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Power of Motorcycle Engine

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***Abstract*: A motorcycle engine is an engine that powers a motorcycle engine are typically two stroke or four – stroke internal combustion engines but other engine types such as Wankel and electric motors have been used. The rear wheel power being sent to the driven wheel by belt chain or shaft. Historically some 2,000 units of the were produced between 1921 and 1925 with front with front wheel drive. With both wheels driven has been produced since 1960. A transmission is a machine in a power transmission system which provides controlled application power often the term 5- speed transmission refers simply to the gearbox that uses gears and trains to provided speed and torque block conversions from a rotating power source to another device. Often a transmission has multiple gear ratios or simply "gears" with the ability to switch between them as the speed varies. This switching may be done manually by the operator or automatically by a control unit. Directional forward and reverse control may also be provided. Single ratio transmissions also exist which simply change the speed and torque and sometimes direction of motor output. In motor vehicles the transmission general is connected to the engine crankshaft a flywheel or clutch or fluid coupling partly because internal combustion engines cannot run below a particular speed. The output of the transmission is transmitted the driveshaft to one more differential which drive the wheels. While a differential may also provide gear reduction its primary purpose is to permit the wheels at either end of an axle to rotate at different speeds essential to avoid wheel slippage on turns as it changes the direction of rotation. Conventional gear belt transmissions are not the only mechanism for speed torque adaptation. Alternative mechanism Include torque converters and power transformation. E. g.: Diesel electric transmission and hydraulic system. Hybrid configuration also exist automatic transmission use a valve body to shift gears using fluid pressure in response to engine RPM, speed and throttle input.**

***Keywords*: Motorcycle.**

1. Introduction

A. Earliest motorcycle engine concept

This 1818 caricature was thought for many years to be entirely fanciful until the Michaux roper and other steam cycles were rescued from obscurity and the stories of the early steam cycle experiment were rediscovered there were no steam motorcycle in 1818 but there soon would be the first motor cycles were powered by steam engine.

The earliest example is the French MICHAUX - PERREAUX STEAM VELOCIPEDE of 1868.

This was followed by the American roper system velocipede of 1869 and a number of other Steam powered two and were wheelers, manufactured and sold to the public on through the early 20th century.

B. Otto cycle

The otto cycle gasoline internal combustion engine was first used on an experimental two wheel created by Gottlieb Daimler to test the practicality of such an engine in a vehicle this motorcycle is credit as the world's first motorcycle by many authorities partially on the assumption that a motor cycle is defined not as any two -wheel motor vehicle but a two- wheel internal combustion engine motor vehicle.

The Oxford English Dictionary for example defines the word motorcycle this way the steam cycle also simply neglected and forgotten by many historians even as the waited forty years on display in the National Motor Museum Beaulieu.

In a recent year surge in interest in clean energy has put many new electric powered two wheelers on the market and they are registered as motorcycle or scooters without the type of power plant being an issue. Diesel motor cycle Diesel motorcycle were also experiment with briefly in the 20th century and are again the subject of interest due to fuel economy and the needs of military logistics. The USMC has ordered a new diesel motorcycle the that can use the same fuel as the rest of their vehicle aircraft cars and trucks the overwhelming majority of the motor cycle produced and used in the world today have small displacement air - cooled single – cylinder engines both two and four strokes.

C. Types stroke

Almost all production motorcycles have gasoline internal combustion engines.

Both four stroke and two stroke engines are used but strict emission laws have led to far fewer two stroke few used rotary engines but no Wankel bikes are currently production.

Motorcycle engines can be air cooled or liquid cooled and optionally include oil as well some scooters use batteries and an electric motor. The "2009" TT races introduced a new category 'TTX' for electric bikes using fuel – cells or batteries.

Motor cycle engines can be mounted transversely with the crankshaft aligned perpendicular to the frame or longitudinally with the crankshaft parallel to the frame motorcycle with transversely mounted engines are more suited to have chain or belt final drive motorcycle with longitudinally mounted engines are mounted suit for shaft final drive.

Motor scooters often have the engine as part of the rear suspension so the engine not fixed rigidly to the main frame

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instead that combined engine transmission swingarm assembly is pivoted to follow the road surface and is part of the chain final drive of scooters runs in an oil bath with the engine casings step through motorcycles may have a rigidly engine or may have scooter type arrangement.

2. Two – Stroke and Four Stroke

A. Introduction

Two stroke engines have fewer moving parts than four stroke engines and produce twice number of power strokes per revolution.

Fuel economy is better in four strokes due to more complete combustion of the intake charge in four stroke engines.

Nevertheless, two stroke have been largely replaced on motor cycles in developed nations due to their environment disadvantage cylinder lubrication is necessarily total loss and this inevitably leads to a smoke exhaust particularly on wide throttle openings two stroke engine motorcycle continue to be made in large number but mostly of load motocross low power and step through under mopeds small scooters and step through where still complete strongly with

For stroke including the highest selling motorcycle of all time the 5occ the major market of two stroke motorcycles in dirt bikes and developing nations.

B. Two Stroke Engine

A two stroke engine is a type internal combustion engine that complete a power cycles with two stroke up and down movements of the piston during on power cycle this power cycle being completed in one revolution of the crankshaft a four stroke engine requires four strokes of the piston to complete a power cycle during to crankshaft revolution in a two stroke engine the end of the combustion stroke and the beginning of the stroke happen simultaneously with the intake exhaust functions occurring at the same time.

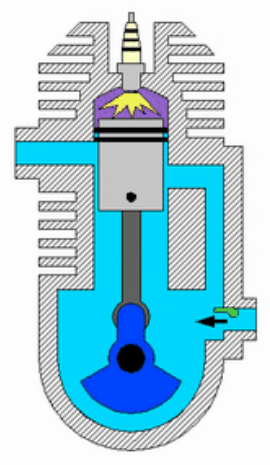

Fig. 1.

Two stroke engines often have a high power to weight ratio power being available in a narrow range of rotational speeds called the power band two stroke engines have a fewer moving parts four stroke engines.

Different two stroke design types:

Although the principles remain the same the mechanical details of various two stroke engines differ depending on the type the design type vary according to the method of introducing the charge to the cylinder the method of scavenging the cylinder exchanging burnt exhaust for fresh mixture and the method of exhausting the cylinder.

Piston controlled inlet port:

Piston controlled inlet port piston port is the designs and the most common in small two stroke engine. All functions are controlled solely by the piston covering and uncovering the ports as it moves up and down in the cylinder in the 1970, Yamaha worked out some basic principle for this system.

However mechanical limit exists to the width of a single exhaust port at about 62% of the bore diameter for a reasonable rig life. Beyond this the rings bulge into the exhaust port and wear quickly.

A maximum 70% of bore width is possible in racing engines where rings are changed every few races intake duration between 120 and 160. transfer port time is set at a minimum of 26. the strong, low -pressure pulse of a racing two stroke expansion chamber can drop the pressure.

One of the reasons for high fuel consumption in two stroke is that some of the incoming pressurized fuel – air mixture is forced across the top of the piston where it has a colling action and straight out the exhaust pipe. An expansion chamber with a strong reverse pulse stops this outgoing flow.

Fundamental difference from typical four stroke engines is that two – stroke is sealed and forms part of the induction process.

C. Redd valve

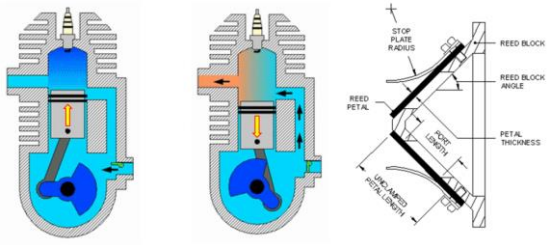

Fig. 2.

In a two -stroke engine when the piston moves upwards in suction - compression stroke, sudden pressure drop occurs in the chamber below the piston. At this moment fresh air fuel mixture is sucked from the carburettor to the crankcase when the piston moves downwards in work exhaust stroke this fresh mixture is pushed upwards to reload to the combustion chamber in order less powerful generation of two stroke engine part of the fresh mixture being pushed out from the crankcase was moving back to carburettor. nowadays one-way valve is used between the crankcase and the carburettor valves is called reed valve allows the mixture to move in one direction from the carburettor to the crankcase it prevents the mixture from moving back to the carburettor. In the effect redd valve improves reloading of the combustion chamber with fresh air fuel mixture this improves power output of modern two stroke engines.

To the left suction- compression stroke reed valve is open.

To the right work exhaust stroke reed valve is closed.

D. Cross flow scavenging

Cross flow scavenging is the gas exchange process in which the charge air passes is directed upwards passing under the cylinder cover and down the opposite side expelling exhaust gas through exhaust ports on that side this system is obsolete now.

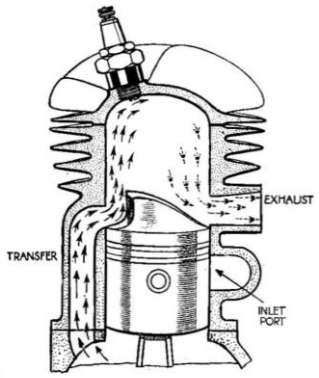

Fig. 3.

E. Loop scavenging

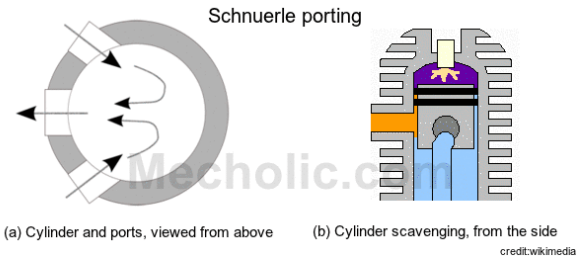

Fig. 4.

Similar to the cross flow scavenging but the inlet exhaust port is replaced the same side of the engine cylinder the gases are encouraged to move loops this type of scavenging use carefully designed transfer port to loop fresh air rise towards the cylinder head on one side and pushes the burnt gas down to the exhaust port installed just above the inlet this is the most used type of scavenging system.

Example: SCHNUERLE PORTING

Four - stroke engine:

A four stroke also four -cycle engine is an internal combustion engine in which THE PISTON completes four separate strokes while turning the crankshaft a stroke refers to the full travel of the piston along the cylinder in either direction the four separate strokes are termed.

1) Intake

Also known as induction or suction this stroke of the piston begins TDC and BDC. In this stroke the intake valve must be in the open position while the piston pulls an air fuel mixture into the cylinder through its downward motion. The piston is moving down as air is being sucked in by the downward motion against the piston.

2) Compression

This stroke begins BDC just at the end of the suction stroke and ends TDC in this stroke the piston compress air fuel mixture in preparation for ignition during the power stroke.

3) Exhaust

Also known as outlet during the exhaust stroke the piston once again returns from BDC and TDC while the exhaust valve is open the action expels the spent air fuel mixture through the exhaust valve

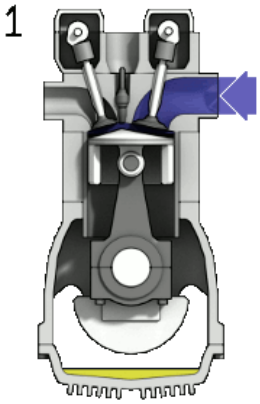

Fig. 5.

Four stroke cycle used in gasoline petrol engines intake 1. compression, 2. power, 3. exhaust, 4. the right blue side is the intake port and the left brown side is the exhaust port the cylinder wall is a thin sleeve the surrounding the piston head which create a space for the combustion of fuel and the genesis of mechanical energy.

3. Conclusion

This paper presented an overview on power of motor cycle engine.

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