

Velg material strength Analysis Of Cast Motorcycle Wheel and Spoke Wheel Of Testing Impact

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Abstract. The use of motorcycles, power wheels is important, because the wheels is one part of the vehicle that receives the voltage and load is quite high. The road surface may result in stress and deformation in *the casting wheel* and *spoke wheel*. Coupled with the speed of the riders who will influence the price impact of *the cast wheel* and *spoke wheel*. Rims types of cast wheel and spoke wheel take the road within 0 hours, 2 hours, 4 hours. Having both types of motorcycle wheels are brought walked, then will be cutting the specimen in order to do impact testing. Testing here will know the impact of energy produced from these two types of alloy wheels. Each specimen specimens will be tested the impact will have a different impact prices, as influenced by the temperature at the spinning wheel and will affect the temperature of the wheels are mounted on the motorcycle used. Impact test results obtained from the difference in price impact of both types of wheels under the influence of the length of time running from the second wheel. Keywords ; Cast Wheel Rims; Spoke Wheel Rims; Time Road; Impact Test.

1. Introduction

Lately many motorcycles in Indonesia found that using a *wheel spoke wheel and casting wheel*. In use motorcycles, power wheels is important, because the wheels is one part of the vehicle that receives the voltage and load is quite high. Given in Indonesia, especially in Lampung still found many holes in the road, of course for riders who are careless and do not have time to reduce speed then the bike will hit the hole. If you often experience these conditions, the wheels will be deformed shapes broke even on the lips. Collisions occur when two objects with each other collide over very short time intervals, which causes the forces are relatively large (impulsive) between objects. Hammering a nail or level of golf bat on the ball, are simple examples of the impact load. Therefore, to support comfort in riding a motorcycle on the highway we have to pay attention to the security of the spare parts. One of them is *wheel* motorcycle. If *wheels* the have constraints will result in inconvenience in driving it.

2. Literature

2.1 Understanding Wheels

Rims is an important component for each vehicle to work on the vehicle's suspension system rested static loads and dynamic loads on a vehicle.

2.2 Rims Iron

Wheel are made of metal iron chrome plated exterior. Rims of this type is famous for its strength withstand the load, and therefore often used in motorcycle enduro / motocross. In addition to strong cost production of wheels Cast iron wheels belonging to the cheapest among other types. Shortage of iron alloy is prone to rust if not cared for properly.

2.3 Wheels Aluminum

wheels aluminum renowned for light weight when compared to *alloy wheels* other types of and resistant to rust. Therefore, an aluminum alloy commonly used in motorcycle drag and road race. Because it is made of aluminum, production costs are higher when compared to the *alloy*. iron-based The weakness of the *alloy* aluminum is, because it is made of soft metal so as not strong aluminum wheels with hard impact and weight of heavy vehicles. On the *wheels* of this type have corrosion resistant properties because it does not happen corrosion and can provide comfort in the vehicle.

2.4 Cast wheels Wheel (CW)

Cast Wheel Rims often called wheel bolt or wheel racing as often used in racing bikes. The advantages of *wheel CW* is because of the rigid solid alias so stable if it is used for motor racing. For the weight of *the wheel* average is equal to the weight of *wheels*, the iron but there are also lighter with magnesium metal base material. For the cost is relatively more expensive when compared to *wheels*. Other types of Rims of this type, the fingers are fused at once with the hub. This type is generally referred to as "light alloy wheel discs".

2.5 The function of the fingers - fingers (Spoke)

Basically, the arrangement of the radius of the center is the liaison with *peleknya* wheel drum. The fingers as well as the support of the weight of the motorcycle how much energy that is charged through the wheel and at the same time as absorbing vibration / shock of the street.

2.6 Drum function (hub)

of the wheel is a holder drum brake system and as the support wheels on *porosnya*. *Sehinggadsni* drum role is no less important to the rim (wheel).

2.7 Function Wheel (Rim)

dibetuk motorcycle wheels in such a way strong enough to cope with rocking and crookedness. Besides, it also formed thereby in order to allow the outer tire and inner tube can be paired perfectly.

2.8 Impact testing

Impact test or *test collisions* is a test carried out to test the toughness of a specimen when administered sudden load through *tumbukan*. *Ketangguhan* is a measure of energy required to break or damage a material measured by the area under the stress strain curve.

Price impact can be calculated using the formula:

$$HI = \frac{E}{A} \dots\dots\dots (1)$$

Where:

- HI = Value Impact (J / mm²)
- E = Impact Energy (J)
- A = Sectional area (mm²) A = Width x Height Notches

3. Design Methodologies

3.1 Equipment and materials

Tools and materials used in this scheme are as follows:

1. 3 cast wheel rims type of fruit.
2. 3 spoke wheel rims type of fruit.
3. vise
4. Term Sorong (Sigmat)
5. Iron Saws
6. Sandpaper
7. Impact Test Equipment

3.2 Stages ones I will do is the following:

1. Specimen Preparation

In this stage, the workpiece collection form that is cast wheel rim and spoke wheel. To do manufacture specimens corresponding workpiece dimensions have been determined. The first step is to do the adjustment finger - the finger wheel spoke wheel in order to take the road with a certain speed and in a pre determined time. After all the wheels brought new roads removed from the motorcycle.

2. Stages of formation of the work piece

At this stage the results of the two wheels after take the road with a certain speed and a specified time. Will be cutting dimensional appropriate specimen testing needs. In forming wheels cut workpieces with a length of 55mm by using a saw so that the heat generated is not too pronounced to the part of the rim.

3. Impact Testing

Testing is performed on three samples of each - each wheel, namely:

1. The sample first did not get treatment, any simply shaped specimens with sizes have ditentukan. Baru will be tested.
2. The sample second was taken the road with a load of 130 kg and a1.5-hour journey by speed varies, after it was formed specimens that have been determined.
3. Was taken the road with a load of 130 kg in a time of 4 hours journey by speed varies, after it was formed in specimens that have been determined. Will be tested.

4. Calculation

Table 1. Testing impact velg cast wheel

Bln	Pengaruh Jalan Terhadap Waktu (Jam)	L (Mm)	Tv (Mm)	P (Mm)	Ta (Mm)	Berat Palu (Kg)	Sudut Palu (90 ⁰)	Energi Impact (J)	HI (J/Mm ²)
1	0	11	6.5	55	8,48	20	90 ⁰	70	0.979
2	2	11	6.5	55	8,48	20	90 ⁰	71	0.993
3	4	11	6.5	55	8,48	20	90 ⁰	75	1.048

Table 2. Testing impact velg spoke wheel

Bh n	Pengaruh Jalan Terhadap Waktu (Jam)	L (mm)	Tv (mm)	P (mm)	Ta (mm)	Berat Palu (kg)	Sudut Palu (90 ⁰)	Energi Impact (J)	HI (J/mm ²)
1	0	14.13	7.5	55	9.48	20	90 ⁰	81	0.764
2	2	14.13	7.5	55	9.48	20	90 ⁰	83	0.784
3	4	14.13	7.5	55	9.48	20	90 ⁰	86	0.811

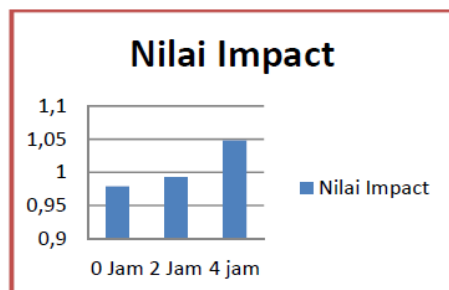


Figure 1. Impact Value graph wheels

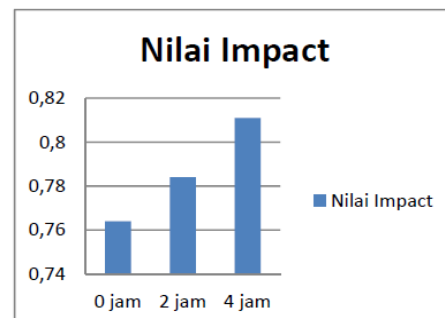


Figure 2. Impact Test Spoke Wheel Rims

5. Cover

5.1 Conclusion

the conclusion that can be drawn from the above results are as follows:

1. Value Impact of each specimen alloy s epeda cast wheel motorcycle types, namely:
 - a. specimen 1 = 0979 J / mm²
 - b. specimen 2 = 0993 J / mm²
 - c. specimen 3 = 1,048 J / mm².
2. Impact value of each specimen type motorcycle wheel spoke wheel is:
 - a. specimen 1 = 0764 J / mm²
 - b. specimen 2 = 0784 J / mm²
 - c. specimen 3 = 0.811 J / mm²
3. Each specimen would be obtained different impact values alloy specimens undergo changes in temperature and microstructure, although only slightly, but affect the impactvalue of both types of wheels.
4. The longer thetaken in journeythe value impact of each wheel will be higher, as it will be influenced by the temperature obtained alloy within "Journey and the collision when the wheel is used.
5. The shape and size of wheels are differentmay also affect in collision testing.

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