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WAVE DISC ENGINE

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ABSTRACT

This paper describes about the development of the latest PISTONLESS rotary-engine, "THE WAVE DISC ENGINE". The Pistonless rotary engines have the most potential to solve the problem of eventually losing the availability of fossil-fuels. The wave disk engine "uses the combustion of air and fuel to build up pressure within the engine, generating a shock wave that blasts hot gas exhaust into the blades of the engine's rotors, causing them to turn,which inturn generates electricity." Since fossil fuels are nearing the end of their existence, finding ways to use less of them is crucial to preserve our supplies as long as possible. The traditional internal combustion engine only uses 15 percent of its fuel for propulsion. The remaining 85 percent is essentially wasted. But the wave disk engine promises a big step forward—it could use 60 percent of the fuel to create power, making it up to four times as efficient. Therefore, perfecting the wave disk engine that requires around thirty percent of the fuel that current engines require will benefit all of man-kind greatly by continuing the convenience of driving from place to place. Thus the WAVE-DISC ENGINE is spinning the future.

Keywords: Alternative energy, Engine, Fossil fuels, Motor, Mueller, Rotary engine, Shock wave engine, Wave disk engine.

INTRODUCTION

A major component of the wave disk engine is its unique wave-like shaped channels that are evenly spaced all the way across the disk of the engine as shown below.

These channels first trap the oxygen and fuel and force them to mix. Also, when the engine is first started and doesn't have any exhaust to spin the disk, it will need to begin spinning somehow. Dr. Mueller accounted for this problem by shaping the channels like waves, allowing the engine to use capture force and pressure more. For example, since the channels are so uniquely shaped, when the liquid gasoline is fed into the chambers separated by the channels, it will come in contact with these channels and cause them to move. The disk begins spinning and continues on through the process. This is possible because the wave disk engine is much lighter than the typical engine in automobiles . Standard engines weigh around six hundred pounds while the wave disk engine can be picked up with only one hand, weighing between twenty and twenty-five pounds. Since it is so light weight, the disk can begin spinning with this little force.

SPINNING COMBUSTION

For electricity to be created in automobile engines, a resource must be turned into energy in some way. In a typical engine, the fuel and air mixture goes through a process called internal combustion to accomplish this. During combustion of a four-stroke engine, a piston makes four different strokes which turn

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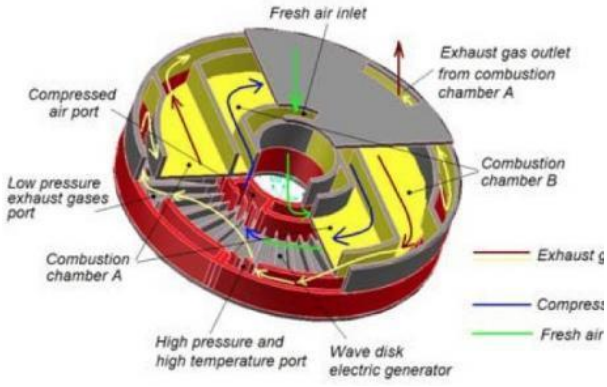
the crankshaft to create electricity. Similar to a standard engine, the wave disk engine must endure its own process of combustion. Once the air and gasoline have mixed and started spinning, a centripetal force compresses the mixture even more, similar to combustion in a typical engine. This also causes a large increase in pressure causing the disk to spin even faster. Eventually, the spinning combined with the large pressure will create enough energy to produce a shock wave that ignites the mixture. The diagram below shows where the fresh air enters, the top, inner inlets and how it enters the chambers below. From there, you can see that the air compresses as it spins and eventually will be ignited by a shock wave. Once the mixture is burning, the exhaust is released through the top outlets on the outer edges of the wave disk.



TURNING THE TURBINES

The turbines of the engine are connected to the rotating disk. Therefore, the main objective for this entire process is to turn the wave disk as much and as fast as possible. The turning turbines will produce electricity similarly to the way that the turbines in modern automobiles do now. As the turbines turn, it has mechanical energy that will be used to create electricity through an alternator. Alternators are basically small generators that create electricity. The alternator's purpose is to transfer the mechanical energy being created into electricity to recharge the battery that is supplying the automobile with electricity . An alternator found in modern vehicles consists of a magnet on an axle that is spins around by a belt. The belt is being spun by the engine. Around the magnet are coils of wire that produce current as the alternator approaches it. However, once the magnet is very close to the coil, the electric field is not changing and therefore the current begins to decrease until the magnet starts to move away from the coil. As this point, the electric field increases and the current begins to flow again to recharge the battery .

THE WAVE DISK ENGINE IS NOT THE PERMANENT SOLUTION

Making the wave disk engine the standard engine in automobiles would dramatically decrease the use of fossil fuels and increase the amount of time that they would be available for the world to use. However, the wave disk engine is not a permanent solution to the energy crisis. The engine still requires gasoline in order to operate and therefore only prolongs the availability of fossil fuels. Eventually, the fossil fuels will still become unavailable and the world will need to find a new energy source to rely on in order to continue to use all of the amenities that require electricity. However, the wave disk engine is a terrific temporary solution because it will allow the human race to use fossil fuels for a longer time; This, in effect, would give engineers and scientists more time to find a more permanent energy source for electricity. This is possible since the engine only requires thirty percent of fuel that a standard engine needs and can increase the estimated fuel mileage by three and a half times what it currently is. Perfecting the wave disk engine and immediately manufacturing it to replace current engines can greatly affect society both immediately and in the future.

IMPORTANCE OF THE WAVE DISK ENGINE

Even though the wave disk engine is still in its developmental stage, it has shown many signs that it can be promising for the future. Dr. Norbert Mueller, the engineering professor in charge of the research project at Michigan State, believes that the engine will reduce the weight of vehicles by about twenty percent, reduce the amount of carbon dioxide by about ninety percent, lower the total price of manufacturing each engine, and increase the

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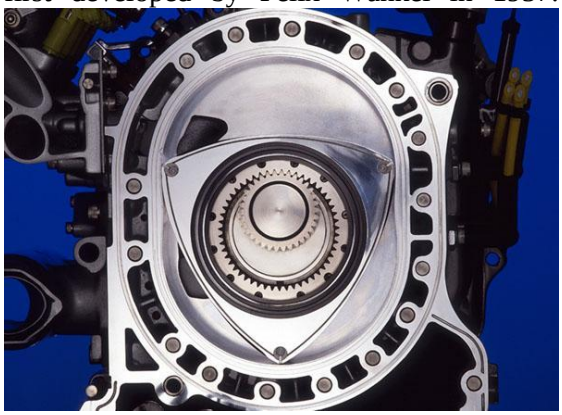
percentage of the fuel that is used for propulsion . When finished the wave disk engine could revolutionize many different aspects of everyday life.

The biggest application of the wave disk engine in everyday life would most likely be the use of it in automobiles. It is important for engineers to invest in the development of the wave disk engine in order to reduce the amount of fuel that is needed to drive automobiles and reduce the cost of manufacturing for automobile engines. Currently there is only one major automobile company, Mazda, mass-produces automobiles that use piston-less rotary engines, similar to the wave disk engine . The first successful piston-less rotary engine is the Wankel engine, first developed by Felix Wankel in 1957.

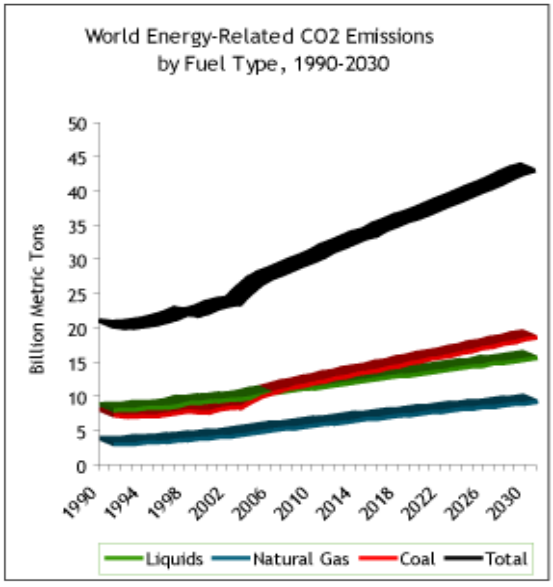


MERITS AND DEMERITS

ENVIRONMENTAL IMPACT

The price of the engine is not the only cost that is lower than the average engine; the price of the engine's fuel will also be lower than that of standard engines because of the need for a decrease in the amount of gasoline to needed fuel the engine. We live in a world of finite resources and we should begin to invest in developing ways to reduce the amount of resources that we use. The average automobile wastes about eighty-five percent of the fuel and only fifteen percent of the fuel used in the engine goes towards propelling the engine. For the wave disk engine, only forty percent of the fuel is wasted and sixty percent of it will be used to propel the engine; therefore, the driver of an automobile with the wave disk engine will only have to use one-fourth of the gasoline to go the same distance as a car with a standard engine . In addition to reducing the amount of gasoline that the driver of an automobile will have to buy, this will reduce the amount of fuel that we would have to purchase from foreign countries. Even though it will not completely end problems involving sustainable energy, the wave disk engine will greatly reduce the amount of fuel needed to preform everyday tasks. Engineers should invest in the development of this engine because it will significantly reduce the amount of fuel that the average American would have to buy in order to drive a car.

In addition to the reduced amount of fossil fuels that will be needed for the engine, the low rate of carbon dioxide emission makes the wave disk engine more environmentally friendly than any other engine that has been used for automobiles, so far. One of the biggest goals of the wave disk engine is to reduce the amount of waste produced from an engine. Most automobiles release about 19.4 pounds of carbon dioxide into the atmosphere for every gallon of gasoline that is burned (about 22.2 pounds for every gallon of diesel) . Carbon dioxide, being one of the stronger greenhouse gases, is potentially harmful for our atmosphere and has been proven to be a major factor in climate change . The research team at Michigan State estimates that, regardless of the engine's size, it will be able to produce more than ninety percent less carbon dioxide emissions than a standard engine of the same size . Below is a graph of the emissions of carbon dioxide up through 2010.



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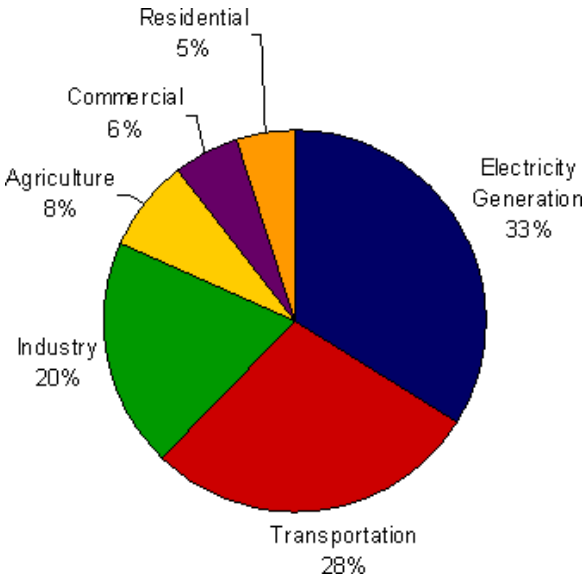
As you can see from Figure , the thick dark line represents the total carbon dioxide emissions through 2010. It is estimated that by 2030, the total amount of carbon dioxide emitted each year will be about 42.2 billion tons a year. Even though lowering the emissions in automobiles will not completely solve the greenhouse gas problem, it will significantly reduce the problem so that there is not as much carbon dioxide emitted each year as predicted. Below is a graph that shows the percentages of the total carbon dioxide emissions released into the atmosphere.



As Figure shows, transportation accounts for about twenty-eight percent of the carbon dioxide emissions released into the atmosphere. If the wave disk engine is as successful as Dr. Mueller and the research team at Michigan State believes, it can be implemented into other fields such as factory machinery and electricity generation. If the wave disk engine is implemented into those fields, it will reduce about ninety percent of approximately four fifths of the total amount of carbon dioxide emissions released into the atmosphere . Even though transportation only accounts for a little more than one quarter of the total amount of carbon dioxide released, Engineers should invest in the development of the wave disk engine for automobiles in order to reduce the total amount of carbon dioxide emissions exerted by cars and use it as a test for other industries to follow.

ECONOMIC IMPACT

In addition to the economic efficiency of the wave disk engine for automobile drivers, the development of the wave disk engine can have several long-term effects on the economy. The first major economy that would be affected by the long-term effects of the wave disk engine is the automobile industry. According to Mueller's predictions, he has estimated that it would cost about $500 to manufacture an engine that would fit a car. Once the patent for the design of the wave disk engine is sold to different automobile companies, car companies can begin to mass produce the new automobiles that run on the wave disk engine. This would benefit the automobile industry because the car companies that manufacture new automobiles with the wave disk engines can sell their products at very inexpensive prices. By selling the new cars at prices that are significantly lower than the prices of standard automobiles, Americans will be more inclined to buy cars with the wave disk engines because of the cars' low cost and high fuel efficiency. The high sales of the new cars would become a major benefit for the automobile economy.

One major long-term importance of the wave disk engine is that it can dramatically affect the gasoline economy. Since an automobile with the wave disk engine uses sixty percent of its fuel input to propel itself instead of the fifteen percent in most cars, automobiles with the wave disk engine can drive about four times as far as an automobile with a standard engine while using the same amount of fuel. Therefore, if the wave disk engine would be mass produced and implemented into the design of most cars, the demand for gasoline would go down. Once the demand for gasoline would decrease, the price of fuel will begin to decrease. This would indicate that we would not need to purchase as much foreign fuel as we are now. The graph below shows the amount of fuel that the United States is importing versus the amount of fuel that the United States is exporting.

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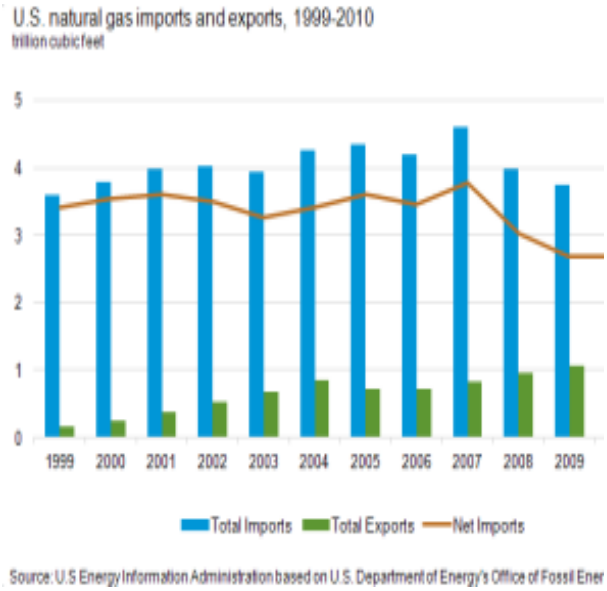

Figure shows that we are significantly dependent of foreign countries for fuel. If the demand for fuel decreases, we will not have to import as much fuel from foreign nations.

Once the automobile and fuel industries begin to prosper, the wave disk engine can be used for other functions besides automobiles. First the wave disk engine will be implemented into other areas of transportation, such as trains, watercrafts, or aircraft. Then the wave disk engines can be used to drive factory machinery. Since most major industries need to mass produce their products in factories, the price of fuel for factory equipment becomes extremely expensive. If the wave disk engine proves to be successful in automobiles, it can be developed to drive factory machinery, which will ultimately lower the amount of fuel that companies need the purchase in order to make their factories functional.

BEST CURRENT SOLUTION

Perfecting the wave disk engine would have great value to almost the entire society. The value of gasoline would decrease because it would no longer be needed as much. Manufacturing the wave disk engine would also be much less expensive because of its light weight and decreased volume compared to standard combustion engines. Engineers and scientists would be given more time to find a permanent solution to create electricity that is not reliant on fossil fuels. Although this project requires government funding and is not a permanent solution, the benefits that the wave disk engine create greatly outweigh the conflicts about money that are caused. The wave disk engine will not immediately solve the current energy crisis, but it will prolong the availability of fossil fuels and the convenience of automobile transportation.

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