# A simple way to adjust your Traction's load distribution

## by Ian McDermott

After fitting new silentblocs in a Traction front axle, one has to adjust the torsion bars to make sure the weight distribution of the car is correct. The workshop manual even says in block letters that this "is of great importance in the matter of road holding, braking and tyre wear." It goes on to say "load distribution is of greater importance than body heights." The difference in weight between the left and right side of each axle is to be no more than 30kg.

The technique in the manual includes using a set of scales (Special Tool No. 2310-T). But if each front wheel weighs something like 300 kg, where does one find a set of scales with this capability? When I was rebuilding my Traction, I was starting to convince myself that it was all too hard, and that setting the heights would have to do. But then I read the following tip on the CTA web site:

"We have noticed that too many Tractions have a poorly adjusted weight on the wheels. When we check this up in our garage we often find differences up to 100 - 200 kg per wheel. When adjusting the correct height of the car you must also check the pressure on each wheel against the ground. If the distribution of weight is severely off then the car will rest on two wheels diagonally opposite each other. This causes unstable behaviour on the road, it won't handle as well as it should do. The effectiveness of the brakes becomes poor and the car will tend to spin more easily with one front wheel on gravel roads. The tyres will also be worn excessively. The car will be less safe to drive. An accurate weight distribution and height check can only be made by a professional Traction garage, with the proper tools and an absolutely flat floor. Take care after a restoration or repair that the front and rear axle are checked and adjusted according to the repair manual."

Such dire warnings clearly warrant a solution better than guesswork. Eventually it dawned on me that there is a reasonably simple alternative to the method in the manual.

The items required are:

- A set of bathroom scales (these usually good for up to 120 kg).
- A plank about 2.5 metres long, and having adequate cross-section to safely take the weight of one wheel of the car. (The plank I used was 240mm x 60mm Oregon).
- A piece of water pipe to act as a pivot for one end of the plank.
- A second plank to support the opposite wheel on the same axle of the car at the same height as the one being weighed.
- Various timber off-cuts, to pack everything up to level.
- A measuring tape.
- A plumb bob.

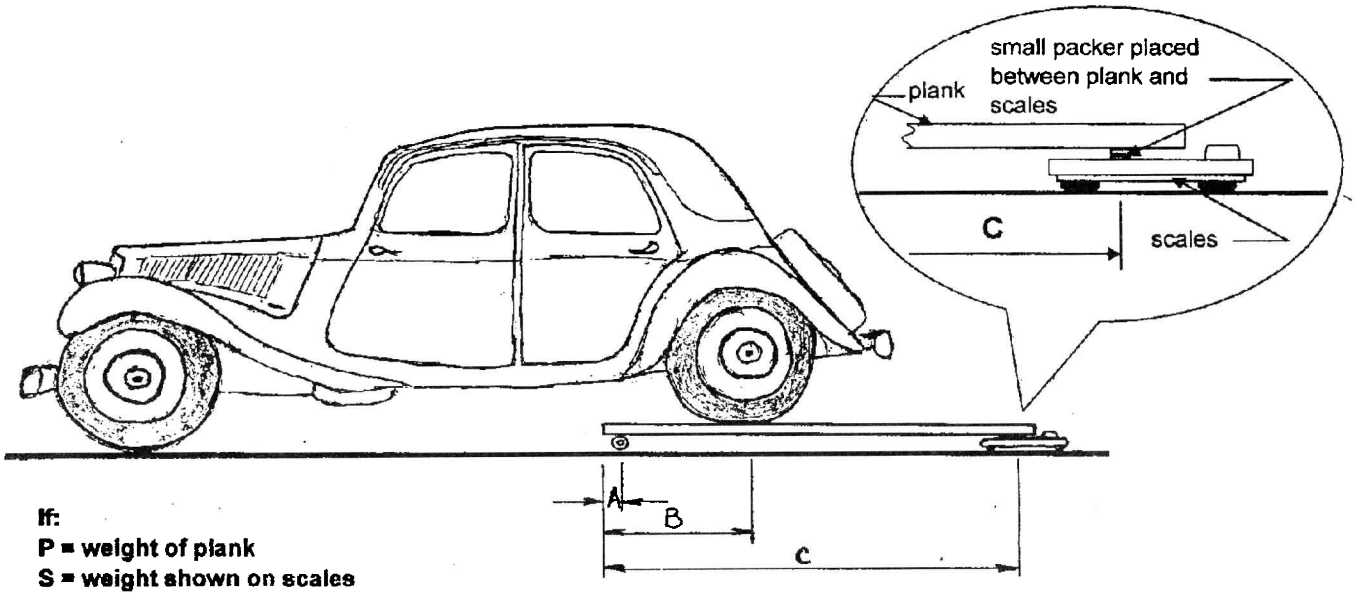
After making sure tyre pressures are even, set the heights under the hull. (Actually, heights can be touchy to measure – bounce the car a few times and it can settle slightly differently). Then set the car up on the planks as per the attached sketch. As a starting point, the wheel needs to be about ¼ of the way between the pivot and the scales. Carefully measure the distance from the pivot point to the centre of the axle (B), using the plumb bob and the tape measure. Note the weight on the scales. Also record the length of the plank, and dimensions A and C on the sketch. With all this information, the weight of the wheel can be calculated. (As a check, I rolled the car along the plank and took measurements at 3 places. All calculations came out within a

few kg of each other).

After weighing each wheel, it turned out that my car was just over the 30kg limit on both front and back axles. So the next thing was to take the car off the planks, jack it up, adjust the torsion bars a bit, recheck the heights, and go through the weighing process again. After a couple of adjustments the weights differed by 10 kg on the front axle, and 25 kg on the back axle. The heights were still OK. I guess I should have recorded how much difference half a turn on a torsion bar adjuster makes, but I didn't. Suffice to say, half a turn can mean the difference between being in tolerance or out.

Ideally, it would be best to have the pivot point and the scales at the very ends of the plank. (That would make the calculations simpler). However, as a first-off job it was easier to set them in from the ends of the plank, and to allow for the overhang in the calculations. And such allowance is necessary!

Does putting this effort into weight distribution make a noticeable difference? Other adjustments are also important, but at this stage, I can say that the car looks straight, runs straight on a flat road, doesn't do anything strange in corners, and brakes straight. Is this method accurate? It probably matters more that the method is repeatable, rather than dead accurate. But the weights on the 4 wheels added up to 1050kg, which seems pretty right!




**If:**
**P = weight of plank**
**S = weight shown on scales**
**L = length of plank**
**A = distance from the end of the plank to the pivot point**
**B = distance from the end of the plank to the centre of the axle**
**C = distance from the end of the plank to the point where the plank bears on the scales.**

**Then:**

$$\text{Weight of wheel} = \frac{\left[\frac{A}{2}\right]\left[\frac{A}{L}\right] P + (C - A) S - \left[\frac{L - A}{2}\right]\left[\frac{L - A}{L}\right] P}{B - A}$$