palatov
MOTORSPORT

INTRODUCTION AND HISTORY SO FAR

Palatov Motorsport is focused on designing and building track day and racing cars that are extremely lightweight while delivering uncompromised performance and safety. The 2012 Palatov D4PPS (Pikes Peak Special) was conceived and built as a no-holds-barred test of our design philosophy.

Starting from 9,000 foot elevation and reaching to over 14,000 feet, the Pikes Peak International Hill Climb is an extreme test of both car and driver. It is also perhaps the only major international race where the overall win and record is potentially accessible to a newcomer on a modest budget. In most established circuit racing series, rules are designed to create close competition. This is done primarily to help maintain audience interest over the length of a season. The rules therefore all but preclude a dramatically different design from entry. Not so at Pikes Peak; a once-a-year event where the Unlimited class places no restrictions on technical innovation.

Being a small team going into its very first competitive event the 2012 Palatov Motorsport effort was greatly constrained by available resources, key among them being budget and time. Just making sure we can show up at the starting line would prove to be a significant and continued struggle. Early in 2012 after securing some initial crowd-sourced backing and formulating a plan, the decision was made to go ahead with the project.

The initial design was completed in February 2012. Fabrication began shortly thereafter and assembly started in early May. With the June 8 Colorado test deadline looming, it became clear that the turbo engine would not be completed in time. Fortunately, a customer generously agreed to support the effort by lending us a Hartley H1 V8 engine from his Palatov D1. With the new engine the car was completed on June 5, one day before departing for Pikes Peak test. It first ran under its own power at the Pikes Peak International raceway, and the following day on the actual Pikes Peak Hill Climb course. The testing was successful and a number of needed improvements and changes were identified.

Upon returning to Oregon, an intensive test and development program was carried out. Key among the resultant changes were aerodynamic improvements that went from virtually no downforce to approximately 400 lbs at 100 mph. During this phase a decision was made to run with the borrowed normally-aspirated V8 in the race rather than risk the unknowns of untested turbo engine. We accepted the couple hundred pound weight penalty and the significant power loss at altitude as tradeoffs for a known and tested configuration.

After being delayed by wildfires, the 2012 PPIHC race took place on August 12, 2012. With David Donner at the wheel, the Palatov D4PPS took first in the Unlimited class with a time of 10:04.652. This put us fifth overall (third car) out of over 160 competitors from all over the world. The team's very first race proved a success. Still, post-race analysis uncovered several issues such as power loss in the engine, drivetrain issues, and a number of other small items. That the car did this well in its early out-of-the-box state, is a strong testament to its ultimate potential. With everything we've learned from the 2012 event, the car now awaits further development. Its racing career is off to a good start and much more is still to come.

CURRENT STATUS

After the 2012 PPIHC race, the borrowed V8 engine was removed and fully rebuilt/updated by Hartley Enterprises. Causes of reduced power output were identified and corrected. Several major systems, including the AWD drivetrain, were disassembled and inspected. Problems were found in the center torque splitter and a new design has been engineered. The originally planned 4-cylinder Hartley H2 turbocharged engine is now being finished and is planned for installation mid-Spring 2012. The rolling chassis is complete with uncoated frame, and all major components (minus the new design torque splitter) are on hand.

ONGOING AND PLANNED DEVELOPMENT

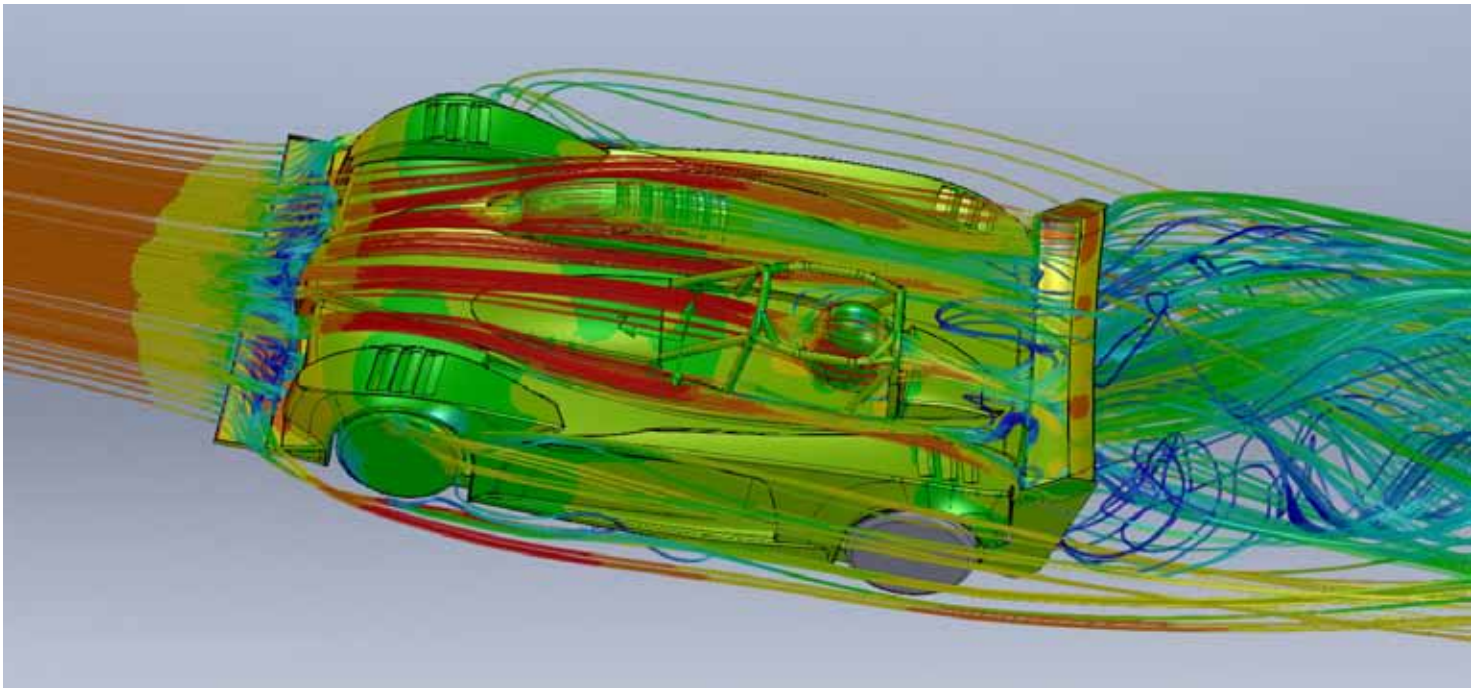
We have learned a great deal from the car's short initial development and its first competitive outing at the 2012 PPIHC. In only a few short weeks we made significant changes to the suspension, carried out aero testing and went from virtually no downforce, to over 400 lbs at 100mph. We also learned how much more potential there is in the design.

Post-race analysis showed that there were several significant issues with the car as it ran. While this didn't keep us from finishing, it did hold us back from an overall win and record which we still believe the design is capable of. Teardown and data analysis showed that the engine was developing less than 200hp (the cause has been identified), there was a malfunction in the drivetrain, aerodynamics were not optimal and the car was a couple hundred pounds heavier than we would have liked. Therefore, we have identified three key areas that we believe would help us find as much as another minute on the mountain.

Engine: We are in the process of building a 1.3L 4-cylinder engine with a Garrett Motorsport turbo. The new engine will allow close to 400hp at the finish line and is approximately 100 lbs lighter than the borrowed normally-aspirated V8 we ran with in 2012.

Drivetrain: Our proprietary AWD system has shown itself to be very effective at putting down a lot of power in an ultra-lightweight car. It is extremely predictable and has a very positive effect on handling. However, we did find that the custom torque splitter is not strong enough to handle the stresses of Pikes Peak. A new, much stronger design has been engineered and will be fabricated before further testing takes place. Besides the AWD system, some further tuning of the Geartronics electronic paddle shift should yield additional benefits in performance and reliability.

Aerodynamics: We made great strides in the aero package and gathered a lot of valuable data with the strain guage equipped suspension. Thanks to our success in 2012, SolidWorks has provided us with their full CFD package which will be of great help in rapidly evaluating proposed changes and optimizing the design. We have already completed the first steps–correlating predicted CFD performance with real-world data, and have found calculation accuracy to be excellent. The predicted downforce for several configurations we ran is within 5% of the actual recorded data, which gives us high confidence in using simulation as a development tool. We believe that significant gains in performance can be found through further aero development.



palatov MOTORSPORT

D4PPS SPECIFICATIONS

Wheelbase: 80”

Length: 113”

Width: 68”

Height: 40” to top of roll bar

Ground Clearance: ~2”

Weight (as-raced 2012): ~1100lb

Weight (2013): ~950lb

Construction: TIG welded tubular 4130 chromoly steel, compliant with PPIHC requirements

Body: Carbon fiber

Aerodynamics: Full tunnel ground effects, carbon fiber

Wheels: 13x8

Tires: Hoosier 20x8-13

Engine (as-raced 2012): Hartley H1 V8, normally-aspirated, 3.0L

Engine (2013): Hartley H2 4-cylinder, 1.3L, Garrett Motorsport turbo, intercooled, ~400 HP at altitude

Gearbox: Hewland 5-speed sequential, Geartronics electronic paddle shifter

Drivetrain: AWD system with chain drive and LSDs

Suspension: Pushrod operated Ohlins adjustable dampers, chromoly double wishbone arms, custom aluminum uprights

PRICING

Palatov Motorsport is looking to partner with an individual or organization who will not just own this car but will be a facilitator and participant in its continued development and success. There are several options available for owning the D4 PPS.

As-is: The car and all currently available parts (including unfinished 4-cylinder turbo engine, transmission and existing drivetrain) can be purchased. It can be used for display and promotion purposes, or, preferably, be further independently developed by the new owner. $65,000

Ready to Test: Palatov Motorsport will finish the build of the 4-cylinder turbo engine and the necessary updates to the drivetrain and various other systems to ‘best currently known’ level. The frame will be disassembled, inspected and powder coated. The car will be delivered late Spring/early Summer 2013 for testing and further development by the new owner. $115,000

Full 2013 Development Program: The car will be completed to ready-to-test condition late Spring/early Summer 2013. From that point, Palatov Motorsport will carry out a comprehensive test and development program, with optional cooperation and participation of the new owner, over the course of Summer 2013.Updates, revisions (up to and including bodywork, if deemed necessary) and maintenance will be carried out throughout the program. The goal will be to extract the maximum performance potential from the design.

The package includes up to 30 hours of private track test time at Oregon Raceway Park, all engineering, fabrication, transportation, crew, support, necessary parts and spares. The details of the program can be tailored to the new owner’s requirements, including expanding testing to additional venues with full support. At the end of the season the resulting car should be a strong contender for the overall win at Pikes Peak 2014 and a variety of other venues. Starting at $165,000 all inclusive.

WWW.PALATOV.COM