

### **C3 CORVETTE STEERING EFFORT INFORMATION**

*This paper was written over four years ago. I do not know if Mr. Robin Wilkie (Vette Brake & Products) is still available or not. I do not know if different control valve springs are still available from VB&P or not. I know that several Forum members tried different springs, but I do not know any real feedback as to success or not.*

I have been following postings on the Corvetteforum websight where C3 owners have been complaining that the steering effort is too light and that they have little road feel with their power assisted steering. There are several things to consider when trying to improve the effort and feel of your C3 steering.

First of all, you must make sure that your steering components and suspension parts are in good shape. A lot of steering complaints can be traced to the idler arm, to lash in the steering gear, deteriorated flexible coupling, loose ball joints, and even incorrect tire pressures. You should first inspect, adjust, and/or replace steering and suspension components that are not operating or adjusted properly.

Your C3 Corvette was designed and the steering and suspension tuned by some of the best ride and handling engineers in the world. However, now that your Vette is 30+ years old a lot of things have changed. The single biggest difference is in the radial tires in use today. The 1968 Corvette came from the factory with bias belted F70-15 nylon tires on 7 inch wide rims. My 1975 roadster came with Goodyear Steelguard GR70-15 radial tires on 8 inch rims and were specified to operate at 20 psi tire pressures front and rear! The alignment settings, shock absorbers, suspension springs, and the power steering control valve were specified to work with a range of tires and pressures through the years! Today, some owners are running 17x8 inch rims with matching tires on that same C3 chassis.

The second thing to consider is that the “new” or the remanufactured control valve that you or the previous owner may have installed on your car may be operating to different specifications than the original control valve. My research into the history of the control valve manufactured by Saginaw Steering Gear Division, GMC, led me to the information that there were two control valves. One in use from 1963 through 1975, the other was used from around 1976 through 1982. The difference was an internal valve spring. The early valve used a 55 lb spring, the later valve used a 40 lb spring. The different loads were specified with the springs compressed to a height of 0.38 inch.

The reason that the spring was changed from 55 to 40 lbs was most likely to make the valve more responsive and probably to compensate for larger cross-section low pressure radial tires. None of the Corvette supplier catalogues that I have reviewed makes any reference to the two different control valves. My guess is that if you have a new or rebuilt control valve, you probably have a 40 lb spring.

This paper will address two specific areas: The control valve and then the chassis area.

## **Control Valve Information**

I have been in contact with people at Saginaw Steering as well as Mr. Robin Wilkie of Vette Brakes & Products, Inc. (1-800-237-9991). Robin works in their technical service department.

If you purchased a rebuilt or a new control valve from General Motors or from any of the Corvette suppliers, it probably has a valve with a 40 lb spring. This valve would give you light parking effort but would also give you fairly light effort steering on the highway. You might want a valve with a 55 lb spring.

Robin Wilkie gave me the following information. Vette Brakes will rebuild your valve with new seals and a 55 lb spring. You have to specify that you want the 55 lb spring. The valve would be returned to you with a 5 year warranty. There is an additional core charge applicable if you request a rebuilt valve without a core.

You could also call the Vette Brakes Sales Department and request a control valve seal kit along with a 55 lb spring if you wanted to do the rebuild yourself (although Robin does not recommend this.) If the Sales Department is unaware of the seal and spring kit, ask for Robin Wilkie and the Tech Dept will fix you up.

## **Chassis Information**

As near as I can tell, Chevrolet has always specified the following front alignment service settings for power steering equipped C3 Corvettes with a full tank of gas.

### **Chevrolet recommended alignment settings:**

#### **Front (with power steering)**

\*Caster +2 ¼ degrees +/- ½ degree

\*Camber +3/4 degree +/- ½ degree

Toe-in (total) 3/16" to 5/16"

\* Must be within ½ degree of opposite side.

### **Vette Brakes & Products Inc. recommendations:**

#### **Front**

Caster + 2 ¾ degrees +/- ½ degree With stock upper control arms.

Caster + 4 ½ degrees +/- ½ degree With VB&P HD offset control arms.

Camber + 0 degree + ¼ - 0 degree

Toe-in 1/32" +/- 1/32"

This is best for all steel radial tires with more negative camber increasing stiffness in turning.

Never use negative caster or positive camber!

The Chevrolet recommended rear alignment settings did change between 1968, 1975, and 1982. I don't know if it was tires or a change in the rear suspension geometry.

<b>Rear</b>	1968	1975	1982
Camber	-7/8 degree +/- 1/4 degree	-1/2 degree +/- 1/2	0 degree +/- 1/2
Toe-in (each wheel)	1/16" +/- 1/32"	3/32" +/- 3/32"	.06 degree +/- .06

**Vette Brakes & Products Inc. recommendations:**

**Rear**

Camber all years 1963-82 0 – 1/2 degree Negative

Toe-in all years 1963-82 1/8" total toe + 1/32 – 0 inch.

Although the rear camber and toe-in settings will have an affect on overall vehicle handling, I doubt that they will cause any change in steering effort or feel.

My thanks to Mr. Robin Wilkie of Vette Brakes & Products Inc for his technical assistance.

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