

DEPARTMENT OF COMMERCE  
BUREAU OF STANDARDS  
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## PNEUMATIC TIRE EQUIPMENT

The bureau frequently receives letters requesting information regarding the relative quality of different makes of tires. It is not considered feasible to attempt to classify the products of an immense business such as the tire industry with respect to the quality of its output. With the bureau's limited facilities, it would be possible to test only a small part of the many kinds and sizes and grades of tires, and then under very limited conditions of service. Consequently, bureau reports could not be made on all tires and an unfair advantage would be given to brands which might be favorably reported. Furthermore, the design and construction of tires and the composition of the materials used in them may vary in different tires, and these factors are certain to change with market conditions and as new products are discovered and new methods developed. Consequently, the test of an individual tire or a series of tires could not be construed to apply to an entire output, at least, not for any great length of time. There is, however, general information which can be applied to the purchase and use of tires which the bureau is in a position to give.

The life of any particular tire is influenced very greatly by the conditions under which it is run. These conditions include among other things the load and air pressure, the speed, the type of roads travelled and the characteristics of the car and driver. Assuming average running conditions, the load and air pressure are probably the items which are subject to the most variation. These two factors should be considered together as the greater the load the higher the necessary air pressure to insure satisfactory service, and conversely the lighter the load the lower the permissible air pressure. Tire manufacturers have in general agreed on certain maximum loads for each size of tire which they recommend should never be exceeded; for instance, the maximum recommended load for a 30x5.00 tire is 925 pounds. If the tire is operated under a lower load, the service obtained will be greater and probably much greater in proportion than the reduction in load. In other words, for the most economical service it is ordinarily better to operate a tire considerably under its maximum rated load. Inasmuch as the load in connection with the ordinary passenger car is largely fixed, the only practical means of bringing this condition about is to use a larger tire. Unfortunately, it seems to



be common practice with some car manufacturers to equip their cars with tires which are too small for economical operation. In such case the remedy is to install larger tires, a thing which can usually be done without any change in rims or wheels. It should be emphasized that the higher cost for larger tires does not mean a higher cost per mile of travel, but rather the additional mileage obtained should result in a lower cost per mile together with less interruptions in service. The use of tires of ample capacity has other advantages in that it permits the use of lower air pressure which results in greater cushioning. It also often permits the use of tires which might be classed as second grade with satisfactory results. One means of obtaining good service from second grade tires is to have them large enough so that they are always operated at considerably less than their maximum rated capacity. This probably accounts largely for the fact that one individual can often obtain good service from a particular brand of tire, which another finds unsatisfactory.

It is common practice for manufacturers to put out two lines of tires known as regular and heavy duty. With balloon tires this usually means 4-ply and 6-ply tires, respectively. Balloon tires were originally built with 4 plies, but experience soon showed that there were conditions where a heavier carcass was superior. During the last few years there has been a tendency to increase the number of plies in balloon tires, some of them being built with as many as 8 plies. The reason for the general tendency toward thicker tires is that it has been shown that the 6-ply tire will stand more abuse than the 4-ply and will not puncture as easily or be damaged as readily by a blow. It seems probable from present trends that the 6-ply or 8-ply tire will eventually replace the 4-ply tire entirely for the larger sizes.

In line with the foregoing, information regarding the purchase and use of tires may be summarized as follows:

(1) What Size Tire Should be Used: The load on tires should not exceed and preferably should be less than the rated capacity of the tires. It is better to have tires too large than too small.

(2) Regular and Heavy Duty Tires: For careful driving on paved roads there is probably no great advantage in heavy duty tires, but if they are used there will be less chance of punctures and less danger of injury to tires due to striking obstructions. Heavy duty tires are preferable for severe service and probably for average service.



(3) What Brand of Tires: Methods of purchasing tires should not differ materially from those used for other articles such as clothing, shoes, etc., and the same general rules should apply. The reputation of the dealer or manufacturer may be the only reason for choosing a particular brand or, the purchaser may wish to take a chance on a cheaper product from a little known source. Satisfactory service is more apt to be obtained from second grade tires if they are operated considerably under their rated capacity.

(4) Load and Inflation: The proper conditions for operating pneumatic tires are dependent on maintaining the relation between load and air pressure such that the deflection or yielding under load is within reasonable limits. With tires of ample size for a particular load, it will be found that relatively low air pressures can be used without allowing excessive deflection.

In addition to points which have been brought up with respect to the equipment, reasonable care should, of course, be given to proper adjustment of wheels, brakes, etc., and to method of driving.





