

The Volt Vette Project

Chapter 27

What Difference Does A Differential Make?

Part 2

Searching For Acceleration

A long, long time ago, perhaps in Chapter 12, I wrestled with one of the big problems of a direct drive electric car.

With no transmission, I need to pick just the right gear ratio for the differential. A gear with too small a number of teeth will be sluggish. A gear with too many teeth will have a top speed that is too low.

Each owner must decide what is the proper acceleration and desirable top speed. In my case, the Volt Vette is way too sluggish. (As I peel away from the stoplight, a turtle with a bad leg zips by me. Not a good sign.)

1987 Corvettes came with one of two diffs. The Dana 36 was very common and had a gear ratio of about 2.5 to 1. The Dana 44 was very rare and had a gear ratio any where from about 3 to 1, on up to about 6 to 1. Today you can buy a used Dana 36 for about \$250. But a Dana 44 will set you back about \$2500. Life is NOT fair!! I spend a few quiet moments beating my head against the nearest wall.



As you can see in this photo, the Corvette differential has “bat wings” that form part of the car’s frame.

Next, I check Craigslist. Nothing. I try eBay. A new problem jumps up and bops me on the nose.

Here’s the deal. General Motors could have named these parts Joe 370 and Joe 380. Older Corvette differentials could have been called Joe 270, but no, they take a lot of different differentials, for many different cars and call them all “Dana 44”! Naughty, naughty GM.

So when I type Dana 44 at eBay, up pops many parts that will not work in my car.

Paul, at Northside Corvette, comes to my aid. He has what seems to be the only new, correct differential that will work for me. I haul the Vette to the shop.



Lee wants the car to have a 5 to 1 gear ratio. Paul thinks it would be very hard to find gears like that, but after a few days of calling around, he finds a 4.88 to 1 gear set. Oh happy day!

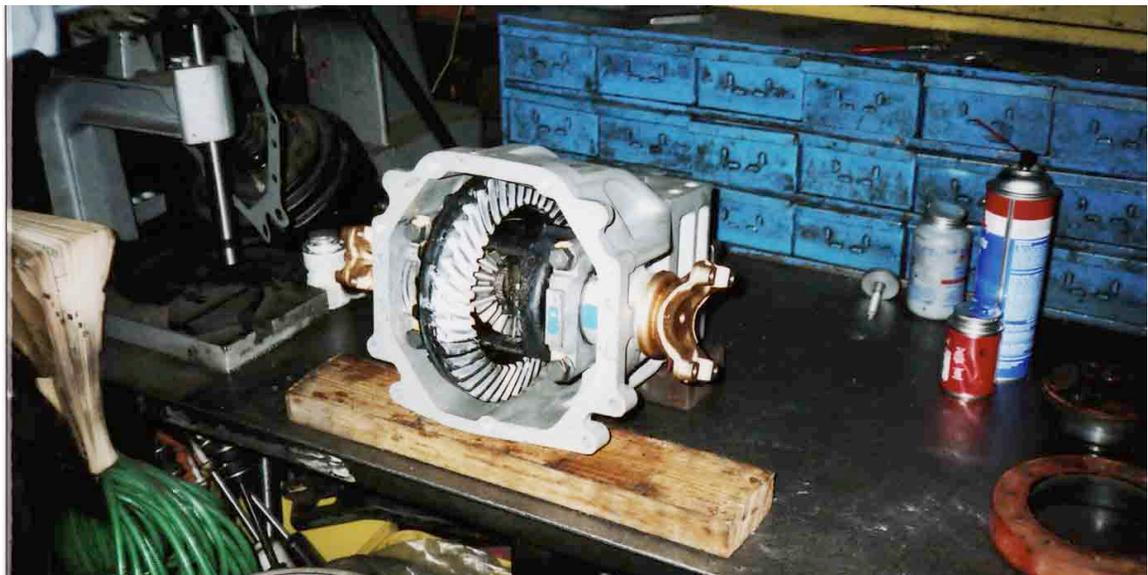


Photo shows Dana 44 differential with batwing removed and 4.88 racing gears in place.

For mere money, Northside mounts the gears inside the differential case and then bolts the Dana 44 to the Volt Vette.



The new differential goes in.

New problem.

I'm told I will need to find a bigger torque tube for my bigger diff. Also, they say, a torque tube for a Dana 44 will be much harder to find. Look, look, phone, phone. Finally, I find a parts supplier who said he had lots of Corvette torque tubes. I zip to his shop. He shows me a stack of tubes 4 feet high. We agree that a Dana 44 torque tube must be shorter and wider than the low cost spread. But every part in the pile is exactly the same; the same as my part! We put our heads together. Maybe General Motors tried to save a few nickels by using the same size torque tube and just changing the location of the bolt holes on the high performance differential? To find out, we go back into the shop. We grab a Corvette with a 44 differential and put it on the lift. We walk under the car and measure.

I don't have to spend hundreds on a new tube. They are all the same!



New differential. Old torque tube. Perfect fit!

I mount the shorten drive shaft and go for a spin. Finally, I have reasonable acceleration!

Next: The relentless pursuit of a perfect charging system.