3SF Bike

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Abstract— In this paper, an attempt has been made to design a bike with a Single Sided Swing-Arm and changes in the design of Front Fork System. The name of the paper 3SF BIKE which stands for "Single Sided Swing Arm and Fork Bike" it self gives a complete idea. The review paper is based on modification of the Conventional Bike into a bike which has a single sided swing arm which initially gives a More Sporty and Stylish look to our Bike. Whereas Single sided fork delivers burly stiffness that dual-legged forks just can't match, and also reducing the weight of vehicle.

Key words: Bike, Single Sided Swing Arm and Fork Bike

I. INTRODUCTION

This paper is based on designing of a bike with a Single Sided Swing-Arm and changes in the design of the front fork system.

There's no doubt the styling department has a lot to do with selecting a single-sided setup, but besides good looks Swing-Arm also offers easier chain maintenance and wheel removal. Fast wheel changes are huge benefit in endurance racing, which is where single-sided technology first became popular. In racing a single-sided swing arm also allows the muffler to be tucked in closer to the bike's center line for steeper lean angles and mass centralization, while on the street it makes it easier to mount larger, close-fitting side cases. Also chain adjustment and alignment becomes easier with single sided swing arm.

Whereas Single Sided Front Fork System offers stronger stiffness which conventional forks just can't match, and also the smooth running needle bearing internally keeps the suspension moving fluidly, even under loads that cause other forks to bend, and they are also designed to be light in self-weight. This all adds up to the front fork system that helps us to stick to any line and any terrain.

II. LITERATURE

Swing-arm was first invented by NORBERT RIEDEL in late 1940's and installed on IMEE-R100 bike, Further this system was used in Galleto by Motto Guzzi in 1953, BMW R80G/S by BMW from 1980 to 1987, Honda/VFR by Honda in 1984, Ducatti 916 by MASSIMO TAMBURINI in 1994.

IWASAKI.H studied Designing of Magnesium Swing Arm in year 2004 which resulted in designing a better fuel efficient and light weight bike.

CASSANI studied Shape Optimization and high performance of Single Sided Swing Arm in year 2005 on S4R DUCATI bike, the research findings involved Stability and stiffness.

Bevan Ian Smith studied Designing of a Carbon Fiber Swing-Arm in year 2014 which involved use of carbon fiber material for manufacturing to reduce the weight and increase the stiffness of the Swing-Arm.

Front fork system was first invented by RADD in year 1984 and installed on HondaXL600R, further on late 1990's RADD installed this technology on Yamaha SR500

A. Discussion and Comparison on Related Research Papers

- The conventional Double Sided Swing-Arm uses Carbon Steel which is heavy and not much Dependable.
- By doing shape optimization in a high performance motorbike, in Ducati Monster S4R by Author Stefano Cassani & Alessio Mancuso the single sided Swing-arm gives naked style of motorbike and also has advantage of fast wheel access and also less stiffness then the conventional double Sided Swing-Arm, Bending stiffness was also increased progressively by modifying Swing Arm Shape.
- Author Hayato Iwasaki, Akiyoshi Mizuta, Hasegawa. T and Yoshitake. H, designed Magnesium Swing-Arm to reduce the weight of the bike and improve fuel efficiency of bike, magnesium also possess high strength thus increasing the strength of the swing-arm.
- Author Bevan Ian Smith proposed design to overcome the twisting movement and torsional rigidity, the material Carbon Fiber proposed by the author is light in weight and also improves the strength of the swing-arm thereby improving the fuel efficiency and thus increasing the performance of the motor bike.

REFERENCE

B. Research Papers

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