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How big is the gap between Chinese fighter aircraft engines and the United States? What is the future development prospect? We have asked military expert Tomita Shao to interpret it for everyone.

Hello, friends, netizens. I'm a parent. Let's take a look at the issue of China's domestically produced aero engines. So many netizens are particularly concerned about the progress and development of China's political development. So what is the current level and world of China's military and civil aviation engines? What is the gap between us at the top level?

Will our future development progress and advanced level become shorter and shorter, or will the gap become wider and wider? Well, this question is really difficult to answer. First of all, we have to emphasize that aero engine is the most difficult research and development of all aircraft systems and the longest development cycle, but it is not the most expensive, so the development of military aircraft has actually experienced a lot. At the earliest stage, the cost of a military aircraft was divided into two parts: the body and the engine. At that time, there were very few airborne avionics systems or airborne electronic systems. There were very few airborne electronic systems during the First World War. So the cost is zero. Fifty percent is the airframe. Fifty percent is the engine. It can be seen that the position occupied by the engine at the time is very important. Without an advanced engine, your aircraft performance will definitely be affected, and the aircraft performance is indeed related to the shape of the aircraft. Design and power plant are closely related. So during the Second World War, avionics began to increase. Probably this ratio is about 5%. Besides, there are some simple navigation systems that have been turned by air communication stations, but the ratio of the aircraft body and the engine is still relatively large, probably each accounted for, but it involves the first-generation jet fighter inter-airborne electronic system during the Korean War. The ratio began to account for more than a dozen percent of the aircraft and engine ratio began to decline. So when it comes to the second-generation fighter, the proportion of the third-generation airborne electronic system is constantly improving, and the proportion of the engine and the body is getting lower and lower. Then the fourth-generation fighter is the era of stealth fighters. What is the ratio of it. Probably each accounted for 20% to 18% of the position, while the airborne electronic system accounted for 50% to 60%. Of course, in addition to the engine body avionics system, there are also some mechanical systems recorded. The proportion of it is probably dyed like this. So the cost of the engine is actually decreasing, but this decrease does not mean that its importance is also decreasing. Not only is its importance not decreasing but Continuously improving. Because the development of the engine is too difficult, although the avionics system includes the operating software, it accounts for a high proportion, but you have amazing capabilities and may be developed. But an advanced military engine, if you want to successfully develop it in a short time, it is basically Very difficult, very difficult. You must have decades of experience to accumulate it may succeed, and if you have experience, there is still a lot of investment and a long time. If the development period of a fighter is ten years, then the development period of the engine is fifteen years. So how much is the development of the current fourth-generation fighter aircraft? It is about twenty years. Then the R&D cycle of the engine will be 20 or even 30 years before it is possible to be mature and developed. This mature transition period is also very long. So some of the power plants currently used by the third-generation fighters are relatively mature compared to the Feibai F Yao Xiaoming used by the American F-15 and F16 fighters. These engines have gradually matured

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after decades of running-in. Russia's engines have also matured over decades and how much their driving force is. Everyone is going to the eighth level. So this is a large engine. Our country has also produced a large-thrust domestic engine. Then its thrust is basically the same as that of the American engine of the same generation. The Russian registration machine is basically a weight class, both of which have a thrust of 12,500 kg to 14,000 kg. In the interval, in addition to the high-thrust domestic engines, some countries are still developing medium-thrust engines, such as the third generation of Frost. The S in the United States is going to test China's new domestic poems and wines, as well as the Ebola developed by European countries, etc. Then these engines are now

They are all at the same level but not developed by the same person. Our country's high-thrust engines are more than the United States and Russia's 3rd or 3rd anniversary, so now the fourth-generation fighters have to be replaced with new low-speed high-thrust power units, so the maximum thrust-to-weight ratios of these power units are generally speaking. More than ten is also an order of magnitude higher than the power unit thrust-to-weight ratio used by the third-generation fighter. Then its development is even more difficult. So when did the United States be the leader? It should be said that in the late 1980s and early 1990s, this engine suitable for heavy stealth fighters was not required to be used. We started in the early nineties and have it now. And in more than thirty years. So the engine of the same type in our country is now under development. Then this gap should be said to be not small, but once we have successfully developed advanced small bypass ratio high thrust engines through our efforts, we can make up for this gap.

Because in the past two to three decades, the development of US military engines, especially military engines, has also been continuously improving, but from the perspective of the magnitude of this progress, it is still limited, leaving us with room for catching up. It makes us to seize the time to increase investment. After hard work, we will develop the next generation of power plants suitable for the fourth-generation fighters. Well, we have succeeded in research and development. Now it has just caught up with the level of the United States in the 1980s and 1990s, and the United States is now proposing its new engines. The equipment and engines are being upgraded and the performance of this upgraded engine is great. What if the increase in the rate may increase our gap? There is no other way to continue to catch up with the continuous accumulation of experience, so these experience must be accumulated through the accumulation of the research and development process. Because if you don't use it, it's impossible to expose its problems. If you don't expose it, it's difficult to analyze and improve it comprehensively. Only by continuously increasing research and development and use of our new generation of engines and active engines can it be possible to continue. Upgrade, continuous improvement, and continuous improvement. I think through the efforts of Chinese astronauts, although we are far behind the world's advanced level, we will eventually shorten the gap to catch up. No matter what, even though we are still in a backward position, we are already Become one of the three countries in the world that can develop high thrust-to-weight ratio and large thrust turbofan engines. We should also see this achievement. So with this achievement, we have cultivated people and laid the foundation for corresponding material design. Then the next breakthrough is just around the corner. Okay, that's all for today's introduction. Thank you everyone for watching. See you next time.