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VDM Carrera 2 Wood Wheel Deconstructed

Being the retired frustrated engineer that I am, I have pondered one nagging subject for many years. That subject and the questions that swirl about it have piqued my interest. Until recently, I have not researched or tackled the subject. All the materials have been in my possession or available to me for years. The subject is VDM T6 Steering Wheels. Last year, I wrote about the differences and features of VDM BP (Black Plastic) and C2 (Carrera 2) Wood Wheels. That was the beginning of my journey into the research and documentation of this subject. That article lead to another about features of the VDM BP wheel with the plastic removed. Now, the final question I have asked myself was how C2 wheels were constructed and why they were constructed in such a manner.

I have two original C2's both in excellent condition. These wheels are highly sought after even with the current crop of remanufactured BP to C2 wheels. The secret was how to tell them apart. The differences in features are subtle and to most enthusiasts, it would not matter. To the authenticity guys, it means the world.

Lingering questions persisted in my mind as to how and why VDM wheels were constructed in the manner they were. For those answers I turned to fellow 356 experts, Mike Wilson, Jesse Rodriquez, and an expert wood worker/neighbor, Doug. All came up with important pieces to the puzzle. It is important to keep in mind that despite what I am about to present, it still all conjuncture. However, with information presented by others from 356Talk forum, it all adds up. The answers came not from direct responses, but in understanding how the wheels were constructed, why, and how to deconstruct the wheel; reverse engineering.

Before starting on the construction, a basic understanding of nomenclature is necessary. This is not an advocacy for standardizing the nomenclature other than for this discussion...

Figure 1

Figure 1 illustration on the left is of a T6 BP wheel with the plastic removed. The Outer Ring is a hoop made from one piece of tube butt welded at the ends. Here is the layered construction of the wood.

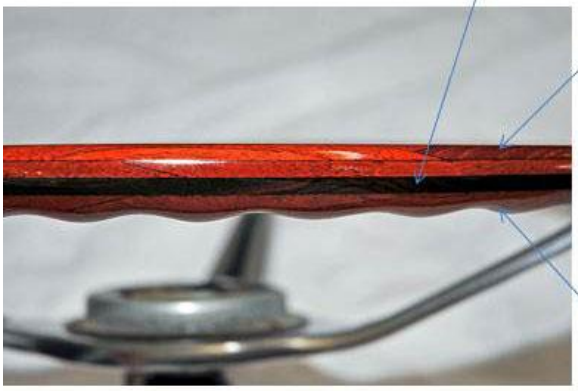

Figure 2

Figure 2 illustrates the 3 main layers of the C2 wheel. Note the staggered pattern of the joints in the layer and their relationship to the neighboring layers.

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Now with the nomenclature established for this discussion we can get into some of the deduced reasons why things are the way they are when the original wheels were made by VDM.

We have to continually remember that VDM was in the business of making money, not steering wheels. Steering wheels are the method to making the money. Just as Porsche is in the business of making money, and not cars. With that understanding, VDM made steering wheels the most efficient and cost effective way possible. Spend as little to make as much as possible.

Why did I clarify this? Because if you look at eh physical size of the wheel, it is 420mm in diameter. If we were to make it one piece, that would mean three layers of wood each 420 X 420mm (approximately 16" X 16" sheets. That is expensive with a lot of wastage. Also, the grain direction adds to the strength and stability of the wheel. The ideal grain direction is tangent to the hub and outer ring at all times. Thus the wood would not crack when pressure is applied. That is why VDM segmented the wheel. To conserve on wood and add strength.

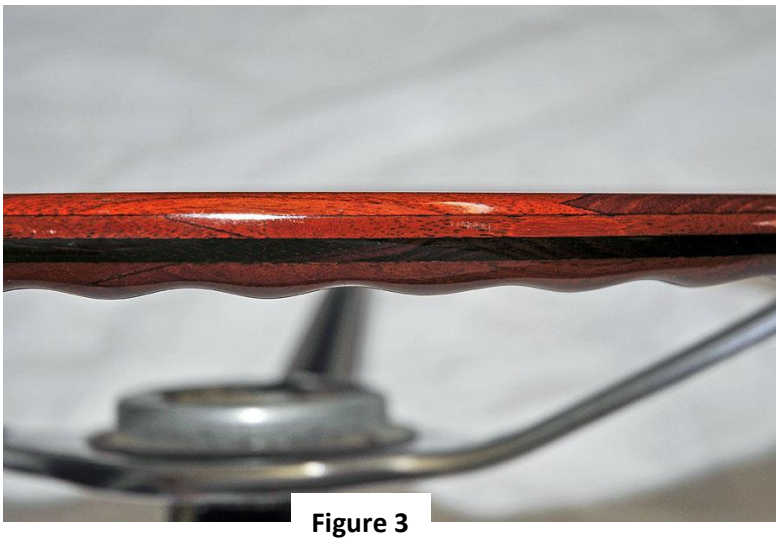

Figure 3

The example I am using is a Jack Arct remanufactured wheel. By all appearances Jack faithfully followed the appearance and construction of the original VDM C2 wheel. Based on this wheel and with the two original wheels in my position, I am 90% confident that what I am about to say is 90% correct. Modern technology may have altered how Jack remanufactured his wheels from VDM manufacturing practices, but the basic principles are the same. The materials used, i.e., may be NLA due to man's aggressive deforestation, similar woods are still available but old growth close grain hard woods are for all practical purposes NLA.

The basic construction of the wood is 3 layers. Each layer is made from short-long grain segments. The grain for all layers is tangent to the hub and outer rings. The reason for this unique construction to these layers is to add strength. The Top Layer is made from 2 plies of like mahogany wood, again to add additional strength to the wheel. Most drivers will lean or push on the wheel during driving, so with grain direction and plying, the loads are distributed in the direction necessary for durability as well as the previously stated strength. It also mitigates cracking of the wheel along the grain of the wood.

Figure 3 is a side view showing all the layers and plies of an original C2 wheel.

You will note that the top layer plies are not spliced at the same location. This staggering is another feature which adds strength to the wood assembly when completed. Similar to how a brick layer staggers bricks.

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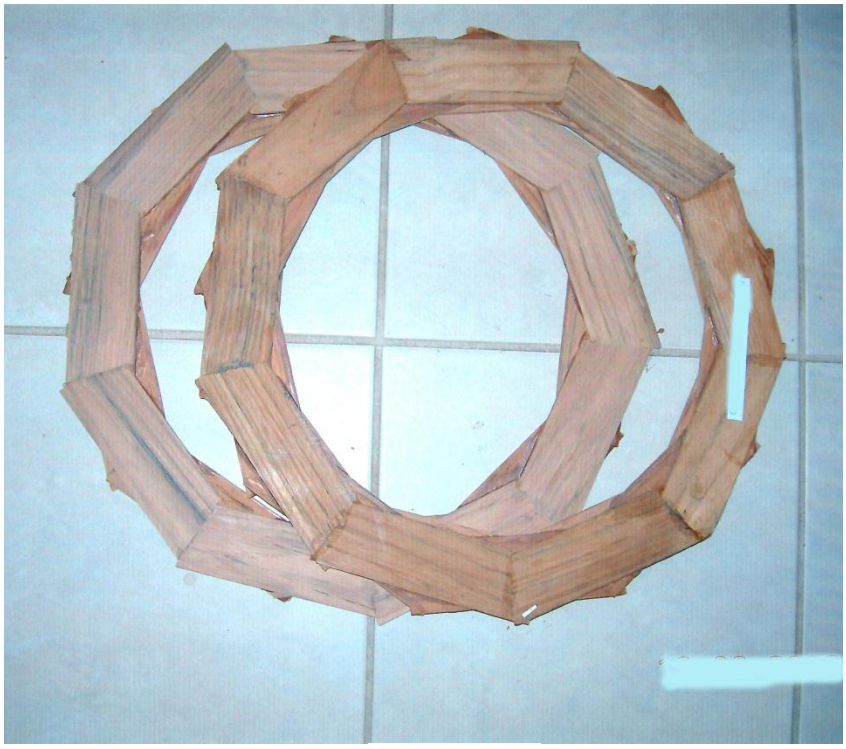

Figure 4

Figure 4. The 3 separate layers with joined segments. Note the grain direction of the segments. The segments are roughly tangent to the hub and the outer ring. By using this construction method, the segments are approximately 2” X 6”, much more efficient use of wood and provide strength/durability to the wheel. Previous wood wheels used one solid piece of wood for each layer which would have measured 420 X 420mm.

Figure 5

Figure 5. The 3 layers laid out in the staggered pattern for the joints.

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Figure 6

Figure 6 shows the 3 layers rough shaped into circular patterns. The middle ring would be made with a dark shaded wood. Some say the dark wood was ebony others mention rosewood, both extremely rare. The inner diameter of each layer is formed.

Figure 7

Figure 7. The 3 layers glued together, mounted on the lathe. Rough shaping and surface planning to provide a constant thickness. Note the method used to mount the wood to the jig. It is glued to the jig plate by 5 tabs.

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Figure 8

Figure 8 shows the rounding and shaping of the top layer.

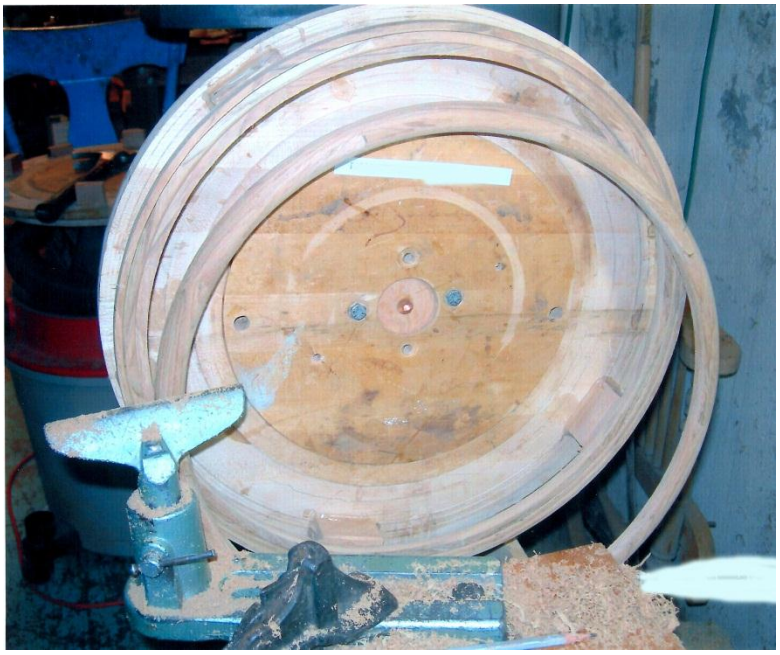

Figure 9

Figure 9. The separation of the top layer and adding the inner groove for the outer ring. This method will give a seamless joint when the layers are bonded together again. The seam is along the top of the inner layer. At this time, the cutouts for the spokes are fitted.

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Figure 10

Figure 10. The metal portion of the wheel fitted to the wood prior to bonding.

Figure 11

Figure 11. With the steel portion of the wheel permanently bonded to the wood. Rough outer shape without finger grooves. Note this wheel was painted incorrectly. The black is from the BP wheel. C2 wheels were bare metal on this side.

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Figure 12

Figure 12. The wheel removed from the lathe jig. And ready for carving the finger grooves.

Figure 13

Figure 14

Figures 13 and 14 show an original period correct C2 wood wheel for comparison.