

ENGINEERING MEMO # 184

TO: Memo Distribution

FROM: R.G. Fuller

SUBJECT: BALANCING & TRUING OF TIRES TO MINIMIZE VEHICLE VIBRATIONS

I. Wheels

While the maximum radial runout is specified at .045" the wheels should be sorted and those indicating radial runout at less than .030" should be selected for personal car production. The limit, .030", may be reduced if the quantity of wheels is large enough to cover production.

II. Tires

- a. Mileage Tires are already segregated for taxi use and since some runout is possible, the tire and wheel assembly should be checked for radial runout before balancing. If runout is more than .060"; remount the tire 180° in the rim. If runout increases when tire is shifted the assembly should be given special attention to determine the component causing this indication.
- b. Purchased Tires for taxi use, when mounted should be indicated and shifted, as above, at the same runout maximum. Purchased Tires for Marathon should be mounted on select wheels and indicated for a .040 maximum radial runout before balancing. Shifting tire 180° on the rim should correct all assemblies excepting those in which the tire is defective.

III. Balancing - After reducing the radial runout to the above; the assemblies should be balanced to within 20 oz. in.

- a. Weight used for balancing must be distributed between the inner and outer rim ledges.
- b. Balancing of tire and wheel assemblies must be done before the effect of a static vehicle load becomes a factor in the tire shape. About thirty seconds after a car stops rolling flat spots develop on the tires, severe enough to cause an error in balancing.
- c. When runout is reduced; the demand for smaller weights will become a problem. Some relief may be found in using two larger weights and separating them at equal intervals from the original position. The extreme of this is, obviously, when the separation interval is 90° at which point the weight size could be increased indefinitely.

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I. Wheels

While the maximum radial runout is specified at .045" the wheels should be sorted by runout indicator reading reserving all with runout less than .030" for personal car production. This runout limit may be reduced if the quantities obtained are greater than requirements.

II. Tires

Since wheels have been sorted and those with larger runout will be used with the mileage tire or with purchased tires having considerably stiffer side wall, tire and wheel assemblies should be checked for excessive runout radially. When more than .090", shifting the tire 180° on the rim should reduce the runout. A larger runout after shifting indicates a radical fault in the casing.

Marathon tires should not be checked for runout. The allowable tire error as measured by the manufacturer may or may not correspond to the physical runout.

III. Balancing - All tire and wheel assemblies should be balanced to within 20 oz. in.

- a. Service will be called upon to correct irregularities in tires and if a tire is shifted on a rim obviously the balancing must be changed.
- b. Vehicle weight must be removed from a tire before a flat spot can develop to make a correction job effective. Flat spots develop in thirty seconds after the vehicle stops rolling.