

## Restoration Completed

**S**teven Edwards has just completed building a remarkably well-finished Pantera for Marty Carrade of San Francisco, California. The car was purchased two years earlier from a Phoenix, Arizona enthusiast. The Pantera was in solid condition but did have several areas of concern. Steven had met Marty through a mutual friend and learned that he was looking to buy a Pantera. Steven helped him search for a car that was well-suited to his requirements. Eventually, the subject feature car was found.

Marty liked the car initially, however, like most Pantera owners, he decided to modify and personalize the car. The two enthusiasts talked over the proposed changes and how to accomplish them. Marty is good mechanically and had no problem with the changes recommended by Marty. Last year, the two men got together after a racing weekend along with fellow Pantera owner Roland Manirin. Marty got an opportunity to look over some of Steven's past work and to ride in his car. It was shortly thereafter that he made his decision and said, "I'm sending you my car to do something's to." It took Steven a year to complete the car shown in this feature article. He began with the engine and six months later, he received the car. In the end, the car was 80% redone, leaving a few items for Marty to complete.

### The Engine

It was decided to build an engine that was based on Steven's design; however, not all of the parts were available at the time. The displacement is 402 cubic inches and uses all new parts. The cylinder block was manufactured by Dart. The bore is 4.125". The crankshaft is a Calley 3.75". Steven says, "The Dart block is a work of art. It is very well done and has several better features than the Ford block does. It is the same Windsor block on the outside with Cleveland mains and head bolt pattern." The connecting rods are 6" Oliver items that contribute to a 10.5 to 1 compression ratio with the pistons. The camshaft is sourced from Crane and is a roller type with a duration of 246 with .580" lift and 254 degrees with .590" lift to actuate the 2.10" and 1.625" intake and exhaust valves. The rockers are Jesel 1.6 arms. Providing reliable oil pressure is a Melling oil pump that feeds off of a Pantera Performance Center aluminum pan.

Steven and Marty found a set of Yates aluminum C3L heads which were sent to Chapman to be CNC



*Marty Carrade of San Francisco, California owns a great example of the breed. The successful restoration by Steven Edwards has produced this handsome Pantera.*



*Above: Group IV taillights and reflective polishing on the bumpers. Exhausts are Mind Train.  
Below: GT5 hood vents have been added. Note early style LM mirrors.*

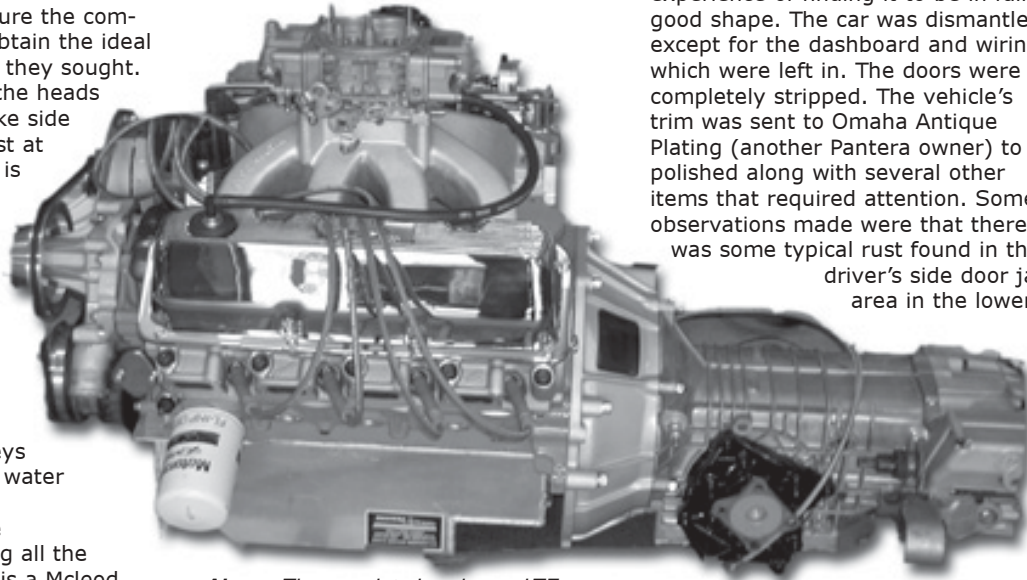




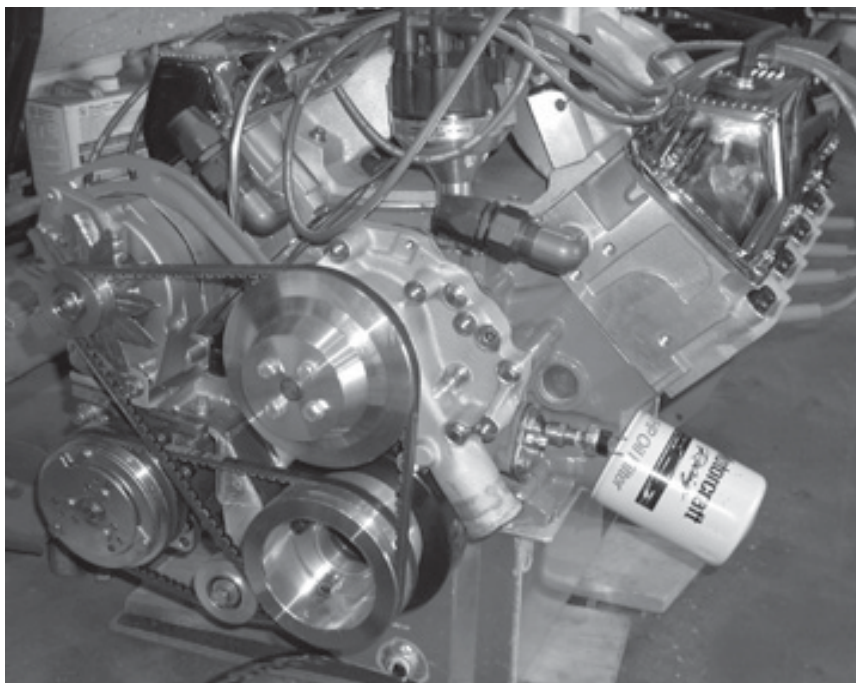
*The Pantera was stripped down to bare metal. The condition of the body was good.*

ported and to reconfigure the combustion chambers to obtain the ideal 10.5 compression that they sought. The resulting flow for the heads is 328 cfm on the intake side and 233 on the exhaust at .600 lift. The manifold is an Edelbrock Victor model topped off with a 750 Holley carburetor. Ignition is handled by an MSD billet distributor with the mechanical advance locked down. Other engine goodies include a Fluidampr dampener, March pulleys and a Stewart stage 4 water pump.

Further back in the powertrain, transferring all the newly acquired power is a Mcleod aluminum flywheel and 2600 pound, long-style pressure plate and dual compound disc. This combination was engine dynoed on a Super Flow machine and produced a power



**Above:** The completed engine and ZF are detailed to perfection. Deep oil pan is from Pantera Performance Center. The manifold is an Edelbrock Victor with a 750 Holley. **Below:** Pullys are from March the water-pump is a Stewart stage 4.



output of 534 horsepower at 6200 RPM. This engine really has long legs. By 6500 RPM, the horsepower output had only dropped by 5. The engine develops 495 foot pounds of torque between 4700 to 5000 RPM. The exhaust system tail pipes are from Mind Train. Steven sent them out for their attractive black coating. The tips are stainless steel and built by Kirk Evans. The new tips slide over the old ones.

### Coachwork

After Steven stripped the body to bare metal, he had the pleasing experience of finding it to be in fairly good shape. The car was dismantled except for the dashboard and wiring, which were left in. The doors were completely stripped. The vehicle's trim was sent to Omaha Antique Plating (another Pantera owner) to be polished along with several other items that required attention. Some observations made were that there was some typical rust found in the driver's side door jam area in the lower

corner from the gas tank void. In addition, the car had been hit in the right front headlight region. Although the damage had been straightened, Steven massaged the damaged area further to meet with his high standards. This car was originally yellow, which was reapplied to the finished car. The front hood was cut-out to accept the hood vents and to let hot vapors to escape from the Pantera Performance Center aluminum, lay-down radiator.

A time consuming job was scraping out the undercoating from the engine compartment. Once completed, Steven sprayed it with PPG DP 90 epoxy black primer. Respecting Marty's request, the undercoating on the bottom of the car was left intact, which can always be refurbished later. Another chore was straightening out the wheel well flares, which at some point in time, had been rolled both front and back, too far, to the point that the front splash shield did not fit.

The hood vents, windshield grills and quarter panel grills were powder coated a semi-flat black. All of the door weather stripping and window cat-whiskers were replaced, having

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earned a well deserved replacement after their 30 years of use. Marty installed a set of Koni brand gas shocks, Wilwood brakes and poly-bushings from PPC. The suspension was further enhanced with the addition of a set of Hall Pantera upper and lower stiffening kits.

The seductive yellow paint was sprayed by Chris Hunke at Cars R Us in Omaha, Nebraska. The paint finish used was a DuPont brand Pantera yellow urethane. The cost of the paint job was \$7,000. While Chris was painting the car, Steven cleaned and then painted the transaxle, using a clear coat of PPG DAU 75. The ZF end plate and axle caps were sprayed gloss black. The paint job has a presence all of its own, it is that good. To compliment the paint, a set of 17 inch Wilkinson rims were selected. The fronts measure 9 inches wide and the rears are 11's. The tires are Michelin Pilots, sizes 245/40-17 in the bow and 335/35-17 in the stern.

The wiring system proved to be one of the more difficult tasks for Steven in this restoration. Having to clean up the system after years of prior fixes was very time consuming. Several circuits appeared to have no purpose. Steven added an MSD ignition 6AL box and a timing computer to control the curve along with a tach adapter and an RPM switch to a light, the brake light between the gauge pods was changed into a shift light. A set of Autometer brand voltage, fuel (electric) and oil and water (mechanical) gauges was added to the instrument panel.

Steven trimmed the interior with a new carpet in charcoal dark grey and then had the rear trunk covered in the same color. In addition, both the underside of the front and rear hoods received the same color trunk liner material, after the painting was completed. The seats are Hall custom items.

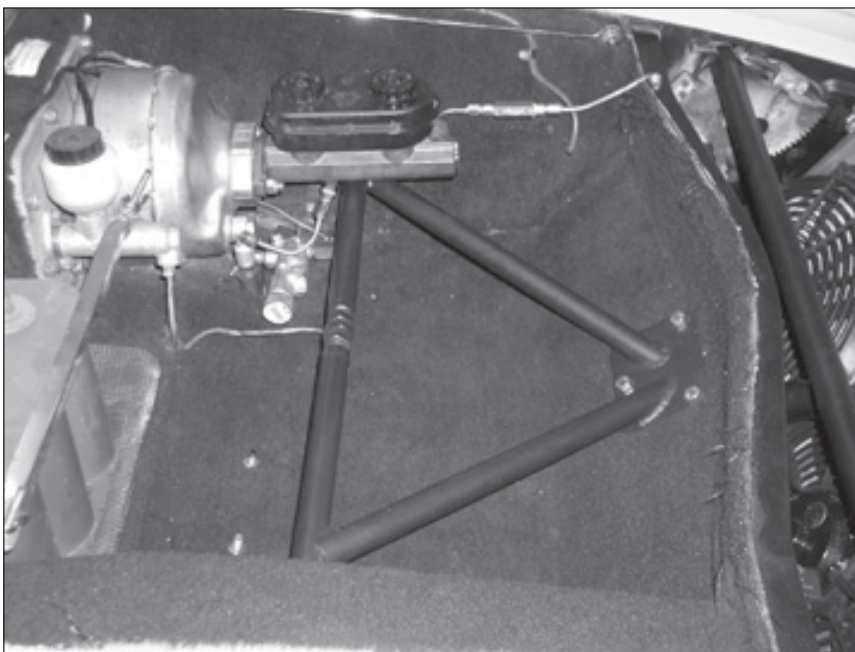
The Wilwood brakes bite down on a set of Porterfield carbon street pads. To compensate for the aggressive camshaft, a vacuum can was incorporated to store vacuum pressure for the braking system.

### The finished car

Once the car was operational with all of the parts in place, Steven's next move was to take the nearly completed Pantera over to famed Pantera racer, E.J. Poss's shop and place the car on E.J.'s Mustang chassis dyno. Edwards wanted to verify the power output of the fresh engine and to set the carburetor precisely. This type of careful dialing-in would ensure Marty's smooth and trouble-free operation once the car was delivered. The Mustang dyno will factor in such



*The European style Boxer or sugar-scoop spoiler can be seen hovering over the roof*



**Above:** The Hall chassis rigidity front-upper brace is shown. Note "sucker" fan and aftermarket brake master. A dry cell battery is used.

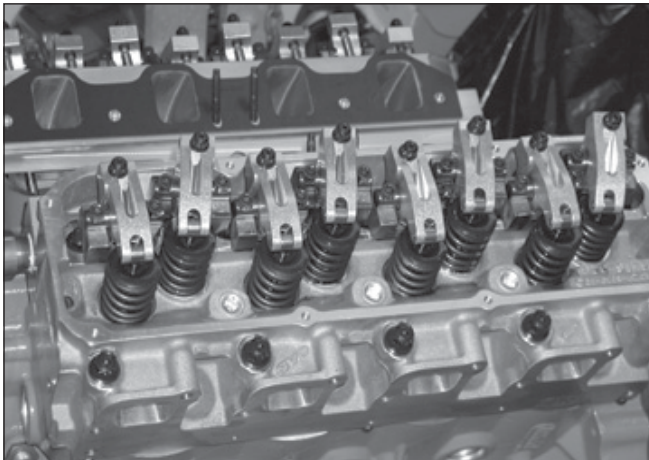


*Owner Marty Carrade and Steven Edwards*



**Chassis number:** THPNMD04009

things as wind resistance and has a linear data string instead of set points. Once the car was up on the dyno, a few adjustments were made, such as, to the throttle cable, before the first "pull" could be made. The net result of the dyno session was a reading of 388.8 horsepower @ 6,300 RPM and 371.2 foot pounds of torque @ 4,700 RPM. These are corrected number for the atmosphere and elevation using the SEA 1349 Rev. 90 standards. This translates to 515 gross horsepower at the flywheel. E.J. was unaware of a previous flywheel test that yielded 534 horsepower that had been conducted on a 20 year old Super Flow dynamometer. E.J. indicated that a Super Flow will read slightly higher due to their different method of measurement. The two dyno tests were only 4% apart which is very close for this comparison. Considering the 515 flywheel horsepower and the 388 rear-wheel reading, this is a 25% loss between the engine and rear wheels. The explanation for this loss can be traced to the transaxle, restrictions in the air cleaner, tailpipes and even the tires. Marty Carrade now owns a definitely cool looking and performing Pantera that retains its early '70's appearance. He should have a lot of fun with his seriously quick Pantera.



**Above:** The Pantera took approximately one year to complete. The cost of the restoration was approximately \$45,000.00. Photos by Steven Edwards.

**Above:** The cylinder block is a Dart brand. Crane cam actuates Jesel 1.6 rockers. Heads are the powerhouse Yates aluminum C3L models.  
**Below:** E.J. Poss' dyno separates fact from fiction. 500 plus horsepower is the proof of the pudding.



The underside of the hoods have been trimmed in charcoal dark grey trunk liner material to match the interior color.



The trim work was sent to Omaha Antique Plating for polishing. The paint color is the original Pantera yellow.



*Chassis number: THPNMD04009 Marty Carrade's Pantera is a classic example of an original appearing car with modest updates.*



*This is one Pantera that will not be a trailer queen. It is prepared with high speed touring in mind.*



*The Carrade Pantera is an excellent blending of the original Pantera styling without significant modification and modern engine development. Only the highest quality components and the workmanship of Steven Edwards would permit such a great result.*

