RX-7 Fender Plot

A plot that takes the mystery out of fitting new wheels and tires.

Plots and information by Don Sherman, Technical Editor, Car and Driver
Photography by Linda Bernstein

Many of you either already have, or would like to install larger wheels and tires on your RX-7. In most cases, if you stay close to the standard sizes, there will be no interference problems with the sheet metal. But let a search for demon performance take a hand and that oversized rubber you select to get you around the corners quicker may end up cutting itself to expensive eraser stock when it contacts a fender lip. Don Sherman, Technical Editor of *Car and Driver* and owner of a rather special RX-7, had just such a problem. To determine the widest wheels and tires that would fit his car, he needed a plot of all the possible interference points between rubber and metal.

All this is somewhat easier said than done. First, he selected a likely choice of equipment, in this case a 15 × 6.5-inch Compomotive wheel shod with a 195/50 VR-15 Pirelli P7 tire. Second, he had to disassemble the front and rear suspensions and then put everything back together *without* the springs. Then he carefully and painstakingly jacked the suspension through all the possible combinations of travel and wheel/tire position. In front, this meant raising the wheel/tire all the way into the fender well, then turning it back and forth to simulate maximum suspension travel coupled with steering angle. In the rear, it meant jacking the rear axle straight up into the car to simulate a maximum bump acting on both rear wheels, and raising one wheel all the way up while letting the other go to full droop to simulate maximum roll, as in cornering. All the way, at every step and every possible position, he took measurements of any potential interferences. These measurements were then transferred to graph paper, and all the worst cases for each position of each wheel were connected by a line, giving a curve of metal-to-tire interference, or a tire/fender plot.

What you see on the next two pages is the result. It is what you need to find out, before you buy, exactly which wheel/tire combination will fit your RX-7. We have reproduced it full size in two halves, so you can photocopy the two pages and then tape them together along the centerline; that way you don't have to cut apart the magazine or try to enlarge a half-scale drawing. The curves *do not* represent a cross-section of any particular area of any fender; they are a series of points representing the closest any piece of metal will ever be to any part of the tire.

So, for a guided tour of Sherman's plot:

1. To the left is the outside of the car, to the right the inside.

2. The vertical reference plane is the wheel-to-hub mounting surface. On the plot it is the centerline of the two halves, and the numbers on it are vertical inch measurements from the horizontal reference plane, the center of the wheel/axle.

3. The centerlines of the stock RX-7 wheel and the Compomotive wheel differ by 0.35", with the Compomotive offset more towards the outside of the car. Note the centerlines of the wheels do not coincide with the wheel-to-hub mounting surface; both are offset inwards.

4. What Sherman terms the "appearance" limits are the outer ranges of tire position beyond which the tire would protrude excessively past the edge of the fender.

5. There are three curves, one for the front and two for the rear, and the front curve represents all combinations of suspension travel and steering angle.

6. In each curve, the A-B portion indicates the area of the fender lip. The B-C segment is the outer periphery of the inner fender. The C-D zone is the strut in the front and the wall of the inner fender area in the rear.

To use this plot to check any wheel/tire combination you need the following information:

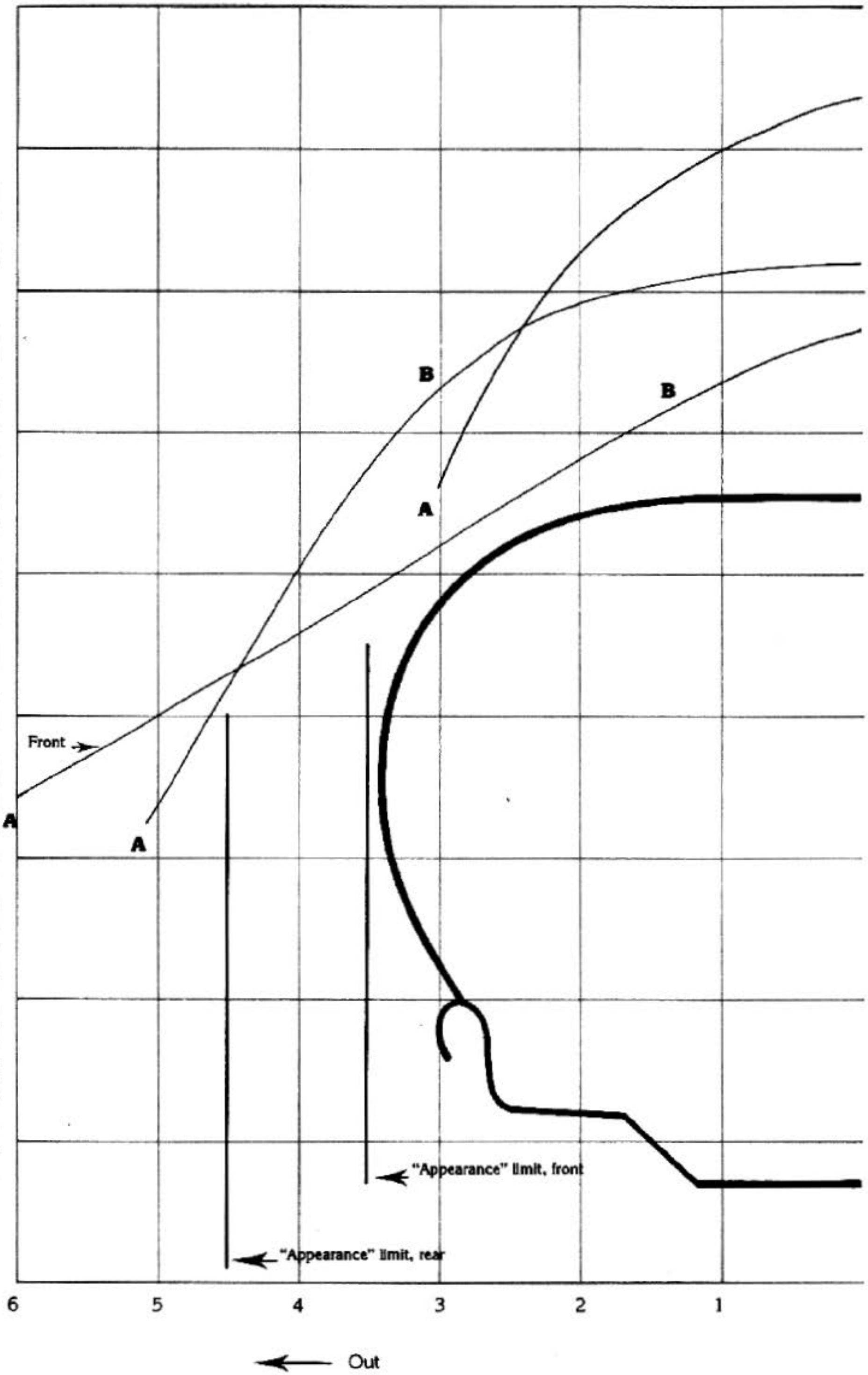
1. Wheel diameter, width and offset.

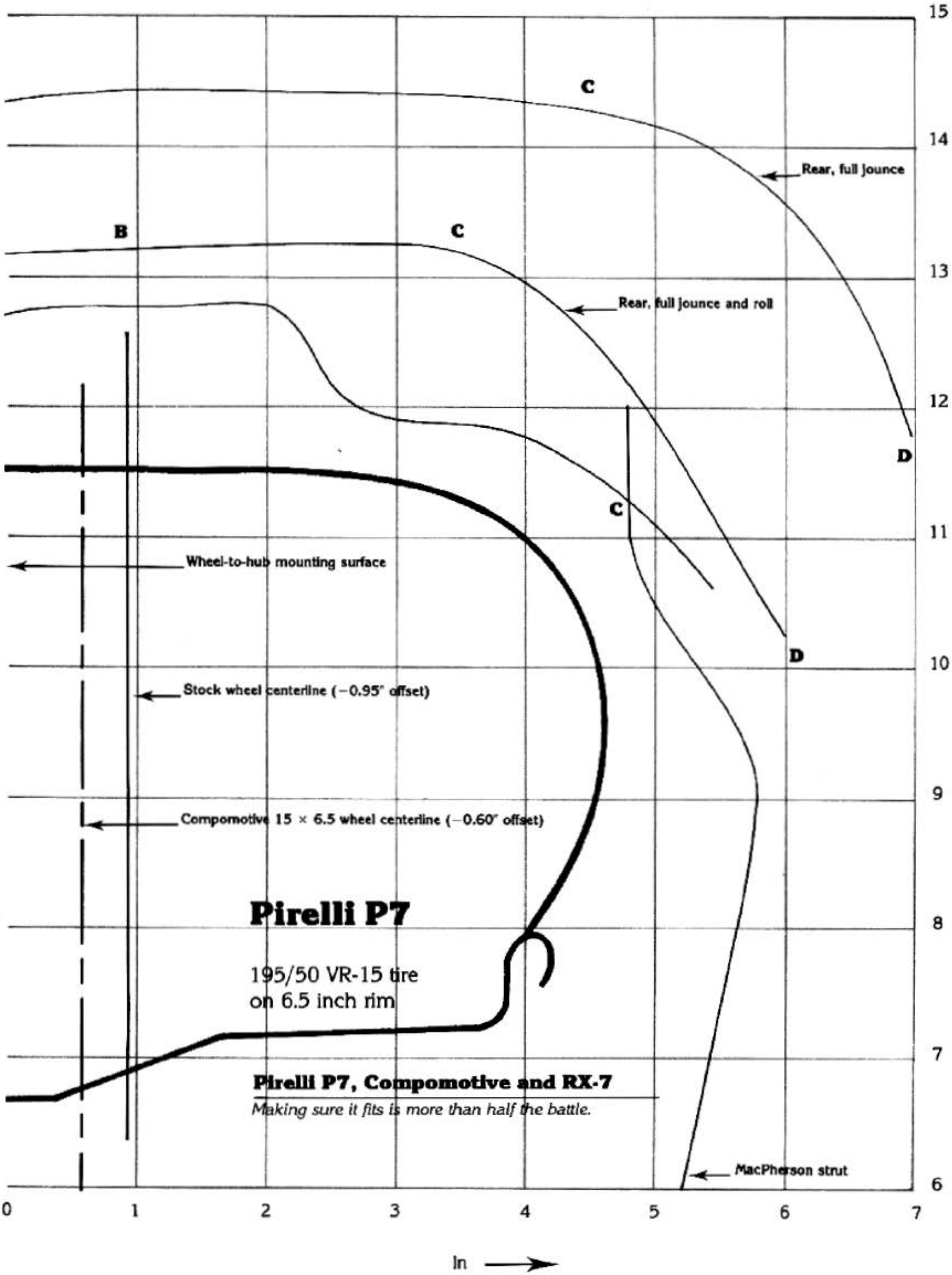
2. Tire outside diameter, tread width and maximum section width.

Before you buy, plot those key points on the graph and any potential interference problems will be obvious, which could save you bundles of cash on parts that won't fit. Sherman recommends leaving at least a half-inch clearance all-around to accommodate cornering deflection of the tire and suspension as well as any manufacturing tolerances. And, he also suggests staying as close as possible to the stock wheel offset of −0.95".

In case you haven't noticed by now, this fender plot is the result of a lot of work on Sherman's part. If you're in the market for new tires and wheels that will be large enough to lend both some show and go to your own RX-7, Sherman's hard work will save a lot of yours. Best of all, now there's no guesswork; you can know what will fit under your fender while the cash is still in your bank account.

MAZDA RX-7 FENDER PLOT




15
14
13
12
11
10
9
8
7
6
0
1
2
3
4
5
6
7
In
C
B
C
Rear, full jounce
Rear, full jounce and roll
D
C
D
Wheel-to-hub mounting surface
Stock wheel centerline (−0.95" offset)
Compomotive 15 × 6.5 wheel centerline (−0.60" offset)
MacPherson strut
Pirelli P7
195/50 VR-15 tire
on 6.5 inch rim
Pirelli P7, Compomotive and RX-7
Making sure it fits is more than half the battle.