A Cheats Guide: Measuring coefficient of friction between tyre and road

Anirudh L Subramanyam, Sandeep Banik

What you will need:

- A force-gauge
- Binding Wire
- Means to lock the rear wheel

Procedure:

1. Measure your bike's weight or obtain it from the brochure. The weight on the rear wheel is measured using a split ratio of 60-40 as standard between the front and rear.
2. Maintain an upright position for the bike by either supporting it or clamping on training wheels.
3. Lock the rear wheel of the bike using a rigid steel rod. If your bike is fitted with mono-shock suspension, you can lock the wheel by tightening the brake nut till the wheel is locked.

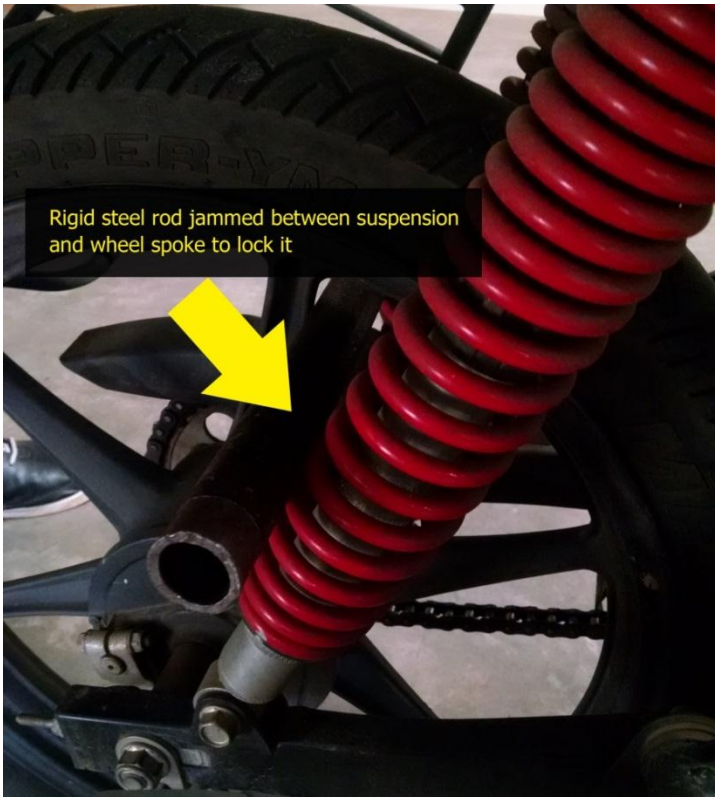

Figure (1)

4. Tie binding wires on both sides of the axle to make sure the pulling remains even and equal.

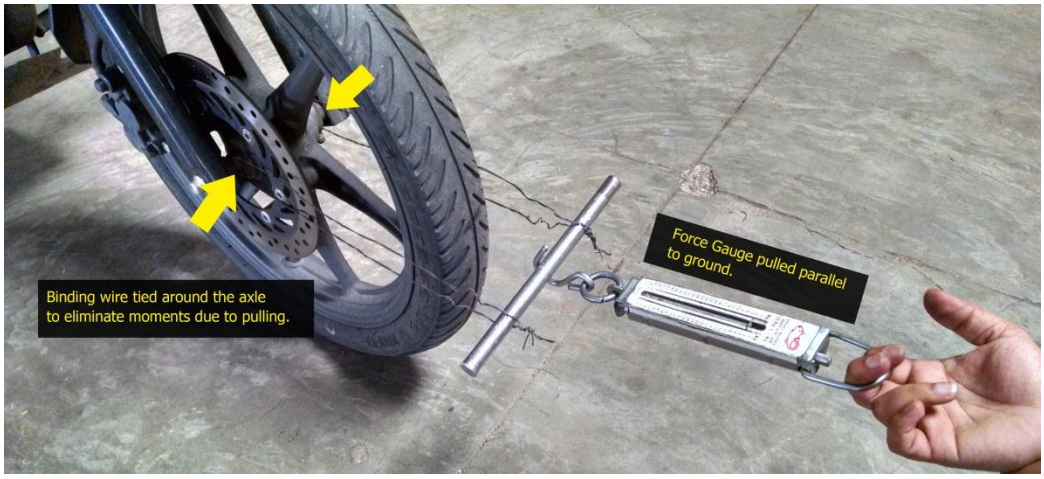

Figure (2)

5. With the use of the force gauge start pulling the binding wire, and thus the bike. Pull the force gauge in a direction parallel to the ground. The point of force application should be as low as possible. Ideally at the wheel axle.
6. Note the force gauge reading when the rear wheel starts to slip.

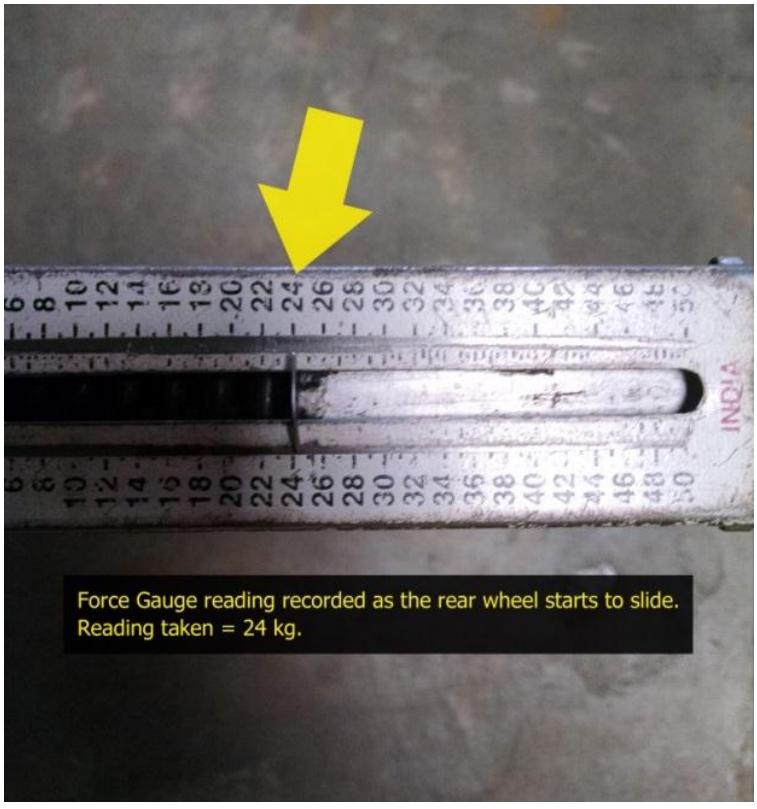

Figure (3)

Weight at the rear wheel, W_r = 44.8 kg

Force Gauge Reading F, for movement = 17.92 kg

We use the formula;

$$\mu \times W = F$$

to obtain the coefficient of friction μ (dynamic) between the road and the tyre. For example the value of μ here is 0.4.

Intent Design Pvt Ltd:

Intent Design is a global technology enterprise providing product engineering, design, and consulting services in the development of intellectual products and components from concept through launch. We are a team of technical experts, engineers, designers and artists with fully resourced facilities which provide optimally engineered mechanical, electro-mechanical, electrical and electronic products for Automotive, Aerospace, Industrial, Medical and Consumer applications.

Authors:

Anirudh L Subramanyam is a graduate of the National Institute of Engineering, Mysore with a Bachelor's degree in Industrial and Production Engineering. He has been with Intent as an Intern since August 2014.

E-mail: anirudh.l.subramanyam@gmail.com

Sandeep Banik is a graduate of Vidya Vikas Institute of Technology with a Bachelor's degree in Mechanical Engineering. He has been with Intent as an Intern since September 2014.

E-mail: sandeep.banik@gmail.com