

TECHNICAL TERMS ARE MADE CLEARER

Twisting Force In Relation to Motor Explained

"Torque" in an automobile seems to be such a mystery to many owners that G. Clark Mather, chief engineer of the Paige-Detroit Motor Car Company recently sat down and wrote the following for the Paige and Jewett house organ.

"You have seen the word 'torque' in print a good many times. You have heard it spoken. Possibly you have used it yourself. What does it mean? Let us see what the dictionary says.

"Webster's definition of 'torque' is, 'that which produces or tends to produce rotation or torsion.' Not so clear. Maybe this less technical explanation would be a little easier to understand. Torque in an automobile motor is the result of the explosive power of the contents of a cylinder full of gasoline vapor being applied through the medium of a piston and connecting rod to turn the crankshaft.

"For example, let us say that the gasoline vapor in one cylinder of an automobile motor is exploded. The piston that slides up and down in that cylinder imparts, through its connecting rod, a thrust to the crankshaft. This thrust is converted to rotary motion by means of the crankshaft and when expressed in pounds in a given radius, is termed torque and is given in inch pounds or foot pounds torque.

"Thus torque is twisting power. This twisting power represents pres-

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ure to turn the crankshaft only when the piston assembly is being pushed downward by an explosion.

"To visualize what this means in manufacturing motive power, draw a circle. Consider this a revolution of a throw of the crankshaft. Now, if

this circle were a disc, say you were going to apply a downward pressure to its outer edge to make it revolve, how far around would the downward pressure be effective? The force applied straight down on the top of the throw would not have a revolving action. The same is true of the force applied straight down at the bottom. There would remain a downward power stroke of some 135 degrees.

"Because torque is twisting power, the basic factor of driving power, it is easy to see that, other things being equal, the bigger the charge of gasoline and the more powerful the resultant explosion, the greater the torque or revolving force exerted by each cylinder of gasoline vapor fired.

"Horsepower is a term used to express the relation of the torque to the speed at which the crankshaft is rotating. The horsepower rating only of an engine is not complete. The revolutions per minute of the motor must be known to determine its real efficiency. Some motors have great torque only at speeds too slow to build up any amount of horsepower; others must be run at a wrecking speed to produce their maximum efficiency. The object is to get the most torque at low speeds and to keep it as long as possible.

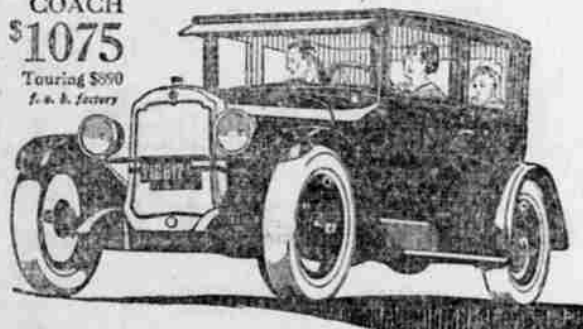
"The big motor of the new Jewett has ample torque, in other words, ample twisting power, ample pulling power, at low speeds where you need it most. Push a new Jewett over the floor. See how much more pressure is required to put the car in motion than is needed to keep it moving once it is started. What you did to move the car, the motor must do every time you start the car.

"The Jewett motor's torque is greatest at relatively low speeds. It is much greater than other cars in its price class. Its extra size gives it its greater torque. This power is needed not only in starting but in going slowly over rough roads in high gear, in accelerating and in climbing.

"Smaller motors can only secure big power by being speeded up, by using small wheels and by using special gears. At the same speed on the road, the smaller motor must turn over many more times than the big motor. This means overstrain and an early breakdown. And if the smaller, underpowered motor is not speeded up, it struggles along, always overstrained, always underpowered."

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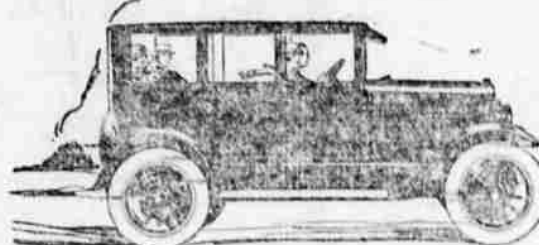
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