HOW WELL DOES IT CORNER ?

I suspect there a lot of Lotus drivers out there who've seen cars compared on the basis of lateral acceleration ("g's" of cornering force) and wondered how to find the value of this mysterious quantity for their own car. The method of doing this is really quite easy. First, find a suitably large parking lot, etc., that you can use for a skid pad. Lay out a circle, using chalk, etc., of known radius (most any radius is OK - about 50 ft. seems to be a good size). Next, have your girlfriend, wife, etc. (both?) time your laps as you drive your car around the circle as fast as it is capable and still remain on the circle. Record the time of your fastest lap and the radius of the circle. (Incidentally, your car's steady-state handling characteristics can be determined at this same time. As you reached the limit to how fast you could drive around the circle, did the rear end of the car start to slide out first, trying to swap ends with the front? If so, your car oversteers. If the front end of the car felt like it was ploughing off the circle first, your car understeers.) Your car's lateral acceleration in g's is given by the following formula:

$$a = \frac{v^2}{rG}$$

where:
- a = lateral acceleration in g's
- v = velocity in ft/sec
- r = radius of the circle in ft.
- G = acceleration due to gravity at your location (~32.174 ft/sec^2)

Velocity (average for one lap around the circle) is given by:

$$v = \frac{2\pi r}{t}$$

where:
- r = radius of the circle in ft.
- t = time to complete a lap in sec.

Combining these two equations gives:

$$a = \frac{v^2}{rG} = \left(\frac{2\pi r}{t}\right)^2\left(\frac{1}{rG}\right) = \frac{1.227\ r}{t^2}$$

For instance, if your car can lap a circle of radius 50 feet in 8.5 seconds, its lateral acceleration would be:

$$a = \frac{(1.227)(50)}{8.5^2} = 0.849\ g$$

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