solar System. 1512: The southern part (historical core) of the Kingdom of Navarre is invaded by Castile and Aragon. 1512: Qutb Shahi dynasty, founded by Quli Qutb Mulk, rules Golconda Sultanate until 1687. 1512: The first Portuguese exploratory expedition was sent eastward from Malacca (in present-day Malaysia) to search for the 'Spice Islands' (Maluku) led by Francisco Serrão. Serrão is shipwrecked but struggles on to Hitu (northern Ambon) and wins the favour of the local rulers.[9] 1513: Machiavelli writes The Prince, a treatise about political philosophy 1513: The Portuguese mariner Jorge Álvares lands at Macau, China, during the Ming dynasty. 1513: Henry VIII defeats the French at the Battle of the Spurs. 1513: The Battle of Flodden Field in which invading Scots are defeated by Henry VIII's forces. 1513: Sultan Selim I ("The Grim") orders the massacre of Shia Muslims in Anatolia (present-day Turkey). 1513: Vasco Núñez de Balboa, in service of Spain arrives at the Pacific Ocean (which he called Mar del Sur) across the Isthmus of Panama. He was the first European to do so. 1514: The Battle of Orsha halts Muscovy's expansion into Eastern Europe. 1514: Dózsa rebellion (peasant revolt) in Hungary.Martin Luther initiated the Reformation with his Ninety-five Theses in 1517. 1514: The Battle of Chaldiran, the Ottoman Empire gains decisive victory against Safavid dynasty. 1515: Ascension of Francis I of France as King of France following the death of Louis XII. 1515: The Ottoman Empire wrests Eastern Anatolia from the Safavids after the Battle of Chaldiran. 1515: The Ottomans conquer the last beyliks of Anatolia, the Dulkadirs and the Ramadanids. 1516–1517: The Ottomans defeat the Mamluks and gain control of Egypt, Arabia, and the Levant. 1517: The Sweating sickness epidemic in Tudor England.[10] 1517: The Reformation begins when Martin Luther posts his Ninety-five Theses in Saxony. 1518: The Treaty of London was a non-aggression pact between the major European nations. The signatories were Burgundy, France, England, the Holy Roman Empire, the Netherlands, the Papal States and Spain, all of whom agreed not to attack one another and to come to the aid of any that were under attack. 1518: Mir Chakar Khan Rind leaves Baluchistan and settles in Punjab. 1518: Leo Africanus, also known as al-Hasan ibn Muhammad al-Wazzan al-Fasi, an Andalusian Berber diplomat who is best known for his book Descrittione dell'Africa (Description of Africa), is captured by Spanish pirates; he is taken to Rome and presented to Pope Leo X. 1518: The dancing plague of 1518 begins in Strasbourg, lasting for about one month. 1519: Leonardo da Vinci dies of natural causes on May 2.Europe at the time of the accession of Charles V in 1519 1519: Wang Yangming, the Chinese philosopher and governor of Jiangxi province, describes his intent to use the firepower of the fo-lang-ji, a breech-loading Portuguese culverin, in order to suppress the rebellion of Prince Zhu Chenhao. 1519: Barbary pirates led by Hayreddin Barbarossa, a Turk appointed to ruling position in Algiers by the Ottoman Empire, raid Provence and Toulon in southern France. 1519: Death of Emperor Maximilian; Charles I of Austria, Spain, and the Low Countries becomes Emperor of Holy Roman Empire as Charles V, Holy Roman Emperor (ruled until 1556). 1519–1522: Spanish expedition commanded by Magellan and Elcano are the first to Circumnavigate the Earth. 1519–1521: Hernán Cortés leads the Spanish conquest of the Aztec Empire. Ferdinand Magellan led the first expedition that circumnavigated the globe in 1519–1522. 1520–1566: The reign of Suleiman the Magnificent marks the zenith of the Ottoman Empire. 1520: The first European diplomatic mission to Ethiopia, sent by the Portuguese, arrives at Massawa 9 April, and reaches the imperial encampment of Emperor Dawit II in Shewa 9 October. 1520: Vijayanagara Empire forces under Krishnadevaraya defeat the Adil Shahi under at the Battle of Raichur 1520: Sultan Ali Mughayat Shah of Aceh begins an expansionist campaign capturing Daya on the west Sumatran coast (in present-day Indonesia), and the pepper and gold producing lands on the east coast. 1520: The Portuguese established a trading post in the village of Lamakera on the eastern side of Solor (in present-day Indonesia) as a transit harbour between Maluku and Malacca. 1521: Belgrade (in present-day Serbia) is captured by the Ottoman Empire. 1521: After building fortifications at Tuen Mun, the Portuguese attempt to invade Ming dynasty China, but are expelled by Chinese naval forces. 1521: Philippines encountered by Ferdinand Magellan. He was later killed in the Battle of Mactan in central Philippines in the same year. 1521: Jiajing Emperor ascended the throne of Ming dynasty, China. 1521: November, Ferdinand Magellan's expedition reaches Maluku (in present-day Indonesia) and after trade with Ternate returns to Europe with a load of cloves. 1521: Pati Unus leads the invasion of Malacca (in present-day Malaysia) against the Portuguese occupation. Pati Unus was killed in this battle, and was succeeded by his brother, sultan Trenggana. 1522: Rhodes falls to the Ottomans of Suleiman the Magnificent.[11]Sack of Rome of 1527 by Charles V's forces (painting by Johannes Lingelbach) 1522: The Portuguese ally themselves with the rulers of Ternate (in present-day Indonesia) and begin construction of a fort.[9] 1522: August, Luso-Sundanese Treaty signed between Portugal and Sunda Kingdom granted Portuguese permit to build fortress in Sunda Kelapa. 1523: Sweden gains independence from the Kalmar Union. 1523: The Cacao bean is introduced to Spain by Hernán Cortés 1524–1525: German Peasants' War in the Holy Roman Empire. 1524: Giovanni da Verrazzano is the first European to explore the Atlantic coast of North America between South Carolina and Newfoundland. 1524: Ismail I, the founder of Safavid dynasty, dies and Tahmasp I becomes king.Gun-wielding Ottoman Janissaries and defending Knights of Saint John at the siege of Rhodes in 1522, from an Ottoman manuscript 1525: Timurid Empire forces under Babur defeat the Lodi dynasty at the First Battle of Panipat, end of the Delhi Sultanate. 1525: German and Spanish forces defeat France at the Battle of Pavia, Francis I of France is captured. 1526: The Ottomans defeat the Kingdom of Hungary at the Battle of Mohács. 1526: Mughal Empire, founded by Babur. 1527: Sack of Rome with Pope Clement VII escaping and the Swiss Guards defending the Vatican being killed. The sack of the city of Rome considered the end of the Italian Renaissance. 1527: Protestant Reformation begins in Sweden. 1527: The last ruler of Majapahit falls from power. This state (located in present-day Indonesia) was finally extinguished at the hands of the Demak. A large number of courtiers, artisans, priests, and members of the royalty moved east to the island of Bali; however, the power and the seat of government transferred to Demak under the leadership of Pangeran, later Sultan Fatah. 1527: June 22, The Javanese Prince Fatahillah of the Cirebon Sultanate successfully defeated the Portuguese armed forces at the site of the Sunda Kelapa Harbor. The city was then renamed Jayakarta, meaning "a glorious victory." This eventful day came to be acknowledged as Jakarta's Founding Anniversary. 1527: Mughal Empire forces defeat the Rajput led by Rana Sanga of Mewar at the Battle of Khanwa 1529: The Austrians defeat the Ottoman Empire at the siege of Vienna. 1529: Treaty of Zaragoza defined the antimeridian of Tordesillas attributing the Moluccas to Portugal and Philippines to Spain. 1529: Imam Ahmad Gurey defeats the Ethiopian Emperor Dawit II in the Battle of Shimbra Kure, the opening clash of the Ethiopian–Adal War. Spanish conquistadors with their Tlaxcallan allies fighting against the Otomies of Metztitlan in present-day Mexico, a 16th-century codex 1531–1532: The Church of England breaks away from the Catholic Church and recognizes King Henry VIII as the head of the Church. 1531: The Inca Civil War is fought between the two brothers, Atahualpa and Huáscar. 1532: Francisco Pizarro leads the Spanish conquest of the Inca Empire. 1532: Foundation of São Vicente, the first permanent Portuguese settlement in the Americas. 1533: Anne Boleyn becomes Queen of England. 1533: Elizabeth Tudor is born. 1534: Jacques Cartier claims Canada for France. 1534: The Ottomans capture Baghdad from the Safavids. 1534: Affair of the Placards, where King Francis I becomes more active in repression of French Protestants. 1535: The Münster Rebellion, an attempt of radical, millennialist, Anabaptists to establish a theocracy, ends in bloodshed. 1535: The Portuguese in Ternate depose Sultan Tabariji (or Tabarija) and send him to Portuguese Goa where he converts to Christianity and bequeaths his Portuguese godfather Jordao de Freitas the island of Ambon.[12] Hairun becomes the next sultan. 1536: Catherine of Aragon dies in Kimbolton Castle, in England.Territorial expansion of the Ottoman Empire under Suleiman (in red and orange) 1536: In England, Anne Boleyn is beheaded for adultery and treason. 1536: Establishment of the Inquisition in Portugal. 1536: Foundation of Buenos Aires (in present-day Argentina) by Pedro de Mendoza. 1537: The Portuguese establish Recife in Pernambuco, north-east of Brazil. 1537: William Tyndale's partial translation of the Bible into English is published, which would eventually be incorporated into the King James Bible. 1538: Gonzalo Jiménez de Quesada founds Bogotá. 1538: Spanish–Venetian fleet is defeated by the Ottoman Turks at the Battle of Preveza. 1539: Hernando de Soto explores inland North America. Nicolaus Copernicus 1540: The Society of Jesus, or the Jesuits, is founded by Ignatius of Loyola and six companions with the approval of Pope Paul III. 1540: Sher Shah Suri founds the Suri dynasty in South Asia, an ethnic Pashtun (Pathan) of the house of Sur, who supplanted the Mughal dynasty as rulers of North India during the reign of the relatively ineffectual second Mughal emperor Humayun. Sher Shah Suri decisively defeats Humayun in the Battle of Bilgram (May 17, 1540). 1541: Pedro de Valdivia founds Santiago in Chile. 1541: An Algerian military campaign by Charles V of Spain (Habsburg) is unsuccessful. 1541: Amazon River is encountered and explored by Francisco de Orellana. 1541: Capture of Buda and the absorption of the major part of Hungary by the Ottoman Empire. 1541: Sahib I Giray of Crimea invades Russia. 1542: The Italian War of 1542–1546 War resumes between Francis I of France and Emperor Charles V. This time Henry VIII is allied with the Emperor, while James V of Scotland and Sultan Suleiman I are allied with the French. 1542: Akbar The Great is born in the Rajput Umarkot Fort 1542: Spanish explorer Ruy López de Villalobos named the island of Samar and Leyte Las Islas Filipinas honoring Philip II of Spain and became the official name of the archipelago. 1543: Ethiopian/Portuguese troops defeat the Adal army led by Imam Ahmad Gurey at the Battle of Wayna Daga; Imam Ahmad Gurey is killed at this battle. 1543: Copernicus publishes his theory that the Earth and the other planets revolve around the Sun 1543: The Nanban trade period begins after Portuguese traders make contact with Japan. 1544: The French defeat an Imperial–Spanish army at the Battle of Ceresole.Scenes of everyday life in Ming China, by Qiu Ying 1544: Battle of the Shirts in Scotland. The Frasers and Macdonalds of Clan Ranald fight over a disputed chiefship; reportedly, 5 Frasers and 8 Macdonalds survive. 1545: Songhai forces sack the Malian capital of Niani 1545: The Council of Trent meets for the first time in Trent (in northern Italy). 1546: Michelangelo Buonarroti is made chief architect of St. Peter's Basilica. 1546: Francis Xavier works among the peoples of Ambon, Ternate and Morotai (Moro) laying the foundations for a permanent mission. (to 1547) 1547: Henry VIII dies in the Palace of Whitehall on 28 January at the age of 55. 1547: Francis I dies in the Château de Rambouillet on 31 March at the age of 52. 1547: Edward VI becomes King of England and Ireland on 28 January and is crowned on 20 February at the age of 9. 1547: Emperor Charles V decisively dismantles the Schmalkaldic League at the Battle of Mühlberg. 1547: Grand Prince Ivan the Terrible is crowned tsar of (All) Russia, thenceforth becoming the first Russian tsar. 1548: Battle of Uedahara: Firearms are used for the first time on the battlefield in Japan, and Takeda Shingen is defeated by Murakami Yoshikiyo. 1548: Askia Daoud, who reigned from 1548 to 1583, establishes public libraries in Timbuktu (in present-day Mali). 1548: The Ming dynasty government of China issues a decree banning all foreign trade and closes down all seaports along the coast; these Hai jin laws came during the Wokou wars with Japanese pirates. 1549: Tomé de Sousa establishes Salvador in Bahia, north-east of Brazil. 1549: Arya Penangsang with the support of his teacher, Sunan Kudus, avenges the death of Raden Kikin by sending an envoy named Rangkud to kill Sunan Prawoto by Keris Kyai Satan Kober (in present-day Indonesia). The Islamic gunpowder empires: Mughal Army artillerymen during the reign of Jalaluddin Akbar 1550: The architect Mimar Sinan builds the Süleymaniye Mosque in Istanbul. 1550: Mongols led by Altan Khan invade China and besiege Beijing. 1550–1551: Valladolid debate concerning the human rights of the Indigenous people of the Americas. 1551: Fifth outbreak of sweating sickness in England. John Caius of Shrewsbury writes the first full contemporary account of the symptoms of the disease. 1551: North African pirates enslave the entire population of the Maltese island Gozo, between 5,000 and 6,000, sending them to Libya. 1552: Russia conquers the Khanate of Kazan in central Asia. 1552: Jesuit China Mission, Francis Xavier dies. 1553: Mary Tudor becomes the first queen regnant of England and restores the Church of England under Papal authority. 1553: The Portuguese found a settlement at Macau. 1554: Missionaries José de Anchieta and Manuel da Nóbrega establishes São Paulo, southeast Brazil. 1554: Princess Elizabeth is imprisoned in the Tower of London upon the orders of Mary I for suspicion of being involved in the Wyatt rebellion. 1555: The Muscovy Company is the first major English joint stock trading company. 1556: Publication in Venice of Delle Navigiationi et Viaggi (terzo volume) by Giovanni Battista Ramusio, secretary of Council of Ten, with plan La Terra de Hochelaga, an illustration of the Hochelaga.[13] 1556: The Shaanxi earthquake in China is history's deadliest known earthquake during the Ming dynasty. 1556: Georgius Agricola, the "Father of Mineralogy", publishes his De re metallica. 1556: Akbar defeats Hemu at the Second battle of Panipat. 1556: Russia conquers the Astrakhan Khanate. 1556–1605: During his reign, Akbar expands the Mughal Empire in a series of conquests (in the Indian subcontinent).Political map of the world in 1556 1556: Mir Chakar Khan Rind captures Delhi with Humayun. 1556: Pomponio Algerio, radical theologian, is executed by boiling in oil as part of the Roman Inquisition. 1557: Habsburg Spain declares bankruptcy. Philip II of Spain had to declare four state bankruptcies in 1557, 1560, 1575 and 1596. 1557: The Portuguese settle in Macau (on the western side of the Pearl River Delta across from present-day Hong Kong). 1557: The Ottomans capture Massawa, all but isolating Ethiopia from the rest of the world. 1558: Elizabeth Tudor becomes Queen Elizabeth I at age 25. 1558–1603: The Elizabethan era is considered the height of the English Renaissance. 1558–1583: Livonian War between Poland, Grand Principality of Lithuania, Sweden, Denmark and Russia. 1558: After 200 years, the Kingdom of England loses Calais to France. 1559: With the Peace of Cateau Cambrésis, the Italian Wars conclude. 1559: Sultan Hairun of Ternate (in present-day Indonesia) protests the Portuguese's Christianisation activities in his lands. Hostilities between Ternate and the Portuguese. The Mughal Emperor Akbar shoots the Rajput warrior Jaimal during the Siege of Chittorgarh in 1567 1560: Ottoman navy defeats the Spanish fleet at the Battle of Djerba. 1560: Elizabeth Bathory is born in Nyirbator, Hungary. 1560: By winning the Battle of Okehazama, Oda Nobunaga becomes one of the pre-eminent warlords of Japan. 1560: Jeanne d'Albret declares Calvinism the official religion of Navarre. 1560: Lazarus Church, Macau 1561: Sir Francis Bacon is born in London. 1561: The fourth battle of Kawanakajima between the Uesugi and Takeda at Hachimanbara takes place. 1561: Guido de Bres draws up the Belgic Confession of Protestant faith. 1562: Mughal emperor Akbar reconciles the Muslim and Hindu factions by marrying into the powerful Rajput Hindu caste. 1562–1598: French Wars of Religion between Catholics and Huguenots. 1562: Massacre of Wassy and Battle of Dreux in the French Wars of Religion. 1562: Portuguese Dominican priests build a palm-trunk fortress which Javanese Muslims burned down the following year. The fort was rebuilt from more durable materials and the Dominicans commenced the Christianisation of the local population.[12] 1563: Plague outbreak claimed 80,000 people in Elizabethan England. In London alone, over 20,000 people died of the disease. 1564: Galileo Galilei born on February 15 1564: William Shakespeare baptized 26 April 1565: Deccan sultanates defeat the Vijayanagara Empire at the Battle of Talikota. 1565: Mir Chakar Khan Rind dies at aged 97. 1565: Estácio de Sá establishes Rio de Janeiro in Brazil. 1565: The Hospitallers, a Crusading Order, defeat the Ottoman Empire at the siege of Malta (1565). 1565: Miguel López de Legazpi establishes in Cebu the first Spanish settlement in the Philippines starting a period of Spanish colonization that would last over three hundred years. 1565: Spanish navigator Andres de Urdaneta discovers the maritime route from Asia to the Americas across the Pacific Ocean, also known as the tornaviaje. 1565: Royal Exchange is founded by Thomas Gresham. 1566: Suleiman the Magnificent, ruler of the Ottoman Empire, dies on September 7, during the battle of Szigetvar.Siege of Valenciennes during the Dutch War of Independence in 1567 1566–1648: Eighty Years' War between Spain and the Netherlands. 1566: Da le Balle Contrade d'Oriente, composed by Cipriano de Rore. 1567: After 45 years' reign, Jiajing Emperor died in the Forbidden City, Longqing Emperor ascended the throne of Ming dynasty. 1567: Mary, Queen of Scots, is imprisoned by Elizabeth I. 1568: The Transylvanian Diet, under the patronage of the prince John Sigismund Zápolya, the former king of Hungary, inspired by the teachings of Ferenc Dávid, the founder of the Unitarian Church of Transylvania, promulgates the Edict of Torda, the first law of freedom of religion and of conscience in the World. 1568–1571: Morisco Revolt in Spain. 1568–1600: The Azuchi-Momoyama period in Japan. 1568: Hadiwijaya sent his adopted son and son in-law Sutawijaya, who would later become the first ruler of the Mataram dynasty of Indonesia, to kill Arya Penangsang. 1569: Rising of the North in England. 1569: Mercator 1569 world map published by Gerardus Mercator.