

3 BUILDS

For under a \$1000 we widened the handlebars, powerband and the suspension on the fun Raptor 250. This setup is good for the budget-minded rider needing only a little extra performance.



• Ever since Yamaha's Raptor 250 was released in late 2007, our phones have been flooded with aftermarket parts suppliers wanting us to feature their products on the little Raptor. We've had engine builders, exhaust pipe manufacturers and suspension specialists all sending parts our way.

In past issues, you have seen hop-up stories on the Raptor 250, but none of them are like this one. In the following pages, you are going to read how to modify the Raptor 250 no matter how big or small your budget is.

We took three separate machines and outfitted them with a variety of components to suit three different budgets. On the low end, we kept the spending cap under \$1000. In the mid-price hop-up, the cost limit rose to around \$3000. To finish off the trifecta, we threw a leg over a no-limits Raptor 250, featuring modifications costing close to \$8,500.

PENNY-PINCHING

Our budget machine came to life when we started by widening the handlebars with a \$50 Trail Tech X-Bar mounted on a set of Rox Risers. Then the powerband on the 250cc, air-cooled, four-stroke was also widened with a \$335 slip-on exhaust system from Dubach Racing Development.

To go along with the theme, we widened the suspension system without stretching our wallet. To keep cost down, the Raptor received a \$190, A-arm widening kit from Diamond J Customs. The kit relocates the mounting location of all four A-arms and the front shocks while the tie-rods were extended. To finish out the mod, the brake lines had to be replaced with longer ones at an additional \$100.

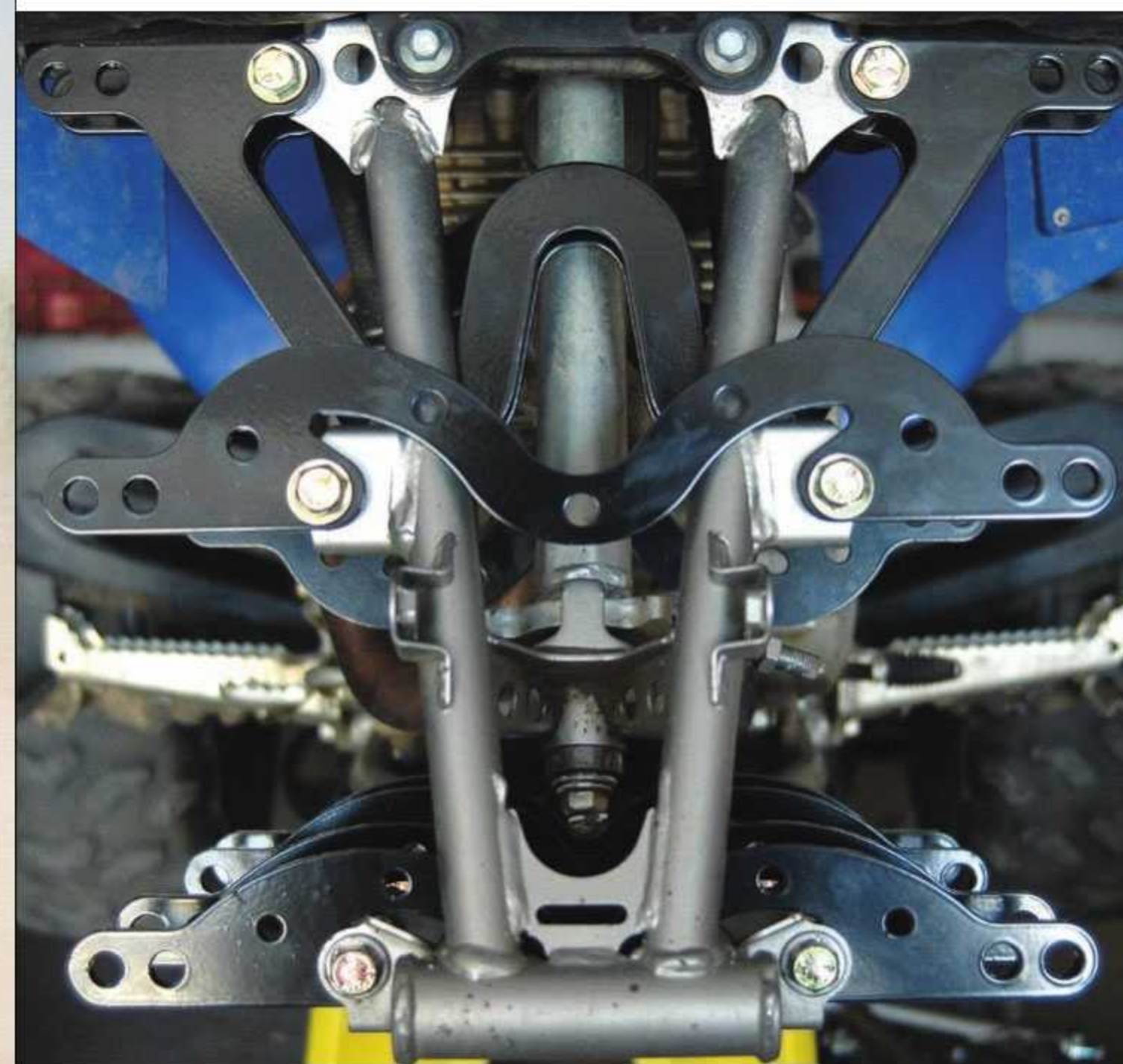
Out back, we simply added a set of Diamond J's \$130, aluminum wheel spacers onto the stock wheel hubs. This process is the least-expensive

way to widen your ATV to make it track-worthy or just more stable on the trail. The wheel spacers installed in minutes, using the stock wheel studs, lug nuts and supplied hardware.

INSTALL AND RIDE

Up front, we needed about two hours to install the A-arm widening kit. To start the install, we had to remove the upper and lower A-arms and front shocks. Next, widening plates were installed onto the stock mounting locations, supplying new mounting points at 2.5 inches and three inches wider than stock. We used the 2.5-inch-wider positions to match the 2.5-inch-wider rear-wheel spacers.

Using the stock shocks, the wider suspension wasn't overly soft. Stability on the trails was a huge improvement. In most situations, we could keep the 250's throttle pinned and just rail in and out of the trees



The Diamond J Customs A-arm extenders give you two mounting locations for the A-arms and shocks depending on your needs. We chose the 2.5-inch wider setting to match the rear wheel spacers.

◀ One of the quickest ways to widen the rear of any quad is to add wheel spacers. Diamond J Customs also has lowering kits and dual A-arm kits for quads that need them. See their complete line of products at www.diamondjcustoms.com.

A \$125 Quad Tech seat replaced both our mild and wild project Raptors. These are some of the best aftermarket seats in the business. ▼



much faster than before. The widening kit gives the front end about three degrees of negative camber, causing the tops of the front tires to tilt in slightly. This allowed for improved steering and a light handlebar feel.

On the track, our lap times were improved by over two seconds a lap. No longer did we have to slow down to keep the quad from tipping or two-wheeling through the turns. The Diamond J-equipped Yamaha railed around the sweepers and carved along the berms with total control. The Raptor does suffer a little bit of front-end push on very tight, flat corners.

CONCLUSIONS

The Diamond J A-arm widening kit and rear-wheel spaces totally transformed the handling of the Raptor 250. It's not a system that should be used for racing, but it will allow you to race your buddies on the trail. And if you do want to hit the track, it will help you there, too. Diamond J Customs offers A-arm widening kits for most of the popular narrow sport quads. They also sell lowering kits, wheel spacers, and wheel conversion kits for the quads that might need them.

Our wider Raptor 250 can now take advantage of the power gains from the DR.D exhaust system. There's power to get down the start straight or wheelie down the trail. We have about burnt up a set of stock tires, so stay tuned as we test more hop-up parts on this fun Raptor 250.

CONTACTS

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Trail Tech: www.trailtech.net;
(360) 687-4530

Dubach Racing: www.dubachracing.com;
(877) 382-2241

Golden West Cycle:

www.goldenwestcycle.com; (800) 383-6776

MILDLY MODIFIED

This mildly modified version began when we installed a Works Performance rear shock back. In this test, we noted that for \$600 this Works Performance shock is among the more affordable ways to improve your Raptor 250. Our 175- to 200-pound riders appreciated the upgrade. Since then, we have discovered even more affordable ways to getting the most out of your 250, without breaking the bank.

For this test, we upped the bankroll to \$3000. To widen the front end, we turned to JD Performance. For \$575, we installed a set of +2 (wide) +1 (forward) 4130 chromoly A-arms. They come complete with camber/caster adjustment, TIG-welded upper and lower arms, ball joints, tie rods, bushings and are

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powder-coated. To run these long-travel A-arms, a longer aftermarket shock is required. Since we had our eyes on a bunch more performance and glamour products to spend our cash on, we wanted to go as cheap as possible. After speaking with a few used parts warehouses like K&K ATV (413) 323-7044 or www.kandkatv.com, we found a set of used Honda TRX450R front shocks. K&K quoted us between \$200 and \$300 for both, depending on the condition. Try getting aftermarket shocks for that price!

The wider front end required longer brake lines as well. Galfer has awesome stainless-steel brake lines that run for \$100. To match the two-inch extended front end we installed an adjustable four-inch-wider Dura Blue Eliminator axle for \$360 at www.rockymountainatvmc.com.

After the big moves were made with the wider front and rear end, we moved to controls and performance. We removed the stock handlebars and replaced them with a set of Renthal CR Highs (\$75). We kept the 7/8-inch-size bar, so additional fat-bar mounts were not required. On the bars, we installed Pro Armor's \$39.99 kill switch, Cycra's \$45 M4 Recoil handguards, and \$13 Spyder grips.

The powerband on the 250cc, air-cooled four-stroke was improved with a \$350 complete exhaust system from Yamaha. Also from the Yamaha GYTR department that we picked out



The JD Performance A-arms matched with the stock Honda TRX450R shocks and were a great boost from stock. The Raptor 250 turned on a dime and was a smooth, plush ride in the rough stuff.

were \$250 aluminum nerf bars, a \$149 aluminum MX front bumper and matched the front with a \$75 aluminum rear grab bar. We wanted to add a little more bling to the little Raptor, so we installed a cool blue Sunline gas stop valve (\$17, available from www.yamaha-motor.com). Then we tore off the beat-up stock graphics and replaced them with a \$64 Blue Flow GYTR graphics kit. The stock seat was beat up after a year of hard testing as well, so we called on a \$125 Quad Tech seat. We went with silver and blue, but it is also available in black/yellow, silver/red, silver/black and orange/black.

The last install was ITP Holeshots wheels and treads on all four corners. We upped the 20x7-10 stock fronts to a little taller 21x7-10 (\$64) size mounted on 10x5 T-9 Pro wheels (\$62) and kept the same 19x10-9-rear size for the Holeshots MXR4's (\$88) and 9x8 T-9 Pro wheels (\$59).

INSTALL AND RIDE

We needed about three hours to install the JD Performance A-arms. To start the install, we had to remove the stock A-arms and front shocks and replace them with the arms and stock TRX450R shocks. The JD arms are supplied with caster adjusting washers on the top A-arms. In order to run



The mildly modified Raptor 250 was boosted a few horsepower over stock, which helped the machine catch some air.

◀ We installed GYTR nerf bars on the mildly modified unit to prepare for race day. Nerfs and a kill switch are needed to meet most race series requirements.

The second stage of our Raptor 250 project saw a GYTR full exhaust installed. ▼



A four-inch wider than stock Dura Blue axle was installed on the mid-price level Raptor 250 as well. This setup worked great to match the front JD Performance A-arms.

◀ Up front on the mildly modified Raptor 250 is a set of JD Performance +2 (wide) +1 (forward) 4130 chromoly A-arms. They come complete with camber/caster adjustment, TIG-welded upper and lower arms, ball joints, tie rods, bushings and are powder-coated.

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the Honda shocks, both the caster washers had to go up front, moving the A-arms to their most rearward position.

The JD Performance A-arms and Dura Blue axle setup felt more stable and comfortable than the budget Raptor. The TRX450R shocks were plusher than the Works Performance shocks we had on previously and are compression and rebound adjustable. For under \$300, this might be the best route available.

The ITP Holeshots mounted right up to the stock Raptor hubs using the stock lugs as well. This wheel/tire combo is lightweight, and we couldn't imagine better traction, which was needed thanks to the 15 percent increase in mid/top power and 11 percent increase on top from the GYTR exhaust system. This setup is also one pound lighter and runs at a low 96 dB readout.

CONCLUSIONS

Whether you've outgrown the "budget" Raptor 250, or have a little extra cash burning a hole in your pocket, this mildly modified version might be the one for you. The JD Performance +2 A-arms, stock TRX450R shocks and +2+2 Dura Blue axle made for a great all-around ride on the track and trail. Installation of GYTR nerf bars and a Pro Armor kill switch made it race legal, and our GYTR graphics and front and rear aluminum bumpers upped our bling factor as well.

CONTACTS

Cycra: www.cycra.com; (740) 929-0188

Dura Blue: www.rockymountainatvmc.com; (800) 336-5437

Galfer: www.galferusa.com; (805) 988-2900

JD Performance: www.jdperformance.net; (951) 676-7957

K&K: www.kandkatv.com; (413) 323-7044

Quad Tech: www.quadtech-atv.com; (949) 859-7823

Yamaha: www.yamaha-motor.com; (800) 962-7926

SKY'S THE LIMIT

This version of our Project Raptor 250 build was set with an unlimited budget. With the help of CT Racing we made the once-timid sport quad come to life. Plus, with the addition of Laeger, Fox, Dura Blue and many more aftermarket products, this Raptor 250 is one of the best you can find anywhere.

SUSPENSION

Laeger +3-inch Long Travel A-arms (\$795) were used. The A-arms

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The CT Racing motor mods made our Yamaha Raptor 250 a screamer! If your budget is deep, this is a great route.



were connected to Fox Float shocks (\$1495). The Fox Floats offer a lot of advantages for this project. To start, they are among the lightest front shocks on the market, so that met with the theme of the project. With the two air chambers—one for ride height and the other for hard impacts—there is so much adjustability you can get them to handle exactly as you want. It also offers easy adjustment for growing riders as ability and weight change. The Fox Podium X rear is a coil spring shock that sells for \$895 and that we found to work extremely well as we put the Raptor through its paces.

The rear end was widened to match the front with a Dura Blue X-33 axle (\$592). The X-33 is heat-treated, tough, light and just what we needed. The X-33 comes with hubs, offered in both cast and billet alloy.

OMF eight-inch beadlocks with ringed inners (\$170) were mounted on the rear end along with Douglas Alumilite rolled-edge front wheels (\$106). Rubber choice was Maxxis 19x6x10 fronts and 18x8x8 rears. The Maxxis tire is only nine inches wide, making it a very light tire. The Maxxis rears did hook extremely well and will be the best tire choice for most MX tracks.

Our "sky's the limit" Raptor 250 is nice to look at. From the X-Factor A-arms and bumpers, to the Quad Tech gripper seat, ASV levers and Universal handlebars, this thing looks great and rides even better.

◀ A \$450 CT Racing Sonic exhaust was installed. It's lightweight and sounds great.

MOTOR

The cylinder and head were popped off, and CT worked aggressively on the flow characteristics of the intake and exhaust parts. The valve guides were replaced with significantly shorter ones because the stock guides are extremely long and hinder air flow through the port. CT racing installed a 1mm larger Kibblewhite Black Diamond intake valve (\$32) and also ran a Black Diamond exhaust valve. The Kibblewhite exhaust valve is significantly lighter than the stock valve. It's not included in the engine kit but is available as an upgrade for \$32. CT also did significant testing and development on valve springs to get them just right; too stiff robs power and too light allows valve float. The CT Valve Spring kit offers titanium valve spring retainers to keep the valve mass to a minimum weight.

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The head was ported with significant changes in port shape and flow characteristics to extract maximum horsepower. CT Racing then completely re-profiled the valve seat area to a five-angle radius valve job extracting maximum seal. A Cometic top-end gasket set (\$60) is included with the package, and their EST kit (Extreme Seal Technology) includes all the gaskets and valve stem seals you'll need to slip this package together.

A 13/1 JE piston (\$159) was used to bump the compression up. CT stocks 11/1, 12/1 and 13/1. They also offer lower compressions to suit choices for lower octane fuel. CT Racing did significant testing with Web Camshafts to develop this Sonic cam profile (\$123) and several other grinds, which were better suited to other applications like GNCC racing.

A Dynatek CDI Box (\$180) replaced the stocker. The Dynatek box offers a more aggressive retarded curve along with a higher rev limit. CT Racing hucked the CV Carb. and installed a 33mm FCR Keihin (\$500). CT only recommends the 33 for a



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very highly modified, high-compression race motor. If your motor is not super modified, the 30mm FCR is the best choice.

A CT Racing Sonic exhaust (\$450) was installed as well. In an effort to keep the Raptor exhaust as light as possible, they went away from their normal disc style design and used a turn-down style of end cap.

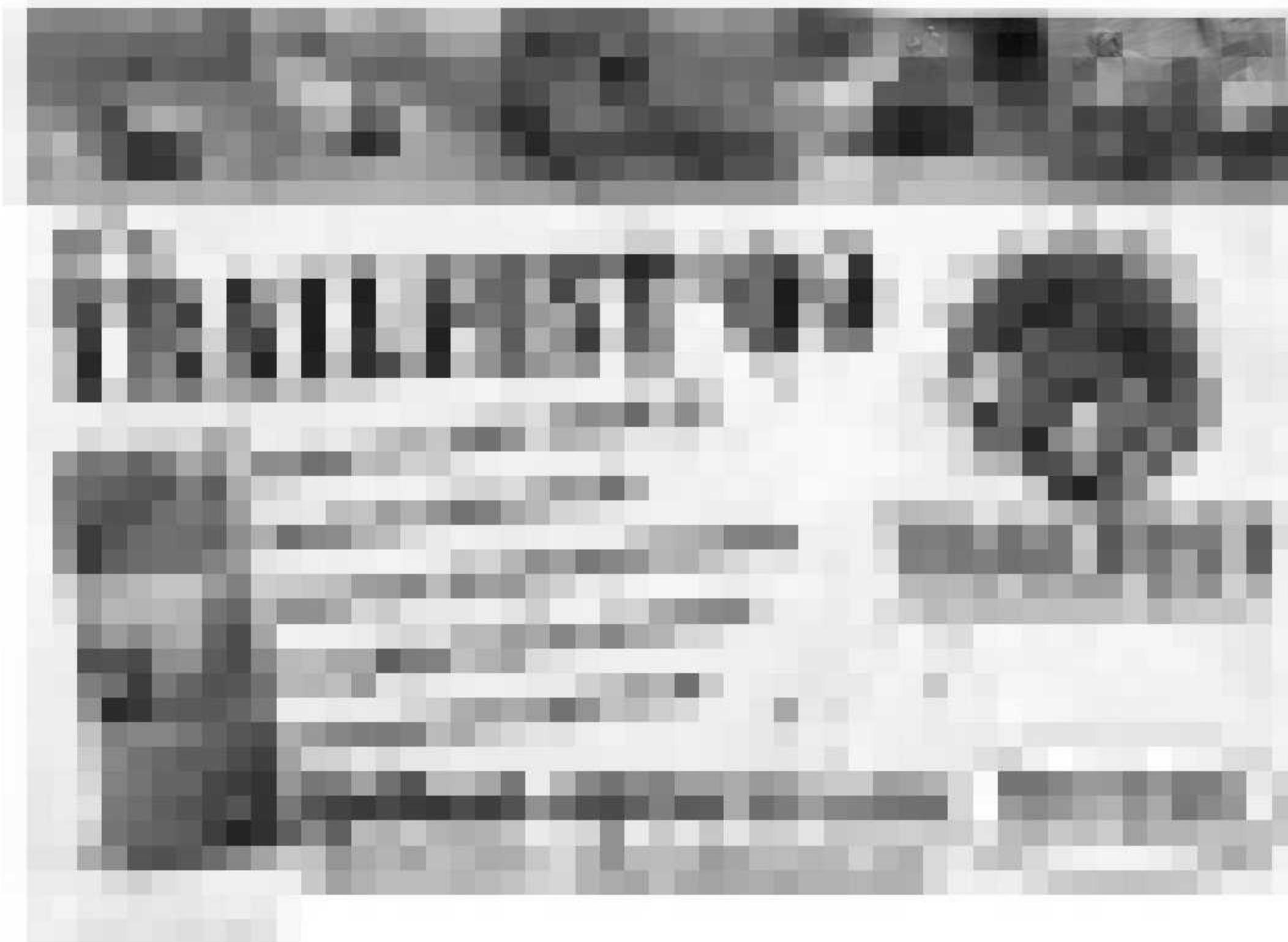
SAFETY & CONTROLS

X-Factor Motorsports supplied their aluminum nerf bars (\$170) and bumper (\$120). Universal Atlas handlebars (\$70), using the CR High Bend, were installed. ASV Pro levers (\$180) and Spider grips (\$16.95) were added to the bars as well.

A Quad Tech seat cover (\$125) was wrapped around the stock seat foam offering a better grip and a more comfortable ride. Quad Tech uses a quilted material that has foam in it, offering a better ride and more controlled grip.

CONCLUSIONS

We've had several days testing on the little Raptor 250 and lots of riders of varying weight, size with rider ability, and we've received no input for changes; everyone was comfort-



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able with the ergonomics and the suspension. We had the Raptor on the Racetown 395 track the same day we were doing the 450 shootout (April 2009 issue), and several of the testers said they could get the Raptor through the whoops section faster than they could on any of the stock 450s. That's a combination of good power, very good handling and light weight all coming together.

CONTACTS

ASV: www.asvinventions.com
Cometic Gaskets: www.cometic.com
CT Racing: www.ctracing.com
Douglas Wheel: www.dwtracing.com
Dura Blue: www.DuraBlue.com
Dynatek: www.dynaonline.com
Fox Shox: www.foxracingshox.com
JE Pistons: www.jepistons.com
K&N Filter: www.knfilters.com
Kibblewhite: www.blackdiamondvalves.com
Laeger Racing: www.laegerracing.com
OMF Performance: www.omfperformance.com
Quad Tech: www.quadtech-atv.com
RIS Designs: www.risdesigns.com
Streamline: www.streamlinebrakes.com
Web Cams: www.webcamshafts.com
X-Factor Motorsports: www.x-factormotorsports.com □

