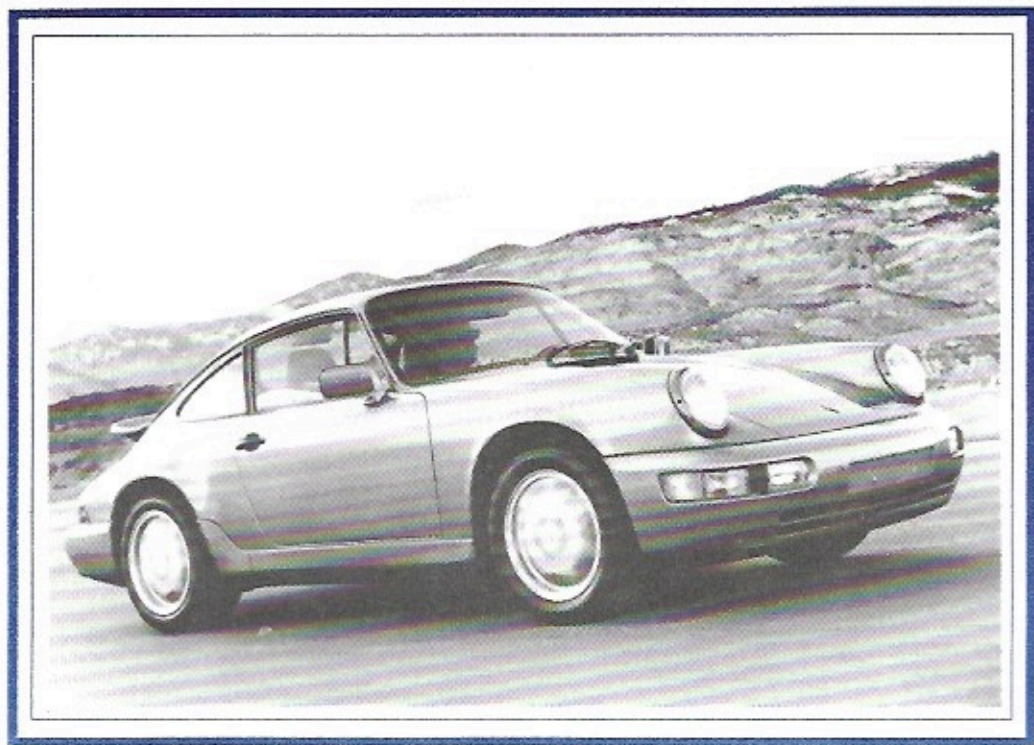




War Bonnet Region

WAR WHOOOP

May - June 1990



PORSCHE *Club* OF AMERICA

On the Cover

The 1990 Carrera 2 is the successor to the 911 Carrera, however it is almost a totally new car. It is different from the original in more ways than it is like it.

The Carrera 2 is 10 times more expensive than the first 911. If you adjust for inflation and compare performance and value I wonder if it is 10 times better. Any comments?

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Why a Turbo?

A few years ago I planed to go to Colorado Springs for the Porsche Parade. Having been through the area in a normally aspirated car and the resulting lower performance at the higher altitudes I wondered what effect I could expect on my 944T. What follows is a compilation of the limited research I did and might provide some insight for some of you that may consider a turbo charged engine in the future.

To get everything in perspective I want to start with the normal 944 engine. When Porsche started the development of the four cylinder engine they were looking to fill a moderate space with a low weight, high torque engine that could provide legal emissions and low maintenance. The Porsche 5 liter V8 had considerable development behind it and components seemed logical to use.

But, four-cylinder engines manifest the "second order" vibration. This comes from the difference in acceleration of two pistons ascending and two pistons descending. The swing of the crank pins on the ascending pistons, operates to shorten the connecting rods as the crank shaft passes top dead center and quickens the pistons downward movement. The swing of the connecting rod big-ends delays the ascending pistons movement upward as the crankshaft passes through bottom dead center.

This variance displays free forces, which can amount to two tons in a BMW two liter engine. The vibrations are produced in a vertical direction at a frequency of 2X the crankshaft speed because the pistons change direction two times per revolution.

So, two tons in a 2.0 liter engine, and Porsche at this point in time is developing a 2.5 liter power plant! At that time it would be the largest four cylinder engine made. Enter Mitsubishi. A license is purchased allowing Porsche to include the two counter rotating balance shafts in the new engine. Running at 2X crankshaft speed and located to provide the best engine range they effectively eliminate vibration.

Porsche has produced the first of what will become a prized array of four cylinder engines for the 944. The next will be the turbo and the normally aspirated four valve. Development continued and the result was increased displacement for the four valve and the normal engine.

Porsche wasn't new to turbo charging production cars. The 911 turbo carrera entered the US production scene with the 1976 model year. A blazing car when driven to 9/10ths, and hazardous to life and limb also. The next turbocharging was with the 924. The Audi 100 engine won little love or praise from owners. The boost range was short and the turbine life not much better. The Porsche developed 4 was the chance to make it up to the enthusiast.

The easiest way to get a better job out of a small displacement engine is to use forced induction. The addition of more air and more fuel adds more power. This can be achieved from two directions. Turbocharging or supercharging. A brief view of the supercharger shows a total mechanical operation. The compressor is usually operated by a belt from one of the accessory points like the alternator.

