SNEAK PEEK: New 35mph Traxxas nitro monster truck



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R/C CAR

THE RADIO CONTROL CAR MAGAZINE

DECEMBER 1999

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Neo TYPE-M

Kyosho's venomous SNAKE BITE!

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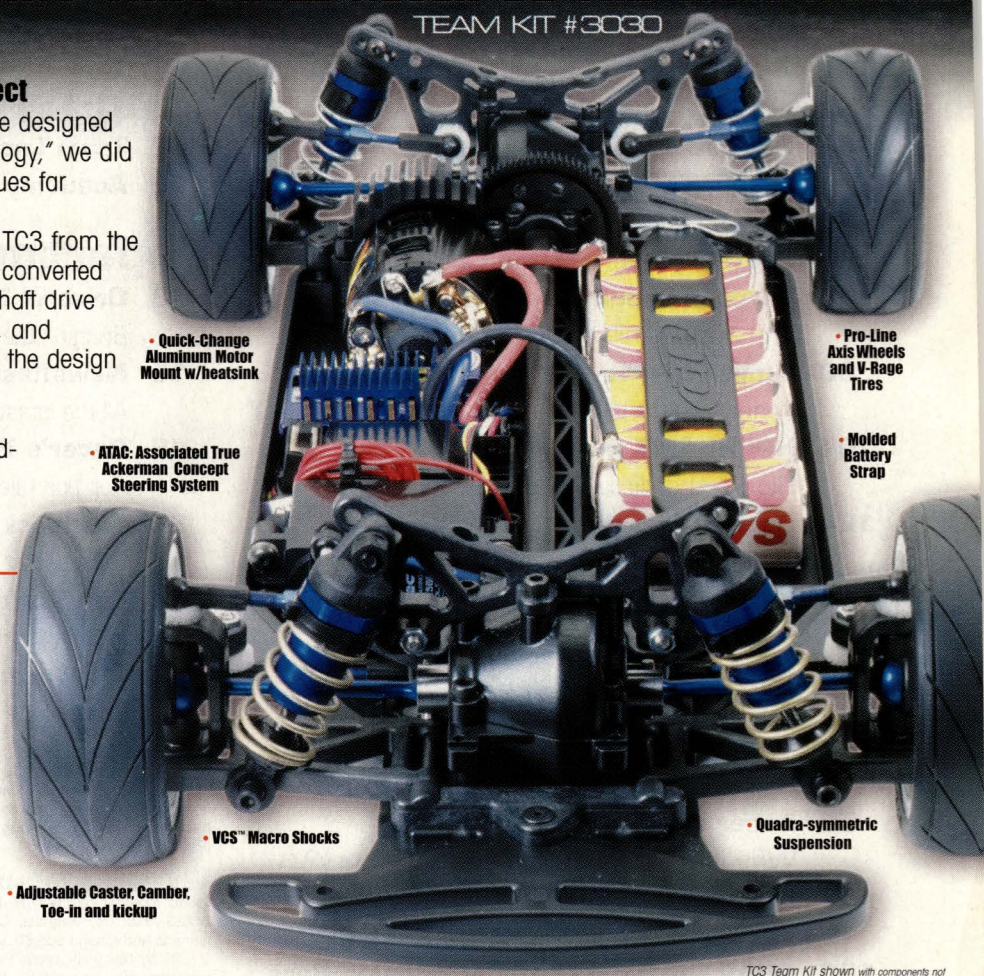
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TC3 Team Kit shown with components not included in kit: 2 channel radio gear, Servos, Reedy Zappers batteries, LRP V6 Speed Control and Reedy Fury Modified motor.

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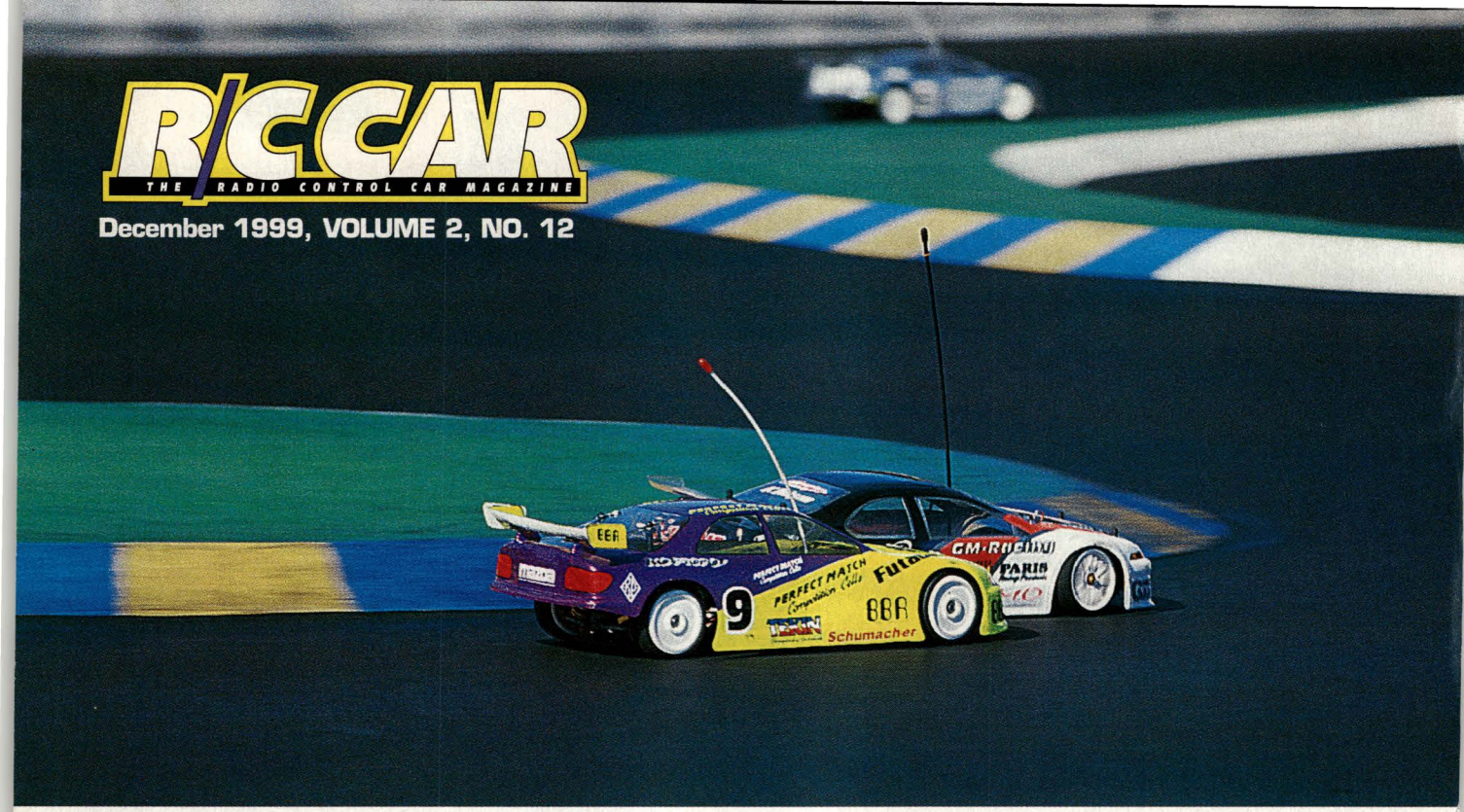
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THE RADIO CONTROL CAR MAGAZINE
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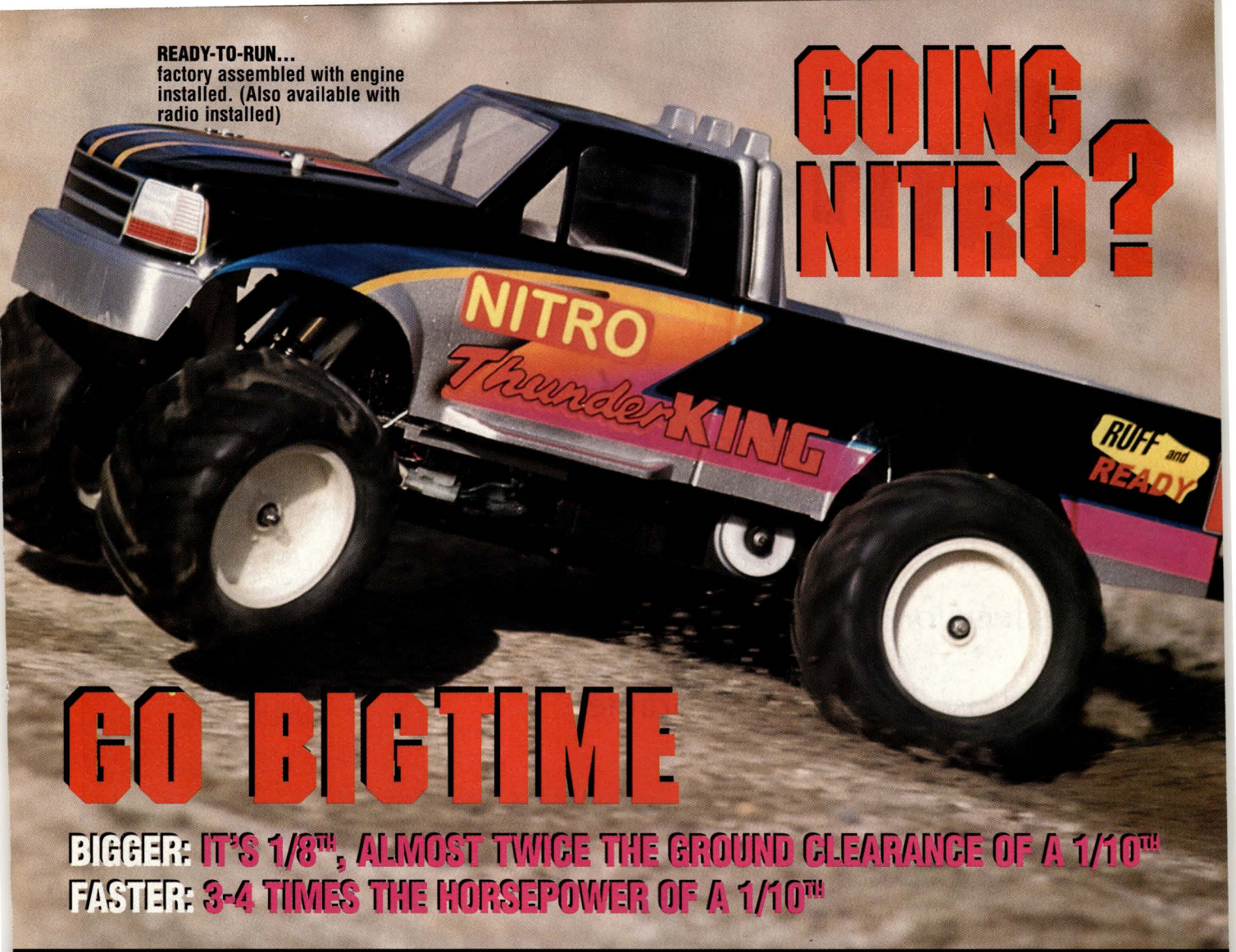
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On the cover: HPI's smokin' new Nitro RS4 2 is poised to take the nitro touring car world by storm! Photo by Kent Clausen. The Kyosho Snake Bite gets ready to crush 'em up. Two other hot new touring cars, the Golden Horizon Neo Type-M and the all-new Serpent Impulse Streetspec get set to make some serious waves in touring car racing too! Photos by John Howell. **On this page:** Touring car racing action from the ROAR On-Road Nats. (Photo by John Howell)

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THE RADIO CONTROL CAR MAGAZINE

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drivers' stand



by Frank Masi

Whew! It's been a hectic month here at the R/C Car offices. With every manufacturer in the country (and some from out of the country) gearing up for October's big Chicago hobby show, there has been a flood of new goodies streaming our way, a handful of which we were able to cram into this month's issue. The Chicago hobby show is the largest of its kind in North America, and I always view it as the R/C industry's "barometer" and the best indicator of the vitality of the hobby. Last year's show was good, but I think that this year's will be even better, with even more new touring cars and accessories than ever (if such a thing is possible). I truly wonder when, if ever, "sedan-mania" will let up!

This leads me to a question I've heard several times recently: what's going on with off-road? Well, lots, actually. As Hans and Franz would say, "Hear me now and believe me later!" Off-road racing is far from dead. In fact, many believe that although attendance was down at this year's nationals, off-road racing is undergoing huge growth at the club-level. Which, in case you didn't know, is where it really counts! Credit this not only to the excitement generated by Losi's new Triple-X and Associated's big win at the Worlds, but to the continued popularity of the gas truck class—which is often the largest racing class at most outdoor tracks.

The hottest new sedans are here!

We pulled out all the stops this month to bring you inside information on what we think will be the newest and hottest sedans for the coming year. First, there's this issue's cover story on HPI's re-designed rocket, the Nitro RS4 2. We've really been anticipating this one, as the original RS4 Nitro pretty much spurred the growth of the nitro sedan market. Does the new Nitro 2 live up to the reputation of its predeccessor? You'll have to read this issue to find out! Speaking of nitro sedans, contributing editor Llto Reyes managed to get his hands on the highly anticipated new Impulse Streetspec from Serpent (actually, "Qui-Gon Lito" summoned the power of the Force to pry this kit out of my hands). We've been jazzed on this car since we saw it at last year's Chicago show, and we've been calling Serpent's Ed Enberg every week to find out when we could get one for review. Needless to say, we found the Serpent to be even better than its hype would suggest. Don't miss this review if you're into nitro!

Speaking of first looks: last month we showed you the awesome new Neo nitro sedan from Golden Horizons. This month we are also the first to build and test the new mid-motor Neo electric sedan, the Type-M. This particular Neo has its motor placed smack-dab in the middle of its chassis—a unique design, I must say—for more "ideal" weight distribution (most sedans have much of the chassis' total weight over the rear wheels). Will we see more sedans like the Type-M in the future? Or is this simply a fad?

Oh yes, we also have a close-up look at the latest M-Chassis from our friends at Tamiya. Called the M-04L, this is the fourth generation of the car that began the Mini craze. For our test, we built a cool new BMW M-Roadster. It was so cool, in fact, that our publisher (a known connoisseur of European automobiles) confiscated the BMW in an effort to "better understand the subject matter of his newest magazine." Ummm...okay...you sign the paychecks. Tamiya has really put the M-Chassis through a serious upgrade, and we feel that it's better than ever in every way.

Keeps those columns coming!

I can't begin to describe how well-received our new columns have been. I guess you guys really wanna know what's on the minds of today's top racers. Sadly (or happily, depending on your take), our "Racers Write" column is one racer short this month, as Mark Pavidis and his wife Susan are expecting their first child (who will probably already have put in a few laps at MnM Raceway by the time you read this). Don't worry; Mark has promised that he will have his next column done in time for the January issue!

That's all for this month, and remember: you can never have enough blue aluminum stuff!

—Frank Masi ◆



Win your own Snake Bite!

Yes, you could soon be driving your very own Kyosho Snake Bite R/C monster truck! Just enter the *R/C Car*/Great Planes Car Crush Contest. To win, simply identify each of the cars being stomped flat by the Snake Bite in this photo (for a better view, turn to pages 48-49 in this issue). You must identify each car and tell us the month and year of the issue in which its review appeared (c'mon, it's not that hard!). The winner will be drawn from among all correct entries, and will receive one Snake Bite kit, one Tower Hobbies radio system and one DuraTrax Nitro Starter System from your friends at Great Planes. Employees of High-Torque Publications and Great Planes Model Distributors Co. and their families are not eligible to win.

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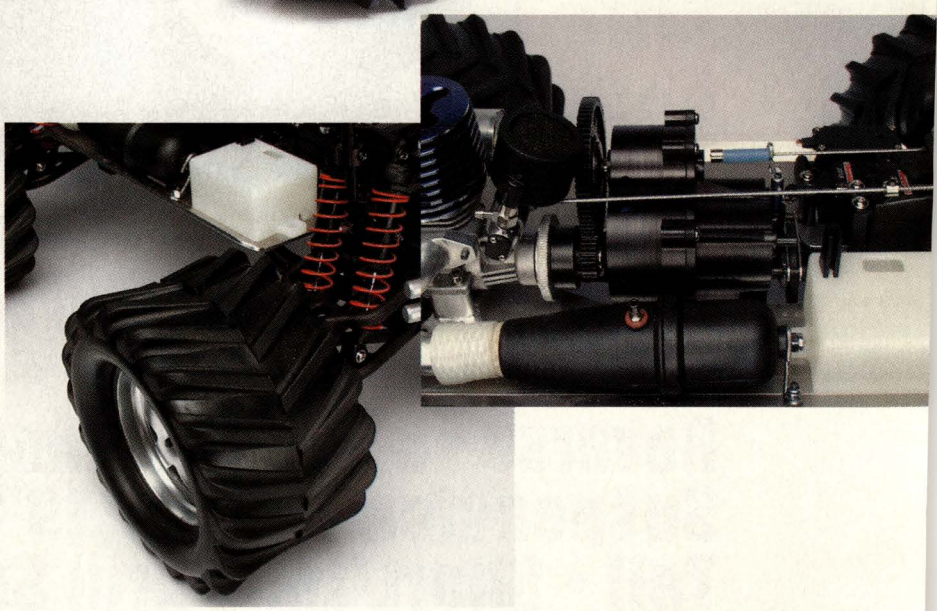
What's new and noteworthy in the world of R/C!
Compiled by the editors of R/C Car

MAXIMUM TRAXXAS!



Having proven that they still know how to make a serious, high-end racing car with the Nitro 4-Tec Pro, the boys at Traxxas have now set their sights on the 4WD monster truck category with the upcoming release of the T-MAXX. It's no secret that when Traxxas makes a product, their goal is to make it bigger and badder than its competition. In the case of the T-MAXX, it looks as if they've fired a successful volley. Just check out some of the features of the T-MAXX.

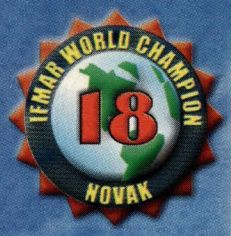
Roughly the size of a Tamiya Juggernaut or Kyosho USA-1, the T-MAXX is powered by Traxxas' Pro-15 glow engine, which will be hooked-up to the EZ-Start on-board starter system—no glow-starters or starter boxes are needed; heck, you don't even have to pull a cord! The T-MAXX is also equipped with a special transmission that provides two-speeds in both forward *and* reverse. That's right! The T-MAXX will be able to shift into reverse using a brand-new three-channel Traxxas radio system. And unlike Kyosho's QRC tranny, the T-MAXX's gearbox has a lock-out system that prevents reverse from being engaged until the truck has slowed sufficiently to prevent any undue wear to the gears. Also, the T-MAXX will be the only reversing nitro vehicle to have a disc brake system.



Traxxas has spent a lot of time and resources developing the T-MAXX—with the exception of a few bits of hardware (and, of course, the engine), this is an entirely new truck designed from the ground up. After the revolutionary tranny design, the T-MAXX's most prominent feature has to be its long-travel, four-wheel independent suspension. With upper and lower wishbones damped by a pair of large oil-filled shocks at each corner, Traxxas reports that the T-MAXX is the most plush-handling truck they've ever built, and its towering stance and 3-1/2 inches of suspension travel allow it to travel over the hairiest terrain with ease. Also, early test reports estimate the T-MAXX's speed at somewhere in the 30 to 35mph range!



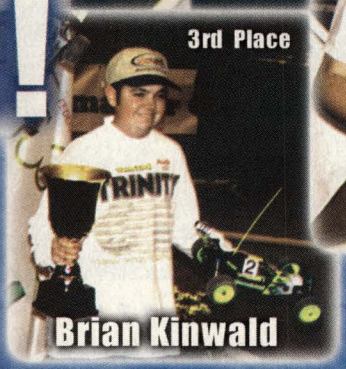
Reports peg the T-MAXX's release date at sometime in the late fall, and although prices haven't been officially set, we've been told to expect a price of approximately $450 to $500 for a completely built, ready-to-run truck with radio. For more information on the T-MAXX, contact Traxxas, 12150 Shiloh Rd., Dallas, TX 75228; phone (972) 613-3300; fax (972) 613-3599. ●





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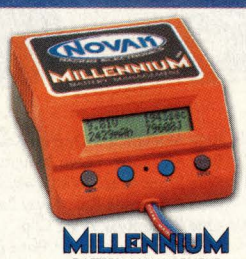
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3rd Place

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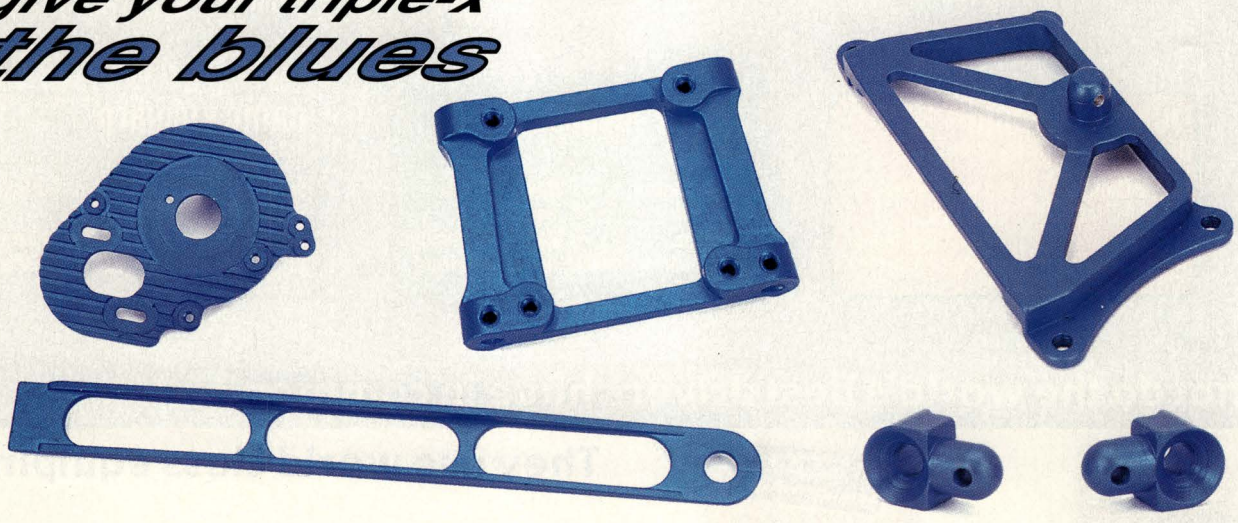
Nitro Monster from HPI



We knew this one was coming! HPI announced recently that it would be introducing its brand-new Nitro RS4MT at this year's Chicago RCHTA Model Hobby Show. Loosely based on the electric RS4MT monster truck, the nitro version will feature full-time SHAFT-DRIVEN (a first for HPI) 4WD, a purple-anodized aluminum chassis with countersunk screw holes, a powerful 15FE pull-start nitro engine, full ball-bearings, and an easily removable molded radio tray similar to that of the Super Nitro RS4 road car. In addition, the Nitro MT will feature the same long-travel independent suspension as found on the electric RS4MT, complete with large-volume oil-filled shocks. Also, HPI designers have given the Nitro MT a longer wheelbase for increased stability and better handling—necessary changes for a vehicle that will be as fast as this .15 c.i. truck.

Expect the Nitro RS4MT to be in hobby shops just in time for the holiday season, with an RS4 Rally version based on the same chassis to follow a few months after. For more information, contact HPI, 15321 Barranca Pkwy., Irvine, CA 92618; phone (949) 753-1099, fax (949) 753-1098. ●

give your triple-x the blues



With Team Kinwald, that is... Trinity's "Blue" division has come up with some awesome hop-up parts for Team Losi's national champ Triple-X 2WD buggy.

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TK5010	Blue Aluminum Upper Servo Brace	29.99
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TK5013	Kydex Transponder Mount	2.99
TK5014	Blue Aluminum Shock Bushings (set of four)	7.99
TK5015	Blue Aluminum 0 Degree Rear Pivot Blocks	29.99
TK5016	Blue Aluminum 2 Degree Rear Pivot Blocks	29.99
TK5017	Blue Aluminum Servo Mounts	TBA
TK5018	Blue Front Brace With Sway Bar Mount	11.99
TK5019	Blue Adjustable Rear Sway Bar Mounts	14.99
TK5020	One Piece Rear Wing Clip	TBA
TK5022	Blue Aluminum Motor Plate (standard)	10.99
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TK5024	Blue Aluminum Screw Kit	18.99
TK5025	Blue Aluminum Bearing Spacers, 4 pcs.	9.99
TK5026	Blue Aluminum Rear Arm Brace	8.99

For more information, contact Team Kinwald, distributed by Trinity Products, Inc., 36 Meridian Rd., Edison, NJ 08820 • phone (732) 635-1600; fax (732) 635-1640 ●

THE FUTURE OF FUTABA!





Who doesn't remember Futaba's Magnum PCM radio? It was the first-ever "super" radio and set the standard of high-quality R/C transmittters for years to come. And who can forget the original Magnum 3PJ, the first radio to offer eight-model memory? Now, with many other radios offerering as many as ten-model memory, Futaba once again breaks new ground with its brand-new 3PJ Super, the only radio to use an external "plug-in" memory expansion pack that can boost model memory to an unprecedented 16 models!

And that's not all. Futaba engineers have given the 3PJ Super a complete software makeover, providing much simpler programming by using three function-select modes: Direct Mode gives easy access to the functions you'll need to change most frequently; Select Mode is the second tier of programming for such functions as A.B.S. and lap-timer; and finally, the Setup Mode lets you program all those one-time-only functions such as servo-reverse and PCM/PPM select. With this new "navigation" system, you won't have to scroll through a lot of functions that you may never use in order to get to the ones you use most often!

Also new on the 3PJ Super is a sleek new black case with improved ergonomics and switchgear that feels more solid and refined. There's even a new black antenna. Of course, the 3PJ Super still offers everything that made the original 3PJ the most feature-laden transmitter on the planet, including Futaba's Traction Control and Anti-Lock Braking systems, a reversible grip for left-handed operation, digital-trim for easy setup, and a choice of Futaba's excellent micro-receivers (R113F for FM/PPM and R113P for PCM modulation).





On the subject of new, we couldn't resist giving you a glimpse of Futaba's latest "sport" radio, the Magnum Junior FM. Futaba has taken its proven Magnum Jr. AM radio and has given it the improved signal clarity and noise rejection inherent in an FM system. And as if this weren't enough, the new radio also gets an ATV function for the throttle-channel, which allows you gas racers to independently set the throttle's forward and brake travel.

For more information on these new radios, contact Futaba Corp. of America, P.O. Box 19767, Irvine, CA 92723-9767; phone (949) 455-9888; fax (949) 455-9899. ●

RCHTA Website Up & Running

The Radio Control Hobby Trade Association, or RCHTA, announces the completion of its website—*www.rchta.org*. Show your support for our manufacturers' organization and pay them a virtual visit! ●



Fate of the Juggernaut

Word of the demise of Tamiya's Juggernaut is all over the internet and spreading. "The Juggernaut is dead..." or "They killed it..." can be read on R/C websites and heard in hobby shops. Yes, it's true that the Juggernaut had gearbox-related problems that could result in failure of the nylon transfer-case gears (brought on by the skipping of the metal bevel-gears in the axle-housings), but official word from Tamiya states that the Juggernaut hasn't been "killed"—just suspended until it is certain that any problems have been fixed and that the kit lives up to Tamiya's reputation for quality. So rest assured, you monster-truckers, that the 'Naut isn't dead, it's just resting. ◆

NEW KITS

RS4 Pro 2



#173 RS4 Pro 2 Kit (no body)

* *R/C Car magazine gives the Pro 2 an overall rating of Ten out of Ten. This is the highest rating yet given by R/C Car. (April 1999 issue)*
* *HPI Team Driver Masayuki Murai wins the Hong Kong International Touring Cup Championship using the RS4 Pro 2.*
* *Racers all over the world submitted their own success stories with their RS4 Pro 2 kits. Their testimonials are featured in HPI's advertisement in R/C Car Action magazine. (July 1999 issue)*

How do you improve on a car that won the 1998 R/C Car Action Car of the Year award? You listen to racers. The new RS4 Pro 2 is packed with the features that were suggested by HPI's Team Drivers and our web page visitors.

Our engineers gave the RS4 Pro 2 an all-new suspension that delivers better performance and increased tuning options. The efficiency of the 4WD drivetrain has been improved, making the Pro 2 even faster than the previous car. Everywhere you look on the car there have been refinements that make the Pro 2 faster, stronger, more adjustable and easier to drive. And it looks good!

Super Nitro RS4

HPI is extremely proud to announce the Super Nitro RS4 kits! Features include larger stance for extra stability, 4WD double wishbone suspension, "Super Size" slick tires on high impact nylon wheels, heavy-duty purple anodized chassis, and a removable radio tray for easier maintenance & cleaning. Also equipped with our powerful .15 size Nitro Star engine for quick acceleration and super speed! Step-up to "Super Size"!

OVER 20 INCHES LONG & ALMOST 10 INCHES WIDE!

20% BIGGER!

SUPER NITRO FEATURES:



#482 Ford F-150 Super Nitro RS4 Kit
#7509 Ford F-150 Body (WB 300mm)

#483 Alfa Romeo 156 Super Nitro RS4 Kit
#7510 Alfa Romeo 156 Body (WB 300mm)

#481 Dodge Viper GTS-R Super Nitro RS4 Kit
#7500 Dodge Viper GTS-R Body (WB 280mm)



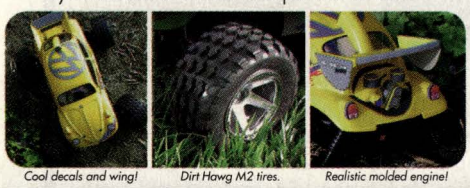


new!

#485 Lamborghini Diablo GT Super Nitro RS4 Kit
#7502 Lamborghini Diablo GT Body (WB 300mm)

RS4 MT

The RS4 MT has gone Off-Road! With the increasing popularity of the MT, HPI knew it was time to release a true off-road machine - the Baja Bug. Combine 3 stage dirt protection and the Dirt Hawg M2 Compound tires, and you can virtually ravage through any terrain! The RS4 MT features a dual belt 4WD system, long-stroke oil-filled shocks, a traction control slipper clutch, HPI 48 pitch gears, fiber reinforced nylon chassis and chrome Super Star wheels.



Cool decals and wing! *Dirt Hawg M2 tires.* *Realistic molded engine!*





Super Star Chrome wheels

#503 Baja Bug RS4 MT Kit
#7154 Baja Bug Body

4WD OFF-ROAD!



RTR NITRO RS4 FEATURES:

Efficient triple belt 4WD system.
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Oil-filled coil-over shocks.
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M-Compound Super Radial tires.
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Tuned muffler.

Comes with a complete set of ball bearings.



#571 Ford F-150 Flareside RTR Kit
#7408 Ford F-150 Flareside Body



#572 Nissan Skyline R34 25GT RTR Kit
#7409 Nissan Skyline R34 25GT Body



NEW!
#575 Ford Taurus RTR Kit
#7417 Ford Taurus Body

#573 Alfa Romeo156 RTR Kit
#7410 Alfa Romeo 156 Body



#574 Dodge Viper GTS-R RTR Kit
#7419 Dodge Viper GTS-R Body

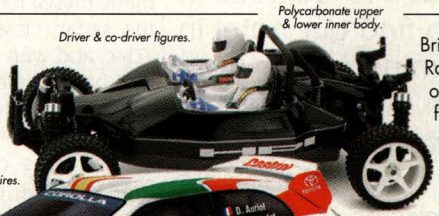


NITRO RS4
Ready To Run! RTR

HPI's RTR Nitro RS4 kit comes **preassembled** with the engine and radio equipment already installed! Now all those hours spent building a kit can be spent on the race tracks or thrashing around with your friends. The kit is equipped with a .15 size engine and a new tuned muffler for massive power, quick acceleration and amazing top speed! The hard part is choosing *which* of these RTR kits to get!

RS4 Rally

Polycarbonate upper & lower inner body.
Driver & co-driver figures.



New skid plate front bumper.
Rally tires.

Bridging the gap between touring cars and off-road buggies, the 4WD RS4 Rally is great for running on dirt, gravel or asphalt! Features include long-stroke oil-filled shocks, all-terrain rally tires on high impact nylon wheels, durable fiberglass dual-deck construction, full ball bearing set, carbon-fiber reinforced spur gear, and our proven dual belt drive system. Whether bashing around or racing, the RS4 Rally delivers high performance on any surface!

THREE NEW RALLY BODIES TO CHOOSE FROM!



#273 Toyota Corolla WRC Rally Kit*
#7400 Toyota Corolla WRC (200mm)

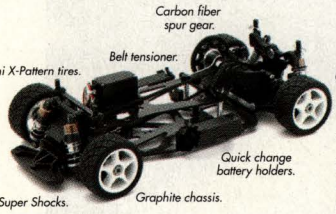


#275 Ford Focus WRC Rally Kit
#7412 Ford Focus WRC (200mm)



#274 Peugeot 206 WRC Rally Kit*
#7407 Peugeot 206 WRC (200mm)

Carbon fiber spur gear.
Belt tensioner.
Mini X-Pattern tires.
Quick change battery holders.
Super Shocks.
Graphite chassis.



RS4 MINI PRO

The RS4 Mini Pro kit features "Pro-level" parts which include a graphite chassis, graphite upper deck, front & rear ball diffs, universal dogbones, belt tensioner, Super Shocks, 4WD and sticky Mini X-Pattern radials.

**also available in a Nitro RS4 Tarmac Edition kit.*

FOUR WHEEL DRIVE 4WD MAXIMUM TRACTION ON ANY SURFACE

NEW!
#298 Rover Mini Cooper Mini RS4 Pro Kit
#7206 Rover Mini Cooper Body



Mini Super Radials.
Quick change battery holders.



RS4 MINI

The RS4 Mini features our dual belt 4WD system, a dual deck design and oil-filled shocks that dampen the independent suspension.

#284 Rover Mini Cooper Mini RS4 Kit
#7206 Rover Mini Cooper Body

Mini Star Wheels.

Both the RS4 Mini and RS4 Mini Pro accept a wide range of HPI Mini bodies and option parts.

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racers write

The Dirtinator Files by Brian Kinwald



Hey, BK here. I haven't done much since the Worlds, but I did go to the ROAR On-Road Nationals in Ripon, California. The race was dialed, except for the heat—it was about 110 degrees in the shade! First off, I drove five hours to find our hotel in central Modesto, which was about a 15-minute drive from the track. We got there around 1:00 a.m. and we were in the middle of what looked like a ghetto with only one-way streets and the directions to the hotel. It took us about 30 minutes of driving around in circles to find it.

Qualifying for 1/12 scale went pretty well. Joel "Magic" Johnson TQed every round. In the first round I finished fourth behind Josh Cyrul and Barry Baker. The second round was better—I finished second behind Magic. Then in the third and fourth round I finished third behind Josh and Magic. So, after the four rounds were over, I ended up taking the third spot on the grid.

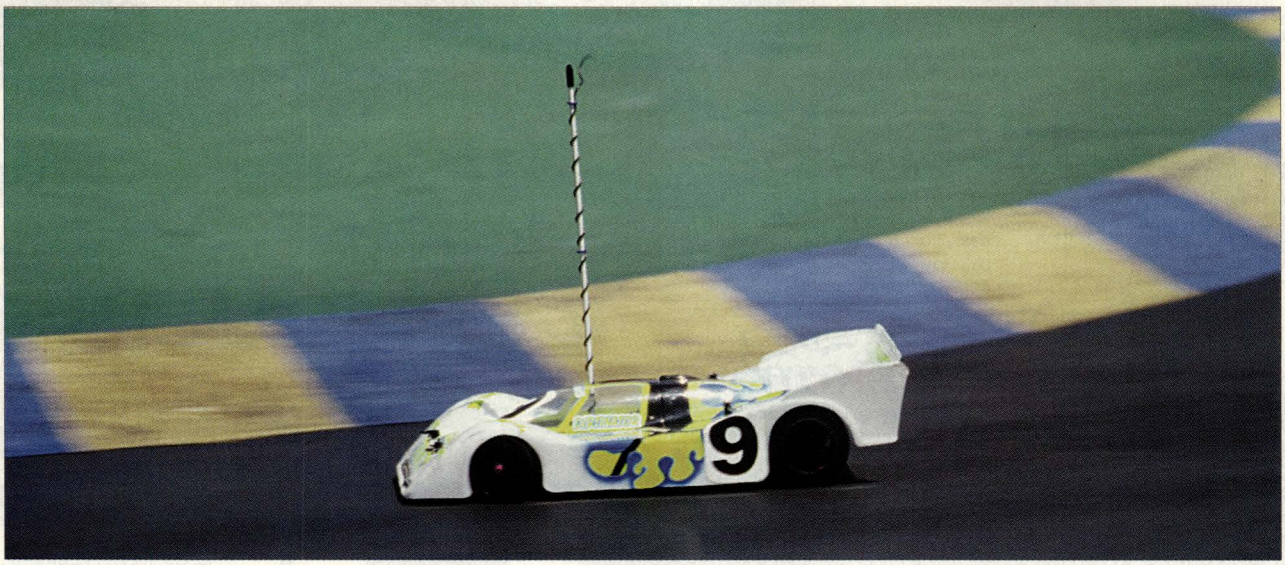
The mains went great! I actually finished without breaking or dumping. In the first main I finished second behind Magic. In the second main I had a little trouble—I got wheeled by someone and I dropped back to last. I managed to work my way back up to fourth, thanks to my good friend Barry Baker. Josh Cyrul ended up beating Joel in the second main, so Joel had to run the third. In the third main, Magic and Josh took off, leaving me and Jon Orr in a battle for third. For eight minutes, we were about 15 feet apart and it stayed that way until the end with me finishing third. So overall, I placed third behind Cyrul in second place, with Joel taking the title.

Sedan didn't go as well—my qualifying heat could have been better. The first two rounds I had to pass about three cars every lap, and no one seemed to want to get out of the way. The last two rounds went okay, except I didn't go fast enough and I ended up TQ of the B-main.

The B-main was right before the third 1/12-scale main, and I wasn't ready, but I threw my car on the track anyway and made myself look like an idiot. The man in the sedan class was Chris Tosolini who TQed and won with nobody even close. I also have to mention Richard Trujillo who TQed and finished second in Sedan Stock with the help of Heidy Ho's radio.

As far as car setup goes—since the Worlds, we've been testing a lot of new parts and tires for the Triple-X. Hopefully they will come out with them soon.

My last big races before the end of the year are the Endless Summer Classic at MnM Hobbies and the Trinity Shootout in Georgia, so I'll be writing about those races next time—so until then, L8R! ◆



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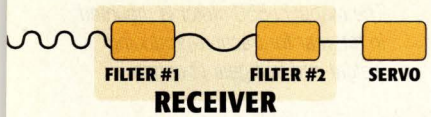
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racers write

by Richard Saxton



Last month I talked about how I made the trip to Detroit for the gas race then immediately left for the Worlds in Helsinki. Since I didn't get the chance to talk about the Worlds much, here it goes...

When Regan and I got to Helsinki, we had to rent a car—my ride picking us up was feeling a little sick, I guess. So we rented a car. Regan's watch has a compass, so we used that to find our way to Rauma. We saw a lot of nice countryside, so that was good. We showed up around 11:00 p.m. that night. I got hooked up with Schumacher for a 4WD ride, but the stuff hadn't shown up yet at the track—I guess a lot of people had trouble with UPS. I ran Teemu's practice car in 4WD until I got my own stuff. I ended up in the L-main—I think that stands for loser. I can count the number of times I've run 4WD on my hands and toes. Anyway, I'd like to thank Robin Schumacher for gettin' it together for me. I still had fun, though.

The track was great—the people put on a good show. I went to the awards banquet and then did a little rally-cross afterwards with Darren Westman, Nanu from Orion and Dingleberry. Richard Trujillo also followed us through the woods—we were wooded through the woods—that was fun.

2WD practice started, and I wasn't turning off the lap times, but I thought if I was consistent that I could make the B-main. The last two Worlds I was in the B-main, and I didn't want to fall down the ladder, but I ended up in the C-main, which was the best I could do without spending a huge time running electric lately.

I'd like to congratulate Jukka on his 4WD victory—I really think he's one of the nicest guys in the sport. He did awe-some—he drove two great runs and that was it! In 2WD my buddy Pavidis TQ'ed, and if anybody was to win it was to be him—he was top of the field! But when the mains came around, he just couldn't buy a start. I think he was just dumpin' the clutch on the line and lettin' it loose! No, that wasn't it—I was setting him down and I glued tires to the bottom of my shoes and tried to make a groove... Man, if I could have bought him a start I would have paid for it, because I think that is what cost him the World Championship. But, it's like any part of racing—you gotta have the full game to complete the task, and that part of his game was off, but I don't think it was his fault. Everything came down to the third main and he got a bad start—and pretty much everyone already knows what happened in the race. I could tell that my buddy Mark was bummed in the end with the result though. There was a lot of tension between him and Kinwald at the end at the trophy presentation, but again, racin' is racin'. Hopefully those two will get past this and provide us all with some good on-track battles in the near future.

So on the way back to Helsinki to drop off my rental car, I got majorly lost at the airport and couldn't find the rental car return area. It was getting pretty late and Regan and I had to catch a flight, so I just parked it somewhere with a note on it. I guess someone found it days later because my credit card statement showed my rental car charge as over $900! There's no way I'm paying that bill...they're outta their minds!

Gotta get ready for my next race—see ya! ◆

racers write

by Matt Francis



What's going on? Just got back from the NORRCA Nats down at Hot Rod Hobbies this last weekend. Although the entry was pretty small, the race itself was great. Let's first talk about the track. Hot Rod Hobbies—this place is what tracks are all about! Not only do they have the best track in the country right now, but they have a well-stocked hobby shop and a good staff that helps you out when you're inside the shop. Check them out at *www.hotrodhobbies.com* for all the info on the track, and results from the Nats.

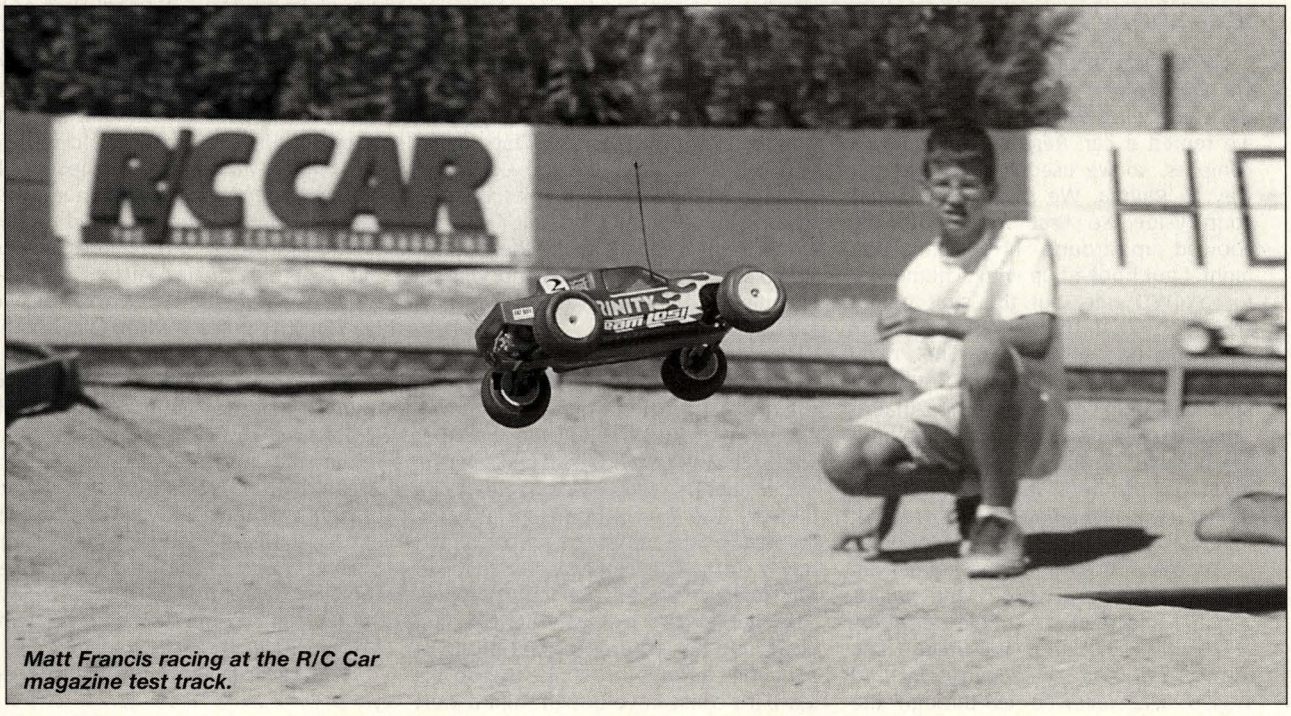
Well, I am coming down to the end on the 1999 major racing season, and for the most part it was pretty good. Although the win category is small—Midwest Championships, 2WD and 4WD; April Fools, 2WD; Houston Invitational and NORRCA Nats, 4WD—I did, however, have lots of top three finishes that completed a Losi/Trinity sweep. And for the companies (not me) that's okay!

I have one more major race this year, the Trinity/Losi Shootout in Dalton, Georgia. Yup, it's this weekend, I am leaving in two days. Brian Kinwald, Mark and I are the only Losi/Trinity drivers going, but I remember from last year that the locals there are very fast.

With no major racing going on, what am I to do? Believe me, there's plenty on the agenda; school, parties, running over stuff in the Subaru, etc.—(just kidding!). I am going to be working on setups for the Triple-X, so when you all come up to me and ask if I have a setup for your track, I will, no matter what the conditions. Another thing I am working on is a "standard" setup. For those of you I have talked setup with, you know I always start with the same setup at every track. I think I already have it dialed, but just doing a little final adjustment. I try to have this "standard" setup so that anyone can go to any track and be competitive. Although it may not be the best possible setup (sometimes it is), it will always work. It makes it easy for those of you who don't want to always change your setup.

If anyone recalls, I said a few months back that I will be having a new roommate in September. Well, two weeks from today (I am writing this on August 31) she will be here. Remember not to salt my game when you meet her! I am trying to finalize the plans for my house as we speak. By the way, I will be having a house/apartment warming party to which anyone who wants to can come. I will keep everyone informed of the date.

Another project in the works is...oops! I'm not supposed to say anything about that! —MF ◆



Matt Francis racing at the R/C Car magazine test track.

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feedback

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Flopped result?

In the September issue of *R/C Car* you cover both the Yokomo MR-4TC and the Reedy touring car race. In the Yokomo MR-4TC review on page 44, you boast that the TC placed first and second, in stock configuration, with Masami Hirosaka placing first and Barry Baker finishing second. Then I flip to page 97 to learn more about the race, and it tells me that Baker finished first and Hirosaka finished second. So which is it? I really like your magazine, but don't you think you need to be consistent with your information?

Brian Chamberlain
Simi Valley, CA

Sorry about that, Brian! We goofed and you caught us (don't you feel superior now?). The real winner of the Reedy Race was, in fact, Barry Baker, with Masami coming in second.

Deja who?

I don't mean to kiss up or anything, but I really like your magazine. I like the variety of stories, "Feedback," and all the car tests. But anyway, I was reading my new issue, and I noticed that you had the HPI Challenge again (it is on pages 76-79 in the October '99 issue, but I'm guessing you knew that). This race was also in the January '99 issue, and I noticed the pictures of the Vipers in both articles look the same. Are those the same pictures!!! I am pretty sure they are, but I could be wrong. Also, the picture of the blue and white Shelby Cobra and the Mini Cooper look very similar to those in the January issue.

Kid Rock
[via online]

Yeah, that's right! We've pulled off the biggest hoax since the "Roswell alien autopsy." It wasn't so hard finding all of the photos from last year's race, but I'll tell you, renting those blimp hangars and getting all those R/C racers to pose for the photos was a pain in the butt!

Baby, get back

What I would like to see is some articles that go "back in time." They would look at all the old RC cars—well, not "old old" but just a few years—and look at kits such as the original RC10 and the Kyosho Outrage. I have or have had both of them, but all you see in R/C car magazines is the very newest stuff that just came out, or that someone used to win the latest, most important race such as the world championships. So, as you can see, I like the mag but it can use some improvements. This is not supposed to sound harsh or mean; I'm just a normal racer in Canada who can't go out and buy every new car that was just put out.

Daniel Schellenberg
[via online]

Humvee fan!

I want to start off by saying that you guys have a great mag. I enjoy reading Feedback and the new car tests best of all. I was wondering if you could do a New Car Test on the Tamiya 1/12 Scale M1025 4WD Hummer? I am interested in buying one but I want to know what you guys think of it. So what do you think? Could ya do it for me?

Ian Schulte
[via online]

Ian, since the Tamiya Hummer is several years old, it's not likely that we'll be reviewing it in the future. However, we can tell you that it's based on Tamiya's TA02 4WD sedan chassis, and that its body shell is a masterpiece of scale molding. If you're a HUMVEE fan, this is definitely the kit for you!

Which Rally car?

I am going to get a rally car for Christmas and want to know which one you recommend I am choosing from the HPI RS4 Rally, OFNA Z-10 rally, Tenth Tech Streetwise and a Yokomo MR-4 rally. Which one would you recommend? I would like one that is easy to assemble and goes fast. I plan on installing a Novak Super Rooster ESC and a Trinity Speed Gem in whichever one I get. I have a Trinity EXTRA matched and 2 Piranha1500 packs. If I get the RS4 Rally (which I am leaning toward) I was thinking I should convert my Trinity saddle pack into a stick pack. I have looked at cars with saddle packs and ESC and it looks like the saddle packs are soldered to the ESC. If so, how do you charge the pack. I have not raced before and do not know what size motor to put in my future rally car.

I currently own a Traxxas Stampede and do not know what the first upgrade should be for it. Slipper clutch? Big bore shocks? Modified motor? Please help me decide.

AJSoccer
via online

P.S I am 11 and all my friend at school have Radio Shack cars and my stampede whoops butt!



We staged a shootout between the HPI, OFNA, Schumacher and Yokomo rally cars in our September '99 issue. To sum up the results: we felt that the HPI held a slight edge over the Yokomo as the best overall car. It was the easiest to build, had excellent ground clearance and suspension travel, and with its undertray and cockpit, we also felt that it was the best-looking of the bunch.

Of the five currently available, only the OFNA rally car can accommodate saddle-style packs. But you shouldn't need to re-solder or re-configure your saddle-pack to use it in a rally car. You should be able to install the pack into the "stick-pack" battery holders of the other rally cars. Just tuck the "jumper" wire out of harm's way.

Soldering the pack directly to the ESC is called "hard wiring," and is a technique most pro-level drivers use to lower resistance and to make their cars more efficient. For the rest of us, good high-quality connectors, if installed correctly, are more than adequate and are a bit less hassle. Hard-wired packs are charged by using alligator-clip leads from the charger, connected to the positive and negative terminals of the battery pack.

Assuming that your Stampede already has ball-bearings (which should be your first upgrade otherwise), go for the slipper-clutch first, followed by the modified motor. The Stampede's shocks are pretty good, but as you make the truck faster, you then might consider upgrading to the Big Bore shocks. ◆

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- **Congratulations to Rick Hohwart for lapping the A-main on his way to dual 1/5-scale national championships using Multiplex servos *exclusively!***

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Torque (in./oz.)	60	42	56	62	75	135	297
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* Profi 3BB is NOT digital or programmable
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1999 ROAR ON-ROAD NATS

Rippin' racing action from Ripon



Welcome to the 1999 ROAR On-Road Nationals! The race was held over the weekend of August 20 through 23 and was hosted by Dan Tannis at his beautiful Ripon Raceway facility in Ripon, California. At stake were the 1/12 scale Stock and Modified titles, the 1/10 scale Stock and Modified titles, and also the Touring car Stock and Modified titles. Yup, a whole lotta title action going on, so let's get right down to it.

1/12 Scale Stock

The 1/12 Stock class was one of the most exciting classes to watch all weekend. Conserving battery power seemed to be the most difficult task in this class during the eight-minute races. TQ Eric Desrosiers didn't seem to have a problem, though. He was by far the most dominant driver in this class. Eric went out and easily won the first of the three A-mains—he led from start to finish and was never challenged. At one point during the race it looked as if he was going to lap the entire field!

In the second A-main, Desrosiers jumped out again to an early lead, but this time Brad Long had something to say about him getting away too soon. Long got by Desrosiers early on and stretched out a decent lead and at the end was the only one to go 34 laps. Desrosiers finished second, followed by James Arluck.

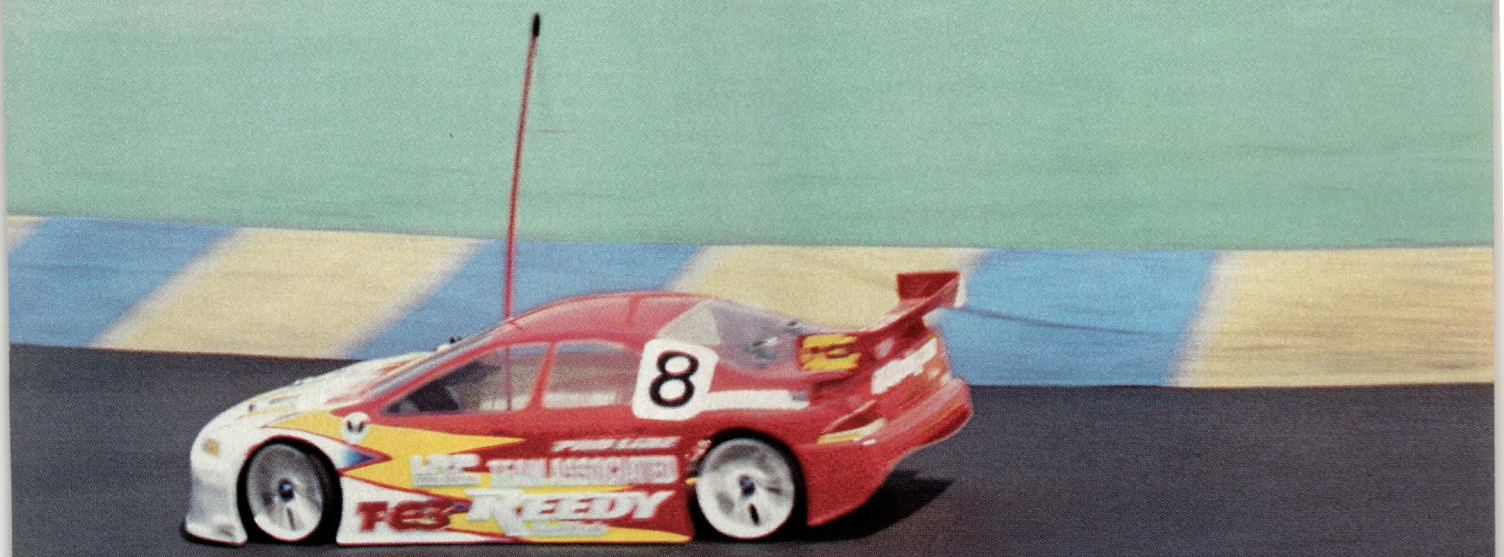
In the third main, Desrosiers got out to an early lead and stretched out a good lead. He battled back and forth with Eric Vazquez. Vazquez reeled in Desrosiers who had a good lead and managed to pass him. With only two minutes remaining, Vazquez got on his lid, which allowed Desrosiers to get by for the lead. The winner of the second main, Long, was sitting back in the mid pack and it looked like his batteries started going a little soft. At the end it was Desrosiers with the win, followed by Vazquez, and Arluck finished third.

1/12 Scale Modified

Yet another exciting class was 1/12 scale Mod. These factory pilots didn't seem to have the same problem with dumping as the Stock class guys, so the battle raged pretty intensely throughout the entire eight minutes. TQ Joel Johnson got out to an early lead in his first A-main but was quickly passed by teammate Josh Cyrul. Joel remained patient and took his



The Mod Touring Class racers get ready to race the second leg of the triple A-mains.



time reeling in Cyrul. Joel eventually made it past Cyrul to take over the lead and didn't look back, and he took the first win in a very close race. Amazingly, at the end of the race as everyone's batteries began to go soft, Brian Kinwald put down the power and beat some of the best on-road drivers to the finish line to take second behind Joel. Jon Orr finished third.

Cyrul had a good showing in the second leg of the A-mains—he led early on and was chased by Johnson, Barry Baker, and Kinwald. Orr started making up some ground on the pack and at the end it was Cyrul taking a very close win followed by Johnson, Orr, and Kinwald.

In the third main, Johnson jumped out to an early lead followed by Cyrul, Kinwald, and Orr. They freight-trained for eight minutes, and at the end they finished in that order. With two first place finishes, Johnson clinched the title.

By far, one of the biggest surprises at the event was how consistently fast off-road king Brian Kinwald was during the A-mains. Brian wrote in his column last month that he was looking forward to this race—we can see why.

1/10 Scale Stock

This class was by far the crowd favorite—each A-main was a complete and utter hackfest! Hate to say it, but it was actually pretty funny watching their races—cars were flying everywhere! TQ Brad Long was lucky to escape the carnage as he weaved his way through the dangerous pack. Long went on to win the first leg of the A-mains, then went on to win the Stock title by winning the second A-main as well. How he got through the pack with his car intact (especially getting past car #9 safely) remains the big mystery of the race.

Throughout the mains, Long's closest competition was James Arluck and Eric Vasutin. Scott Tomasello also made a strong showing in the second A-main as he finished second behind Long. With Long sitting out the third and final A-main, James Arluck went on to win followed by Vasutin and Tomasello.

1/10 Scale Modified

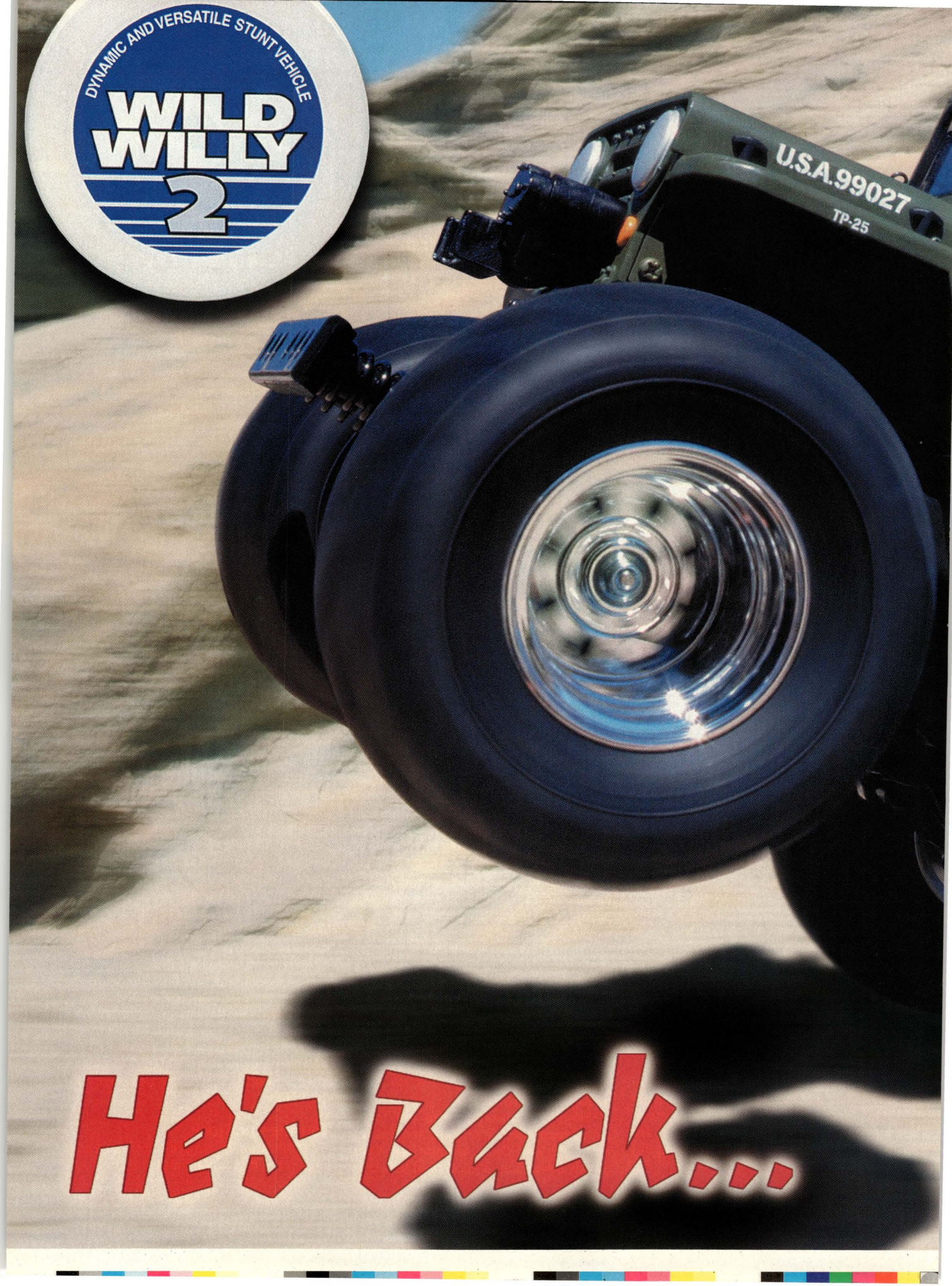
TQ Joel Johnson jumped out to an early lead in the first A-mains and was followed by Josh Cyrul. Johnson and Cyrul quickly opened up a good-sized lead over the rest of the pack and ran that way until the end. Chris Dosek finished in a strong third place behind the leaders.

In the second A-main, Johnson got a great start again and led early on. He was followed by Dosek in second with Cyrul in third. As the race wound down, Cyrul managed to make a pass on Dosek and he cruised in to take second place behind the winner Johnson. Dosek held on for third place. With two wins under his belt, Johnson claimed the title early.

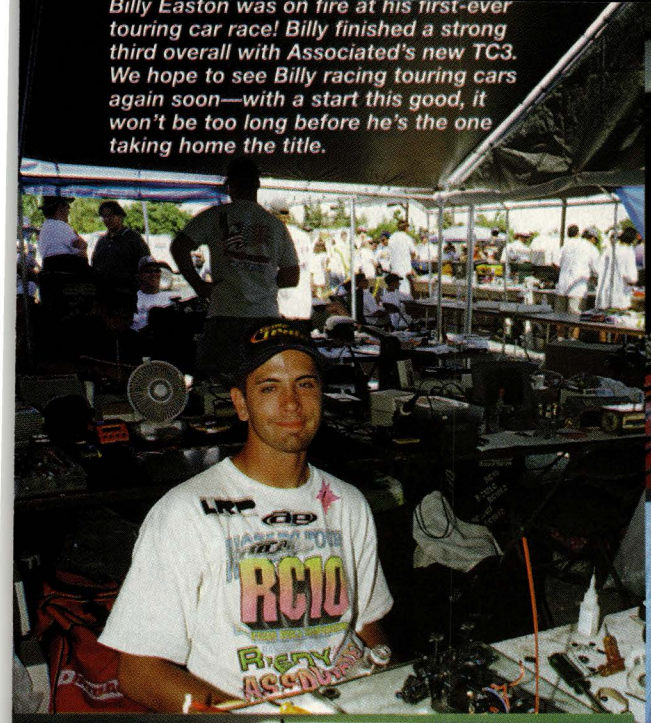
With the champ sitting out the third and final main, Cyrul got out to a good lead over the rest of the pack. Sitting comfortably in second place was Dosek. Cyrul was so dominant in the race that he managed to come around and lap third place and looked like he was going to try and make a charge to lap Dosek who was still sitting in second place. At the end, Cyrul was the only one to go 20 laps. Dosek finished second, followed by Dave Vera in third place.

Touring Car Stock

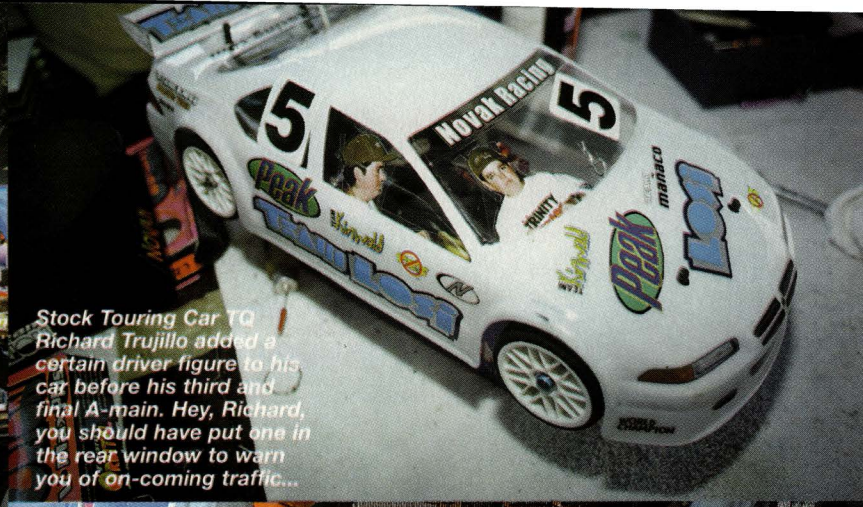
TQ Richard Trujilo got out to an early lead in the first A-main and stretched out


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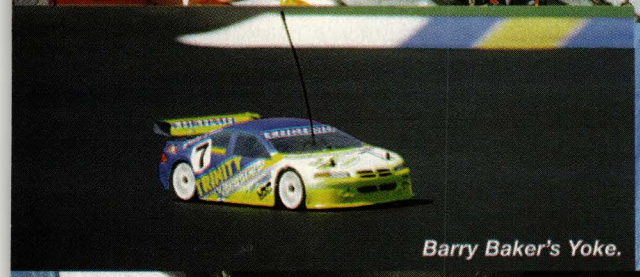

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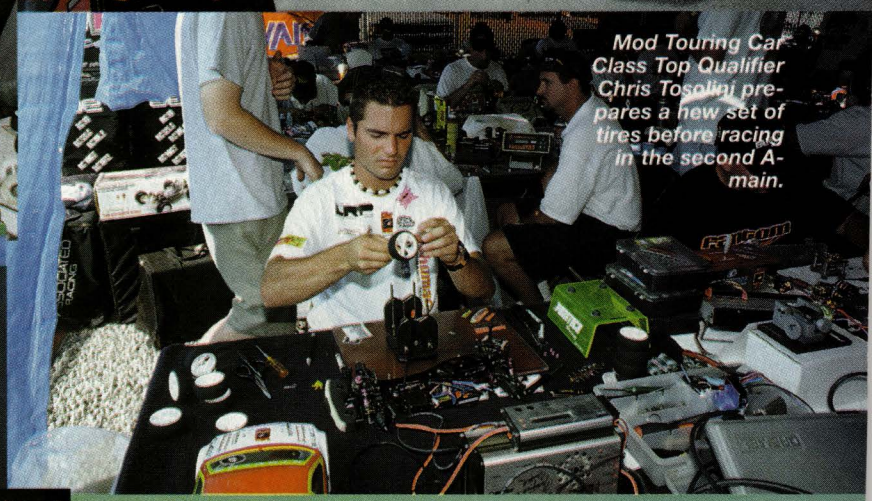
Billy Easton was on fire at his first-ever touring car race! Billy finished a strong third overall with Associated's new TC3. We hope to see Billy racing touring cars again soon—with a start this good, it won't be too long before he's the one taking home the title.



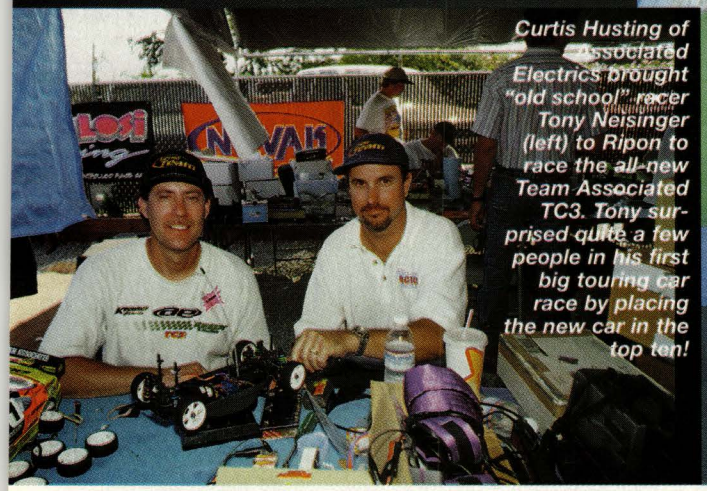
Stock Touring Car TQ Richard Trujillo added a certain driver figure to his car before his third and final A-main. Hey, Richard, you should have put one in the rear window to warn you of on-coming traffic...



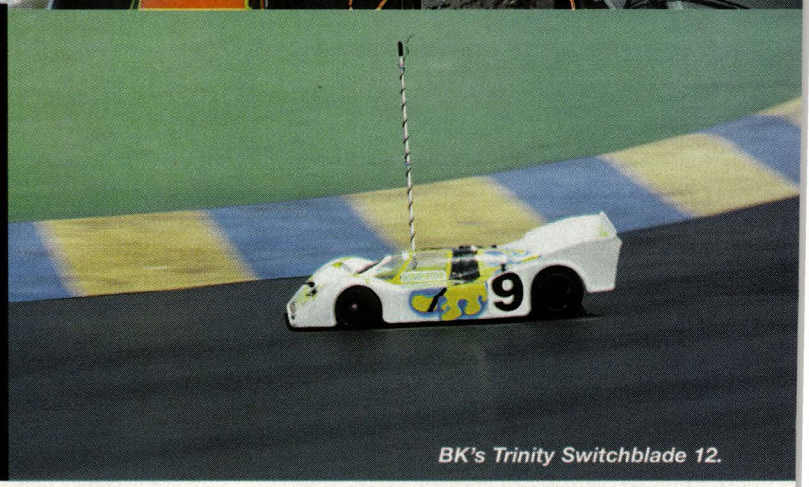
Barry Baker's Yoke.



Mod Touring Car Class Top Qualifier Chris Tosolini prepares a new set of tires before racing in the second A-main.



Curtis Husting of Associated Electrics brought "old school" racer Tony Neisinger (left) to Ripon to race the all-new Team Associated TC3. Tony surprised quite a few people in his first big touring car race by placing the new car in the top ten!



BK's Trinity Switchblade 12.

1999 ROAR ON-ROAD NATS

a good lead early on. Trujillo got on his lid not long into the race and that allowed Darren Shank in second place to catch up a bit. Trujillo started getting pressure from Shank up front and he rolled it and dropped back in the pack as Shank moved past into first place. Trujilo had to battle back towards the front of the pack.

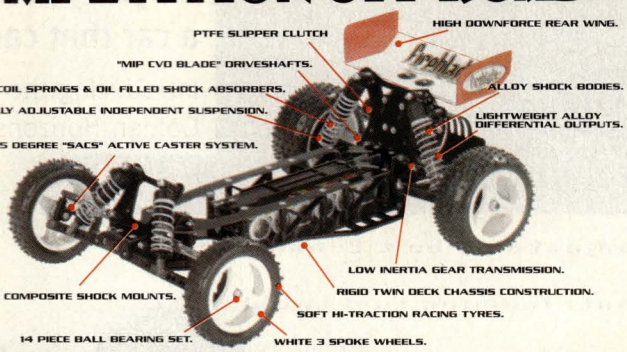
In the second A-Main, one of the most exciting and closest races of the day, Trujilo got out to an early lead (thanks to a huge pileup from second place back) and he managed to hold off a hard-charging Shank at the end, setting up a third and final A-main showdown.

Trujilo got out to an early lead off the start, but didn't get quite the break he got in the second main. Second qualifier Shank was sitting in second place behind Trujilo, applying pressure early. Soon into the race, Shank punted Trujilo out of his way as he ran right into the back of his car and took him out—the crowd immediately started booing him as they did to Easton in the second main in the Touring Mod class (see Mod Touring section). Amazingly though, Shank was not given a stop-and-go as Easton was. Trujilo was put back far into the pack and had to work his way up to the front. Shank managed to get to the front of the pack and held on to the race until the end when he crossed the line first. So with two wins, Shank secured the National championship. A understandably disappointed Trujilo finished second, while Spencer Perdue took the third spot.

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Interview with 1/12 and 1/10 Mod Title Winner Joel Johnson



R/C Car: *Congratulations Joel! So how many ROAR titles does this make it now?*

Joel: I believe that this makes 34 for me. I won my first title when I was 13 and have never looked back.

R/C Car: *How do you top something like this? Actually, how can anyone top this? You've been so dominant over the years against so many different racers. They must all be a little frustrated by now that they haven't even come close to achieving the level you've attained.*

Joel: I don't think I can top my performances at the On-Road Nats for the past 9 or 10 years. I have doubled at each nationals since 1990 if my dates are correct. I missed one Nationals in 1994 when I got married but have basically won every one since. Last year was the first time I lost the 1/12 title in several years, but I backed it up with a win in sedan and 1/10. While I would like to chalk it up to pure skill I have to say that you have to have a bit of luck on your side to win this consistently.

While I'm sure none of the drivers I compete against are totally frustrated with my success, I'm sure they wouldn't mind seeing someone else (like themselves) on the top of the podium. Drivers like Josh Cyrul, John Orr, Barry Baker etc. are all great drivers and are tough to beat. All have won many races I've been at, but they also have many years ahead of them to catch my winning streak.

R/C Car: *How have you remained so dominant for all these years?*

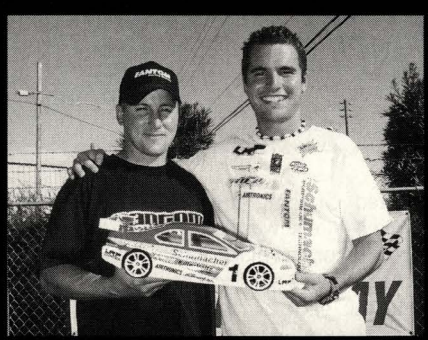
Joel: I attribute my continued success on the track to natural talent, starting at a young age and knowing when to take a break. When I got my first R/C car at the age of eight I couldn't stop playing with it. It was literally a toy I never got tired of! Soon after I started racing and it really became addicting and I raced at every possible opportunity. Racing at this early age really set a solid foundation for the rest of my career in R/C. As I got older I really became aware of the "burnout" factor of doing something for so long and on such a regular schedule. Part of being successful at something is really having a passion for it. Once the passion is gone so is the success. I had some times when I raced, when it was the last thing I wanted to do and the results showed it. It was at this time I realized that I needed to take a step back and do other things between the national events to keep from getting total burnout on R/C. For me this worked great and helped my keep the passion for racing radio controlled cars peaked. Too much of a good thing can be bad. I still need to practice to keep my skills honed, but I only do it twice a month and really try and enjoy racing as a hobby and leave the true seriousness for the National events.

R/C Car: *Who was your toughest competitor at this event?*

Joel: At this event I would have to say that my teammate Josh Cyrul was my toughest competition in 1/12 and 1/10. He had just as good of chance to win either class as I did, but things went my way this time. When we hit the carpet it seems that the roles are reversed and things go his way more since that is what he races most. We have Cleveland in November on carpet and I'm sure that I'll be chasing him there, along with Spashett, Orr and the rest.

Also, I would also like to congratulate Chris Tosolini on his Mod Sedan win. Chris is a real talent and a great guy to joke and race with.

Interview with Touring Car Mod Title Winner Chris Tosolini



Troy Schroeder of Fantom and Chris Tosolini.

R/C Car: *Congratulations on your win, Chris–this is the first big touring car win for you, but most of our readers probably don't realize that this isn't your first big win in R/C racing. You have a longtime background in racing 1/8-scale on-road nitro cars. Tell us how you got started in that.*

Chris: Well, I've been racing 1/8-scale on-road cars for a long time now. My first big win was at the '94 ROAR Nationals–I was racing for BMT at the time. I backed up the win again in '95 with BMT. I've also won the Winter Nationals in Florida, and I have too many seconds and thirds to remember...

R/C Car: *You qualified six seconds over second place, set the fastest lap time, and also set the track record–that's some pretty impressive work!*

Chris: Well, that stuff happens when everything comes together. When you get a clean track and everyone looks out for you, and you have a good announcer like Barry Baker–Barry was announcing my laps, so I knew when I was running fast, and when I needed to pick it up a bit. That helped a lot.

R/C Car: *So tell us about the race between you and Billy Easton in the second main.*

Chris: Like in the first main I got a pretty good jump off the start. I was out front, running my race and I noticed that there were a lot of problems with traffic back in the pack. At this time in the day, the track started getting a little cooler and my car wanted to traction roll a bit–which happened and it let Billy catch up to the back of me. I wasn't really worried about it–I thought I could hold him off, but he hit me in the back and rolled me over. He waited for me which I thought was really nice and I thought he was going to let me go, and then I cut him off going into the corner and we got together. I don't think it was really anybody's fault. Then the crowd booed, and they issued a stop and go for Billy which I didn't think was right. He let me past on the back straight and then I crossed the line for the last lap and he didn't. I heard though that he would have dumped if he made the last lap–he must have used a lot of batteries to catch me early on in the race. I didn't want to win that way–on a stop and go like that. The first wreck, Billy was faster in that section, but just ran into me. The second wreck where he got the stop-and-go wasn't an intentional thing, I feel we were both equally at fault, and I don't believe he should have gotten the stop-and-go penalty. Overall, though, I think I proved myself in the first main and in qualifying that this was my race to win. I really appreciate what Billy did, he's a really good sport, and I think he did really, really well at his first sedan race.

R/C Car: *Well, congratulations again, Chris–anyone you'd like to thank?*

Chris: Thanks, and yes, I'd like to thank Russ and Troy at Fantom Racing for doing such a great job on my motors and batteries all week, Schumacher, LRP, Airtronics, Jason Ruona from Pro-Line Racing, Kimbrough Racing, and Jared Scott. ◆

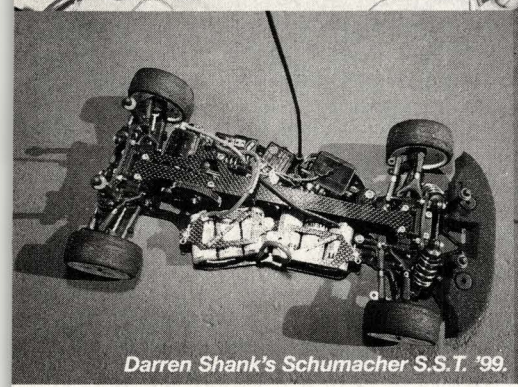


Only two weeks prior to this event Jurgen Lautenbach was at the IFMAR Off-Road World Championships in Finland, then the week after he flew to L.A., then after that he drove five hours north up to Ripon. So was he going to relax after the race? No, right after the ROAR Nats he hopped on a plane headed to Europe for the EuroChamps race...what a trooper!

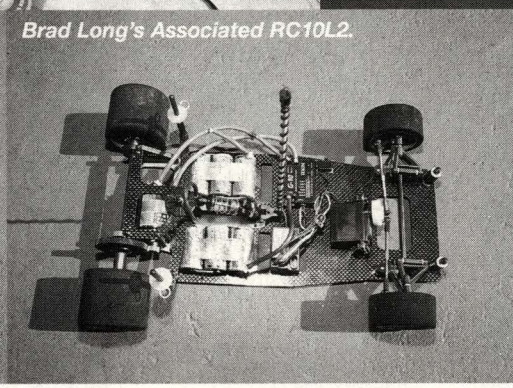


David Jun's Tamiya TRF 414x touring car was the fifth different car making the show. What a race!

Brad Long's Associated RC10L2.



Darren Shank's Schumacher S.S.T. '99.





Eric Desrosiers Speed Merchant RK.

1999 ROAR ON-ROAD NATS

Touring Car Modified

By far the most anticipated race of the event was the Mod Touring Car class. TQ Chris Tosolini easily won the first race–he led from start to finish and was the only driver to make 18 laps. The battle for second was between Joel Johnson and Billy Easton with Johnson taking second at the end, followed by Easton.

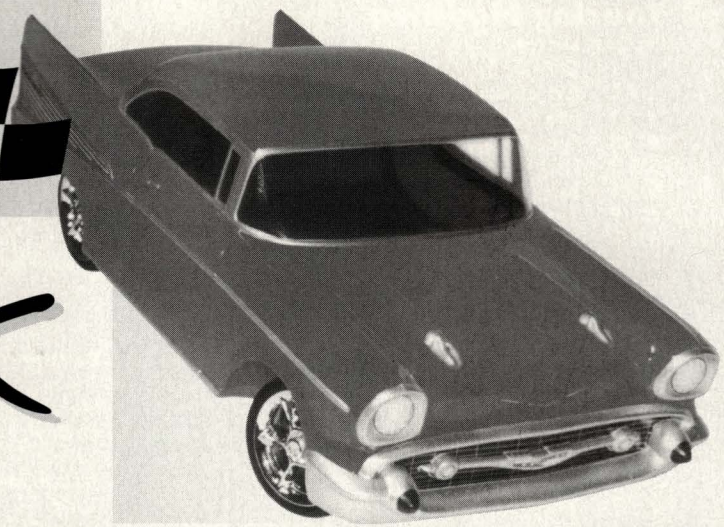
Tosolini got out to a good start again in the second main and looked as if he was going to run away with the race. Easton started charging towards the front and looked like he was going to make a run on Tosolini for first place. Easton tried to make an aggressive pass on Tosolini and pushed into the back of his car, flipping Tosolini over. Easton was a good sport though and waited to let Tosolini get started again. As Tosolini was going by, they got together again, the crowd booed, and the announcer called for a stop-and-go for Easton. The controversial bit of contact allowed Tosolini by into first place which then gave him the win as he ran with the lead to the very end of the race (see Tosolini interview for more details on the contact issue between him and Easton). With two wins under his belt, Tosolini claimed the championship while Easton had to settle for second place.

With Tosolini sitting out the third and final main, Dave Vera got an early jump on the pack, but it was Easton who took over the lead before the first lap was finished. Easton was followed by Barry Baker and Greg Hodapp. All three managed to get together and Johnson took over the lead, followed by Easton, Baker, and Hodapp in that order. Johnson started pulling out a lead while Vera started making his way up through the pack and found himself sitting in second place. At the end, Johnson finished first with a good lead, followed by Vera in second, and Hodapp placed third.

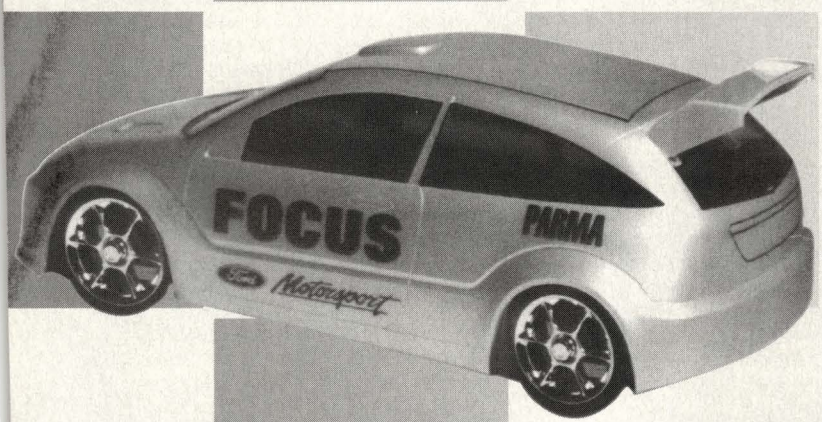
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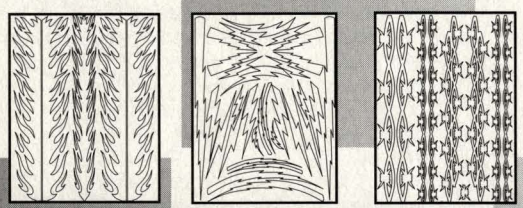
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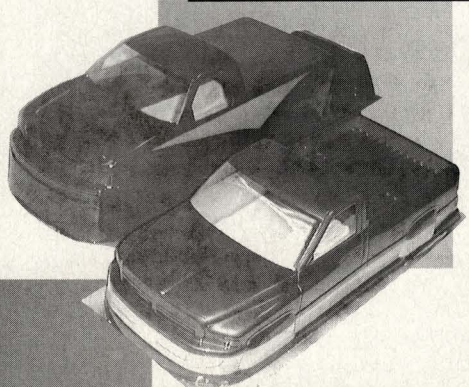
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Touring Modified

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1	1	Chris Tosolini	Schumacher SST '99	Fantom	Fantom	LRP	Pro-Line	Andy's Stratus	Airtronics
2	6	Joel Johnson	Losi IWC SW	Trinity	Trinity	Novak	Pro-Line	Andy's Stratus	Airtronics
3	2	Billy Easton	Associated TC3	Reedy	Reedy	LRP	Pro-Line	Protoform Stratus	Airtronics
4	10	Greg Hodapp	Losi IWC SW	Trinity	Trinity	Novak	Pro-Line	Losi Stratus	Airtronics
5	3	Dave Vera	Yokomo MR4TC	Fantom	BSR	LRP	Pro-Line	Andy's Stratus	Airtronics/Futaba
6	5	Barry Baker	Yokomo MR4TC	Trinity	Trinity	LRP	Pro-Line	Losi Stratus	Airtronics
7	9	Todd Hodge	Losi IWC SW	GM	GM	GM	Pro-Line	Losi Stratus	Airtronics
8	8	Jon Orr	Yokomo MR4TC	GM	GM	GM	Pro-Line	Andy's Stratus	KO Propo
9	4	Tony Neisinger	Associated TC3	Reedy	Reedy	LRP	Pro-Line	Protoform Stratus	Airtronics
10	7	David Jun	Tamiya TRF 414x	Reedy	Reedy	Novak	HPI	Protoform Stratus	Futaba

Touring Stock

Fin.	Qual.	Driver	Car	Motor	Battery	ESC	Tires	Body	Radio/Servo
1	2	Darren Shank	Schumacher SST '99	Handout	Trinity	LRP	Pro-Line	Andy'sStratus	Airtronics
2	1	Richard Trujillo	Losi IWC SW	Handout	Peak	Novak	Pro-Line	Losi Stratus	Airtronics
3	5	Spencer Perdue	HPI RS4-Pro 2	Handout	Orion	Tekin	Pro-Line	Andy's Stratus	Airtronics
4	3	Jay Niell	HPI RS4-Pro 2	Handout	Maxtec	GM	Pro-Line	HPI Stratus	Airtronics
5	10	Brian Karwan	Xpress Roadrunner	Handout	Alpha&Omega	Novak	Pit Shimizu	Protoform Stratus	JR/Airtronics
6	7	Albert Guardado	Losi IWC SW	Handout	Trinity	Novak	Pro-Line	Losi Stratus	Airtronics
7	4	Jeff Mauren	Schumacher SST '99	Handout	WorldClass	LRP	Pro-Line	Andy's Stratus	JR/Airtronics
8	8	Clint Riley	Schumcher SST '99	Handout	Team ESP	LRP	Pro-Line	Andy's Stratus	Airtronics
9	9	Andrew Gray	FSR Bullet	Handout	GM	Novak	Pit Shimizu	Losi Stratus	Airtronics
10	6	Pat Thavornthon	Yokomo MR4TC	Handout	Orion	LRP	Eagle	Andy's Stratus	Airtronics

1/10 Modified

Fin.	Qual.	Driver	Car	Motor	Battery	ESC	Tires	Body	Radio/Servo
1	1	Joel Johnson	Trinity Switchblade	Trinity	Trinity	Novak	TRC	Andy's Merc	Airtronics
2	2	Josh Cyrul	Trinity Switchblade	Trinity	Trinity	Novak	TRC	Andy's Merc	Airtronics
3	3	Chris Doseck	Assoc. 10L Proto	MightyCD	SMC	GM	Jaco	Protoform Nissan	KO Propo
4	4	Dave Vera	Assoc. 10L2	Fantom	BSR	LRP	Jaco	Andy's Merc	Airtronics/Futaba
5	5	Brent Wallace	Assoc. 10L	Maxtec	Maxtec	Novak	Jaco	Andy's Merc	Futaba
6	6	Aaron Alexander	Trinity EV10	CD Super Pro	Trinity	Novak	TRC	Andy's Merc	Futaba
7	7	Sean Cooper	Assoc. 10L2	Fantom	Fantom	LRP	Jaco	Andy's Merc	Airtronics
8	10	Jim BishopJr.	Trinity Switchblade	Maxtec	SMC	Novak	TRC	Andy's Merc	Airtronics
9	8	MarkAdams	Trinity Switchblade	GM	Pro Parts	GM	TRC	Andy's Merc	Airtronics/Hitec
10	9	Dominic Favorito	Assoc. 10L2	GM	GM	GM	Jaco	Andy's Merc	Airtronics

1/10 Stock

Fin.	Qual.	Driver	Car	Motor	Battery	ESC	Tires	Body	Radio/Servo
1	3	Brad Long	Assoc. 10L2	Handout	Reedy	Tekin	Jaco	Andy's Merc	Airtronics
2	1	James Arluck	Assoc. 10L2	Handout	Orion	LRP	Jaco	Protoform	Airtronics
3	2	Eric Vasutin	Trinity Switchblade	Handout	Trinity	Tekin	TRC	Andy's Sauber	KO Propo
4	4	Scott Tomasello	Trinity Switchblade	Handout	Nuclear Power	Novak	Jaco	Andy's Merc	Airtronics/Futaba
5	6	Rob Moots	Trinity Switchblade	Handout	GM	GM	N/A	Assoc. Nissan	Airtronics
6	5	Tom Esposito	Trinity Switchblade	Handout	Xipp	GM	TRC	Andy's Merc	JR
7	8	Chad Stowe	Assoc. 10L	Handout	ESC	Novak	Jaco	Protoform	Airtronics/Futaba
8	7	Doug King	Trinity Switchblade	Handout	Birdman	Novak	Jaco	BBR Mazda	KOPropo/Futaba
9	9	Mel Thomas	Assoc. 10L2	Handout	GM	LRP	Jaco	Andy's Merc	Airtronics
10	10	Todd Skelton	Trinity Switchblade	Handout	Trinity	Novak	TRC/Jaco	Andy's Merc	Airtronics

1/12 Modified

Fin.	Qual.	Driver	Car	Motor	Battery	ESC	Tires	Body	Radio/Servo
1	1	Joel Johnson	Trinity SB12	Trinity	Trinity	Novak	TRC	Andy's Merc	Airtronics
2	2	Josh Cyrul	Trinity SB12	Trinity	Trinity	Novak	TRC	Protoform	Airtronics
3	3	Brian Kinwald	Trinity SB12	Trinity	Trinity	Novak	TRC	Protoform	Airtronics
4	4	Jon Orr	Assoc. 12L3	GM	GM	GM	Jaco	Andy's	KO Propo
5	6	Barry Baker	Trinity SB12	Trinity	Trinity	LRP	TRC	Protoform Nissan	Airtronics
6	10	Jason Corl	Trinity SB12	Trinity	Trinity	LRP	TRC	Protoform	Airtronics
7	5	David Jun	Assoc. 12L3	Reedy	Reedy	Novak	Jaco	Protoform P35	Futaba
8	9	Jeff Brown	Assoc. 12L3	Reedy	Reedy	Novak	Jaco	Protoform P35	Futaba/JR
9	7	Mike Blackstock	Assoc. 12L3	GM	GM	GM	TRC	Protoform	JR
10	8	Jacob Pritchard	Assoc. 12L3	GM	GM	GM	Jaco	Protoform	Airtronics

1/12 Stock

Fin.	Qual.	Driver	Car	Motor	Battery	ESC	Tires	Body	Radio/Servo
1	2	Eric Desrosiers	Speed Merchant RK	Handout	NewWave	Novak	--	Protoform P35	Futaba/JR
2	3	Brad Long	Assoc. 12L3	Handout	Orion	LRP	Jaco	Andy's	Airtronics
3	1	James Arluck	Assoc. 12L3	Handout	Orion	LRP	Jaco	Protoform P35	Airtronics/Futaba
4	4	Andy Smolink	Assoc. 12L3	Handout	Reedy	LRP	--	Protoform	Airtronics
5	7	Eric Vasquez	Assoc. 12L3	Handout	Fantom	LRP	Jaco	Protoform	Airtronics
6	10	Dennis Racine	Assoc. 12L3	Handout	Ballistic	LRP	Jaco	Protoform P35	KOPropo/Futaba
7	5	Shawn Conde	Trinity Switchblade	Handout	ESP	Novak	TRC	Andy's Merc	Airtronics/Futaba
8	9	Jason Moberly	Trinity Switchblade	Handout	GM	GM	Jaco	Protoform P35	Airtronics
9	6	Kevin Cimoli	Assoc. 12L3	Handout	World Class	Novak	Jaco	Protoform P35	Airtronics/Futaba
10	8	Bruce Carbone	Speed Merchant RK	Handout	NewWave	Novak	Jaco	Protoform	JR Racing

XXX

Out of the molds and into the Winner's Circle

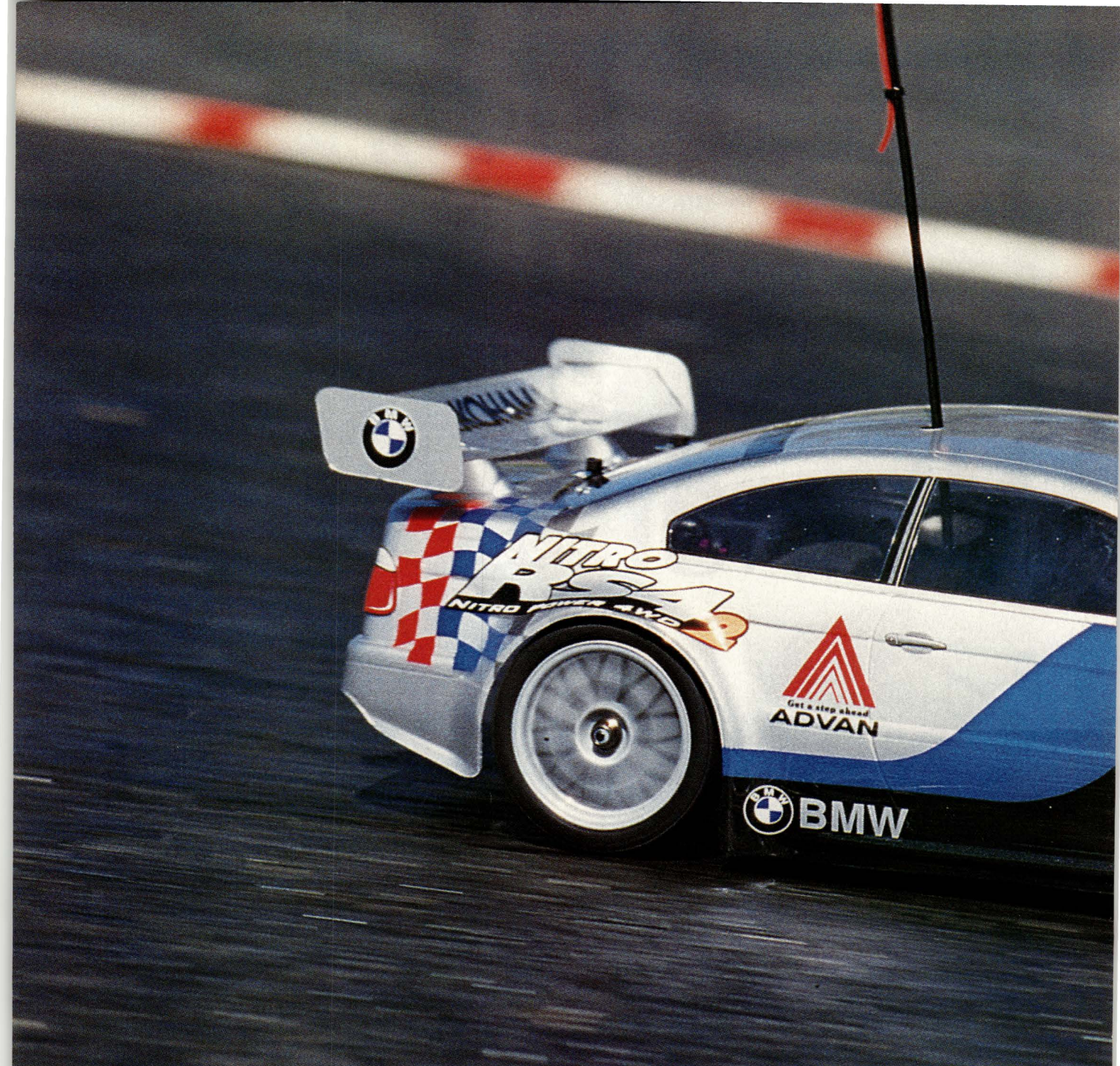
- Team Losi XXX cars dominate the '99 Nats with full-blown production models.
- Team Losi XXX 9 out of 10 in the A-main — beat the best the U.S. had to offer.
- Team Losi XXX turned its first wheel only seven days prior to the start of the Nats.
- Team Losi XXX designed right... The first time!



	Driver	Car	Front Tire	Rear Tire	Motor
1	Brian Kinwald (TQ)	XXX	Silver Wide Body	Silver Taper Pin	Trinity
2	Matt Francis	XXX	Silver Wide Body	Silver Taper Pin	Trinity
3	Billy Easton	B3	Silver Wide Body	Silver Taper Pin	Reedy
4	Chad Phillips	XXX	Silver Wide Body	Silver Taper Pin	Trinity
5	Greg Hodapp	XXX	Silver Wide Body	Silver Taper Pin	Trinity
6	Rick Hohwart	XXX	Silver Wide Body	Silver Taper Pin	Peak
7	Todd Hodge	XXX	Silver Wide Body	Silver Taper Pin	GM
8	Travis Amezcua	XXX	Silver Wide Body	Silver Taper Pin	Orion
9	Jason Corl	XXX	Silver Wide Body	Silver Taper Pin	Trinity
10	Mark Francis	XXX	Silver Wide Body	Silver Taper Pin	Trinity

TEAM LOSI Racing

Team Losi, Inc. • www.TeamLosi.com • feedback@TeamLosi.com



Although it didn't invent the 1/10-scale nitro sedan category, HPI was the first company to produce a kit that transcended the confines of the cul-de-sac with real high performance and chassis tunability that was on a par with that of electric racing sedans. The original Nitro RS4–which has been with us for nearly four years–set the standard for the nitro sedan class when it was released and has continued to dominate this growing market segment as a perennial best-seller.

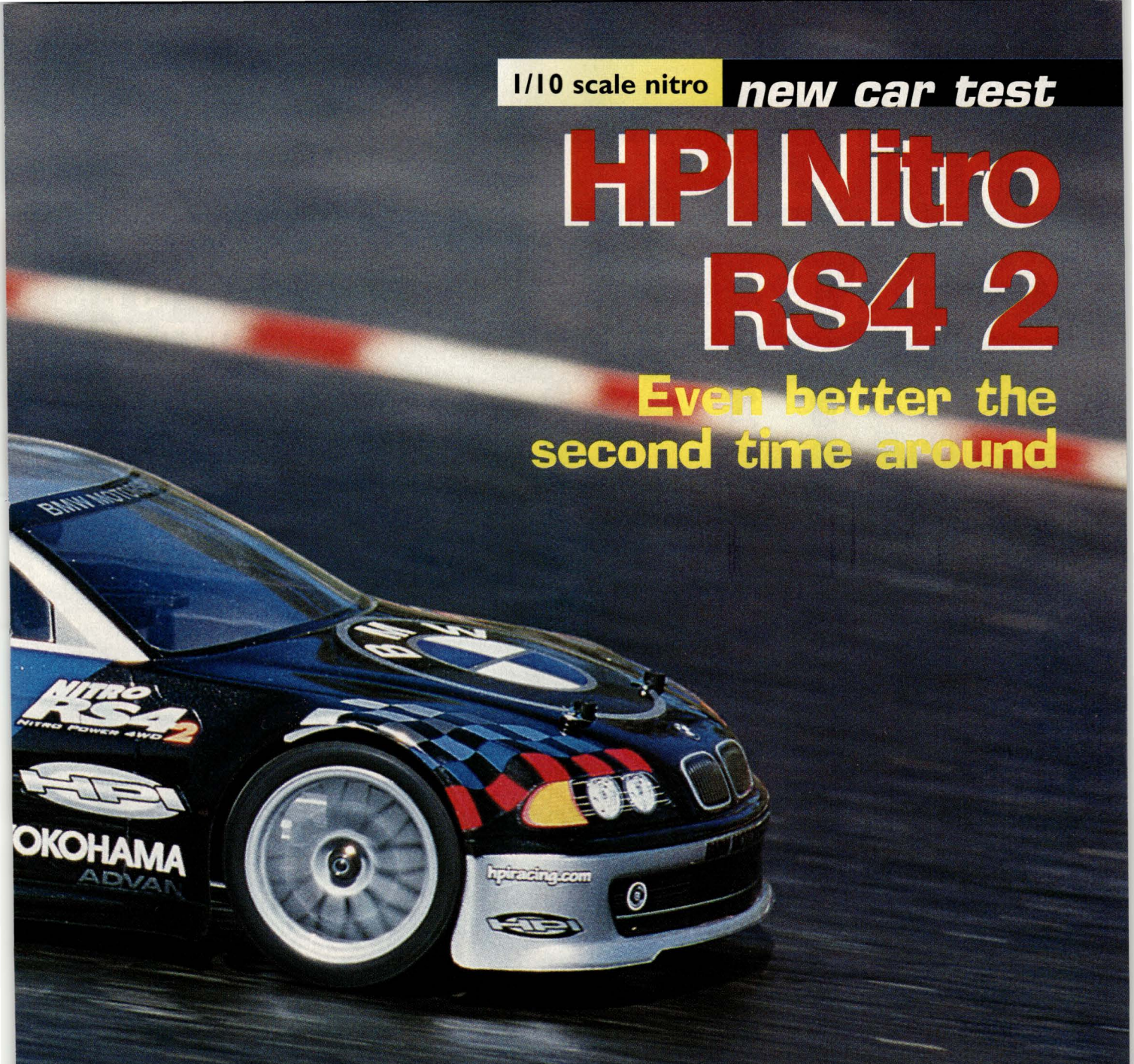
Why then, would HPI choose to monkey with such a successful formula? For starters, four years is a fairly long product life in any industry, but in R/C, it's an eternity. Also, the RS4 Nitro had begun to come under siege by new models from other companies; ironically, in the market it pretty much helped to create. The Nitro RS4 2 (you never, ever mess with successful brand awareness!) isn't a radically different car from its predecessor, but a thoughtful update based on all that was right with the first Nitro RS4 with a healthy dose of changes based on racer feedback.

What's the difference between the Nitro RS4 2 and the original Nitro RS4?

(1) The Nitro RS4 2 (we'll call it the "N2" for brevity's sake) uses a thicker (2.5mm

HPI Nitro RS4 2

Even better the second time around



vs. 2mm) aluminum chassis than that of the original Nitro RS4. The thicker chassis provides a more flex-free platform for the N2's four-wheel independent suspension, which means that the each suspension arm is more isolated from what's going on with the rest of the chassis. As a result, handling becomes more consistent, especially on bumpier tracks. Also, the N2's new chassis (which is anodized in a trick-looking purple) features a fully countersunk bottom, which eliminates protruding screw-heads which can scrape and snag on the ground, slowing the car.

(2) HPI has endowed the N2 with suspension geometry that parallels that of its electric RS4 Pro 2. Longer front A-arms—more closely matching the length of the rear arms—provide the front suspension with a roll-center that's similar to that of the rear. This change means that the N2's front and rear traction has a much more balanced feel than that of the first Nitro RS4. You'll find that the N2 will drive in a more neutral fashion by comparison.

(3) The N2 comes with two pairs of front steering uprights that give you a choice between 8 or 10 degrees of caster. Changing the uprights isn't an exceptionally easy project—there are other cars that make changing caster easier—but doing so makes a significant impact on handling. Less caster gives more low-speed steering and makes the car more responsive on tighter tracks, while more caster makes the car turn in a little harder, but takes away a bit of steering when exiting a turn. The new design of the N2's front suspension also makes it stronger and less likely to flex, so you'll be less likely to break the front end of the N2, and it will retain its suspension geometry better under high loads—the result of its consistent steering response.

(4) The N2 comes with HPI's Nitro Star 15FE engine instead of the smaller 12FE. The 15FE is the engine that was first introduced in the larger Super Nitro RS4—and did a good job at motivating this bigger

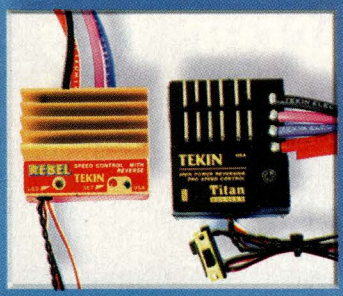
Test Gear

- Airtronics Caliber 3P transmitter
- FSR 20-percent fuel
- Hitec HFS-04M1+ FM receiver
- KO-Propo PS2001 FET servos

R/C PERFORMANCE GEAR



NEW G-10 pro OUT NOW!



REVERSE ACTION

The REBEL, speed control reliably delivers highspeed forward/reverse/ and brake action at a low price. Unique Thermal Transfer Technology for no over-heating, even with a 10 turn motor. Easy push button setup. Now with new GoldFET III transistors for 40% increased power handling and reduced heat.

The TITAN pumps out maximum amperage with two rows of GoldFET transistors. It can power 10-turn or even dual mild motors, with blazing speed. Built in motor and battery plugs. Features include adjustable reverse delay 0-5 seconds, plus lock-out.



DRIVING FUN

The FORMULA-10 and 412P SPEED-STAR are both are great heavy duty electronic speed controls, at a practical price. No motor worries, the High Torque output won't overload, even with 10 turn modifieds. Smooth proportional throttle control from a slow crawl to wide open. Powerful adjustable braking. Built-in motor diode. Simple manual adjustments. Genuine high frequency operation gives 25% more run-time, plus your motors last much longer.

The COMMAND-10 includes QuickTune one-button setup, and brake light activating wire. (Lights available separately.)

COMPETITIVE ADVANTAGE

The P-12 and G-12 are our most advanced style, and use only the best quality electrical components, along with patented circuitry, to maximize power and run time. They deliver the precise control and maximum performance top racers demand.

G-12c III adds new CoolSwitch circuit, TurboStart mode, more speeds for smoother operation, and PowerDrive motor interface. NEW anti-glitch software. The G-12c III is *Highest Amp-Flow* (torque) speed control made, for extra acceleration. 1997-8 World Champion.

The G-9 is the only SuperSonic bypassed speed control, for the extra regenerating power and run time to win the biggest races. 1996-7 World Champion. ROAR Champion. Fast for stock motors too.

SPEED EXTREME

The advanced generation G-10 speed control provides new levels of modern tuning performance.

Programmable read and set for all critical parameters, including throttle curve, drag brakes, neutral/brake, dual current limiters with timer. Easy operation, adjusts in seconds. Over 600,000 possible setups. Indicator lights advance as throttle is applied. GoldFET IIIb transistors improve handling with a low center of gravity. Replaceable power wires. Exclusive advanced internal circuitry handles the most rigorous racing and performance demands.



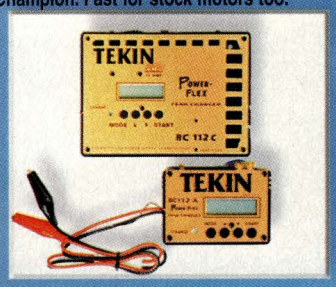
PEAK CHARGING

The BC5A or BC110L deliver reliable performance and rugged durability with todays demanding batteries. Unique adaptive peak sensing circuit delivers better charges and longer battery life by monitoring the charge profile. Easy to use. Cool, safe operation and complete overload protection. The BC110L DC charger handles 0-10 amps. The BC5A has a solid 0-6.5 amp AC/DC power supply built-in.



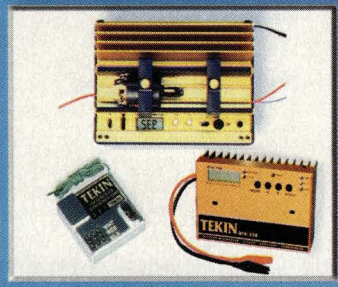
DIGITAL CHARGING

Custom LCD displays and microcomputer operation give you an inside picture to what the cells are doing. BC 48 is 0-8 Amp DC. BC 67 is AC/DC, with 5 Amp power supply built-in. Both feature 4 function LCD digital display, 3 charge profiles modes, and fully automatic operation. Reliable Adaptive Peak Sensing means your batteries are in safe hands. High performance Linear Current outputs for long, powerful runs. Gets you charged properly, reliably, and fast. 4-8 cells.



POWER-FLEX PRO CHARGING

The 112's deliver the best charge with Power-Flex circuitry that conditions the cells internally, so they produce more power with lower resistance, while also extending the battery life noticeably. Charges 1-12 cells, at up to 10 amps. LCD has 5 display modes, and 3 charge profiles with full settings. Connects to optional discharger for a complete high-end battery maintenance/test system. BC112A accepts 10-24volts DC. BC112C has a 24 volt, 10 amp AC/DC power supply built in. World Champion.



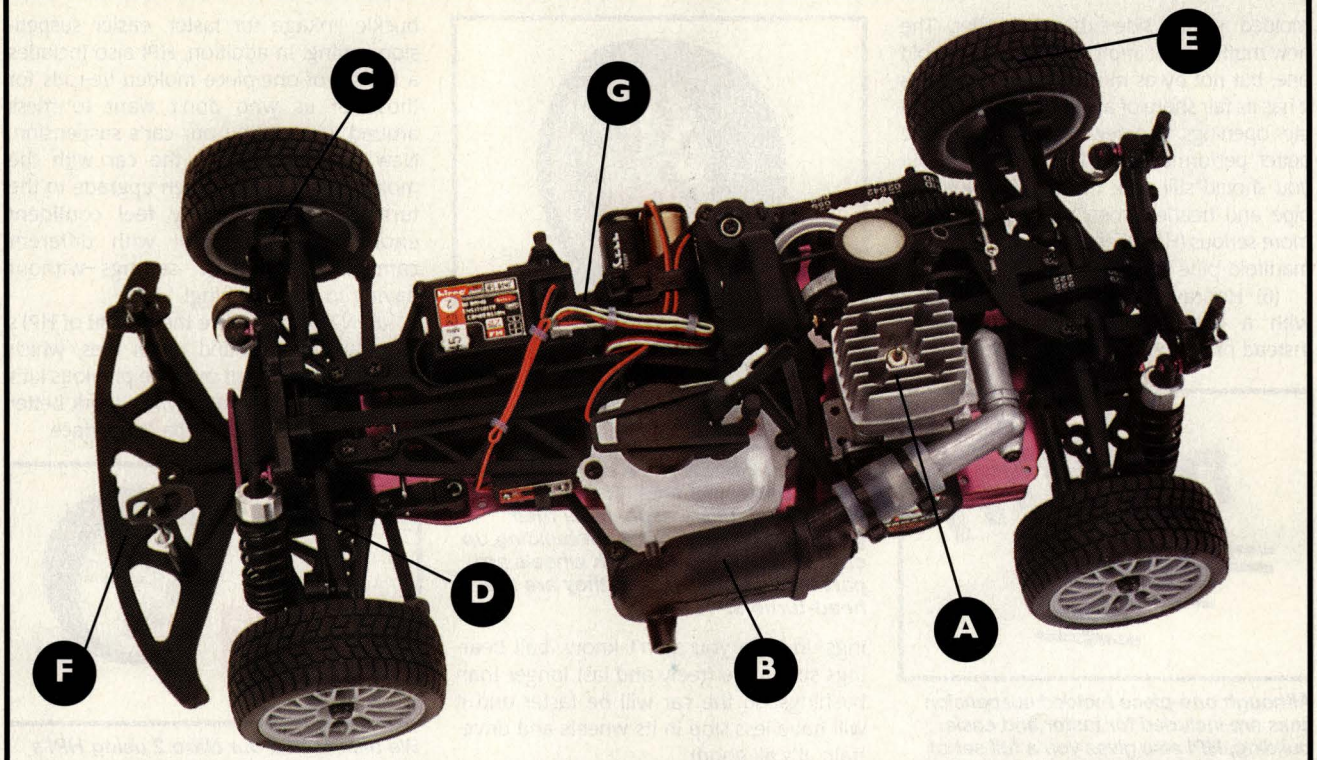
RADIO ACCESSORIES

AM and FM chrome micro receivers are super small and light, just 1.4" square, .45 ounce. Perfect for any vehicle. DYN900 motor dyno tests and tunes your motors to peak power. Works with stock or modified motors. Proprietary design has tuned World Champion motors. Digital LCD display. NEW DIS-350 battery Discharger/ Cycler to accurately rate cells. Use alone to discharge packs or cells, or with BC112 for complete cycling system. Portable. 0-30 amp output with adjustable settings and LCD display. 45 amp stress test mode.

Team TEKIN

R/C Racing Gear
MADE IN USA

940 Calle Negocio. San Clemente, CA 92672 USA www.tekin.com (714)498-9518



A: HPI's pull-start 15FE glow engine comes with the kit. This big "small block" has plenty of ponies for the 1/10-scale Nitro 2.

B: A "tuned" muffler is also included. It's not quite as good as a genuine tuned pipe, but it's less restrictive (and looks a lot cooler) than your typical model airplane-style muffler.

C: Revised suspension geometry provides more consistency in the handling department, and offers more tuning adjustments.

D: HPI includes turnbuckle tie-rods as well as one-piece molded suspension links for novice (or lazy) builders.

E: Super-Compound radial tires with mesh-style wheels for high traction and great looks.

F: The front bumper has been strengthened for added crash protection and more secure mounting of the front body posts.

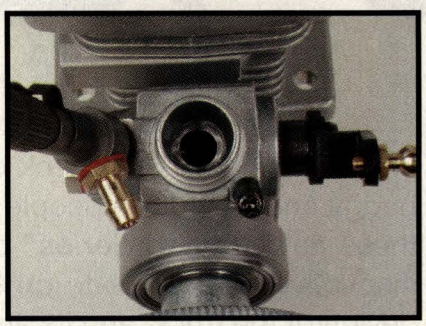
G: A 2.5mm-thick purple-anodized chassis is now standard. The bottom of the chassis is smooth, thanks to the use of countersunk screws. A previous "hop-up" item only.



HPI's user-friendly (and fast) 15FE engine comes with the new Nitro 2 kit. This engine has a pull-start for easy operation (no starter box is needed) and a simple, one-needle carb for easy tuning.

and heavier car, so you can imagine that it has no problems moving the smaller N2. In addition, HPI has increased the size of the 15FE's carburetor opening from 4mm to 4.6mm, thereby boosting the engine's power substantially.

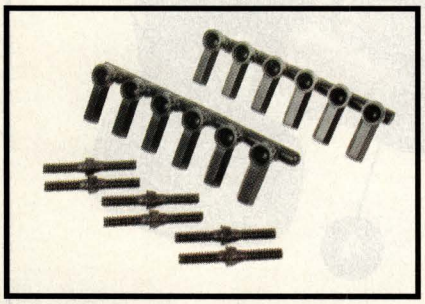
(5) HPI has given the boot to its old "airplane" style muffler in favor of its new



The 15FE was first used in HPI's Super Nitro RS4 kit—so you can imagine that this engine has little trouble moving the smaller and lighter Nitro RS4 2. To increase power, HPI has increased the size of the carb's barrel opening to 4.6mm.

molded plastic side-exhaust muffler. The new muffler is an improvement over the old one, but not by as much as you'd think, as it has its fair share of angles and small diameter openings. The new muffler will provide better performance and easier tuning, but you should still seek out a genuine tuned pipe and header when you decide to get more serious (HPI offers its own aftermarket manifold/pipe for this engine).

(6) Hooray! The N2 comes standard with a complete set of ball bearings instead of the old car's bronze Oilite bushings. In case you didn't know, ball bearings spin more freely and last longer than bushings, so the car will be faster and it will have less slop in its wheels and drivetrain. It's all good!



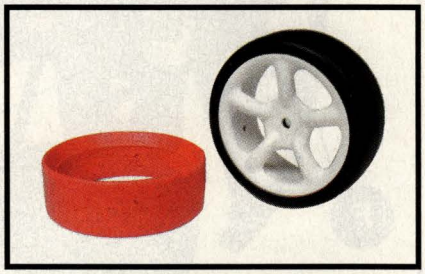
Although one-piece molded suspension links are included for faster and easier building, HPI also gives you a full set of steel turnbuckle tie-rods with nylon ball-cups. The turnbuckles enable more experienced racers to change the car's suspension settings for added track tuning.



The stock kit gets HPI's sticky Super-Compound radial tires. These tires work very well on dusty asphalt, as their grooves help keep dirt from building up on the treads. These mesh wheels are part of the BMW kit, and they are real head-turners.

(7) The original Nitro RS4 came with lame threaded steel rods for suspension tie-rods, but the N2 comes with steel turnbuckle linkage for faster, easier suspension setting. In addition, HPI also includes a full set of one-piece molded tie-rods for those of us who don't want to mess around with setting our car's suspension. New racers can build the car with the molded links initially, then upgrade to the turnbuckles when they feel confident enough to experiment with different camber and toe-in settings—without having to buy anything!

(8) N2 owners have the benefit of HPI's new Super-Compound radial tires, which are an improvement over the previous kit's M-Compound tires, and which work better on nearly every type of paved surface.



We also tested our Nitro 2 using HPI's new 24mm 33R Belted Slick tires with HPI's medium-firm Red molded inserts. These tires work really fantastic on clean to slightly dusty pavement.

SOME PEOPLE LIKE US FOR OUR BODIES...





We don't mind if you check out the sexy new bodies we've created for the Associated B3 buggy and T3 truck—people just notice a great looking body! For example, you've noticed these new ***"Speed Series"*** bodies from Deans (*and so will everybody else!*). You saw the innovative number plate on the buggy (*no more numbers on the windows!*). The realistic design of the truck, and its advanced aerodynamics got your attention (*we didn't even show you the trick tabbed spoiler!*). ***Get speed*** - get ***"Speed Series".***

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(9) A newly re-designed front bumper provides additional crash protection for the N2, and serves as a sturdier platform for the car's front body-mounting posts.

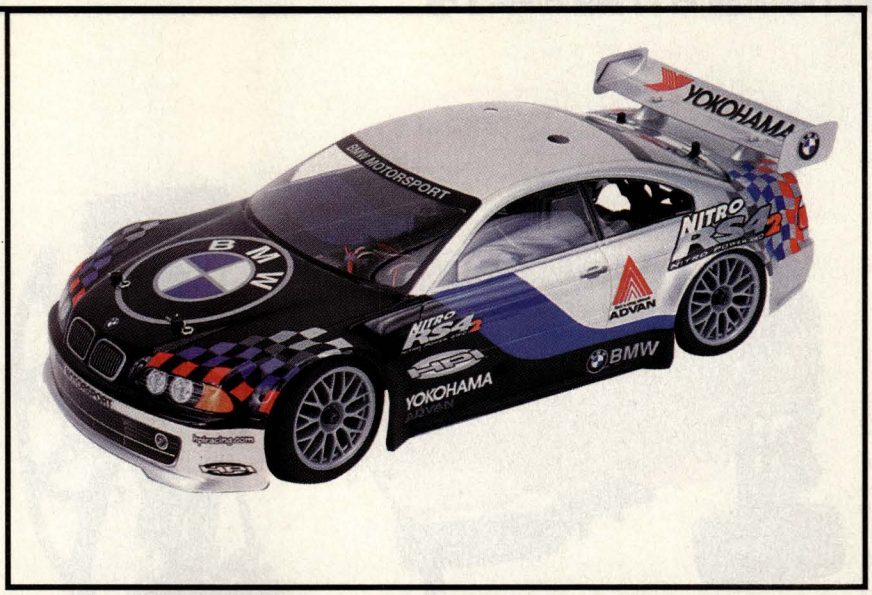
How does the Nitro 2 perform?

Startup and break-in: We can't say enough good things about HPI's 15FE engine—but here goes. First, this is one of the very, very few "sport" engines that comes factory pre-set with a properly adjusted carb needle. The carb was rich enough for break-in, so we didn't have to touch its settings until after the fourth or fifth tankful of fuel (at which time we began to lean the engine incrementally). Beginners will have no trouble getting this engine started and broken-in properly.

Power: Once broken-in, the 15FE provides plenty of go for the Nitro 2. With the stock gearing, top-end speed is formidable if not all-out ballistic. The lack of a low-end needle adjustment on the carb does limit the low-end throttle response, but HPI offers a hop-up carb for this engine that fixes this (see this month's buyer's guide for more detail). All-in-all, the 15FE is a good match to this chassis, and we even liked the gutteral roar from the "pseudo" tuned pipe!

Steering: Using the kit-supplied Super Compound radial tires, the Nitro 2 is about as neutral a handler as you'll find. There's a hint of push, or understeer, as the car enters a turn at speed. Once it enters the turn and begins to apex, application of the throttle is usually enough to induce a controllable drift that helps overcome the car's built-in push. Overall, this is a very easy car to drive quickly—you don't have to stay 100-percent focused to turn in quick lap times (good for us older folk!).

Brakes: For some reason, we had a little trouble dialing-in the right amount of brake. The kit's linkage seemed to require a bit more travel than we felt it should have,



We chose the Nitro 2 kit that comes with HPI's awesome new BMW 328i body. We found this body to give a nice balance between front and rear downforce, and it looks exceptionally cool (thanks to Kent at HPI for the paintwork!).

OTHERS LIKE US FOR OUR MINDS!

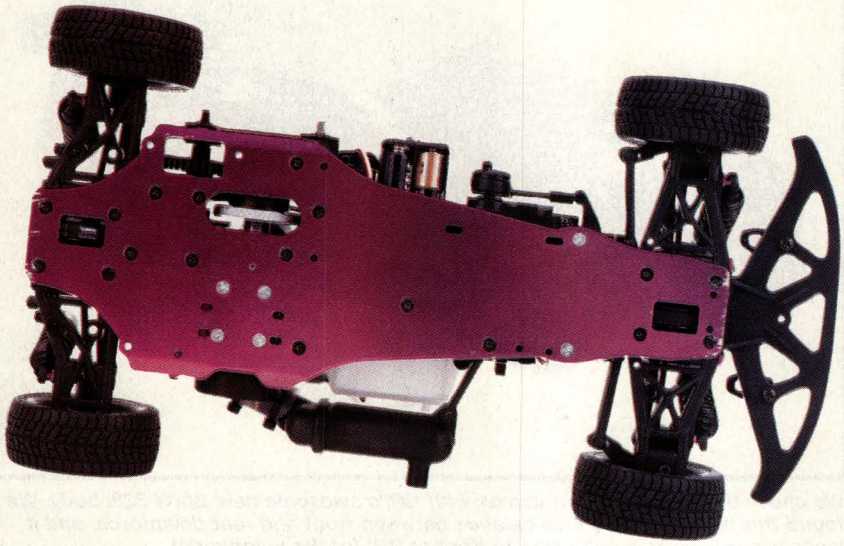


Finally, an easy way to build a pack. The revolutionary new ***"Speed Jig"*** makes pack building a one man (*or woman!*) job. The innovative bar clamp, holds the battery bar in place during soldering (*patent pending*). Building a pack couldn't be easier or quicker. ***Get speed*** - get the ***"Speed Jig"***.

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HPI NITRO RS4 2



Type: 1/10-scale nitro-powered 4WD touring sedan
Manufacturer: HPI, 15321 Barranca Pkwy., Irvine, CA 92618 • phone (949) 753-1099; fax (949) 753-1098
Price: $595.00
What you get: Complete rolling chassis with .15 c.i. pull-start engine. You must purchase 2-channel radio system with two servos, glow fuel (10-15 percent nitro is recommended), a glow igniter, CA (super glue) cement, and suitable paint.

Length 14.1 in/360mm
Width 7.7 in/197mm
Wheelbase 10 in/256mm
Track (F/R) 6.7 in/171mm
Weight ..... 3 lbs, 8oz.

Not for racers only: Formerly an optional part (and standard on the RS4 Nitro Racer kit), HPI's excellent 2.5mm purple aluminum chassis comes with the Nitro 2. The chassis is not only thicker than that of the previous Nitro RS4, but thanks to the use of countersunk screws, its bottom is smooth.

given the design of the supplied servo-arm/brake arm. Reducing the amount of "free play" between the brake actuation rod and the brake arm helped solve this problem, although unwanted brake drag was always just one trim-click away.

What we don't like

(1) The 15FE engine bolts directly to the chassis, and you can't adjust the gear mesh at all. To change gearing, you'll have to purchase an optional adjustable engine-mount set from HPI. The stock setup is probably the best way for novice builders to ensure proper mesh, but we would like some flexibility.

What we like

(1) The RS4 Nitro 2 is a new car that will accept all of HPI's and other manufacturers' aftermarket hop ups for the old Nitro RS4.

(2) HPI gives beginners the option of installing simple molded-plastic suspension links, while more experienced racers can use the included steel turnbuckles and nylon rod-ends.

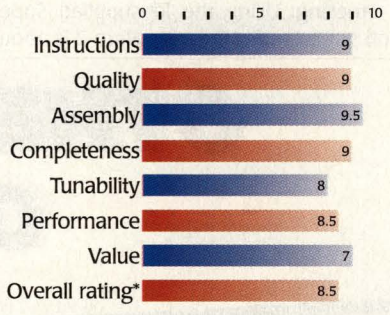
(3) The Nitro RS4 2 is about as complete a kit as you can get. Really, all you need is a two-channel radio, and HPI supplies the rest, including excellent throttle linkage that's a snap to set up.

(4) The included Super-Compound radial tires will get you hooked up right away—you won't have to toss the stock tires until they wear out, unlike some other kits.

What we really think

The Nitro RS4 2 is intended to be all things to all people. HPI makes the kit very user-friendly, so beginners will have a pretty easy time building and running this car, and there are enough racing features and tuning options built in to make this an appealing kit to the experienced racer as well (and don't forget the near-limitless hop-up potential). No one car kit can meet the needs of every hobbyist, but few, if any, come as close to the mark as the Nitro RS4 2. Its father would be proud. ◆

Ratings



**The overall rating is not the average of the subjective ratings. It is our overall appraisal of the kit's quality and features.*



New to the Nitro RS4 Nitro 2 are these front uprights. Shown installed are the uprights that have 10 degrees of caster. Optional (included) uprights can be installed that reduce caster to eight-degrees for increased low-speed steering.

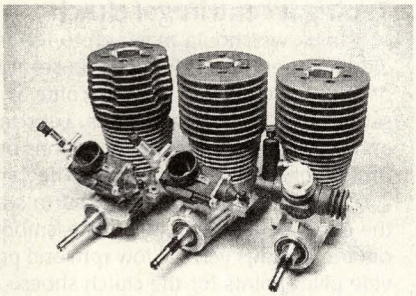
SOURCES

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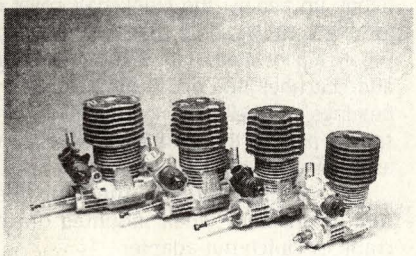
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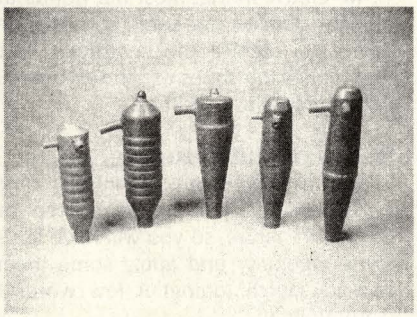
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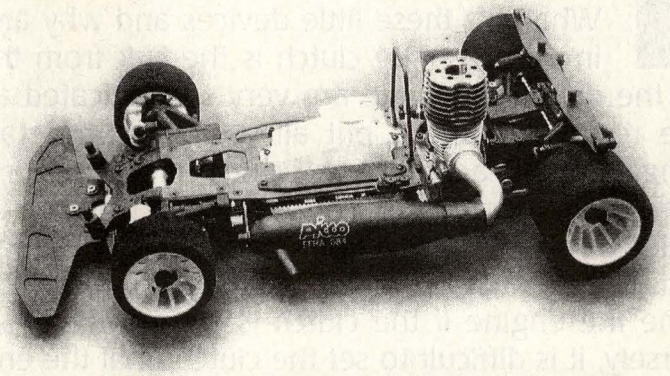
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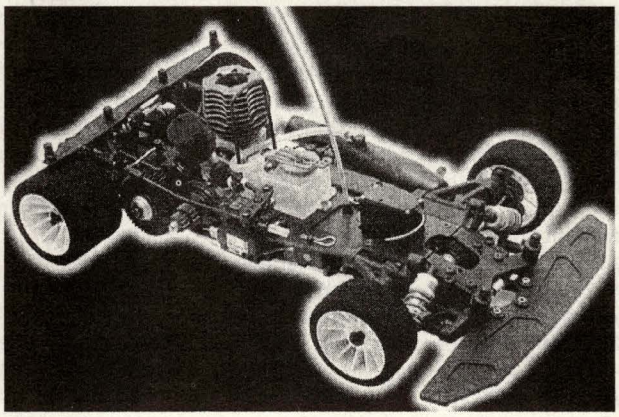
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ron paris

Coming through in the clutch!

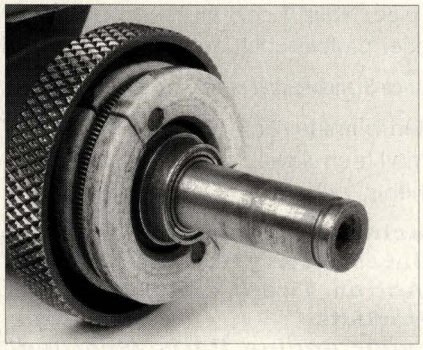
This month I think we should touch on clutches. What are these little devices and why are they so important? The clutch is the link from the engine to the drivetrain. Some are very sophisticated and some are relatively simple, but all are very important. If the "engagement" action of the clutch is not set or tuned to the requirements/needs of the engine and the track conditions, you will have a finicky and difficult-to-tune engine. This is the "catch 22" of R/C racing! It is difficult to correctly tune the engine if the clutch is set incorrectly, and conversely, it is difficult to set the clutch until the engine is at least in the ballpark!

So what to do?

It may sound like an impossible task, but with a little practice, setting your clutch will become second nature. I think the most important thing is to start with a stock or conservative clutch setting until the engine is broken in and in a "close" state of tune. Once the engine is running consistent and stable, you can start looking at the clutch before going for that fine "race" tune on the engine! I'm getting ahead of myself here—first lets talk about the different types of clutches.

Types of clutches

Every manufacturer makes clutches that they believe best suit their cars, but these clutches are almost always supplied from the factory in a very "conservative" state. This is because there are so many variables that it would be impossible to supply the clutch in a "perfect for all conditions" form.



A typical clutch setup has a pair of semi-circular clutch shoes wrapped by a spring. The spring actually "lightens" the clutch shoes by helping them to resist the centrifugal force of the spinning flywheel.

Some of these variables that effect how you would set the clutch are:

- Available traction.
- Tire diameter and selection
- The nitro content (percentage) of your fuel.
- Altitude and atmospheric onditions
- Gear ratio
- Tuned pipe selection
- The engine itself

The type of engine you have can also affect the clutch's setting. Even if you had two identical engines (same brand and type), fine-tuning the clutch to each engine will provide benefits because each engine can develop its own "personality." Now don't panic—it's not that difficult, so hang in there and read on!

There are two basic kinds of clutches used in modern R/C cars: The traditional "centrifugal" type that uses from between two to six plastic/composite shoes that pivot on pins, and the more sophisticated "centrifugal-to-axial" type such as Picco's Syncro and Serpent's Centax. These types of clutch are now commonplace in 1/8- and 1/10-scale on-road cars; however, some of the 1/10-scale touring sedans are now using these types of clutch as well (but they're normally optional equipment). The basic difference between a standard centrifugal clutch and the centrifugal-to-axial clutch is that the latter converts centrifugal force into linear force, which is then used to overcome an opposing-force adjustment spring. This engages the clutch disc assembly. As far as I know, these complex clutches are not being used in off road—their close-tolerance parts would not get on well in dirt!

Tuning a centrifugal clutch

I think we should move on to the traditional centrifugal clutch because most of the hi-tech types already come with set-up and tuning instructions. Let's talk about the components and functions of a basic centrifugal clutch system. They are:

(1) The engine flywheel: used to start the engine, maintain engine idle, smooth out the engine cycles at low rpm and provide pivot points for the clutch shoes.

(2) Clutch shoes: used to progressively engage and transmit engine power to the drivetrain. A clutch can have from two to as many as six shoes (my standard warning here—more is not necessarily better, just different!).

(3) Clutch nut: used to hold the flywheel tightly up against the crankshaft collet or locking cone. In some cases, it may incorporate a pilot shaft that the clutch bearings and clutchbell ride on. In other cases, the bearings and bell may ride directly on the special pilot of the crankshaft (referred to as SG or pilot-style cranks).

(4) Clutch bearings: the clutchbell rotates on these when mounted on the crank or clutch-nut adapter

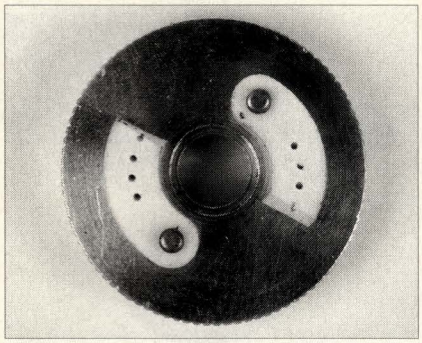
(5) Clutch bell: the housing with gear teeth attached to it, normally available in different tooth configurations so you can select the correct gear ratio to suit track conditions. The clutch shoes that pivot on the flywheel come in contact with the inside of the clutchbell to provide the "drive" to the drivetrain.

(6) Clutch spring: most but not all traditional clutches use some sort of spring device to oppose the centrifugal force that makes the shoes expand or open up and contact the clutchbell.

Basics of clutch tuning

Because every manufacturer's clutch system will vary, I have to keep this generic in nature, so you will have to use some ingenuity and apply some theory to your clutch tuning! A few words of warning first!:

- Buy at least one or two *extra* sets of clutch shoes and one set of springs before experimenting with clutch tuning (these are considered wear items and spares are good to have anyway).
- Follow the kit instructions carefully.
- Make sure the shoes are installed the correct direction. Normally (99-percent of the time), the pivoting end of the



This Associated RC10GT flywheel and clutch demonstrates the principle of centrifugal force. As the engine spins the flywheel (in a counter-clockwise direction), the free ends of the clutch shoes (the ends not attached by the flywheel pins) are pushed outward by the force of the spinning flywheel.

clutch shoe that has the hole is the leading edge of the shoe, and the (normally) thinner end without hole is the trailing edge. Note that ALL model car engines run in a counter-clockwise direction (if you are looking at the flywheel).

Here's how to make sure you install the shoes in the right direction. With the flywheel facing you, rotate the flywheel so that one of the pivot pins is in the twelve o'clock position. Using your left hand, install the leading edge of one shoe and spring (if used) on the pin at twelve o'clock; the trailing edge should be toward your right hand or hanging toward the pins that are in the two or three o'clock positions. Now you know for sure you have the shoe installed the correct way, and you can continue installing the rest of them in the same fashion.

• Make sure that when the bearings and clutchbell are installed that the clutchbell can spin freely with NO DRAG whatsoever from the shoes. If there is drag, something is wrong and the clutch will never work correctly! Also, be sure the clutchbell is properly shimmed so that it doesn't have too much or too little end play (that's the free movement the bell can travel in and out on the shaft).

Most kits come with a bag of spare shims to adjust the clutchbell's end play. You can place them between the inside bearing and the clutch-nut or between the outside bearing and the clip/screw assembly that holds the clutchbell to the engine. This is not a critical setting, but be sure the clutchbell cannot rub the flywheel. Also, be sure that if you pull out on the bell away from the flywheel, it does not expose the clutch shoes. As long as you have at least .010 to .020 inches of end play (about the thickness of a business card up to a matchbook cover), you're okay.

Clutch-tuning tips

Here are a few ways to tell if your clutch is set properly.

• With its wheels off the ground, the car should be able to idle and its wheels shouldn't spin at all. If the wheels are spinning, either the idle is so high that the shoes are engaging the clutchbell, or the shoes/springs are installed and/or adjusted incorrectly.

• You should be able to slowly apply throttle and see the wheels slowly begin to engage and spin.

• With the car on the ground, the clutch should not slip after more than a brief moment or after a few feet of travel when you apply full throttle.

• The clutch should not be FULLY engaged immediately upon applying throttle! TIP: You'll be able to relate to this if you own a car with a stick shift: Imagine being at a stop sign, and when you go to drive away, you simply slid your foot off the clutch instead of letting it out smoothly while simultaneously applying throttle! Yup, it would "bog down" or chug away until the rpms build up to the point the engine gets into its powerband and can accelerate the car!

The other extreme would be if you were at that same stop sign and you put the throttle all the way to the floor and you only let the clutch out partially. Right again, it would slip the clutch like crazy, the engine would be racing but the car really would not be moving very fast. If you kept this up you will burn up the clutch and possibly damage the engine!

These examples also apply to your R/C car. It's important to have an adequate amount of slip without overdoing it. The problem with the R/C car is you do not have control over the clutch like you would in a full size car, so you must find a good compromise. This may explain why two identical cars may have all the same equipment but one car seems like it has more power and is faster—it simply may have the clutch set better for the conditions!

The big question: How do I know if my clutch is set correctly?

I'm not exactly sure how to explain it, but when the clutch is too heavy or engages too soon the car will have what we like to call the "do-waa's." In other words, when you give the car full throttle from a slow corner or roll, the engine will bog for a second or so, then come to life as the engine comes up in the power band. Kinda like a "DoooooWaaaaaaaaaaaaaaaa!" (Cool sound effect if this were an audio format!) This symptom is commonly confused with an incorrectly tuned carburetor! Most the cars I have seen with this problem tend to have their clutches set too heavy or engaging too soon.

I wish I could tell you exactly how to modify the clutch, but every kit is different and your conditions will vary. What I can do is give you the basic theory of how the clutch works and the basic ways to modify or adjust it! Let me repeat: it would be a good idea to buy one or two extra sets of shoes because there is a learning curve involved here! Please don't be angry with me if you ruin a set or two, but if you use common sense and keep in mind three main things you will achieve success.

• When tuning your clutch, you will be removing weight and surface area, and once it is gone it cannot be put back on!

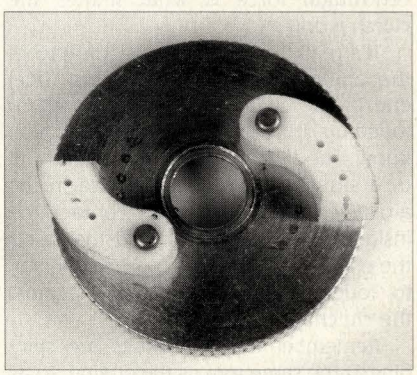
• Take your time; it may take several attempts until you get it right. You may have to go too far with the modification to see were the limit is between to soon and too late for full clutch engagement!

• Once you have experienced the gradual changes, you should be able to recognize the correct sound/feel without going too far.

• I can't repeat this enough; MORE IS NOT ALWAYS BETTER; sneak up on it!

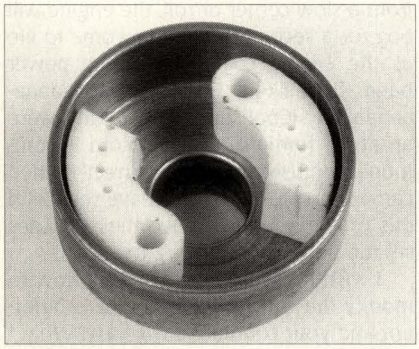
Here comes the basic theory of how your clutch works!

This is what you've been waiting for, right?



This photo better illustrates how the free ends of the clutch shoes are forced outward when the flywheel is spun. The part of the shoes that "stick out" are the parts that "grab" the inside of the clutchbell and cause it to spin.

ron paris



This photo clearly shows how centrifugal force sends the "free" end of the clutch shoes flying outward, where they contact the inside of the clutch bell and cause it to spin.

(1) The flywheel and shoes are affixed to the engine's crankshaft and rotate at the same speed as the shaft.

(2) The clutchbell is meshed to the drive gears, which are affixed to the drivetrain (the transmissions, differentials, axles, wheels, etc.).

(3) There are five basic things that "tune" or affect clutch engagement, and I've listed them in the order I feel have the most overall effect on the engagement (from having the most effect to the least).

A: The weight of the shoes.

B: The spring tension used to resist centrifugal force (if used).

C: The surface [swept] area of the shoes.

D: The clearance between the shoes and clutch bell.

E: The friction properties of the shoes.

I have been using the word "centrifugal" a lot; because, along with friction, centrifugal force is what makes the clutch work!

It's really very simple: As the rpm of the engine increase, the trailing (free) end of the clutch shoes fly outward or "open up" from the centrifugal force (you know, like if you tied a rock to the end of a string and swung it around in the air). Eventually, the shoes contact the inside of the clutch bell, and the faster the engine spins the harder the shoes try to "lodge" or wedge themselves against the clutchbell.

Remember that the shoes are spinning at the same rpm as the engine, so as the shoes drag across the inside surface of the clutchbell, they drag or pull the bell along with them and cause the gears to turn and the car to move forward. The shoes are made of a special material that has both bearing and friction properties. This is because the shoes must slip somewhat against the bell until the engine can get into it's powerband and the drivetrain gets up to speed. If the engagement happens too quickly, the engine will bog, and if too slowly, the clutch will burn up from excessive friction and heat.

If you modify the clutch to engage more slowly (at a higher rpm), you will get more slip and possibly improve performance, so how do you modify the clutch? Remember, the heavier the shoe, the sooner and more positive the clutch engagement will be. The most common method used to lighten or make the clutch engage later is to trim a little material from the trailing edge of each shoe with a hobby knife. Be careful and trim just a thin sliver of 1/64-inch at a time.

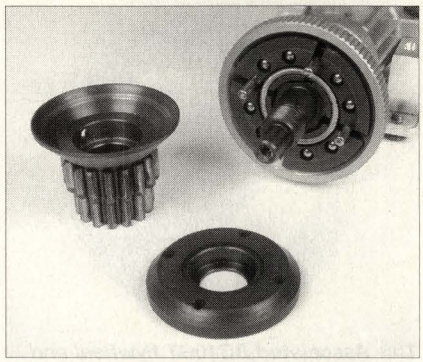
Try the car—does it accelerate faster? Did your modification help get rid of the "dooo-waaaas?" If it helped, try trimming a bit more—as I said, it is a matter of trial and error. Eventually, the car will start making a lot more noise and rpm but will not be accelerating any better—you'll have gone too far and have removed too much from the shoes.

Now you have experienced several stages of clutch slip, hopefully you will have learned the "right" sound and feel. In the future you will know what you looking for and not have to go too far and ruin a set of shoes!

You can take the conservative route and simply stop experimenting as soon as you see improvement. But for a relatively small investment, you can accelerate your learning curve and tuning expertise. Just use caution if the engine seems to be over-revving—if this happens, STOP NOW or you'll cause engine damage! Another tip is not to remove too much off the trailing edge, otherwise, you can reduce the surface area of the shoe too much. This could result in shoes that do not last long or start slipping in high traction conditions.

Here is an alternative tuning method

Let's say you have made several trims of the trailing edge of the clutch shoes, but you feel a little more slip is in order and don't want to take any more material from the trailing edge. Relax, because you can lighten the shoes by carefully trimming some of the material from the underside (the area that fits around the clutch nut). This way, you can lighten the weight without losing wear surface!



This is an example of a centrifugal-to-axial clutch setup (made by Neo). Here, centrifugal force flings the weighted clutch shoes outward and forward, where they push the clutch pad (the circular piece) outward against the clutch bell. These types of clutch are very easy to adjust and tune.

Some clutch systems have adjustable springs or springs with different tensions. Springs with greater tension will have the same basic effect as lighter shoes—more rpm will be needed to fully engage the clutch. Increasing the clearance between the shoes and the bell can give you more snap or punch off the corner . This works by increasing "stall" or free-rpm before engagement starts; the shoes can build up more speed before they touch the clutchbell.

This is much more difficult and requires a lot of trimming to the underside of the shoe. It may also require the modification of the spring/springs. Because of its complexity, I recommend this modification only for experts!

The last tunable item is the shoe material itself. Most companies only have one type of shoe, but I know Mugen off-road buggies, for example, have two types of shoe material—one is white and the other is black, and each has different slip characteristics.

Last tip: On-road cars can get away with a little more slip because of the more consistent track surface. Use caution with off-road buggies and trucks because of the rapidly changing conditions, which can leave you out in left field. Be a little more conservative with off-roaders, as you'll usually need to have a quick engagement to "work" the ruts and jumps! You may sacrifice some straight-line acceleration, but drivability may be better! I hope this shed some light on the mysteries of the clutch!

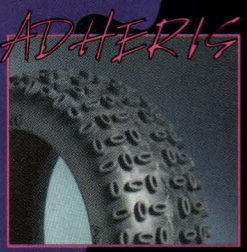
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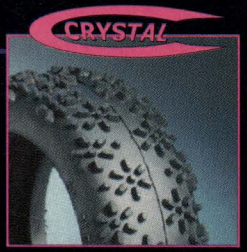
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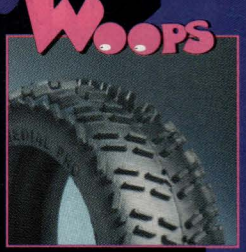
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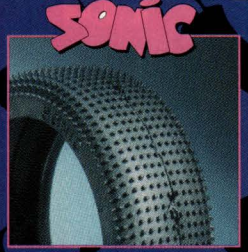
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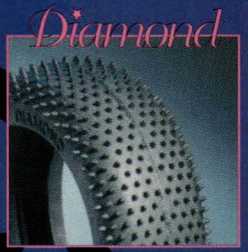
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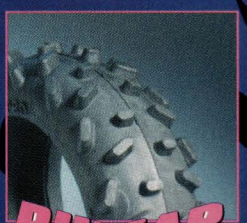






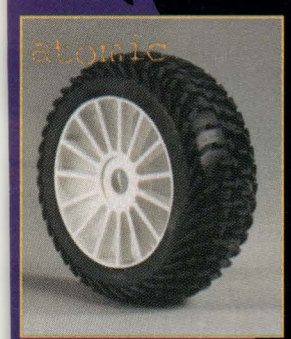


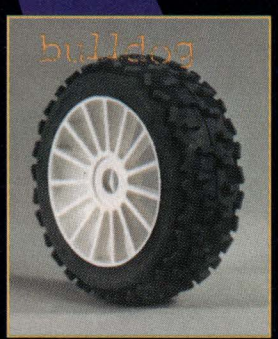


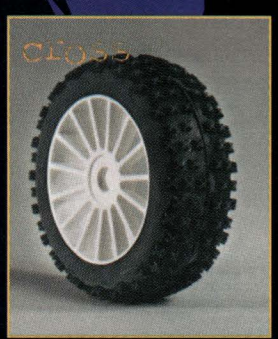


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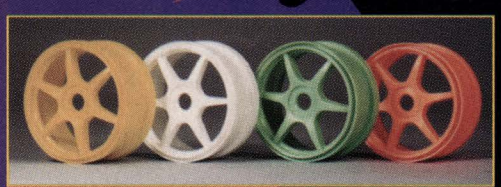


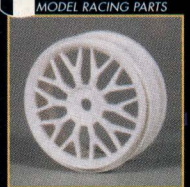


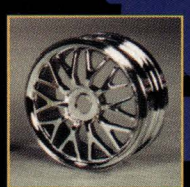


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Kyosho Snake Bite

Fast and furious fangs!

Somewhere within the Kyosho Corporation, there must be a guy whose sole job is to think up wild and crazy R/C vehicles. How else can we explain the release of the new Snake Bite monster truck? It has a .10 c.i. nitro engine—nothing out of the ordinary about that. It has big terra tires—no big deal. It has a special transmission that allows you to drive the truck in reverse—SAY THAT AGAIN?! Yep, the Kyosho guys have invented a transmission that acts like any normal gearbox when you pull the throttle, but grab for some brake, and you'll soon be spinning all four of the truck's tires in the opposite direction!



Kyosho's revolutionary QRC (Quick Reversing Clutch) transmission, released two years ago in the Baja Beetle kit, is currently the only gearbox of its kind, and any time it finds its way into a new Kyosho kit, we're excited. Add to the mix a fully licensed replica body of the Snake Bite monster truck—the very first "theme" monster truck on the USHRA Monster Jam circuit ("theme" meaning it was the first truck to break from traditional pickup truck lines and get into "character")—and you've got yourself one wild ride. How wild? We put the 'Bite through its paces during a recent test; here's the dope.

Platform shoes

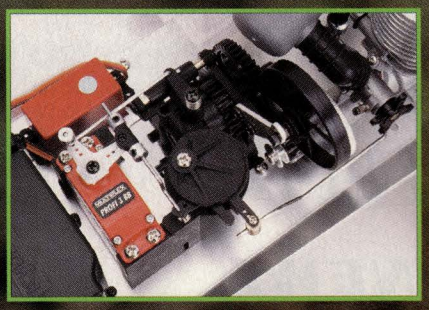
The basic layout of the Snake Bite is a model of simplicity, with a large, flat 2mm-thick aluminum chassis serving as the backbone for the truck's drivetrain and suspension.

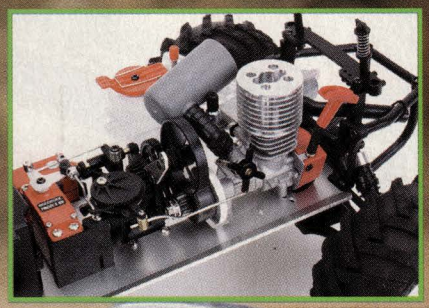
Nestled not-so-quietly toward the rear of the chassis is Kyosho's proven GS-11X pull-start glow engine. Hey, it may only have .10 c.i. of displacement, but it makes up for its small size by being one of the most user-friendly "sport" engines around. The engine is made friendlier by its simple single-needle carburetor. Yes, this limits your engine-tuning



The Snake Bite's large plastic radio box is actually pirated from the original Kyosho MP-5 off-road buggy. Nonetheless, it does a decent job of protecting the receiver. The box is also a great place to stuff all that extra wiring, so your truck always looks pro.

Although it's not the strongest gearbox on the planet, Kyosho's neat QRC provides this nitro truck with a reverse gear to enable it to back out of sticky situations. No more long hikes to free your stuck truck!





Once you get it started and broken-in, Kyosho's little GS-11X engine runs like clockwork. A single-needle carb makes for easy tuning, but ultimately limits the engine's horsepower at lower rpm (unless you choose to forsake engine longevity and run the carb very lean).

options, but since we're not all Ron Paris, it's a lot easier to set one high-speed needle than to tune a two-needle carb, right?

Smack-dab in the center of the chassis resides the reason you bought the Snake Bite in the first place—the QRC tranny. Because it's a relatively complicated and delicate piece of hardware, Kyosho has thoughtfully pre-assembled this wonder-box for you—all you have to do is bolt it into place. The QRC actually sits inside a cutout in the chassis, so that it partially protrudes below, where its outdrives connect to the driveshafts that go to the front and rear gearboxes.

Inside both the front and rear transmissions is a bevel-gear differential that allows the left- and right-side wheels to spin at different speeds during cornering. Because the Snake Bite has independent suspension arms at all four corners (damped by plastic oil-filled shock absorbers), long dogbone driveshafts run from each diff outdrive to the steel axles located at each wheel. So what you end up with is a chassis design that's quite scale-looking, with the "transfer case" and axles below the chassis and the "dry goods" safely stowed up and out of harm's way atop the stout chassis plate.

How does that darn QRC-thing work?

Like most modern miracles of science, Kyosho's QRC is remarkably simple—one of those "why didn't I think of it?" contraptions. But you didn't think of it, so get on

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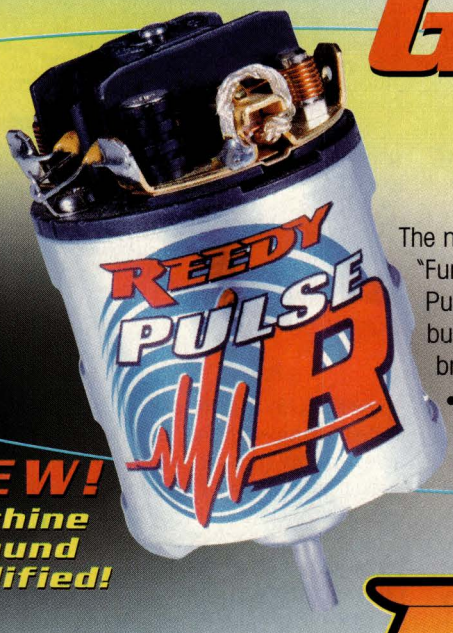
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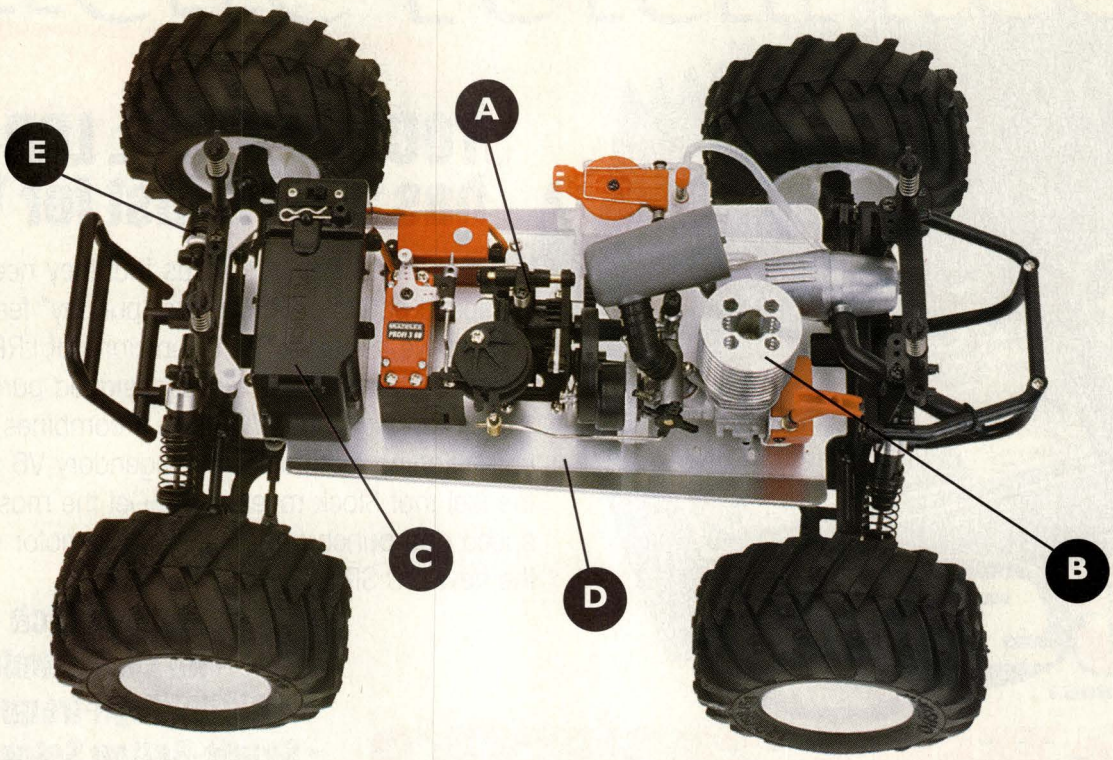
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A: Kyosho's revolutionary QRC (Quick Reverse Clutch) transmission allows both forward and reverse operation with a glow engine.

B: A pull-start Kyosho GS-11X .10 c.i. glow engine is included. Surprisingly, this little powerplant does a good job of motivating the ponderous Snake Bite chassis.

C: A large, semi-sealed radio box is handy for keeping your battery pack and receiver safe from dirt and moisture (to a degree, anyway).

D: The Snake Bite's 2mm-thick aluminum chassis is raised high off the ground by the truck's long-travel suspension, keeping most of the drivetrain and electronics out of the muck.

E: Long-travel, four-wheel independent suspension arms are damped by plastic oil-filled shock absorbers.

with your life. Really, the QRC is like two trannys in one. One tranny has two gears, the other has three. When the truck is traveling forward, it uses the two-gear side of the tranny. When this happens, the top gear spins clockwise, which means that the bottom gear gets spun counterclockwise. When you ask the QRC to shift into reverse, it switches to its three-gear side. The top gear spins in the same direction—clockwise—as before, but this time, there's a middle gear in the mix. The middle gear, or counter gear, spins counterclockwise just like the bottom gear of the forward gearset. The middle gear then spins its bottom gear clockwise—the opposite direction that the bottom gear of the forward gearset spins—to make the wheels spin backwards. Not so complicated when you think about it.

How powerful is the engine?

Powerful enough; it has to be, because Kyosho doesn't recommend that you use any engine but the GS-11X with the QRC tranny. Why is this? Because they feel that the QRC won't stand up to long-term abuse with a bigger, more powerful engine. But don't let this dampen your enthusiasm for the Snake Bite, as the GS-11X, when tuned properly, propels the rather hefty truck at more than adequate speeds.

If you follow the proper procedure for breaking in the engine (see our "Break In" article in the March '99 issue), you'll find, as we have, that the GS-11X will give you good, reliable performance for a long time. If you simply can't wait to get running and bypass the break-in steps, we have no pity on you and your poorly running and slow engine!

Because this is a single-needle carb, you will find that you'll have to run the engine a little on the rich side to avoid overheating, so resist the temptation to extract every last bit of power from the little engine, or you'll cook it. If you want your GS-11X to make more power, the best thing you could do is to replace the restrictive airplane-style muffler with a free-breathing tuned pipe. This will not only allow the engine to make more power, but it will also make it easier to tune.

What's it like to drive the Snake Bite?

Just to clarify things, you need to know that the Snake Bite isn't a racing truck. Rather, it's been designed for backyard exploration and reconnaissance. In this context the Snake Bite rewards you by being particularly adept at low-speed crawling and climbing, and it's no slouch when it comes to making high-speed banzai runs across sandy parking lots and grassy fields (as long as the grass isn't too high). You'll also have a blast jumping small obstacles, but we recommend that you keep the Snake Bite away from monster jumps which could damage the QRC tranny.

When shifting from forward to reverse, you'll quickly learn that the QRC tranny makes plenty of loud, ominous-sounding clunking noises, but don't let this alarm you—it's just the little pin that engages the forward and reverse gears. The only drawback to having the QRC is that you forego brakes. That's right, the Snake is literally unstoppable—but in a not-so-good way! And don't even think

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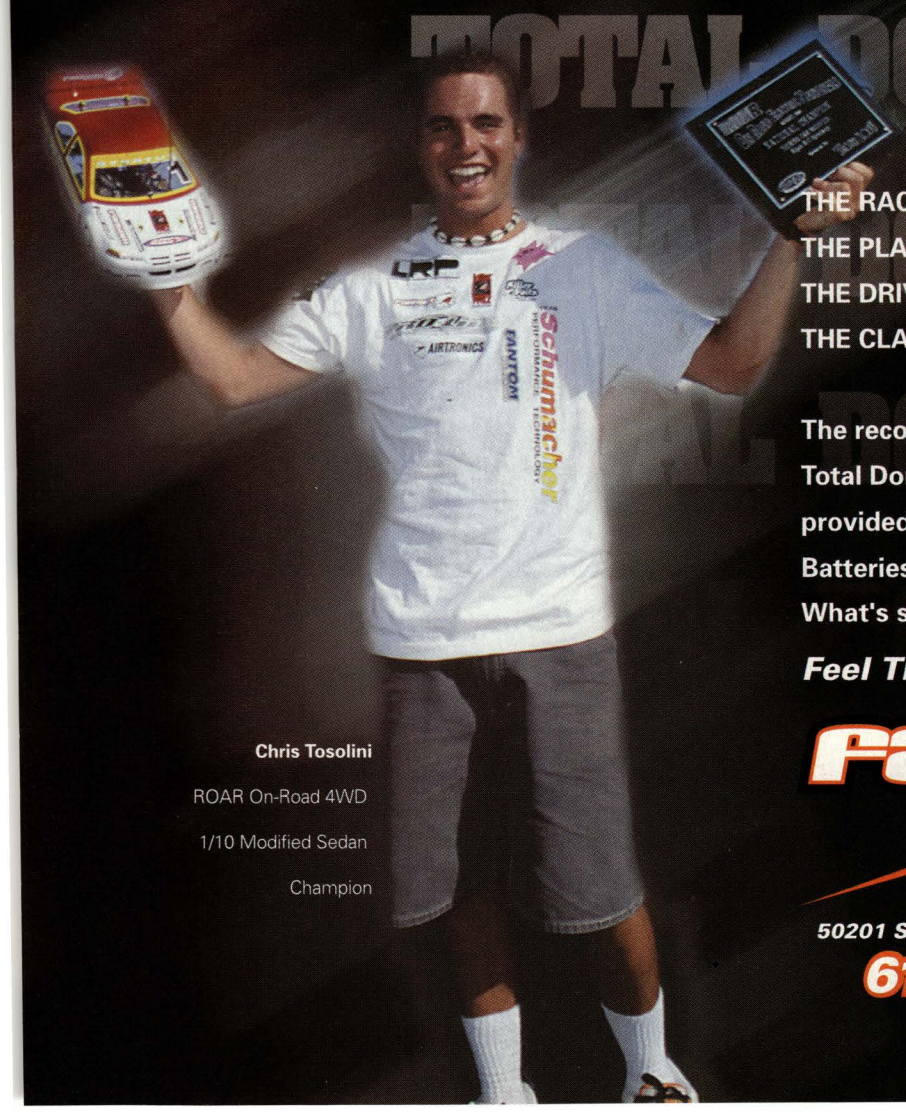
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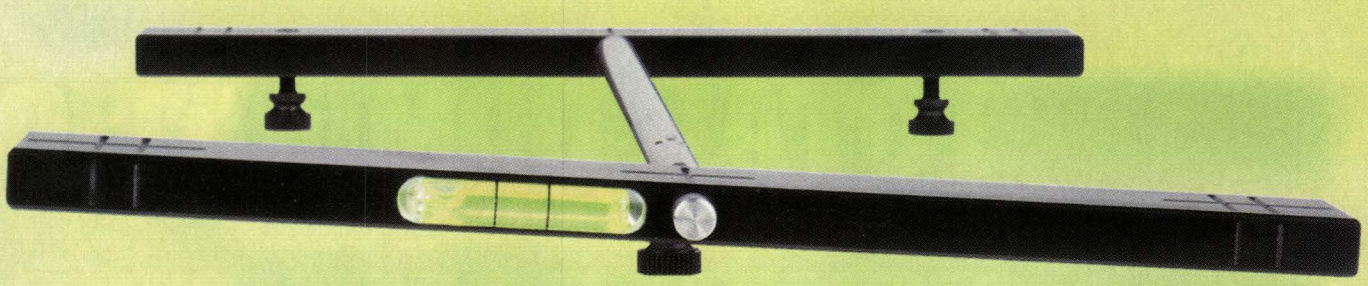
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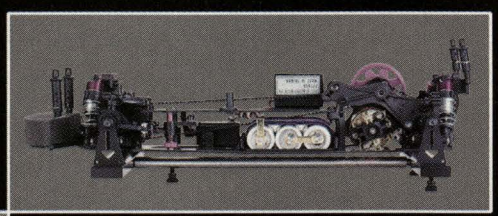
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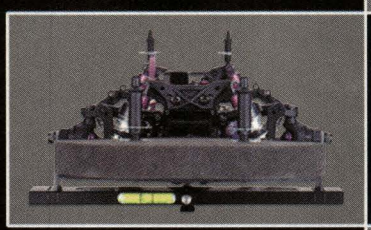


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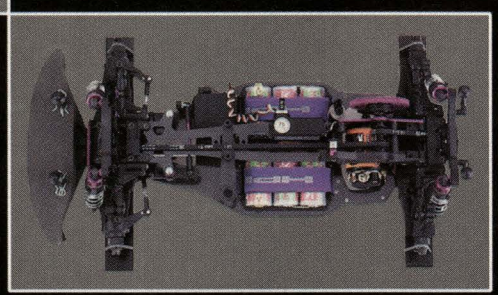


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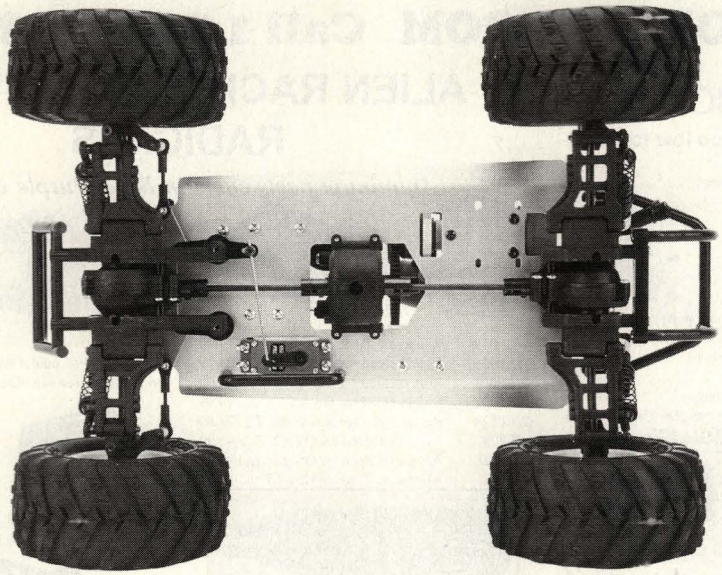
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KYOSHO SNAKE BITE



Type: 1/10-scale nitro-powered 4WD monster truck with reverse

Manufacturer: Kyosho, distributed by Great Planes Model Distributors, 2904 Research Rd., Champaign, IL 61826-9021 • phone (217) 398-6300; fax (217) 398-0008

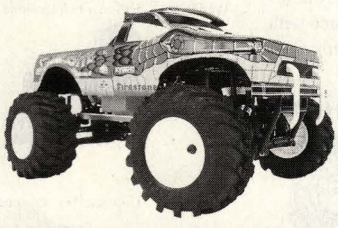
Price: $399.99

What you get: Complete rolling chassis with Kyosho GS-11X pull-start engine. *You must by a two-channel radio, fuel, glow-igniter and paint to finish this kit.*

Includes: Kyosho GS-11X engine w/recoil start

Length ..... 15.7 in/400 mm
Width ..... 11.4 in/290 mm
Wheelbase ..... 10.4 in/264 mm
Weight ..... 4.0 lb/2300 g

The underside of the Snake Bite. Notice how the lower portion of the QRC tranny (middle) protrudes beneath the chassis plate. Driveshafts from the QRC send power to the front and rear differentials to provide full-time 4WD traction.



Deja who? Although we've seen this chassis several times in the past (Kyosho's Baja Beetle and Dodge Ram pickup), the QRC off-road platform takes on a whole new personality when topped with the ferocious-looking Snake Bite body.

What we like

(1) You'll wish that every nitro car or truck you own had reverse! There's no better way to get yourself "unstuck" from a precarious situation.

(2) Kyosho's little GS-11X engine, while not the most potent powerplant on the block, runs like a champ and is easy to get running.

(3) The Snake Bite's large, molded radio box accommodates all types of receivers and batteries, and does an excellent job of keeping out the elements.

(4) C'mon, how many times in your life do you get the chance to drive a truck that has big fangs?

What we don't like

(1) There aren't any brakes! This is the price you must pay to go backwards, we guess...

(2) The kit's steering servo-saver is way too weak. This allows the front wheels to be easily deflected by bumps, causing the steering to seem imprecise and vague. We recommend that you wrap the servo-saver with a tie-strap to stiffen it up.

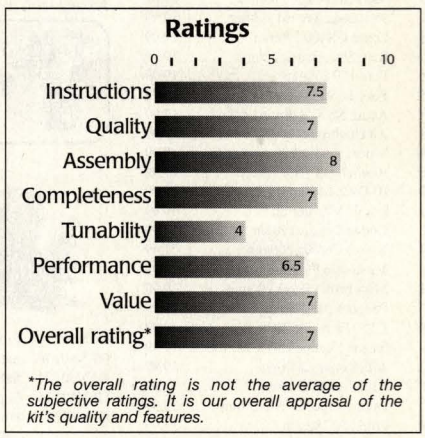
(3) We have never liked the type of muffler that the Snake Bite comes with. They are way too restrictive and can make tuning the engine more difficult. A low-restriction pipe would be so, so welcome.

What we really think

With so many new kits easily falling into convenient categories, we always love new releases such as the Snake Bite that go against convention. To be honest, it shatters convention. The R/C hobby is all about having fun, and it's good to see that companies such as Kyosho always bear this in mind just when things seem to get too serious. It's not a racer, but the Snake Bite will definitely hold its own in the most important arena—the one that most newcomers enter when they buy their first kit. To that Kyosho guy who thought this monster up in the first place—thanks! ◆



Even though the Snake Bite's suspension can trace its ancestry back to an on-road car, special hubs and huge wheels and tires give it all the travel and toughness needed for off-road terrain. We found the Snake Bite to be very rugged when the going gets rough.



**The overall rating is not the average of the subjective ratings. It is our overall appraisal of the kit's quality and features.*

SOURCES

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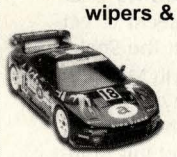
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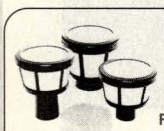


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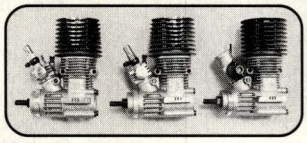
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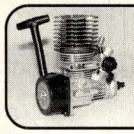
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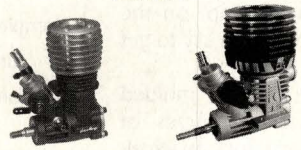
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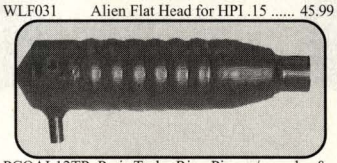
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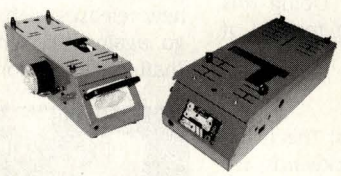
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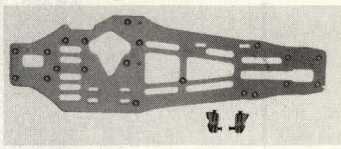


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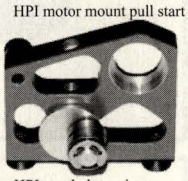
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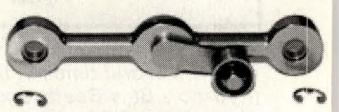
WLF003	HPI motor mount non PS	18.99
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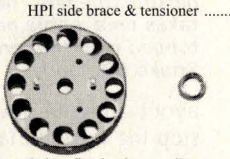
WLF008 HPI rear belt tensioner 33.99



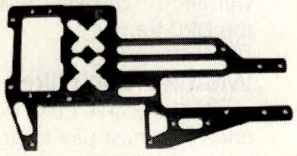
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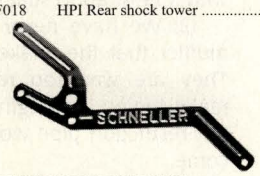
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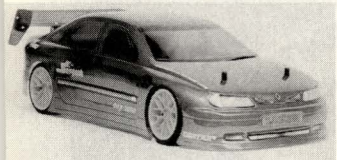
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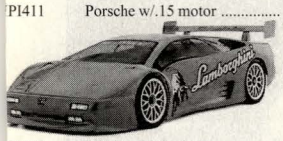


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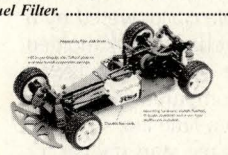


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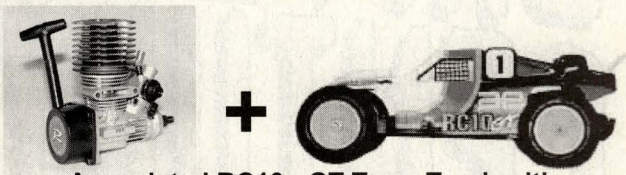
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JOEL JOHNSON: DRIVER OF THE CENTURY!



Why he's our pick for the driver of the Millennium

By John Howell

So why did we pick Joel "Magic" Johnson as our "Driver of the Century"? Was he given this highly prestigious honor because he's won over 30 ROAR National titles? Is it because he's an IFMAR title holder in both on-road and off-road? Is it because he can race just about anything on wheels? Well, partially, but that's not the entire reason. You see, we here at the magazine agreed that Joel deserved this honor not only because he is one of the most talented drivers in the world, but also because his good-natured attitude makes him one of the best ambassadors our hobby has ever seen.

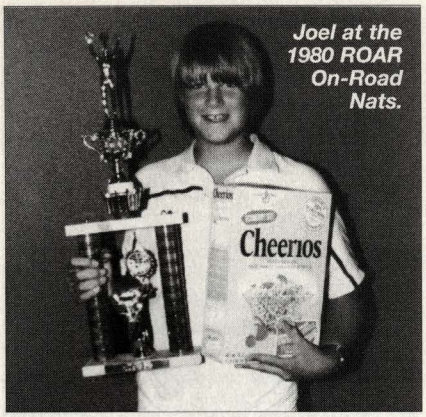
Recently I attended the ROAR On-Road Nationals in Ripon, California where Joel claimed his latest 1/12 scale and 1/10 scale Modified titles. Both victories proved that he truly is one of the best drivers out there today—and has been for many years. What impressed me even more, though, was what happened after the trophy presentation.

As people packed up to go home, many stopped by Joel's pit area on their way out to congratulate him. I just stood there and watched as person after person came up and shook his hand. Each time, Joel stood up from his chair, firmly grasped their hand, smiled and thanked them for taking the time to stop by. And to the people that helped him throughout the weekend, he was quick to thank them for all their support—if you picked up a body clip for him that he dropped, he would make you feel like you wrenched on his car for him all weekend long. That's just how he is. And it's been that way for years. Simply put, Joel has always been a class act.

Flashback to the '70s

Joel got his start in R/C in the early '70s when he was just a kid growing up in the Bay Area in Northern California. "Back in 1975 my Dad owned a hobby shop called Hobbies Galore and I was around eight years old when I got my first R/C car. It was a Jomac 1/12-scale car powered by a Cox .049 engine and it had a thick molded Lexan chassis and a really thick Lexan body—it was a brick compared to what we drive today! I was just a little kid, so I used to beg people to help me start my car for me so I could run out in front of our hobby shop. Early on I couldn't wait to get home from school every day so I could run my R/C car—it was like an addiction. I would literally wear out a set of tires in a day," says Joel.

And it didn't take long for the racing bug to bite him. "I saw my first race in '75—it was a big 1/12-scale race in the Bay Area and once I saw it I was hooked. My Dad told me he'd build me a car to race at the next big race. When that happened, I was like any typical kid starting out—I was banging the boards, barely able to get the car around the track." Soon afterwards



Joel at the 1980 ROAR On-Road Nats.

though, with a lot of practice under his belt, Joel was winning local series races near his hometown. He went on to win the 12-and-Under Junior class in the series four years in a row.

By this time the '80s were fast approaching and the on-road racing scene was rapidly changing. On-road gas racing was beginning to phase out and was being replaced by the more popular 1/12-scale electric segment. 1980 saw the release of Team Associated's new 1/12-scale racer and the hobby underwent a serious racing craze that has yet to slow down. "I raced my first 1/12-scale Nationals in 1980 and raced for MRP. Gary Kyes, who worked for MRP at the time, was the first person in the industry to give me a sponsorship. I was 12 at the time and I managed to make it into all the B-mains at my first big race." Soon after, Joel's racing career would take a turn in a whole new direction and launch an "epic" career.

Moving into the big leagues

After placing well in his first National event, Joel was approached by a friend about a potential sponsor from the east coast. Going on the friend's advice, 12-year-old Joel picked up the phone and placed a call back to New Jersey—a call that would ultimately affect his life to this very day. Joel recalls the way he and long-time friend Ernie Provetti first met. "Well, in between my first Nats and the next Nationals in '81, my friend Jim Agguire hooked me up with Ernie Provetti from Trinity. My buddy Jim knew about Ernie's slot car racing background, and he heard that he was getting into the R/C market. He gave me his number, and I called Ernie and shortly afterwards he sent me the coolest-looking motors I had ever seen.

"Somehow my Dad managed to convince my Mom that it was okay to let their 12-year-old son fly across the country to Massachusetts to race in the Nationals as long as Gary Kyes was with me. So MRP flew me out to Ratty's Raceway back east, and that's where I met Tony P. and Ernie Provetti of Trinity Products for the very first time. This was also the first National where Team Associated was out in full force with their on-road team. I remember Ernie

Ernie Provetti, CEO Trinity Products

What can I say that has not already been said about Joel "Magic" Johnson. I have known him since he was 11 years old. He has more talent than any R/C racer I have ever seen. He raced in an era of competition that does not exist today. In these modern times, people race very infrequently. Back in the day, people raced every day. The talent level was higher and there were more "top dogs." At a given race, you could have Kent Clausen, Mike Lavacot, Ralph Burch, Gary Keyes, Repete Fuscso, Tony Neisinger, Art Carbonell etc. etc. This was an era when everyone in the main was a superstar, and Joel Johnson dominated this era.

Ten years later, in this era, he is still dominating (just winning both the 1/10th and 1/12th ROAR National Championships). He is still the only R/C racer to ever win a World Championship without qualifying for the team. He qualified for the '89 Off-Road World Championships as an alternate (since he does not really race off-road). He went on to dominate that race and take the upset win at the World Championships.

He races in a country (USA) which is the biggest R/C market in the world. No offense to others, but he does not race in Japan where he "races against himself" or Europe (where there are one or two superstars). He has taken the best the USA could offer for 20 years...and he still dominates.

To say he is special does not really speak of his talent. That goes without saying. He is the most unselfish driver I have ever met. He races within the team. He is a professional in every sense of the word. He is the greatest ambassador for our sport that R/C racing has ever experienced.

My favorite story about Joel is the 1984 All-Japan National Championships. I believe he was 14 at this time. He was the clear favorite to win the IFMAR World Championships that year in Denmark. 1/12th scale was his class! It was a given from most experts that he would have won the title, had it not been for me asking him to skip that race and go to Japan so I might be able to "import my own motor." I remember his response as clear today as it was 15 years ago. "Joel, I need you to skip the Worlds. I hope you understand." His response? "Whatever is best for Trinity." Unselfish and professional. He went on to dominate the All-Japan Championships and basically built Trinity's company in the process. I will never forget this.

There is one other thing I will never forget; how proud I am to be able to know him, watch him grow up and evolve and to be able to call him my friend. Joel is a man today, but in my book he was a man when I met him when he was 11. He was special then and he is special today. Anyone who was ever privileged enough to meet Joel's dad (Gary, affectionately known as the "Boat Guy") understands why Joel is so special. He was "one of the good guys," as is Joel!

We are all lucky to have witnessed Joel's greatness whether it be on the track or just having a conversation with him. Congratulations, my friend....you are truly the "Racer of the Century." ●



Joel's Dad Gary designed one of the first "competitive" on-road cars in his hobby shop in Northern California—the HG Special.

JOEL JOHNSON: DRIVER OF THE CENTURY!

coming in, looking around at Team Associated's organized pit tents, box vans, etc. and then looking at 12-year old me as his only driver. He was shaking his head wondering if he was ever gonna make it. Luckily for him, and me, I went out and won both the Stock 4-cell and Stock 6-cell National title. I also finished fourth in the production class, third in Mod 6-cell, and second in Mod 4-cell which also happened to be my first modified races. The '81 Nationals helped put him and I both "on the map," so to speak."

Both have come a long way since the '81 Nationals—Joel is now one of, if not the most recognized and respected R/C racers in the world and with his help, Trinity Products Inc. quickly grew into a Fortune 500 company.

Gil Losi Jr., Team Losi

Beside being a good friend and about the nicest guy you'll ever meet, Joel is the best test/development driver I have ever worked with. Everyone will tell you about all the races he has won, but his greatest talent is his positive attitude and work ethic when things aren't going well. Joel doesn't let adversity get him down; instead, he just works harder to get things better. Joel has an ability to enjoy and take advantage of the mental side of main event racing. He always seems to make mid-lap or mid-race decisions to achieve the best possible outcome. He always seems to get the most out of his equipment. Joel really loves the hobby and is quick to do what is best for the sport, even if it is not in his own best interest. I don't think many people know or can appreciate the role Joel (like his dad, Gary) has played in developing modern day racing in Northern California. In conjunction with Castle Hobbies and a club he started, Joel has been running sedan and electric on-road races for years. When he's not running the races he is usually helping the racers with their problems.

Congratulations Joel, I look forward to many more good times together. ●



Ralph Burch, Joel Johnson, and Mike Lavacot at the '82 ROAR On-Road Nats in Indianapolis.

Mike Reedy, Reedy Modifieds/Team Associated

I have known Joel since he was a 12-year-old youngster learning the ways of R/C racing under the guidance of Gary Kyes. Even at that early age, Joel was very competitive—particularly in 1/12 scale. Through the years Joel has been a dominant force in any form of racing he's participated in. The fact that Joel has won more ROAR National titles than you can count and several World titles has made him one of the best-known R/C racers in the world.

Joel's specialty has been 1/12 scale where he acquired the title of "Magic," but to me, the class he shines in is oval racing. He might not lead the early laps, but nobody is a smarter driver and he is right there in the end.

One thing Joel does not get a lot of credit for, but I think is as important as his race record, is the image he projects. He has been a good representative for R/C racing through the years and I have enjoyed the competition with him and look forward to more in the future! ●

Gil "Pops" Losi, Team Losi

Joel Who? I first met Joel at the 1/12 World Championships in Anaheim during the early 80's. He was with Gary Kyes and the MRP team. Although he didn't win (Art Carbonell won, I think) you could see that with his smooth driving style and super fast lap times he would be an awesome force in the future. I think we (Team Losi) hooked up with Joel when Gil Jr. designed the Reflex 1/12 car (which became the 12L) that Joel used to dominate in Cleveland. Joel is such a great driver that in addition to his on-road championships, he won the Off-Road Worlds in Romsey with a Kyosho car and then top qualified and almost won the Worlds for Team Losi in Basildon, England.

Joel has won countless World and National Championships, but more importantly has always been a great friend of Jr. and myself. He has always busted his rear to help develop and support our products. I will always be thankful for his help with the Street Weapon and the World Championship he helped it win. All of this support from Joel was out of friendship.

The most memorable event in my brief R/C career was beating Joel at the first IFMAR Off-Road Worlds. Hey Joel, remember this? "Magic Man he goes fast but Pops Losi kicked his ass." Joel showed them at Ripon that the legend continues. I'm sure it will go on for a long time. Congratulations Joel, thanks for everything—you deserve it! ●

Tony P., President, Trinity Products Inc.

Joel was very important in the early growth and meteoric rise of Trinity from a small three person "garage" business to one of the leaders in the industry in a very short time. Joel was so good that he could win against the might of the then all-conquering Team Associated, which was unheard of at the time.

I remember the first Nationals we ever attended, (at Ratty's Raceway in Massachusetts) and Joel, then 13 years old, had a single GE and a single Sanyo battery pack. He used these two packs for all the heats and mains at the Nats and came home with our first two National titles. What makes this even more amazing is Sanyo's were new at the time and they worked best on the first charge. The Associated guys were using a new set of batteries each run.

Joel was truly amazing on the track and winning all those races gave us credibility and a marketing tool for our motors. He probably cut five years off the time it would have taken for our business to get where it is now.

Joel is also responsible for the team drivers actually being paid for their talents. Joel was the first paid "professional" driver. He paved the way for talented drivers to actually be able to earn a living doing what they do best. Before Joel, drivers just received their race expenses and parts. All the team drivers had to work jobs and race in their spare time. Joel changed all that. R/C is a sport, not a hobby, on the level that drivers like Joel, Kinwald and the rest compete. They make it possible for R/C companies to prosper. They deserve to be compensated for their efforts. Joel opened the door for everyone who has come after him. ●

Joel's Epic Adventure in Japan

1	JOEL JOHNSON	㉝ 8°11'76
2	堀 正宏	㉝ 8°11'19
3	愛澤隆志	㉝ 8°15'95
4	鞍橋 等	㉜ 8°01'38
5	井達六男	㉜ 8°02'00
	水越康之	㉜ 8°03'06

Most of us in the industry have been very lucky to hear one of the best racing stories ever told. It involves a young Joel Johnson and Ernie Provetti of Trinity flying to Japan in an effort to get their foot in the door to be able to import their own motors into the U.S.—a move that effectively would make or break Trinity Products. All Joel had to do to get an audience with Mr. Suzuki at Kyosho was to enter and win the Japanese On-Road Nationals. At one point the race wasn't going their way—simply put, it was a disaster for them. How bad was it? Well, going into the last qualifier, Ernie turned to Joel and said "no pressure, kid, but my entire life depends on these next eight minutes." We'll let Joel tell you the rest:

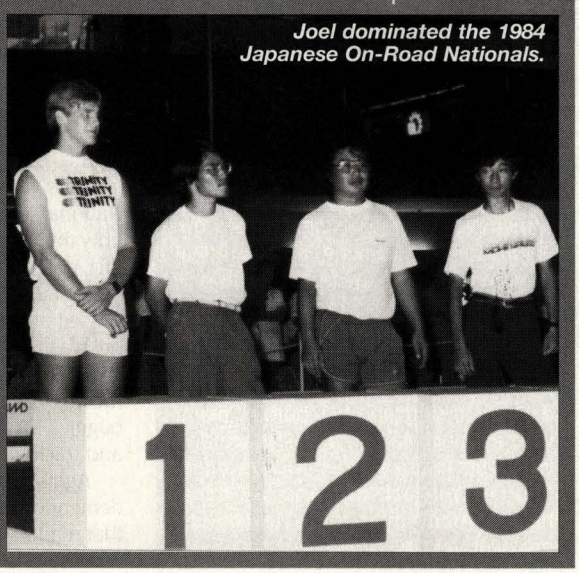
"This was a bittersweet trip for me in that I was missing a World Championship to race in the Japanese Nationals, but I also understood that this was an important race for Trinity as well. The trip was ultimately to see if Trinity could get import rights to their own motor which would set the company up for great success.

"From the minute we arrived at the race I knew we were in for a tough time. The problem was the language barrier. While we had an interpreter, he wasn't always next to me. This made it tough to figure out when it was time for me to practice, what heat I was in or even when to start the heat. Everyone seemed to be doing his or her best to help us out, but it was still trying at best.

"Since this was the first time that the Japanese had held their Nationals on carpet I knew we would have a slight advantage going into the race and we would need it. If I remember correctly there were three rounds of qualifying and we missed the first one because we had no idea we were supposed to be racing. The second heat ended in disaster when the right front stub axle broke while going down the straightaway. So it was down to the last round of qualifying. Our luck held out and we ended up TQ'ing by quite a margin. One of two missions was accomplished. We showed we were fast, now we had to win the event.

"The buzzer went off for the A-main and I jumped into the early lead, now our whole trip depended on the next eight minutes. One thing that the Japanese did that I had never experienced was the playing of music over the PA while the race was running. This was slightly disturbing, but they were playing "Footloose" and it was the mid '80s! As the song ended at the 3-minute mark, and I suddenly realized that I would have to hear this another two times. I liked the song, but not that much. Well, the rest of the eight minutes went according to plan except for getting knocked over the boards and losing half a lap, but we came home the big winners at the Japanese Nationals.

"This win opened all sorts of doors at Japanese manufacturers and as they say, 'the rest is history.' While that may have been my year to win a 1/12 World Championship, the effect that race had on Trinity and myself was well worth the missed opportunity. I had a great experience with the Japanese on that trip and also learned for the first time about the business side to the sport as well." ●



Joel dominated the 1984 Japanese On-Road Nationals.

Team Losi Tech-Talk

Threaded Shock Body Nuts

Many of you are no doubt using Team Losi's threaded shock bodies at this point. Some of you may have found the adjusting nuts to move a bit too easily. If this is the case, there is a simple solution to tighten the nuts. Simply touch the tip of a hot soldering iron to the threaded surface inside the adjustment nut. You will only need to touch the iron to the nut for a second, and very lightly. The objective is to slightly deform the threads in one area of the nut so the nut will function as a locknut. This will hold the adjustment nuts firmly in place once installed on the shock bodies, but still allow for easy adjustments.

Center the Steering

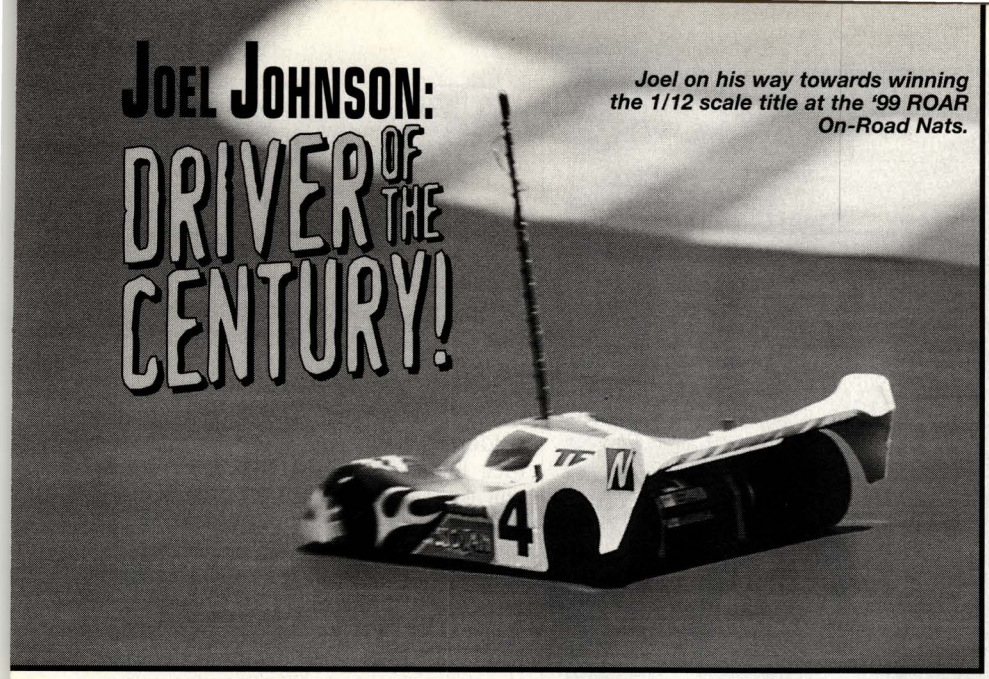
The steering assembly on the new Triple-X car is neatly packaged to be concealed between the chassis and the front bulkhead. While this makes for a very low maintenance and well-protected design, if the directions are not followed while assembling the car the amount of steering to the left and right can be different. It is important to make sure that when the wheels are pointing straight that both steering bellcranks are centered in the chassis. If the bellcranks are off to the left or the right, steering throw will be increased in one direction. This will cause the car to turn more to the left or the right – depending on which way the bellcranks are off.

Excessive Steering Throw

In the past, many racers would crank excessive steering throw into their cars. In other words, even though the steering spindle was against the stop, racers would crank a bit more steering throw in the transmitter to ensure that there would be no tire wobble in the turns. This is simply not necessary with the Triple-X. Due to the design of the steering mechanism of the Triple-X, there is virtually no bump-steer in the car. What this means is that if the spindle is against the stop at one point of the suspension travel, the spindle will remain against the stop throughout the range of travel. Increasing steering throw beyond the point at which the spindle reaches the stop will only cause the front suspension to bind and can actually decrease steering on the track.

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JOEL JOHNSON: DRIVER OF THE CENTURY!



Joel on his way towards winning the 1/12 scale title at the '99 ROAR On-Road Nats.

Jack Johnson, Team Losi

I have had the pleasure of knowing Joel for many years now. First, let's set the record straight. I can't tell you how many times I have been asked if Joel and I are related. The answer is no—not that I would be ashamed to be related to one of the greatest racers in the sport!

Joel is one of the only racers still active that I can remember racing when I got started racing R/C cars all the way back in the late '70s. Yeah, I know, that's a long time ago. Somehow Joel has managed to maintain a great attitude about racing throughout the years. He has managed to remember that when all is said and done, the sport of racing R/C cars is supposed to be fun. That's not to say that Joel isn't competitive. His track record unequivocally proves that Joel is a competitor, and a damn good one at that.

Even though Joel has won more national titles than any other person on the face of the planet, he has remained level-headed. He is one of the most approachable factory drivers at any race and is always willing to lend a hand to a fellow competitor. Joel will also remember and sincerely thank anyone who may have helped him at a particular event. Joel takes nothing for granted and truly appreciates any assistance he receives.

The bottom line is that our sport could use more enthusiasts like Joel. In this day where most team racers' attitudes seem to be, "What have you done for me lately?", Joel continues to have the attitude of, "What can I do to help"? I whole-heartedly support *R/C Car's* selection of Joel Johnson as Racer of the Century. ●

Tyree Phillips, Novak Electronics

I remember when I first met Joel Johnson. It was at the US indoor Championships. Joel was 13 years old and driving an MRP 1/12th car. I introduced myself to him as I was walking by his hotel room. I think he struggled at Cleveland that year. Who would have thought that Joel would win most of the U.S. Indoor Championships from that point on. Simply amazing!

Joel and I have raced together as teammates and competitors. When we were competing at the first 1/10th On-Road World Championships in Pomona, we worked well together as teammates. I can think of no better person to have as a teammate in that type of situation. Information was shared freely and because of that Trinity won that Worlds—Joel finished first and I finished second. It's funny but I didn't mind losing a World Championship to Joel.

These days I am one of Joel's sponsors. From a professional point of view I can say that any company would love to have Joel associated with them. He has a clue about how the promotional side of the business works. You never see Joel in the middle of compromising situations. There are full-size race drivers who are making a great deal more money that always seem to find themselves in compromising situations. They should take a page out of Joel's book.

Overall, I think anyone will find it difficult to find another human being with as much talent, poise, grace and competitiveness as Joel. It is also cool that he likes jazz, too! And just think, he has many more races to win—it's not over yet! ●

Gary Kyes, Team Losi

I don't know of a nicer, more talented young man. I've known Joel since he was six years old. At age eight or so his father allowed me to start taking him to "big" races and the "little kid" from Cambell, California, has been winning races ever since. Joel is a shining example of how R/C racing can be a positive influence on a youngster's life. With the support of his family, friends, and industry supporters Joel has realized spectacular accomplishments but more importantly he has been a role model for young racers and learned a lot about life. Joel has continued his education and become part of the hi-tech computer industry. The same dedication, concentrated focus, and preparation Joel developed through his R/C racing obviously aided him greatly in his journey into adulthood. Although he is now married and working full time, he is still the best active all-round racer I know. Congratulations, kid! ●



Joel, getting an early start back in 1975.

Racing ever since...

Since he started his R/C racing career in the early '70s, Joel has accomplished many feats. Amazingly, this on-road specialist also holds a 2WD IFMAR Off-Road title (Romsey, England 1997, with a Kyosho Ultima.) In addition, he also has a 1/10-scale IFMAR On-Road title (Pomona, California, 1992, with a Trinity Evolution 10), and he holds the first-ever PROCAR Oval World Championship title (King, North Carolina, with a Trinity Evolution 10ss). Joel has an impressive 33 or 34 ROAR On-Road National titles (even he can't remember how many he has anymore!). As a matter of fact, going all the way back since he started racing at the Nationals in 1980, he has only missed one Nats event—back in 1994 when he was getting married to his wife Julie. Over the years, Joel has also successfully raced 1/8-scale on-road and 4WD off-road buggies, 2WD and 4WD off-road buggies, and trucks.

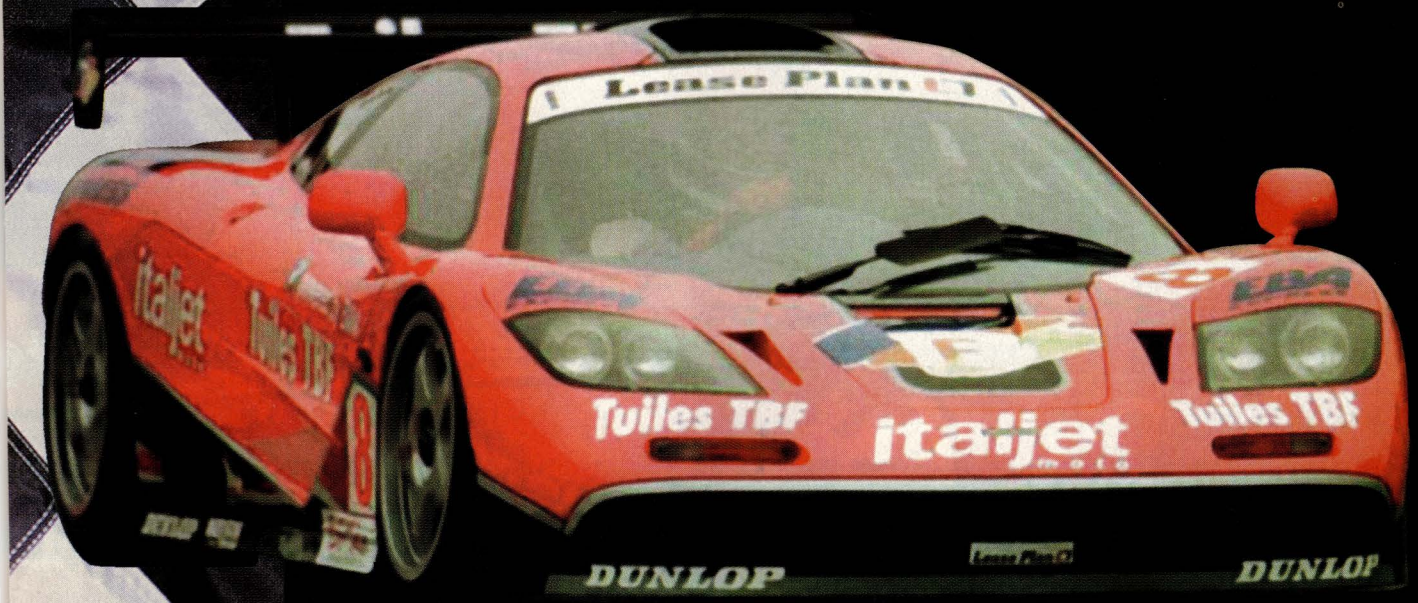
Again, though, it's his good-natured demeanor and positive off-track attitude that made our pick for Driver of the Century an easy one—our congratulations, Joel! ◆

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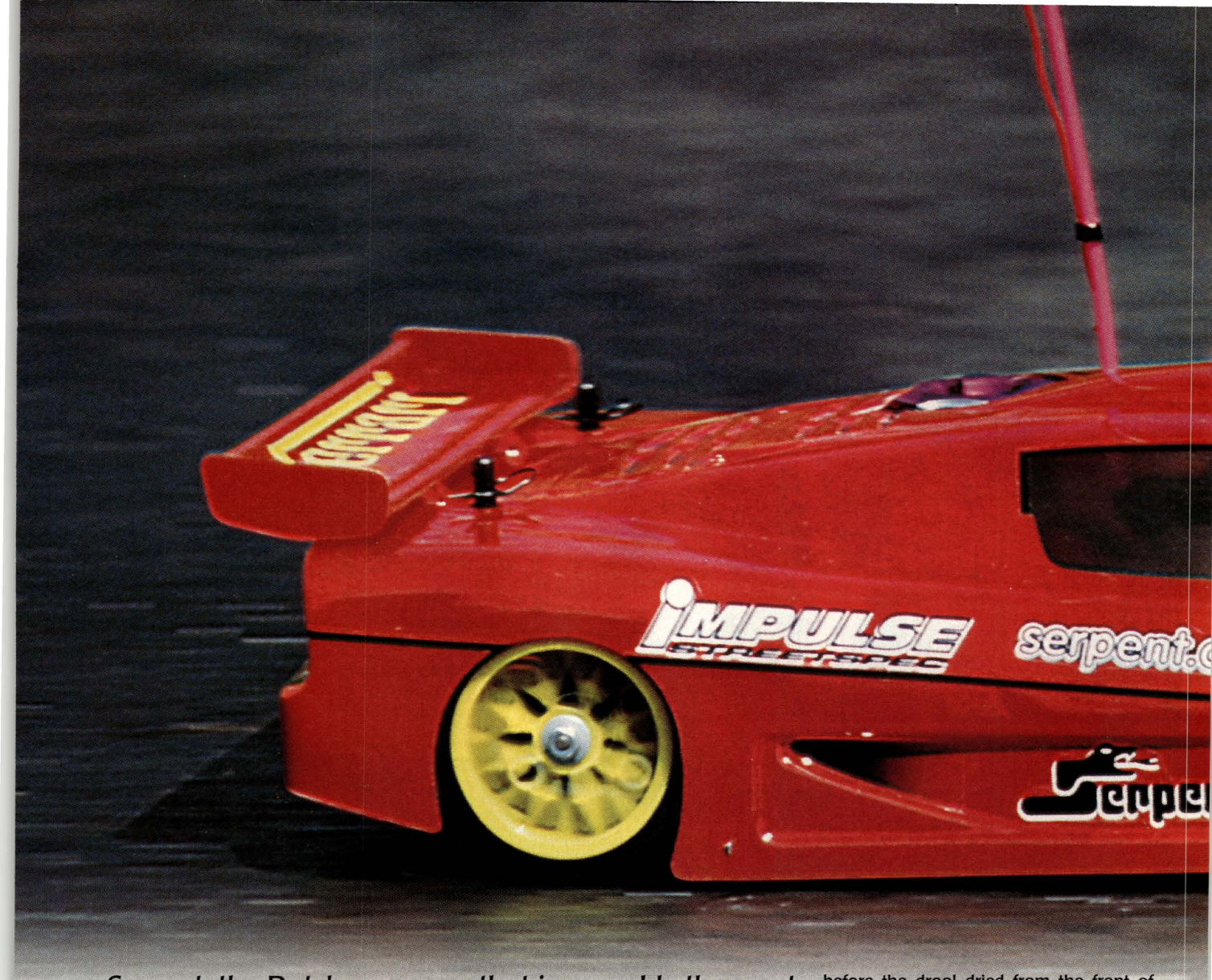
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Serpent, the Dutch company that is arguably the most respected name in nitro-powered road racing, has finally commenced production of their long-awaited 1/10-scale nitro touring car. This new car, called the Impulse Streetspec, was first unveiled last year with a prototype that stirred much interest on the hobby show circuit. Its lineage included the 1/10-scale Impact series and the 1/8-scale Vector series.

The impulse was originally scheduled to be released this past Spring, but this target got pushed back, as targets tend to be with new cars. Michael Salven and the Serpent team wanted to fine tune the chassis and to make sure that the Impulse not only met Serpent's own high standards, but also that of the buying public who associate the Serpent name with the very best in engineering design. Status reports and updates kept the anxious public abreast of the latest developments on Serpent's website, The Serpent Network *(http://www.serpent.nl)*. After almost a year of anticipation, the Impulse is finally here!

Inside the snakepit

From the moment we opened up the metallic-silver-lettering-on-matte-black box top, we knew that it would be a while before the drool dried from the front of our shirts. We first perused the manual that Serpent produced, which is undoubtedly the finest made and which impressed us all. Large full-color step-by-step diagrams taken directly from the production CAD images are organized neatly into 11 steps. Eight whole pages are dedicated to setup and tuning and contain full-color photos of all the adjustments.

The main box contained three separate boxes; one for the tires, wheels and inserts, one for the neatly bagged parts and hardware, and one for the Nova MEGA SX-12 engine that is built for Serpent by Italy's Novarossi. A collective "Oooooohhh!" came from all of us who were gathered around to see what was in this kit, as we were all aware of the power that would come from this famed powerplant, the fraternal twin of Novarossi's C-12. We had a feeling that we were going to have fun with this one!

Now that is a suspension

The main thing that sets this car apart from the majority of the nitro touring car

Serpent Impulse Streetspec

Sssoo-fast!

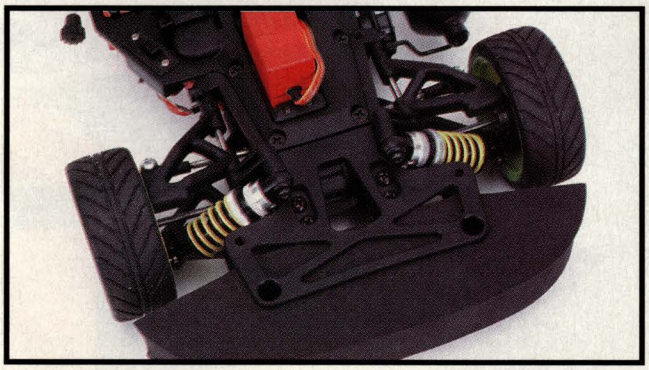
by Lito Reyes



A Hot Bodies Ferrari F50 body tops the Impulse. Find out more about this sexy, low-slung Italian by calling Hot Bodies at (609) 893-7716

field is the robustness of the suspension components. Basically, Serpent took the design from its larger 4WD car, the Impact, and narrowed it to fit on a 200mm chassis. Instead of using hingepin-supported uprights and carriers, the extremities of the arms pivot on 8.5mm "pillow balls."

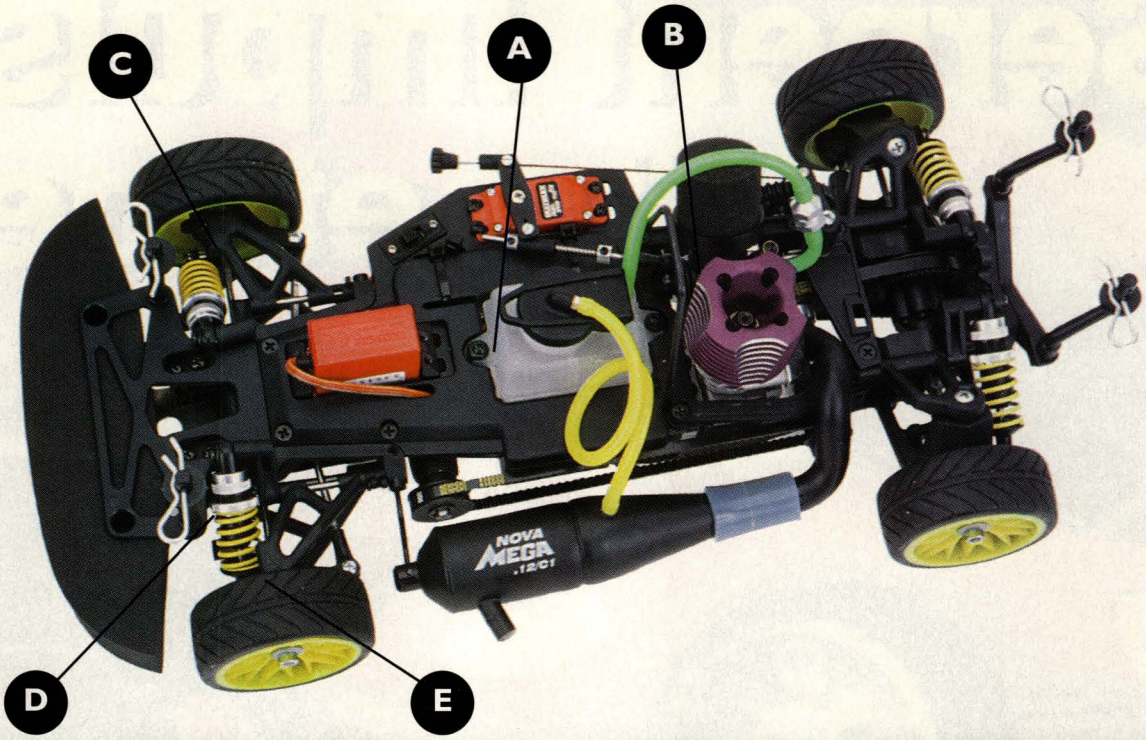
The primary benefits of this style of suspension are adjustability and tight tolerances. Each side of the rear suspension is supported by three pillow balls—two adjustable lower pieces and one fixed one on top. By screwing in or extending the lower balls, camber and toe can be infinitely set to the desired angles. On the front, the pillow ball design eliminates the need for separate carriers and steering blocks. The one-piece blocks have upper and lower balls that are used to change camber setting. The biggest complaint we hear about most touring cars is the amount of "slop" that is inherent in hingepin-based designs on components



My, what a big bumper you have. With the speeds the Impulse can go, a little extra protection is nice. The extremely laid-down shocks help contribute to a low center of gravity. Yes, that's one of Multiplex's trademark bright red-cased servos handling the steering.



A custom manifold had to be designed to clear the left chassis stiffener and middle belt. Maybe that's what took Serpent so long to release this car. No other touring car has suspension parts this solid.



A. Center-mounted fuel tank

B. One h.p.-rated Nova MEGA .12 engine

C. Suspension design taken from Serpent's multi-title-winning Impact and Vector nitro pan cars

D. Externally adjustable laydown shocks.

E. Pillow-ball mounted uprights and steering blocks.

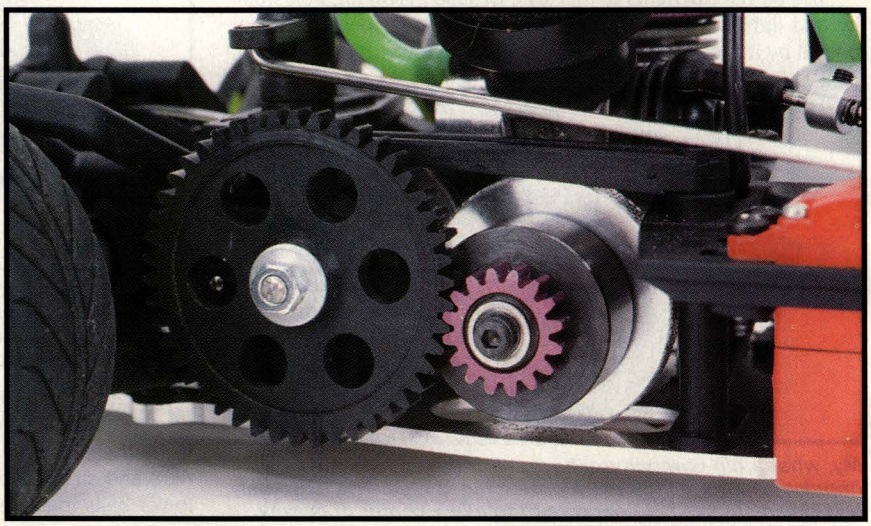
that move on multiple planes. The suspension on the Impulse has *absolutely no slop.*

The parts that do ride on stainless steel hingepins are the upper and lower arms on both ends of the chassis, all molded of a stiff nylon composite. The suspension arms themselves are much deeper and larger than typical touring car arms, which certainly adds to their strength and lack of slop. Three-millimeter set screws that key on pre-ground flat spots secure all four hingepins. On the front, the upper arms can be easily shimmed forward or back on the hingepin to adjust the caster angle from three to 15-degrees. All of the suspension's hingepins mount to the front and rear bulkheads, which are very thick and are made of the same nylon composite that the arms are made from.

Rounding out the suspension are Serpent's oil-filled coil-over shocks. Also molded from nylon composite, they feature threaded bodies for easy and precise track-side adjustments, O-ring lower seals, and externally adjustable piston damping. These unique pistons are comprised of upper and lower disks that snap together. When rotated in one of four positions, holes are opened and closed that let the pistons move through the oil with greater ease or with more effort (given equal compression force). To change the damping, just fully extend the shaft while rotating it in the shock body until it locks. Then you will be able to twist the shaft to one of four detents covering a range of about 60-degrees. Fully counter clockwise is the soft setting (four holes open) and full clockwise is hard (one hole). All four shocks lay down low on the chassis, which contributes to the Impulse's low overall center of gravity.

Kevlar: Bullet-proofing isn't just for vests...

As with most nitro touring cars, the single-speed drivetrain uses a design featuring three belts, all of which are Kevlar-reinforced. The front and rear belts are 5mm



A replaceable aluminum pinion screws onto the machined steel clutch bell. The chassis is a whopping 3mm thick.

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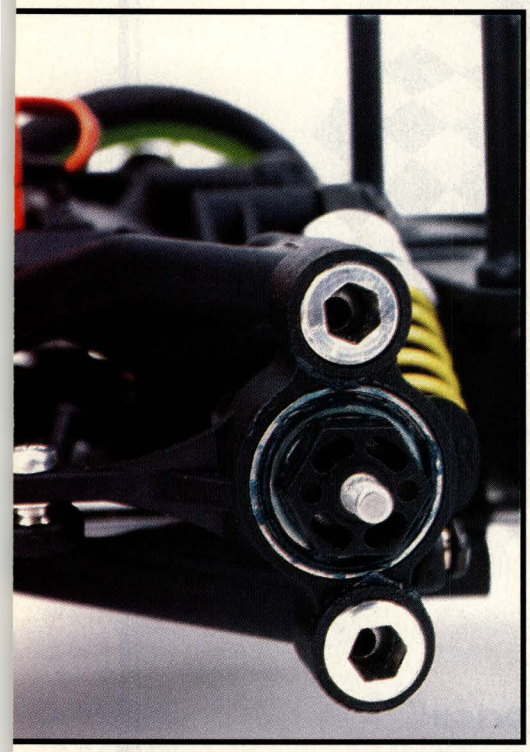
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Right side steering block. Inside the aluminum cap, you can see the pillow-balls. Tighten the upper one to give more negative camber; adjust both equally to slightly alter the car's width.

wide while the middle belt has a width of 4mm. The rear layshaft has one pulley that drives the rear differential and another that drives the side belt. The side belt connects to the front layshaft that connects another belt to the front differential. No belt tensioners are included with the Impulse, as Serpent is confident that the Kevlar reinforcing is not prone to stretching like rubber/fiber-based belts. Although the front and rear differentials are not the same size, the front-to-rear drive ratio is still an even 1:1, due to the sizes of pulleys used to tie the ends together. Both ball differentials use high-tensile steel planetary gears, and are grease-filled to slow down the action. Every rotating part rides on smooth ball bearings.

The narrow lower chassis plate is a CNC-milled piece made from 3mm-thick 7075 T6 aluminum. Finished to a high polish, it has strategically placed cutouts to decrease weight, but is remarkably stiff. The upper deck that connects the front and rear bulkheads is made from more of that molded nylon composite. As expected, the chassis is one of the stiffest available, if not *the* stiffest.

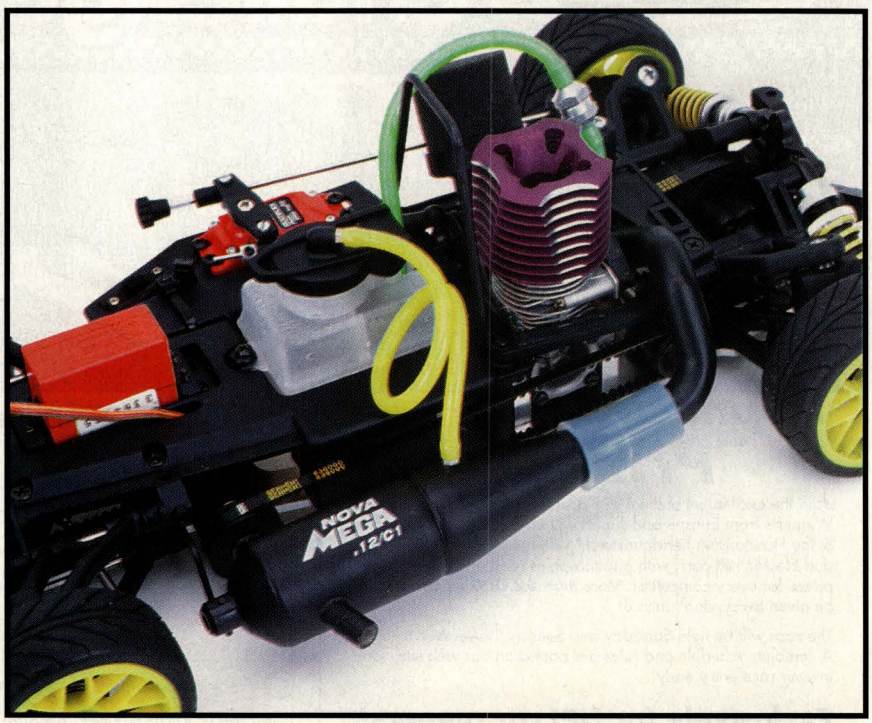
All of the radio gear gets mounted to the upper deck, which includes a molded recess that is made to fit a five-cell, in-line receiver pack perfectly. The fuel tank is also mounted to the upper deck, perfectly on the centerline and nearly exactly between the front and rear wheels. This is so chassis balance will remain the same whether the tank is full or empty. A filter is integrated into the bottom of the tank.

As mentioned above, the powerplant included in our kit is the Novarossi-produced Nova MEGA SX-12 engine. It has ABC construction and includes a specially designed side-exhaust header and a two-chamber pipe. Also included are a machined steel clutch bell, a replaceable anodized aluminum pinion, Teflon/nylon clutch shoes, a slide carburetor, and a foam air filter with filter oil.

To properly take advantage of the potential of the Impulse, we decided to outfit it with some of the highest quality radio gear available. A pair of Multiplex's Profi Speed MC V2 handled the steering and throttle/brake duties. The direct steering design is quick and, again, slop-free. The stainless steel disc brake is activated by a unique brake horn system. An Airtronics M8 transmitter fed radio signals to Hitec's DCX dual-conversion FM receiver. And last, but not least, a Dynamite 5-cell 600mA receiver pack rounded out the running gear.

After following all of the basic adjustments and linkage settings as outlined in the manual, we broke the engine in using a combination of bench-running and low to mid speed runs. After we began to lean out the SX-12, we started to get a feel of what the Impulse is capable of. Before mounting them, we couldn't guess how the stock treaded tires and BBS-style wheels would perform, but they worked pretty well on out an unprepared surface. Once we started to let it loose, it felt like it was pushing a little bit. So we brought it in firmed up the rear by going to the next firmer piston valve adjustment -- without even having to fully remove the shocks from the car! Each click felt like about a 10-weight change in oil. Now the Impulse felt more "on the edge"--this is what we will probably use as a baseline racing setup. Even without swaybars, the Impulse showed very little body roll on our medium traction proving grounds. When compressed by hand, the shocks feel like they might be too soft for this car, but when both ends are working together, the extreme shock angles support and dampen the car well.

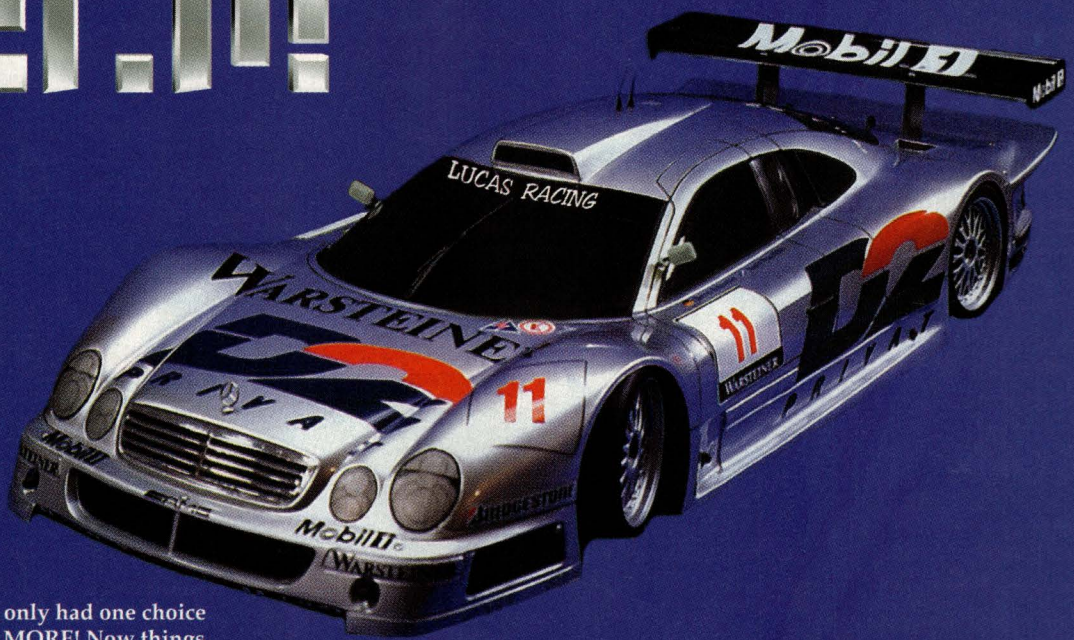
Three things really impressed us about the Impulse's handing. The steering was very precise due to the lack of slop, the direct servo connection, and the pillow-ball design. It also carries speed though the turns like it is on rails and tracks and brakes like a slot car. Its handling belies its weight, though the ponies from the Nova MEGA engine helped). Our other big impression is how "beefy" (to use a well over-used adjective) the suspension is. We're not sure what kind of calamity it would take to break something, but rest assured, we'll do our best to find out in our long-term test of this car.



A dual-chambered tuned pipe keeps the engine running at top performance. Note that the tank has no priming pump. Priming the carb is done by covering the exhaust stinger while turning over the flywheel a few times.

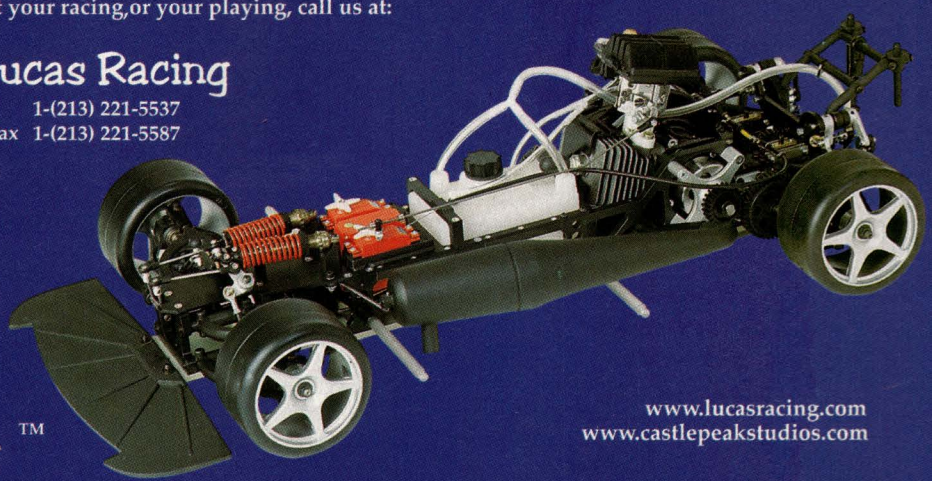
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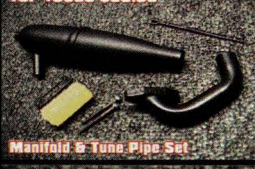
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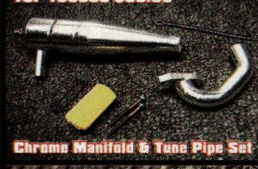
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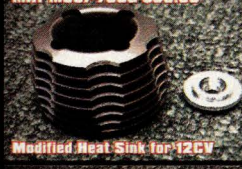
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TOP T3806 $39.95



Front Gear Box for RS4 Series

TOP T3819 $19.95



Castor Block for RS4 Series

TOP T3810 $19.95



Rear Arm for RS4 Series

TOP T3809 $19.95



Front Arm for RS4 Series

TOP T3807 $39.95



Rear Gear Box for RS4 Series

TOP T3813 $39.95



Rear Block for Nitro RS4 Series

TOP T3814 $19.95



Rear Hub Carrier for RS4 Series

TOP T3812 $19.95



Center Block for Nitro RS4 Series

TOP T3815 $19.95



Steering Block for RS4 Series

TOP T3811 $19.95



Steering Bell Crank for RS4 Series

INT E2005 $45.99



High Current 20A Pack Discharger

INT C22301 $29.95

0.05"
1/16"
3/32"
5/64"
1.5mm
2.5mm



Titanium Hex Wrench Set (6pcs)

TOP T3843 $39.95
(Inch & mm)



Precision Dual Dial Caliper

TOP T3381 $2.50



24mm BBS16 Wheel 0mm Offset

TOP T3397(M) $3.99



Medium Molded Tire Insert 24mm

EAG EMODL M003 $79.00



Diamond Bit $65.00
55T Motor $29.00

EAG 1261 $25.99



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EAG 1262 (8 degree) $25.99



Castor Block for Pro2 Series

EAG 1263 $25.99



Front Arm for Pro2 Series

EAG 1264 (2 degree) $25.99



Rear Hub Carrier for Pro2 Series

EAG 1265 $25.99



Rear Arm for Pro2 Series

EAG 1257(F) $15.99
EAG 1258(R) $19.99

Shock Tower for Pro2 Series

VESC Matched Panasonic 3000

510s-519s	1.17V	1.16V	$39.95
520s-529s	1.17V	1.16V	$44.95
520s-529s	1.19V	1.20V	$65.95
530s-540s	1.17V	1.18V	$49.95
530s-540s	1.19V	1.20V	$69.95
540s-550s	1.17V	1.18V	$64.95
540s-550s	1.19V	1.20V	$74.95

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380s-384s	1.16V+		$65.95
385s-389s	1.14V	1.15V	$49.95
385s-389s	1.16V+		$69.95
390s+	1.14V	1.15V	$64.95
390s+	1.16V+		$74.95

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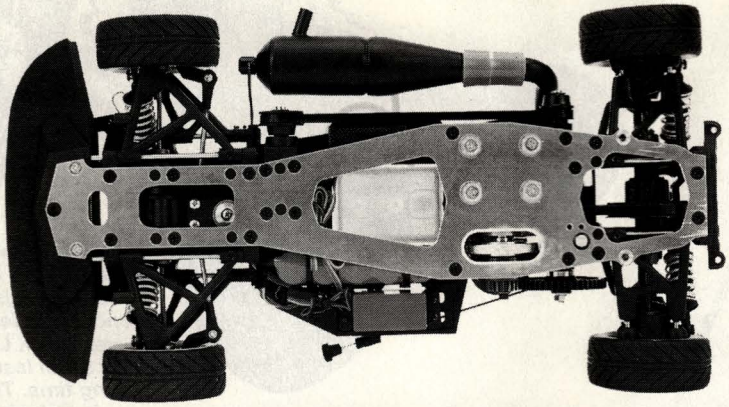
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SERPENT IMPULSE STREETSPEC



Type: 1/10-scale 4WD nitro touring sedan chassis

Manufacturer: Serpent USA, 2832 NW 79th Ave, Miami, FL 33132 • phone (305) 639-9665; fax (305) 639-9658

Price: Complete kit w/engine—$400; w/o engine—$260 (est. 'street' prices).

What you get: Complete rolling chassis kit. Required Items: two-channel radio system with two servos, body, polycarbonate paint, CA adhesive for the tires

Length 14.5 in/370mm
Width (F;R)7.7 in/196mm; 7.8 in/199mm
Wheelbase.....10 in/257mm
Weight.....1400 to 1600 g. (race-ready)

What We Don't Like

(1) As much as we love the manual, the parts could be bagged a bit better. Having all the related hardware for every step bagged together would be really helpful.

(2) Because there are no parts trees with reference numbers, careful attention is sometimes required to make sure you are using the right part for the step.

(3) The car is fairly heavy. But that is the concession that was made to produce a car that is built like a tank.

(4) The brake cam extends about 1mm below the chassis line and is prone to dragging on the running surface. Otherwise, everything else is flush with the bottom.

(5) The brake rod extends almost out to the wheels. We're afraid that a T-bone accident might damage that linkage.

(6) Turnbuckle tie rods are not included for the steering links.

What we like

(1) Serpent has set a new standard in quality with the Impulse's manual. They have raised the bar really high, and we hope that others follow their lead.

(2) The Impulse is very, very adjustable. The pillow ball suspension allow infinitely minute settings to help get that "perfect" setup.

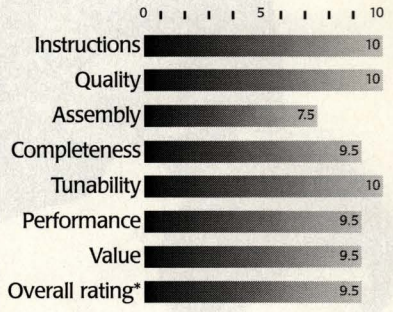
(3) Every part is of the highest quality materials.

(4) Little time had to be spent trimming flash from the molded parts, since most did not come on trees.

(5) The externally adjustable shocks are wonderful.

(6) Handling is sharp, responsive and precise. That precision, combined with its neutral handing, makes the Impulse easy to drive.

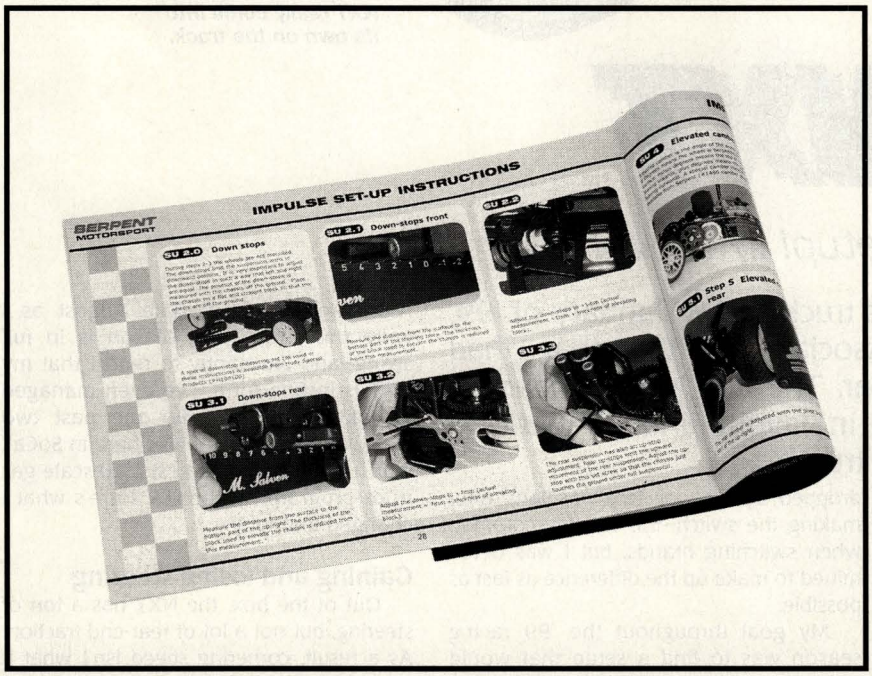
Ratings



**The overall rating is not the average of the subjective ratings. It is our overall appraisal of the kit's quality and features.*

What we really think

Serpent's Impulse Streetspec should really make an big impression on the competition level nitro touring car market. Though not the lightest car out there, it is plenty nimble and is really easy to drive fast. Because of the complexity of the setup, it is definitely not for beginners to the hobby, but more for the high-intermediate to advanced racers. But once you get it set up, it's kind of like a Jaguar XJR–a very fast car that is still luxurious; maybe not as fast as a Ferrari, but it doesn't require the same amount of maintenance either. For a very fair price, you get the highest quality, most robust, and technologically advanced nitro touring car on the market. ◆



Serpents manuals have always been great. The setup guide is full of large color photos. The assembly portion doesn't have photos; instead it uses the actual production CAD (Computer Assisted Design) graphics. We have a new benchmark.

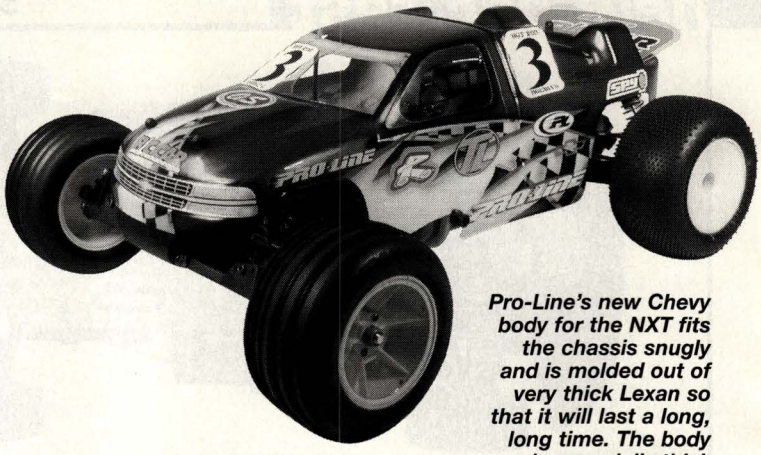
SOURCES

Airtronics, 1185 Stanford Ct., Anaheim, CA 92805 • phone (949) 978-1895; fax (949) 978-1540

Dynamite, distributed by Horizon Hobby Distributors, Inc., 4105 Fieldstone Rd., Champaign, IL 61821 • phone (217) 355-9511

Hitec, 12115 Paine St., Poway, CA92064 • phone (858) 748-6948; fax (858) 748-1767

Multiplex USA, 14751 Calvert St., Van Nuys, CA 91411 • (818) 785-2401; fax (818) 785-3946



Pro-Line's new Chevy body for the NXT fits the chassis snugly and is molded out of very thick Lexan so that it will last a long, long time. The body is especially thick around the rear shock-tower area—an area that gets all the abuse when the truck rolls over. I have to admit that I found the original NXT body to be a bit boxy by comparison, but I do miss the distinctiveness it offered.



Team Losi's NXT is essentially a modified version of the company's original gas truck, the GTX. Careful tuning and the addition of a few new parts make the NXT really come into its own on the track.

Team Losi NXT

At last, the perfect setup! By Frank Masi

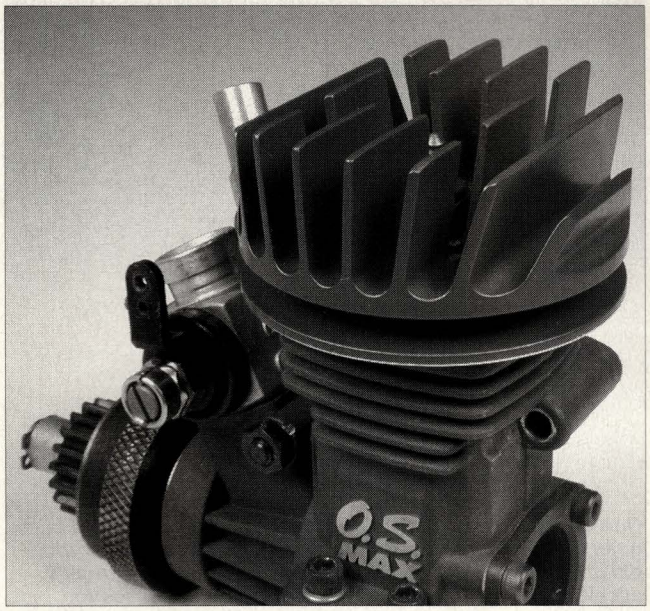
I began testing Losi's NXT gas truck during January of '99, having switched from the Associated RC10GT that I had been driving the previous year. The first lesson I learned was that despite similarities in layout and dimensions, these were two very different trucks.

For starters, I believe that for my driving style and the type of track I race on, the Associated truck was closer to being dialed-in straight out of the box than the Losi. Using the kit-supplied shock oil, springs and gearing, the Associated was more suited to my style. Initially, the Losi seemed to have more aggressive tendencies and felt less hooked-up when exiting turns. It seemed that my race results had dropped by one or two positions after making the switch—this is fairly common when switching brands, but I was determined to make up the difference as fast as possible.

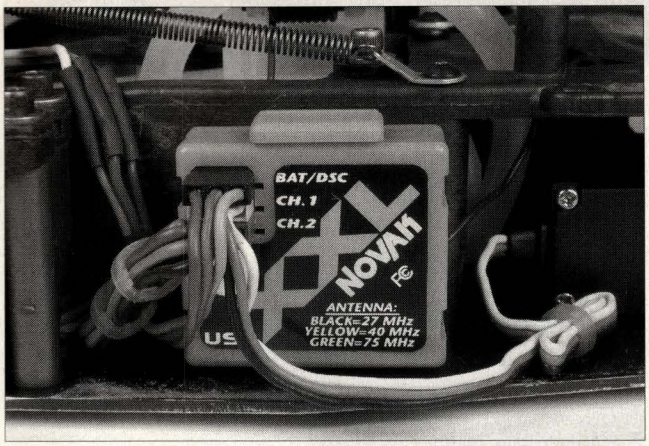
My goal throughout the '99 racing season was to find a setup that would not only make the NXT's handling more to my liking, but to also regain the competitive edge I felt I had with my old Associated truck. It's late August as I write this—the racing season is in full swing—and I'm happy to report that my NXT is in fine form. I've even managed to take TQ honors for the past two weeks at Hot Rod Hobbies here in SoCal, which has one of the best 1/10-scale gas truck programs in the U.S. Here's what I changed and why.

Gaining and losing steering

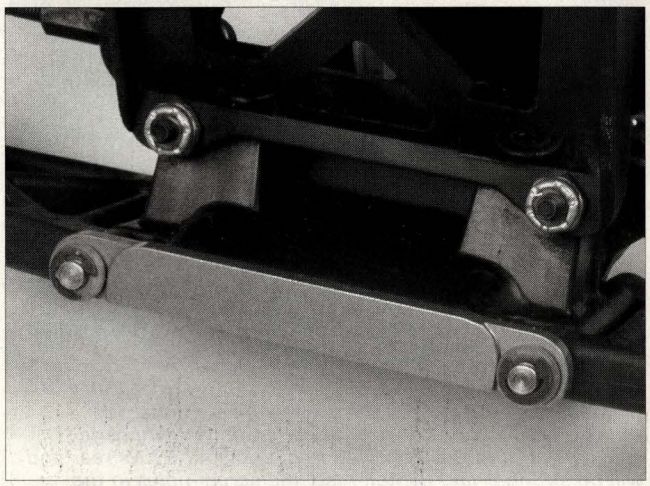
Out of the box, the NXT has a ton of steering, but not a lot of rear-end traction. As a result, cornering speed isn't what it should be. I had tried a bunch of different spring and oil combinations, but none had produced significant results.



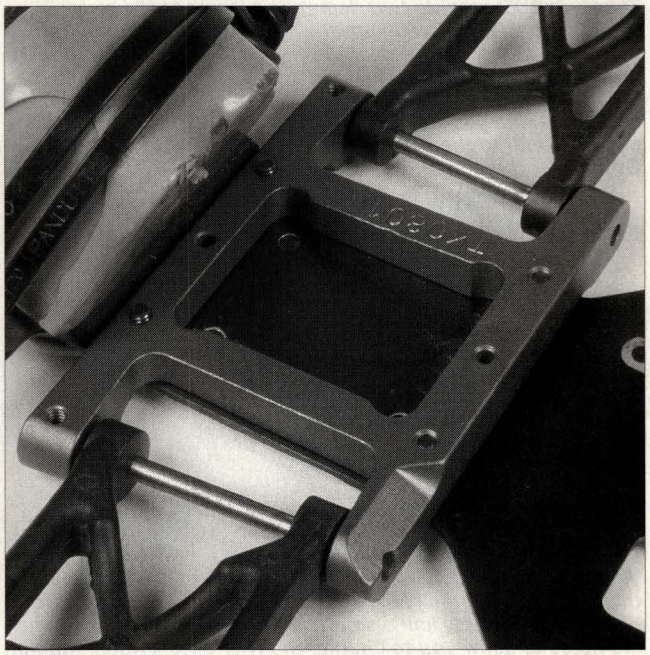
Team Kinwald's new Hyper-Punk cylinder head (part no. TK3502, $45) for the O.S. .12CV and CZ engines features a low-profile design for a lower (and better) center-of-gravity. The head is also anodized in blue so it looks ultra trick.



Novak's extra-svelte XXL micro receiver is perfect for nitro trucks because it's virtually sealed from the elements (and fuel). Still, we recommend that you use a receiver cover (such as the Lexan one provided in the NXT kit) for added safety. Fuel spills aren't pretty...



Brace yourself: A Team Kinwald GTX/NXT aluminum front-arm brace (TK3008, $9.99) serves two purposes: It prevents the front bulkhead from snapping if you hit something really hard, and because it strenghtens the front suspension and reduces flexing of the bulkhead, steering is increased. Oh yes, and it looks cool, too! The supplied hingepins are a little long, so I took up the extra length by installing O-rings between the front E-clips and the brace



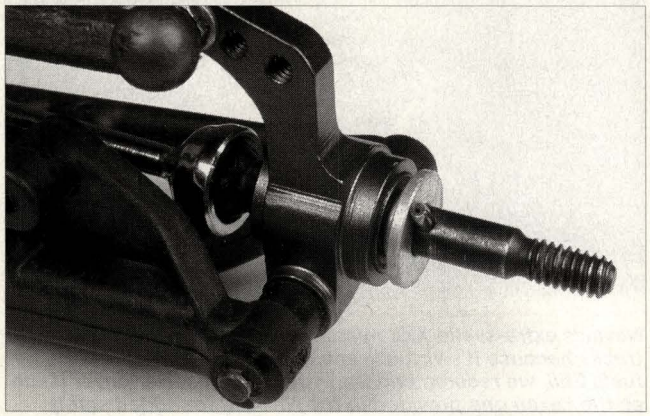
To beef-up the rear suspension area for those long gas truck main events, I installed Team Kinwald's one-piece rear arm-mount for the NXT (part no. TK0801, $33.99). The new mount is near-bulletproof and adds a little weight to the back of the truck for a bit more rear traction. The only complaint I have is that the brace doesn't include the setscrews needed to secure the hingepins.



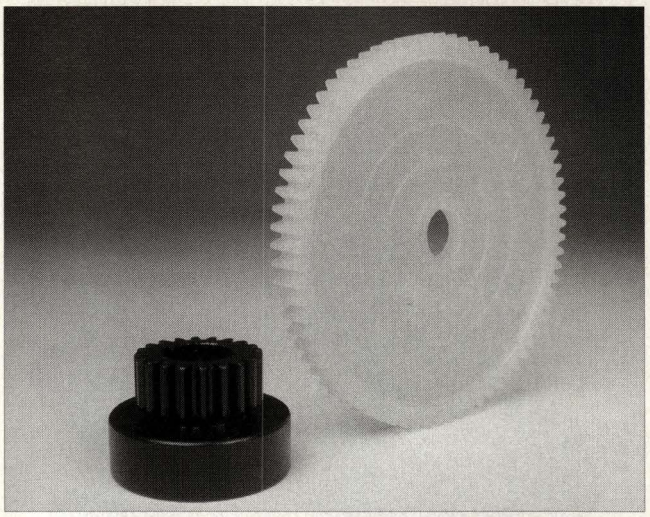
Piping hot: I tried a lot of different pipes, but the Team Associated tuned pipe is the one I come back to again and again. This pipe doesn't seem to have the high-end of the stock Losi pipe, but its response throughout the throttle range is superb. This is the Factory Team version that's been powder-coated in black, with a matching black Associated manifold.

I began using Losi's red springs up front and pink springs in back (the stock setup), and filled the shocks with Losi's 35 wt. "certified" shock oil with no. 56 (pink) pistons all around. This setup worked well, but the truck had a tendency to push on high-speed sweepers. Following the suggestion of my friend Matt Hirsch, who also runs an NXT, I installed the stiffer red springs on

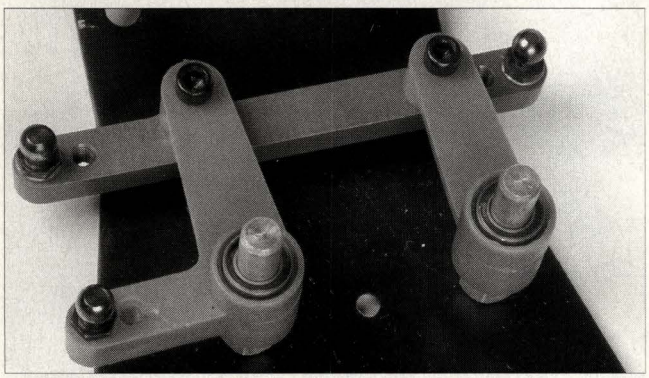
Team Losi NXT



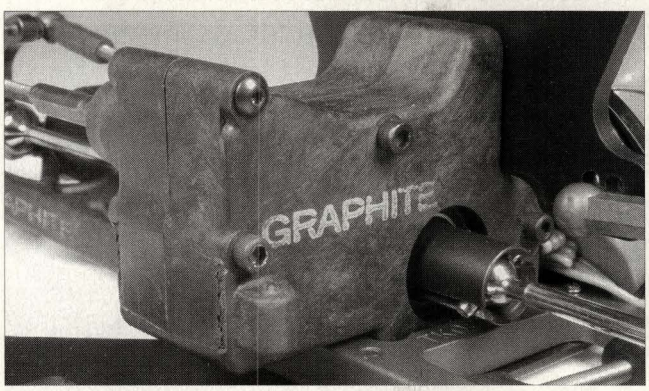
Watch your toes: Integy's new aluminum NXT hubs (part no. T3841, $19.95) provide two degrees of toe-in to the rear wheels (when combined with the two-degree arm mounts, they provide four degrees of toe-in per side). More rear toe-in provides better rear traction and harder acceleration. You'll find that the bearings are a bit loose when installed on the hubs, and that you may need to add some small shims to the pivot-pin and to the axle to eliminate unwanted play. Otherwise, the added toe-in is greatly appreciated.



One of the best things you can do to your NXT is to add taller gearing. I use the kit's 76-tooth spur gear with a 19-tooth pinion (clutch bell). This new ratio smooths out the truck's acceleration (making it easier to drive) and increases top speed. You may need to slightly richen the engine's settings to compensate for the slight increase in load. Also, when you buy new gears, look for the new, improved white spur gears from Losi—they're stronger than the old gray ones.



The Team Kinwald aluminum steering link (part no. TK2500) is thicker than the stock link, so it won't flex at all during hard cornering. The new link also offers an alternate set of mounting holes to allow you to change the NXT's Ackermann angle.



On the NXT, the transmission case is a vital structural member, so it makes good sense to replace the stock Stiffezell cases with Losi's optional graphite-composite cases. It's not that expensive to do, and your NXT's rear end will be stronger and lighter. Also, the screw-holes in the graphite cases are less likely to become stripped.

the back shocks as well. This change made all the difference in the world, and not only eliminated the push, but generally made the truck feel much more hooked-up.

Geometry lesson

Up front, I'll almost always leave the shocks in the middle holes in both the arm and the tower. I might lean the tops of the shocks inward if I want a slightly sharper steering response, but I never move the bottoms of the shocks from the middle hole. I have tried both camber holes in the front shock tower, but I generally prefer the innermost hole because it makes the steering feel more consistent.

Because I'm using the stiff red springs in back, I felt that I needed to use a camber-rod position that would allow a bit of chassis roll so that the truck could maintain a fair amount of rear traction. I run the camber link in the innermost, or "A," hole on the hub and in the innermost and lowest hole in the shock tower. I also have the tops of the rear shocks leaned in all the way. I feel that this setup allows the stiffer springs to keep more weight on the front tires for added steering, yet the softer roll-center provides decent rear traction.

Tires, too!

Next came tire choice. On Hot Rod's blue-groove-type track, I almost always use Pro-Line M3 Holeshot rear tires and either M3 Edge or Losi Silver Directional front tires. For the past few weeks, I have been using Pro-Line Edge front tires that I had "scuffed" down by running them on pavement. This takes the sharp edges off the ribs and makes the tire less "grabby" and more consistent.

Conclusion

Using this setup, my NXT is super-aggressive in the turns and requires little if any braking (if you don't have to brake for a turn, you're going faster). Coming out of the turns, the truck will literally do wheelies if you grab too much throttle. This phenomenal traction lets me make up ground on short straights and when coming out of tight corners. ◆

SOURCES

Associated Electrics, Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626 • phone (714) 850-9342; fax (714) 850-1744

Integy Technologies, Inc., 1140 Centre Dr. #E, City of Industry, CA 91789 • phone (909) 444-2766; fax (909) 627-4132

Novak Electronics, Inc., 18910 Teller Ave., Irvine, CA 92612 • phone (949) 833-8873; fax (949) 833-1631

Pro-Line, P.O. Box 456, Beaumont, CA 92223 • phone (909) 849-9781

Team Kinwald, distributed by Trinity Products, Inc., 36 Meridian Rd., Edison, NJ 08820 • phone (732) 635-1600; fax (732) 635-1640

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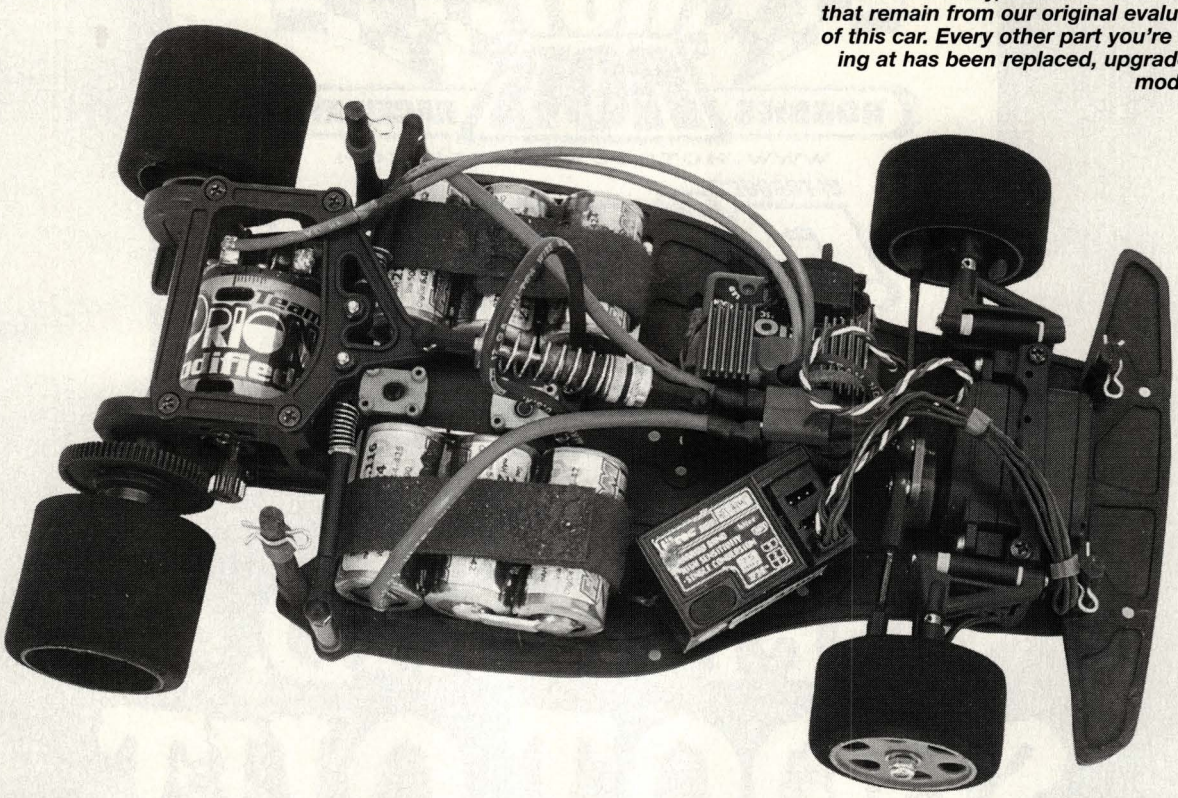
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Long Term: The chassis, receiver, rear axle, front bumper, spur gear, differential assembly, and front arms are all that remain from our original evaluation of this car. Every other part you're looking at has been replaced, upgraded or modified.

Academy SP3

A Little More Time... (Get it—"a little")

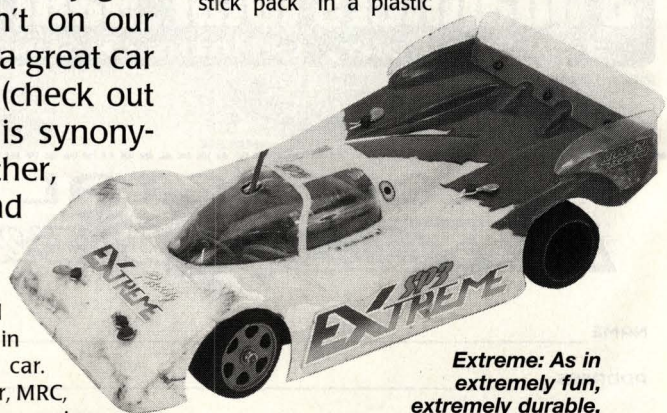
Cars are a lot like people; some you like instantly, some are more of an acquired taste, and unfortunately some are rather not to your liking almost immediately. While it's fair to say that the Academy SP3 left us with a rather silly grin on our face after our first encounter, it wasn't on our "please, please, please" driving list. Come on, it's a great car for 65 bucks but it wasn't a $WD sedan either (check out your keyboard and you'll find that the $ sign is synonymous with 4). Nevertheless, after a while together, the SP3 has become a weapon of choice around here at local parking lots, and here's why:

Out of the frying pan...

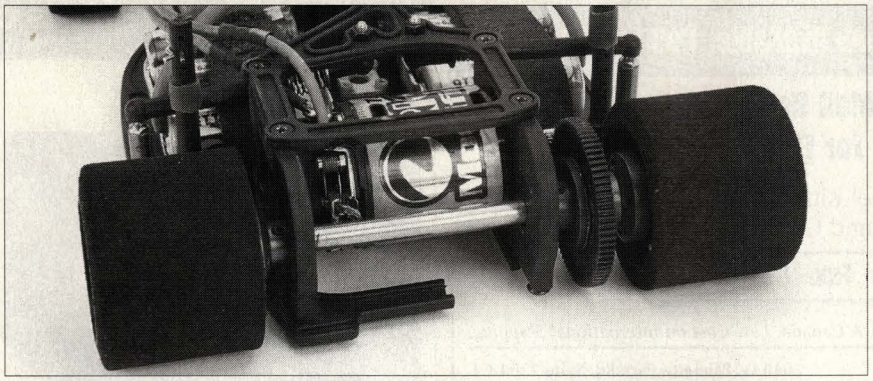
Remember back to our original test of this car (February '99), and you'll recall that Academy wasn't aiming for the high-end 1/12th-scale market, instead letting the current crop of manufactures that control that niche continue to duke it out amongst themselves. Instead, a "hit 'em where they aint," theory had been implemented and essentially resulted in an "entry-level" car. Additionally, the distributor, MRC, stood behind Academy's reasoning instead of chasing the latest trend of sedans. One reason for this could be because dollar for dollar this little razor destroys the larger, slower (yes, slower) sedans. This ability is most easily explained in three little words: power to weight.

Academy's entire dish is served up on on a thick plastic chassis, or pan. Yes, it's a pan car. The entire thing is rigid enough for the stock 540 Mabuchi motor, but slip in a performance stock, or even mild mod motor, and a more rigid material becomes desirable. The only problem encountered in the original chassis was snapping the connecting "T" plate. Chalk one up for the boundary-board bogey-man.

As recommended in the original setup instructions, the car (which comes 90 percent prebuilt) accommodates the popular "stick pack" in a plastic



Extreme: As in extremely fun, extremely durable, extremely fast and oh, yeah, extremely affordable!



How fast do you want to go? The Mabuchi 540 went well, the stock Fantom Racing motor was frightening, and the 16 turn Orion—"forget about it..."

battery cradle. Remove a couple of screws and the chassis is willing and waiting to accept a saddle pack. Running the saddle pack lowers the center of gravity and more evenly distributes it over the whole car. This helps corner speed, steering and traction. Do this.

Once the batteries are laid in place, the traditionalist tapes them securely in. We did this. We did it over and over and over. And over. Time for a new system.

The first system utilized some bulk hook and loop tape. You can't see it here, but we found some real cool red stuff at the local hardware store and it cost less then a buck! Shoe Gooing the straps in place worked initially. However, tape easily holds the cells super-firmly in place and to do this with the hook and loop tape requires tugging very firmly. This constant tugging, especially in SoCal's scorching hot summertime eventually led to the Shoe Goo letting go. Drill out the chassis with a small drill bit, countersink it and run a screw through the whole thing to secure it down with a nylon nut. Cheap? Yes. Effective? Yes.

Fun-loving and good folks that they are, the people at MRC sent us a couple of SP3's to play with. Our associate 1/12-scale fanatic (we'll call him Larry, because that's his real name) devised his own system of battery lock-up. "All you need to do is get the Losi XXCR battery hold-downs, and cut 'em down. After that, pick up a couple Associated body posts. Drill out the chassis and countersink the holes, just like for the hook and loop system. Next, secure the posts in front of the saddle pack, one-half inch away the antenna holder on each side. Now, Dremel out a half-moon on each side to butt up against the damper post mounted in the rear of the chassis. Run a 4/40 screw through the post to hold the XXCR battery holders down. This system mimics the Yokomo (and other) sedan battery mounts.

Push & Shove.

MRC offers an aftermarket coil-over, oil filled shock that has a threaded assembly for easy and minute adjustments. We filled ours with 80wt. This helps dull the terribly imperfect road surface, at least front to back. Side to side movement is controlled by a rather antiquated system of shoving grease into long ball cup arms. Messy, yes. Effective...yeah, sort of. We found some old springs and placed them on the lateral posts to add rebound.

With the rear end planted relatively firmly on the asphalt, the car now pushed into corners and gave up the tremendous "corner in" performance a 1/12th-scale rear-wheel drive thrives on. To sharpen our knife, we tossed the somewhat stiff stock front springs and found an old pair of Cobra "soft" springs literally buried in our local shop's "junk" box. No idea what the part number was, and cost was fifty cents. Substitute any kind of softer spring and be happy.

Show me the money.

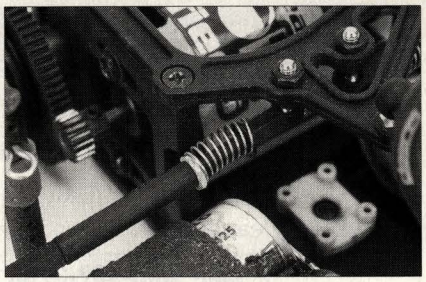
The more we drove the SP3, the more we liked it, and the more we liked it, the more we drove it. The more we drove the little inexpensive rocket ship, the easier it became to figure out where the money we'd saved would be spent. Tires.

Stop right here and ignore the next paragraph if you own, or plan to own, an SP3 and spend hours and hours of fun just driving it. Let us not forget that this is exactly what the device was designed for. A few others will read on here. You go outside and run a pack with yours, meet us back here in a couple of minutes to catch up.

Okay, the rest of you realize we're as compulsively hooked on competition as the next person. Around here, we race to



Heavy load: The SP3 weighs next to nothing, but we still found that 80wt. in the adjustable, upgradable, coil-over micro-adjustable shocks worked best to plant the rear wheels.



Springtime: the super-thick grease crammed into the long ball-cup arms was good for damping but offered little or no rebound. These did.

the coffee machine, the fax machine and even the copier in the office; why wouldn't we race the Academy, right?

We took our pair of SP's to our local parking lot race one Sunday afternoon. Because of the unfortunate lack of 1/12th in attendance, the promoter ran "the twins" with the stock mini class. It was a massacre. Our dynamic duo sliced, diced and iced these 1/10th-scale midgets without breaking a sweat. The beauty of 1/12 scale is the added run time the smaller and lighter car provides, yet after 6 minutes, the only competition to be offered from the minis was how long it took to lap them over and over. The biggest thing holding the car back (or actually not holding it at all) was the stock tires. They actually work adequately, but their wear left something to be desired. At the end of two 6-minute qualifiers and a 6-minute main, the front "tires" were literally running partially on the plastic rims—yikes!

If our non-racing friends have re-joined us again, let me just say to them that the stock tires work magnificently! For everybody else keeping track at home, shell out $10 - $20 a set and get some foams from JACO or BSR. The "pink" offers the most grip and longest wear but, as expected, cost the most as well. Budgeting? Stock up on the "white" compound front and rear. Make sure that you order the two-hole configuration.

To accept the front rims, purchase BoLink's hub carriers/axle set and a new set of bearings to match. This will allow the use of traditional aftermarket foams more readily found in your hobby shop. While you're working on the front of your car, make sure that you install Academy's turnbuckles which are drilled out for easy adjustment. Turn them in until the front tires lean in toward the chassis 1 to 1-1/2 degrees for improved performance.

Wing and a Prayer.

The speed was there and the very best tires available were in place and car still didn't cut in at speed like it could. A small wing, easily formed from Lexan, was installed with CA on the sides and screws in the rear. This added downforce was just what the doctor ordered.

The rest of the body, which appears to be slightly thicker then the current "light-

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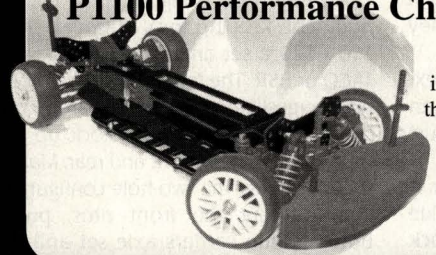
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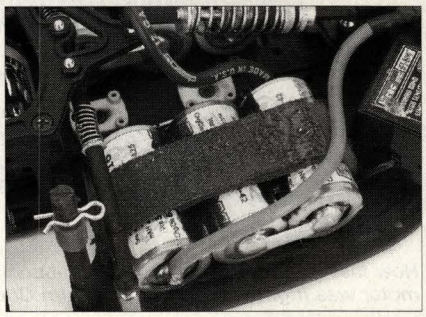
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Academy SP3



Watergate: Nixon was taped, our SP3 wasn't. We tired of the cramped procedure after every single pack and installed some bulk hook and loop tape to speed things up.

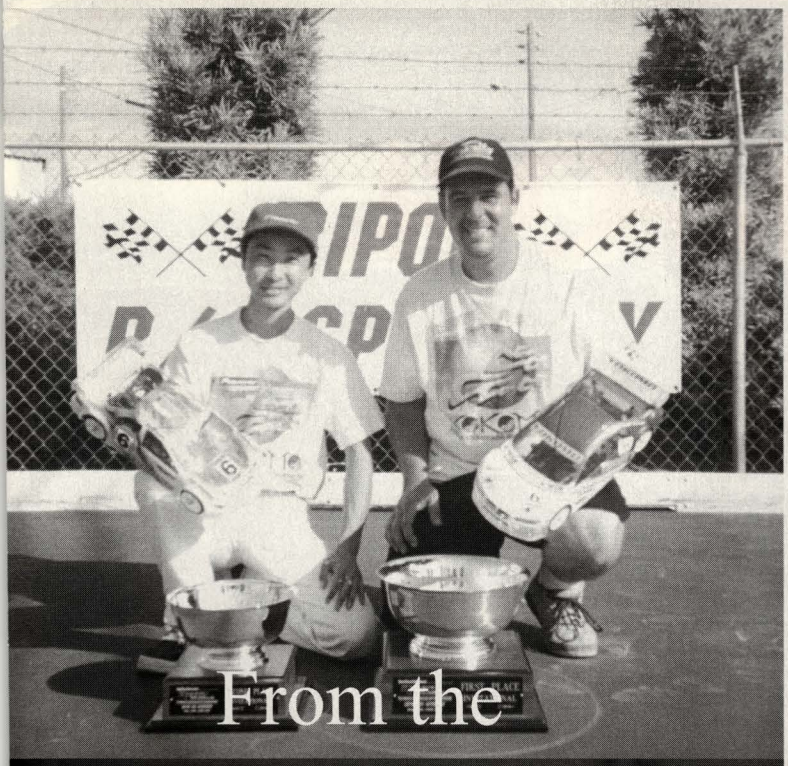
weight" (and conveniently more inexpensive to make) bodies out as of late, really took a bitter beating and still continues to do its job. Take exceptional care to cut the appropriate amount of material away from the wheel wells; the tires are expensive, and it's a shame to destroy them foolishly when it can easily be avoided.

A Little Later (and the end of the "little" puns)

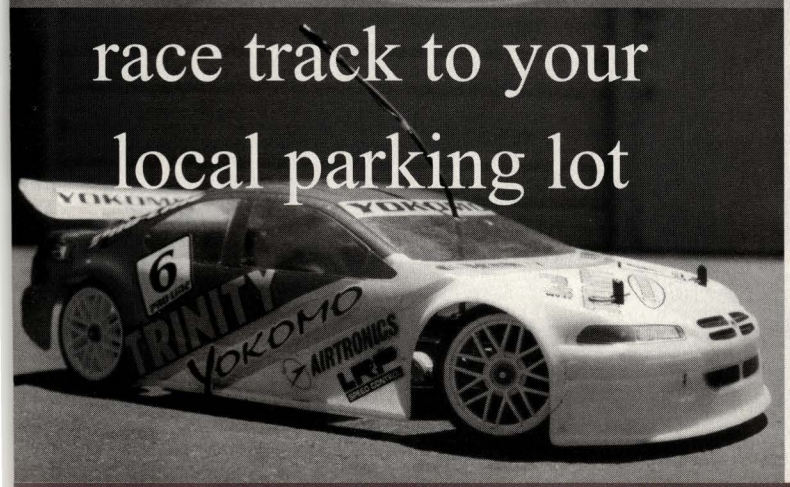
After making these very simple and reasonably inexpensive mods, our friend Larry piloted his SP3 to victory and a course lap record; shattering all other lap times including his own in sedan and even the expert gas class. Our crew had well over $1,500 of the latest R/C products on the pit table for further evaluation that day, and shockingly, the item that drew the most attention and conjured up the most questions was our pair of sub-$100 SP3's. It's cheap, it's remarkably tunable, it's fast, it's small and for the money we have found it hard to beat (heck, it's hard to beat even without considering the money)! ◆

SOURCES

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Tamiya M-04L

Bite-sized Bimmer



Versatility, thy name is M-Chassis. Let's face it: real automobiles come in all shapes, sizes and drivetrain styles, and so expecting them all to scale down perfectly to a "standard" 190mm sedan chassis is an unreal expectation. Who wants a Porsche 911 that's the same size as a Honda Accord?

Tamiya has built a reputation as the world's finest producer of scale models, and its R/C lineup reflects a dedication to scale authenticity that's second to none. When it created its original M-chassis (the "M" stands for "mini," for the Rover Mini Cooper that was the first to employ this small chassis), Tamiya succeeded in producing a platform that could accommodate accurate 1/10-scale representations of real "small" cars such as the aforementioned Mini Cooper, the Porsche Boxster and the Mercedes SLK.

In addition to its diminutive size, the M-chassis is perhaps the most versatile available. Throughout its various iterations, the M-chassis has been configured in front- and rear-wheel drive versions, and in a variety of wheelbases. This has allowed Tamiya not only to accurately scale-down the full-size cars to true 1/10-scale, but has also allowed them to reproduce each car's drivetrain style in miniature.

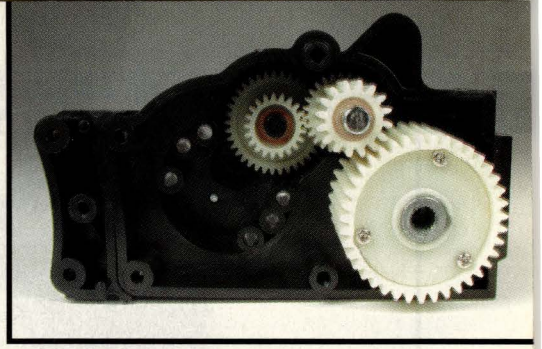
The M-04L is the fourth generation of the M-chassis family, and is closely related to the M-03 with which it shares its basic design; in fact, the 03 and 04 are more similar than any two previous M-chassis generations. Tamiya sent us the first kit to make use of the M-04 chassis—the BMW M-Roadster. A similar kit of the new Honda S2000 roadster is already on sale in Japan; however, Honda has insisted that Tamiya refrain from importing this kit to America until the real two-seater goes on sale this Fall.

M-Chassis 101

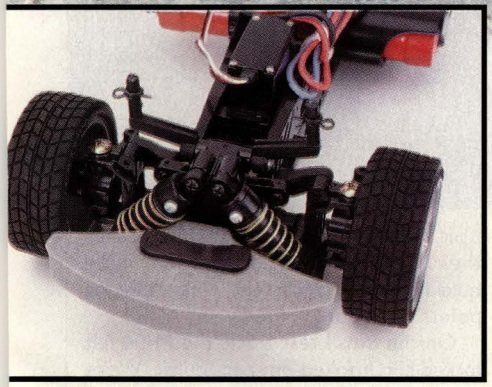
Despite radical differences in appearance, all M-Chassis share a common design theme, which is that they are all modular. Every Mini is made up of three main components: the gearbox, the "dummy" gearbox (basically the same shape and size as the real gearbox, but without a transmission) and a center section. The center section is what Tamiya uses to alter the Mini's wheelbase—it lengthens the center section to increase wheelbase, and shortens it to reduce the wheelbase.

All new Minis have a four-wheel independent suspension. The suspensions are cleverly hung from the gearbox and the dummy gearbox, which makes the car even more modular. To create a front-





A new gearbox was designed for the M-04. It has a lower overall ratio to help the motor cope with the BMW's larger diameter wheels and tires.



Tamiya thoughtfully includes a protective foam bumper to keep the chassis and the front of the body from becoming severely damaged in a crash. Notice that the front shocks have been leaned inward to provide more responsive steering.

wheel drive car, Tamiya simply flips the chassis around so that the gearbox and motor are in front, and adds the front uprights and steering arms to the gearbox's lower suspension arms. The dummy gearbox, now in the rear of the car, receives the rigid rear hub carriers.

What makes the M-04 new?

We know that we said that the M-04 and M-03 are pretty closely related, but the differences, however subtle they may seem, create drastic differences in the M-04's demeanor.

(1) The biggest difference between this new M-Chassis and the previous generation is that the 04 is RWD (rear-wheel drive)—there were no RWD M-03 kits. Generally, RWD cars are better on the racetrack than FWD (front-wheel drive) cars because they have more steering and can be powered through the turns in tail-out drifts, called "throttle steering" by some.

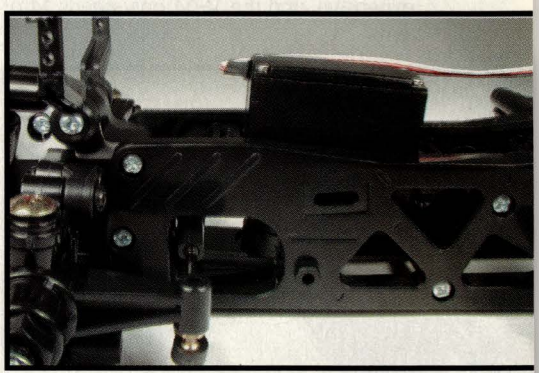
(2) The M-04's steering servo is placed much lower inside the chassis. This gives the car a lower CG (center of gravity) and improves stability and cornering. In addition, the M-04's steering servo is mounted in the chassis at a slight angle to match that of the steering kingpins. This is usually done to reduce bump-steer and provide a correct Ackermann angle—you can imagine how perplexed we were when we noticed that the M-04 had significant bump-steer (the wheels toe-in when the suspension is compressed).

(3) There's a new gearbox on the M-04, and there's more to it than the fact that it's mounted in the rear of the chassis. The new tranny gets a higher ratio than that of the M-03 to better accommodate the larger wheels and tires that come on several M-Chassis kits—most notably the 03-based Mercedes SLK and Porsche 911, and the new M-Roadster. Bigger wheels and tires—the same size as those used on larger 1/10-scale 4WD sedans—offer a large performance gain over the typical mini-scale rubber, especially on bumpy tracks.

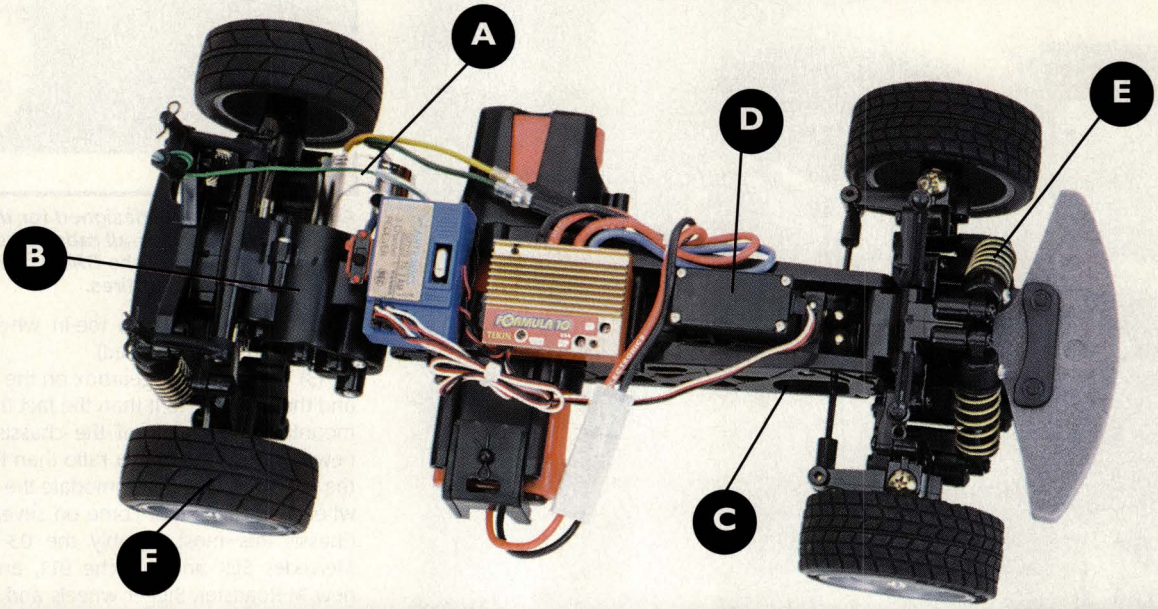
(4) The new M-04 is designed to easily accept Tamiya's new M-04 Stabilizer (swaybar) Set (part no. OP-382). Yes, the previous M-Chassis could be fitted with swaybars, but doing so required a relatively complex series of mounts and hardware. The M-04 swaybar kit bolts right to the front and rear of the chassis and requires a minimum of parts.

(5) All of the M-04's plastic parts are molded in a serious-looking black color. The M-03's gray chassis pieces look positively docile by comparison. Also, the center chassis sections of the M-04 have a "bridgework" design that saves weight over the solid pieces of the M-03 chassis.

(6) The suspension pieces of the M-04 also have received an update. First, the upper camber links have been shortened



Tamiya positioned the steering servo low in the chassis to lower the M-04's center of gravity. This results in faster cornering and greater stability. Notice that the servo is also leaned slightly rearward to match the angle of the steering kingpins for improved Ackermann angle.



A: Mabuchi RS-540 motor comes in the kit. For a car as light as the M-04, this mild stock motor provides plenty of speed and excellent run time.

B: A redesigned transmission has a lower overall ratio to help the motor cope with the larger wheels and tires.

C: The chassis' side-plates have been "bridgeworked" to reduce weight. The plates also are longer to extend the car's wheelbase.

D: The steering servo is placed much lower in the chassis for a lower center-of-gravity.

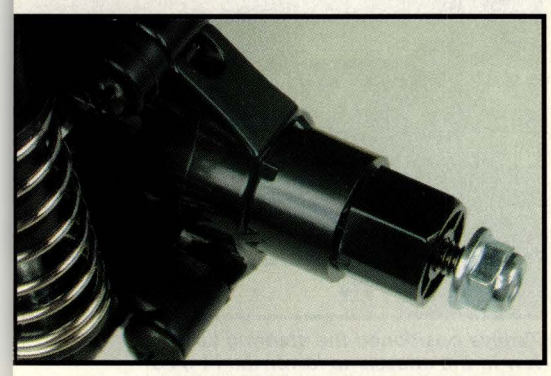
E: The dual front shocks have been inclined 45-degrees to provide more progressive damping and crisper steering response.

F: Type-B radial tires in back provide more traction than the front tires to make the car easier to drive, i.e., enough understeer to keep the car from fishtailing.

to provide the car with increased camber gain during suspension compression, which improves traction when the car negotiates high-speed turns. Secondly, the front shocks have been inclined at a 45-degree angle to provide damping that's more progressive, resulting in steering response that's more aggressive overall.

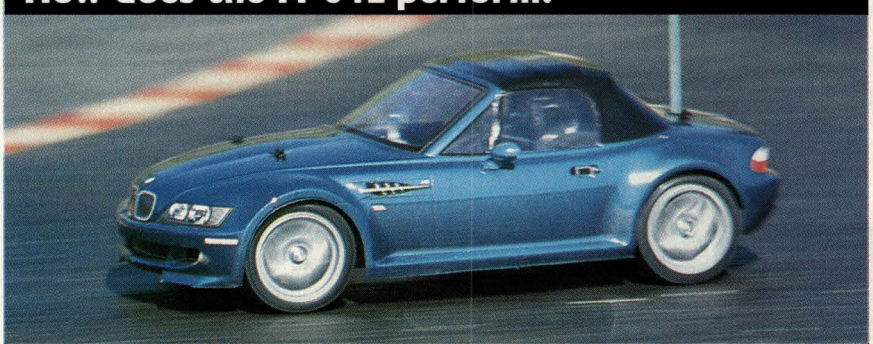
What we don't like

(1) Power-robbing and slop-inducing plastic bushings. Ball-bearings aren't that expensive, and the M-04 only needs 14 of 'em.



In the rear, wider hex-hubs are installed over the axles to widen the car's rear track. This was done not only to improve rear traction, but also to help the chassis fill out the M-Roadster's wide rear wheel-wells.

How does the M-04L perform?

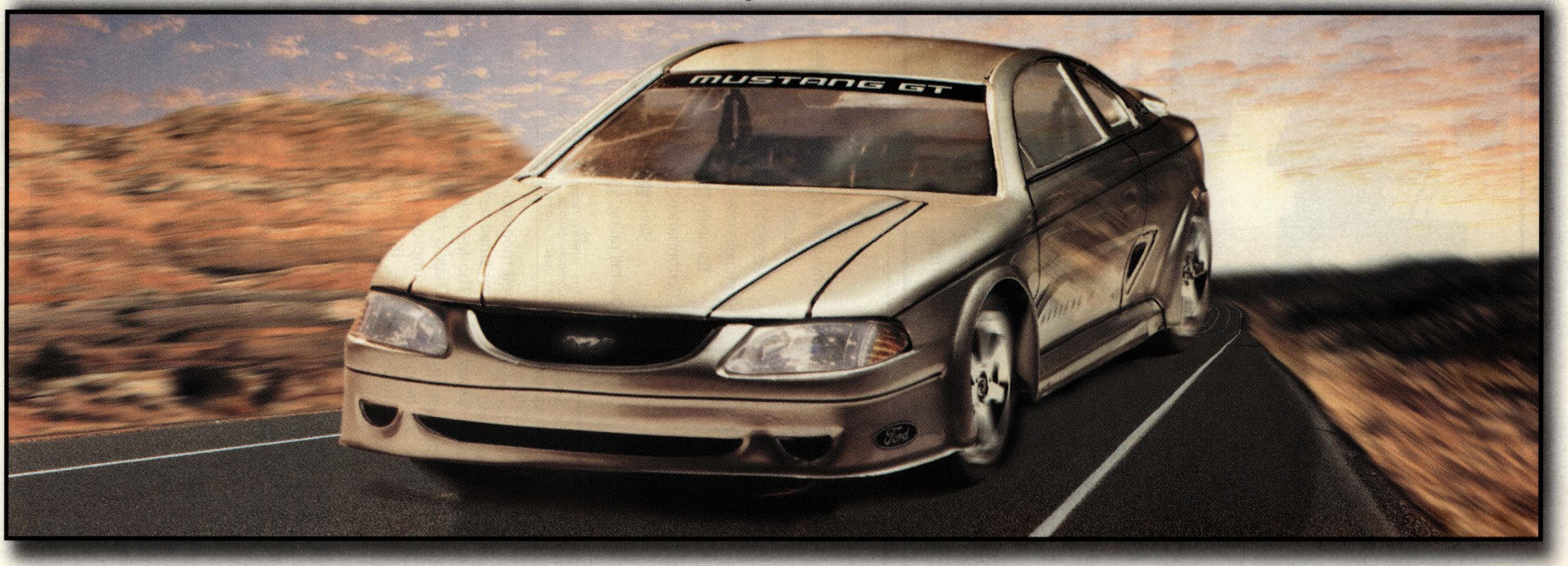


Despite its "box-stock" form, we were pleasantly surprised by the M-04L's handling. This little chassis is much more stable than any other M-Chassis we've driven previously. It is not only much better at entering and exiting turns, but the M-04's revised steering linkage does a better job of centering on corner exits as well.

Even with the Tamiya Stabilizer Bars installed, there's still quite a bit of body roll in all but the slowest turns. But don't let this bother you, as it does little to upset the balance of the chassis—even if the car looks as if it's going to flip over! With the M-04L, there's always just a bit of understeer in almost all conditions. This is mostly due to the car's longer wheelbase and sticky B-Compound rear tires. A little "push" such as this makes the M-04 more challenging to drive quickly, as you must get your "braking points" dialed-in!

On our small test track, the M-04 felt incredibly hooked-up and quick. We're sure that on a larger track, or an open space such as a parking lot, that the kit-supplied Mabuchi 540 may seem slow. But in our experience, adding higher-horsepower motors to these little M-Chassis cars tends to accentuate the body-roll and make the car less stable. We like the M's with the slower motors, as they're more fun to drive this way. Plus, you'll get more than eight minutes of run time if you use the 540, and that's just more fun! ●

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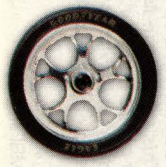
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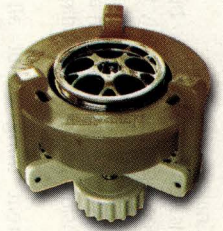
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(2) Stock steering geometry that causes the front wheels to toe-in during suspension compression. There isn't really much you can do to correct this, as there isn't much room to add shims beneath either steering pivot ball.

(3) The kit comes with non oil-filled friction dampers (with coil-over springs). These dampers don't really provide much resistance to the suspension's action, so as a result, the M-04 tends to bounce (and keep bouncing) over larger bumps. Including a set of plastic oil-shocks wouldn't raise the price of the kit much, if any, so we feel that Tamiya omits them simply because they would be harder to build than the friction dampers.

What we like

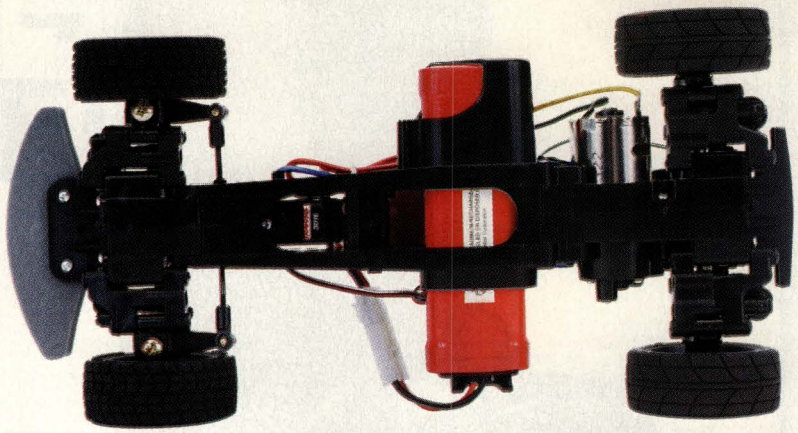
(1) The M-04 is the best M-Chassis to date. The suspension is much more rigid than that of any previous mini we've tested (and more so than most of Tamiya's other touring car chassis). There is also a pronounced absence of slop in the steering linkage (in comparison with previous generation M-Chassis).

(2) This kit is supremely easy to build. The chassis goes together so quickly that you'll wish there were more steps to the assembly process! Little features such as E-clip-less suspension pins make building a breeze.

(3) The great thing about all of Tamiya's M-Chassis kits is that they are one of the only types of car that don't feel under powered when a standard Mabuchi 540 (included in the kit) is used. And with handling that's good enough to allow you to "hang" with most larger sedans, the M-04 provides big thrills in a smaller package and adds about two or three extra minutes of run time.



Tamiya provides its A-Type radial tires for the back of the car to keep it from oversteering. This makes the M-04L an especially easy car to drive for beginners. Expert drivers will want to mess with the setups to gain more steering.



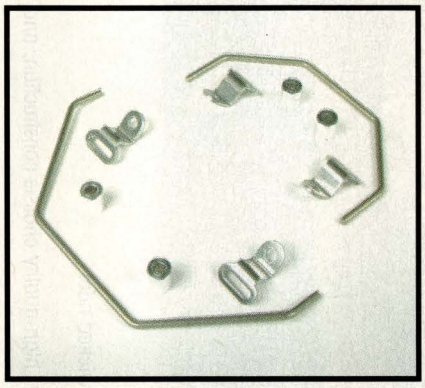
Type: 1/10-scale RWD electric sedan chassis

Manufacturer: Tamiya America, Inc., 2 Orion, Aliso Viejo, CA 92656-4200 • phone (949) 362-2240; fax (949) 362-2250

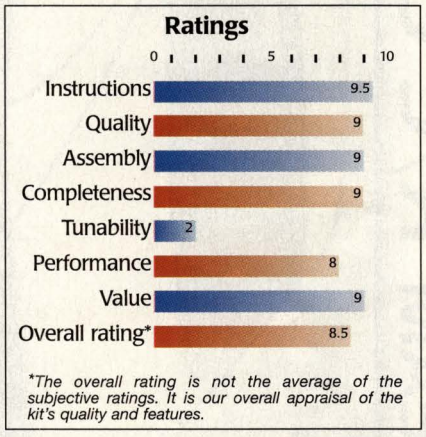
Price: $154

What you get: Complete rolling chassis with 540-size electric motor and mechanical three-step forward and reverse speed control. You must purchase two-channel radio, electronic speed control (optional), six-cell battery pack, battery charger and suitable paint.

Length 12.9 in/328mm
Width 6.8 in/173mm
Wheelbase 9.38 in/239mm
Track (F;R) 5.4 in/137mm; 5.75 in/146mm
Weight ..... 2lbs, 12.5oz.



Tamiya's optional M-04 Stabilizer Set (part no. OP-382) is a cheap hop-up that pays huge dividends in the handling department. These bars stiffen the front and rear roll-centers of the car and make it corner much flatter (and faster).



(4) We might as well cut and paste this one into every Tamiya review: the beautifully molded polycarbonate body shell is chocked with enough detail to put many plastic model kits to shame.

(5) To make the M-04 easier to drive, Tamiya includes a pair of stickier Type B radial tires for the rear. These provide more traction than the standard radial front tires to give the car a mild understeer.

What we really think

Tamiya's M-Chassis kits are, if you'll indulge our sentimentality, a return to a simpler time, when R/C kits weren't so complicated. Simple means that these kits are easy to build and to maintain, but by no means do we imply that the M-Chassis kits aren't fun to drive. In fact, an M-03 (albeit modified) is one of the fastest cars at our small test track!

The M-04 is a worthy addition to the M-Chassis family. And with the substantial improvements that Tamiya has made, it's also the best handling. So whether you race in a local TCS event, are looking for an easy way to become involved in parking-lot or sedan racing, or are just a fan of the full-size Bimmer M-Roadster, the M-04 deserves a thorough investigation. ◆

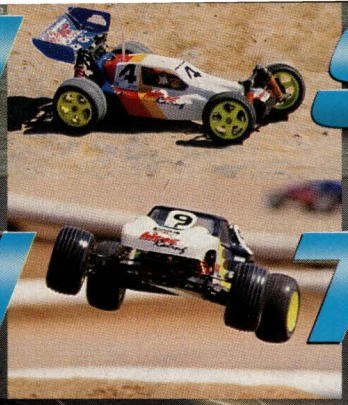
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Hitec's new HS-925MG and HS-945MG are the first and only servos to incorporate an **ALL METAL GEARTRAIN**, using precision-cut aluminum and brass gears for low rotating weight and durability. *These servos are as tough as they get!* The top quality **CORELESS MOTORS** and dual, ultra smooth ball bearings provide incredible resolution, outstanding performance and excellent centering. They'll enhance the "feel" of any vehicle, allowing for more precise control and improved lap times. No one else gives you this level of quality and performance at such a low price! *That's what Hitec is all about!*

NEED SPEED?

The HS-925MG is the fastest standard sized servo you can buy, when all samples were tested at 6 volts. Don't be fooled by the other guy's inflated speed and torque specs. Try it and see for yourself.

NEED TORQUE?

The HS-945MG delivers a massive 153oz/in of usable torque, the most of any standard sized servo on the planet!

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Hitec #	Description	Torque 6.0V	Speed 6.0V	Bearing	Size LxWxH	Weight	1/12th 1/10th Pan	1/10th Sedan (Gas/Electric)	1/10th Buggy	1/10th Truck	1/8th On Road	1/8th Off Road
HS-77BB	Low Profile	77oz.	.14 sec.	Top BB	1.7"x0.9"x1.0"	1.3oz.	X					
HS-225BB	Mighty Mini	67oz.	.11 sec.	Top BB	1.3"x0.6"x1.3"	.95oz.	X	X				
HS-225MG	Mighty Fast Mini	67oz.	.11 sec.	Top BB	1.3"x0.6"x1.3"	1.1oz.	X	X				
HS-235AG	Mighty Fast Mini	43oz.	.09 sec.	Top BB	1.3"x0.6"x1.3"	1.1oz.	X	X				
HS-300BB	Standard Servo	49oz.	.16 sec.	Top BB	1.6"x0.8"x1.4"	1.75oz.	X	X	X			
HS-303	Standard Servo	49oz.	.16 sec.	Nylon	1.6"x0.8"x1.4"	1.75oz.	X	X	X			
HS-525BB	High Speed	55oz.	.12 sec.	Top BB	1.6"x0.8"x1.4"	1.6oz.		X	X	X		
HS-525MG	5-Pole Motor	55oz.	.12 sec.	Top BB	1.6"x0.8"x1.4"	1.75oz.		X	X	X		
HS-545BB	High Torque 5-Pole Motor	73oz.	.17 sec.	Top BB	1.6"x0.8"x1.4"	1.6oz.		X	X	X		
HS-605BB	High Speed	91oz.	.13 sec.	Dual BB	1.6"x0.8"x1.5"	1.73oz.		X	X	X	X	
HS-605MG		91oz.	.13 sec.	Dual BB	1.6"x0.8"x1.5"	2.12oz.		X	X	X	X	
HS-615MG	Ultra Torque	132oz.	.18 sec.	Dual BB	1.6"x0.8"x1.5"	2.12oz.				X	X	X
HS-925MG	High Speed Coreless	103oz.	.08 sec.	Dual BB	1.5"x0.8"x1.5"	2.04oz.		X	X	X	X	X
HS-945MG	Ultra Torque Coreless	153oz.	.12 sec.	Dual BB	1.5"x0.8"x1.5"	2.04oz.		X	X	X	X	X

MG=Metal Gear. Note: All Hitec metal gear servos use aluminum output shaft. 6V rating used for use with ESC. If using 5 cell Rx pack add 12%.

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1998 NORRCA Nationals
Winner, 1/8 Buggy; Winner, 1/10 Truck

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It's obvious that nitro touring cars are hot business right now. It seems everywhere you look a new bunch of nitro touring cars spring up right before your eyes. Arguably the most popular of the pack is one of the originators in this category—HPI's Nitro RS4.

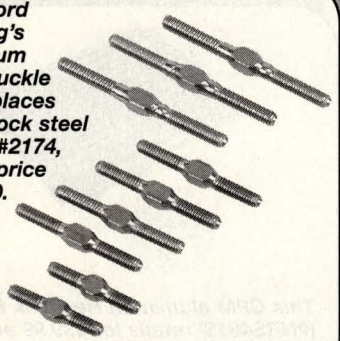
The extreme popularity of the car stems from the fact that it comes in a few different versions for all levels of enthusiasts—a new, ready-to-run kit complete with running gear and radio for the beginner, the original Nitro RS4 for the up-and-coming local racer, and, of course, the Racer Nitro RS4 version that comes complete with all the hop-ups most racers look for first when setting up their cars for competition.

For all you die-hard racers (and serious parking-lot pounders), we've compiled some of the hottest hop-ups available for the car. From mods like aluminum gear pulleys and two-speeds to trick lightweight chassis and titanium turnbuckles—we have only the best! So let's take a look and check out the latest and greatest parts available.



1000 go fast, look good bolt-ons for your HPI nitro sedan!

Lunsford



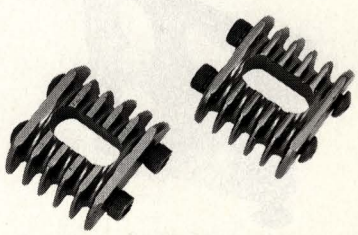
Lunsford Racing's Titanium Turnbuckle kit replaces the stock steel links. #2174, retail price $32.50.

Alien Racing



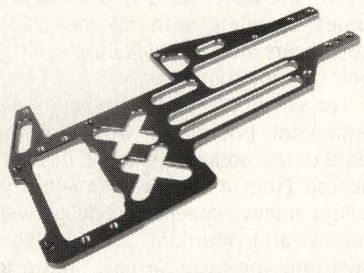
This Alien Racing/Wolf Pack Radicals aluminum Side Belt Tensioner (#WLF015B) on the left retails for $45.99 and comes in three different anodized colors. The aluminum Universal Belt tensioner (#WLF006B) on the right comes in four different colors and retails for $29.99.

Alien Racing

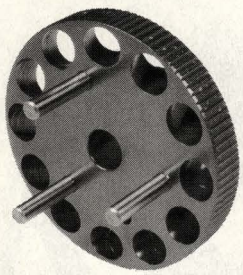


These Alien Racing/Wolf Pack Radicals blue anodized aluminum Motor Mounts (#WLF003B) come in four other colors and retail for $24.99.

Alien Racing



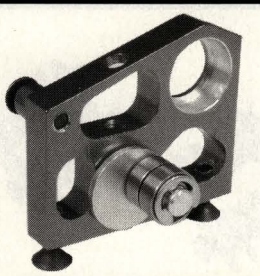
This aluminum Alien Racing/Wolf Pack Radicals purple anodized Upper Radio Tray (#WLF002P) retails for $33.99.



Alien Racing/Wolf Pack Radicals purple anodized Three Shoe Flywheel (#WLF004P) comes in blue also and retails for $24.99.



This Alien Racing/Wolf Pack Radicals purple anodized Head for O.S. Racing .12 engines (#WLF007P) also comes in five other colors and each retails for $59.99.



Alien Racing/Wolf Pack Radicals purple anodized Rear Belt Tensioner (#WLF008P) also comes in blue and gold colors, and each retails for $45.99.

Alien Racing



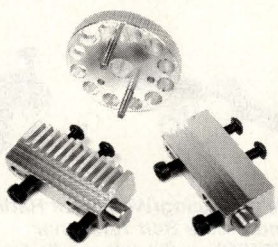
These blue anodized aluminum Servo Mounts from Alien Racing/Wolf Pack Radicals (part #WLF009B) come in three other colors, and each set retails for $13.99.



This purple anodized Head for the HPI .12 engine from Alien Racing/Wolf Pack Radicals (#WLF019P) retails for $36.00 and comes in two other colors.

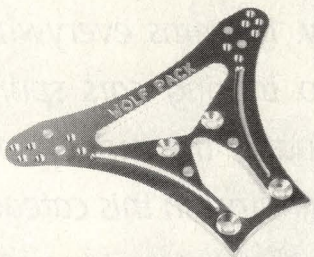


This purple anodized "Schneller" Y-Brace from Alien Racing/Wolf Pack Radicals (part #WLF017P) retails for $27.99 and it also comes in a blue and silver finish.



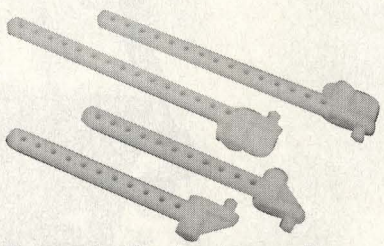
Alien Racing/Wolf Pack Radicals HPI .15 rear exhaust conversion kit (#WLF029) comes in either a purple, blue, or silver finish, and retails for $79.99.

Alien Racing

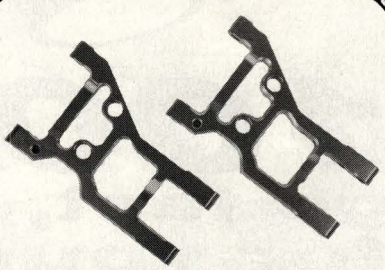


Alien Racing/Wolf Pack Radicals aluminum rear shock tower (#WLF018) retails for $29.99.

GPM



These nylon front and rear yellow body mounts from GPM (#NRS4201Y) retail for $5.00 a pair.

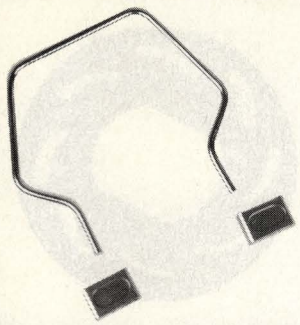


GPM's 190mm aluminum Rear Suspension Arms set (#PRS4056) retails for $25.00 a pair.



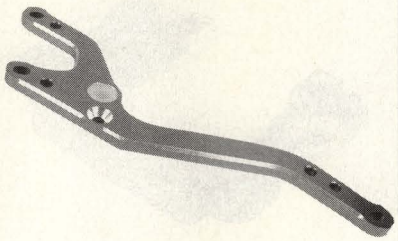
This GPM aluminum Heatsink Head (#NRS4813) retails for $39.99 and it fits most popular .12s.

GPM



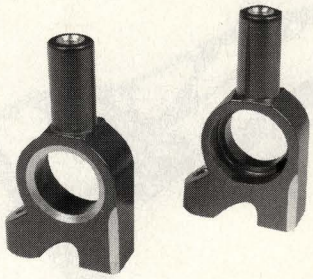
GPM's alloy Handle Set (#NRS4112) retails for $25.00.

GPM

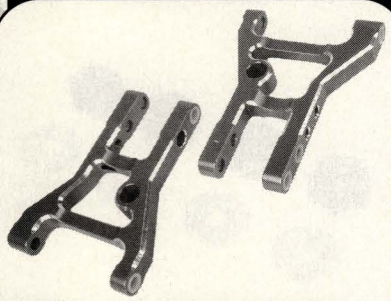


GPM's aluminum Y-Brace (#NRS4015) retails for $30.00.

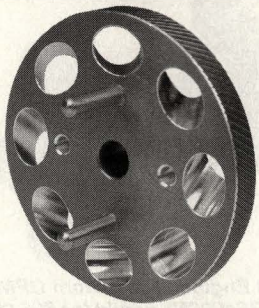
GPM



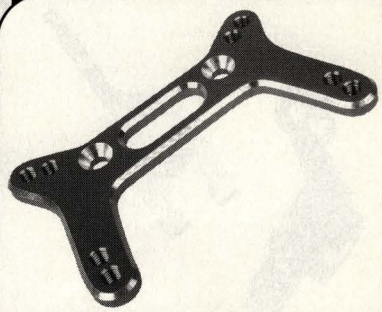
These Front Pulley Mounts from GPM (#NRS4039) retail for $25.00.



These replacement aluminum Front Suspension Arms from GPM (#NRS4055) retail for $25.00 per pair.



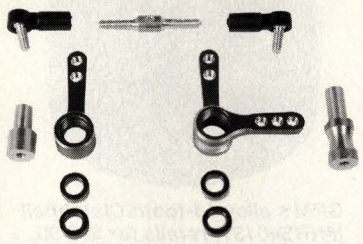
This lightened 40mm 2/4-pin Flywheel from GPM (#NRS4100) retails for $20.00.



GPM's alloy Front Shock Tower (#NRS4028) retails for $15.00.



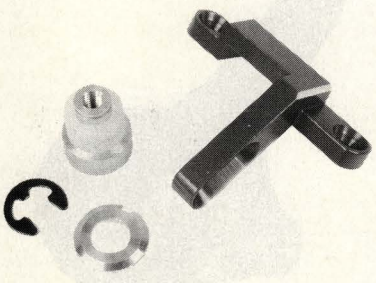
GPM's aluminum Rear Diff Housing/belt tensioner (#NRS4040B) retails for $30.00.



GPM's alloy Steering Kit (#RS4048) is a complete kit and it retails for $40.00.



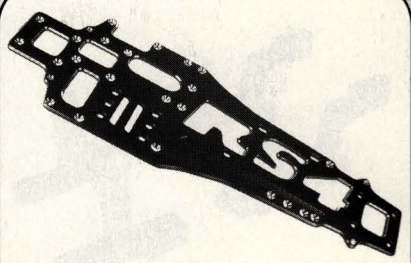
This Mid Belt Tensioner from GPM (#NRS4026) retails for $20.00.



This alloy GPM Front Belt tensioner (#NRS4023) retails for $20.00.

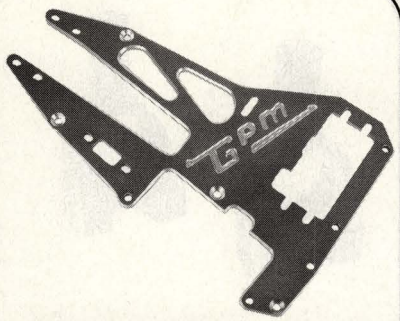


This alloy Rear Shock Tower from GPM (#NRS4030) retails for $20.00.

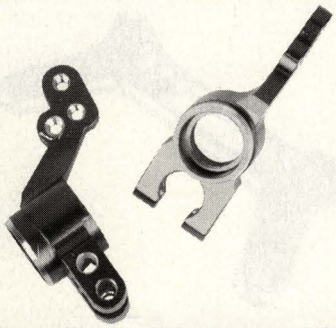


GPM's Signature Aluminum Chassis with its distinctive RS4 cutout (#NRS4016) retails for $45.00.

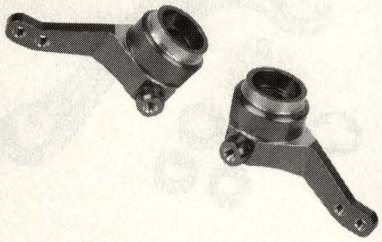
GPM



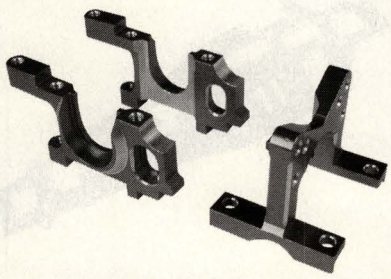
GPM's alloy Top Plate (#NRS4014) retails for $30.00.



These alloy Rear Knuckles from GPM (#NRS4022) retail for $25.00.

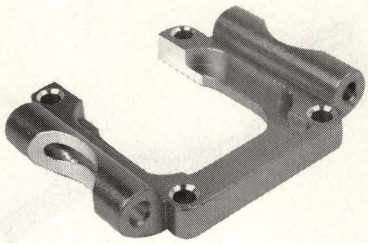


GPM's alloy Front Knuckles (#NRS4021) retail for $25.00.

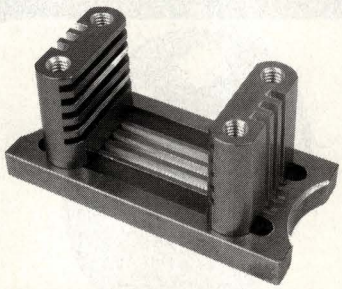


This alloy Front Gearbox set from GPM (#NRS4012) retails for $50.00

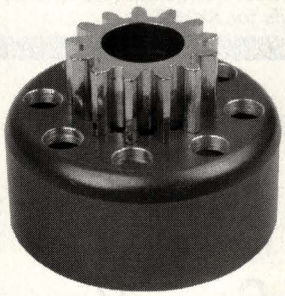
GPM



GPM's alloy Front Suspension Arm Mount (#RS4008) retails for $25.00.

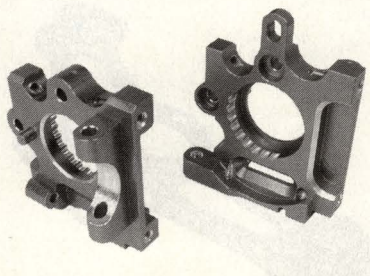


This Engine Mount from GPM (#NRS4080N) retails for $25.00.



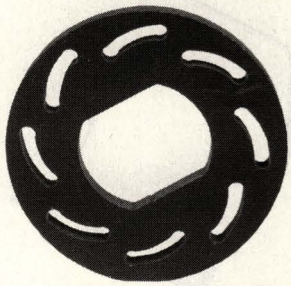
GPM's alloy 13-tooth Clutchbell (#NRS4013T) retails for $20.00.

CRC

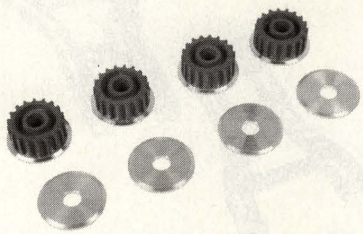


CRC's aluminum Rear Gearbox set for the Nitro RS4 (#4813) retails for $54.99.

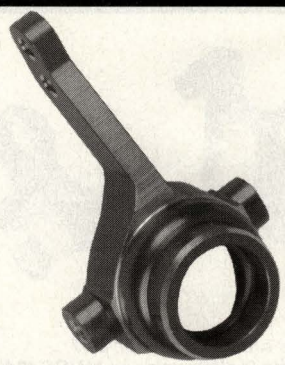
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This Carbon Brake Disc from CRC (#4807) retails for $20.00.



CRC's aluminum 18-tooth pulley set (#4886) retails for $44.99.





These aluminum Front Steering Knuckles from CRC (#4821) retail for $29.99.

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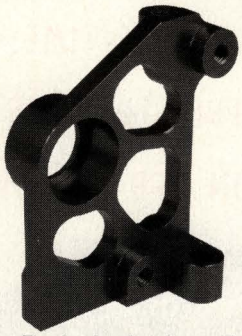
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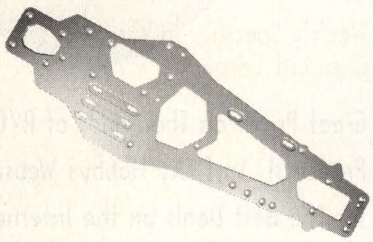
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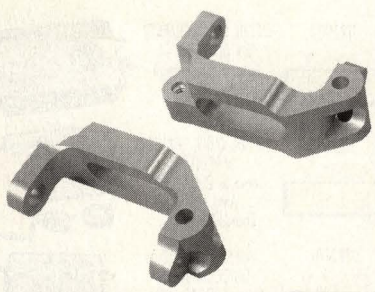
Cross



Cross Racing's aluminum Brake Block (#CH-13) retails for $39.99.



This 3mm-thick aluminum Main Chassis Plate from Cross Racing (#CH-19) retails for $103.99.



Cross Racing's pair of aluminum Front Hub Carriers (#CH-39) retails for $44.99.



This pair of 2-degree aluminum Rear Hub Carriers from Cross Racing (#CH-42) retails for $41.99.

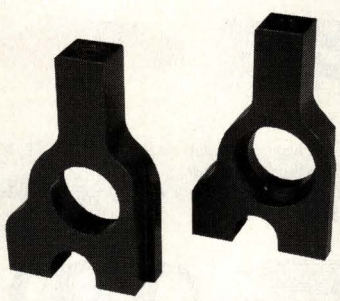
Cross



Cross Racing's aluminum Front Bulkhead set (#CH-48) retails for $57.99.



This aluminum 0-Degree Lower Front Suspension Arm Mount from Cross Racing (#CH-49) retails for $44.99.

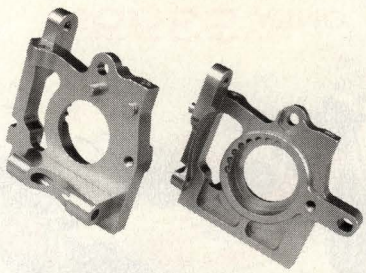


Cross Racing's aluminum Counter Blocks (#CH-51) retail for $38.99.



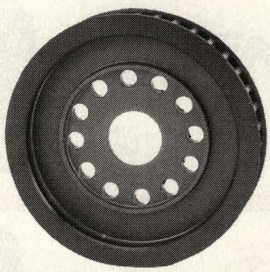
These black anodized Front Knuckle Arms from Cross Racing (#CH-135) retail for $41.99.

Cross

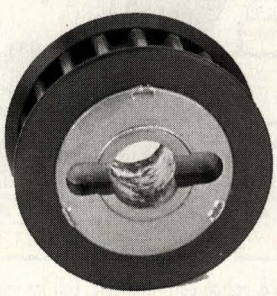


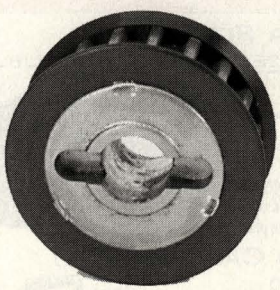
Cross Racing's aluminum Rear Bulkhead set (#CH-153) retails for $57.99.

Robinson Racing



Robinson Racing's front alloy diff pulley (#RRP1528) retails for $22.50.





These two hard-anodized, alloy 18-tooth pulleys from Robinson Racing (#RRP1538) replace the stock plastic units. Retails for $22.50 a pair.

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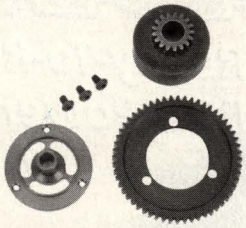
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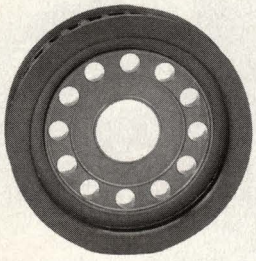
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BUYER'S GUIDE

Robinson Racing

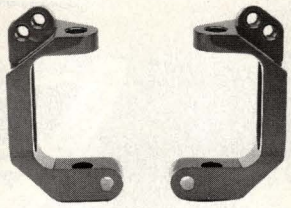


This 32-pitch conversion kit from Robinson Racing (#RRP1535) features finer pitch gears than the stock kit. Retail price is $28.50.

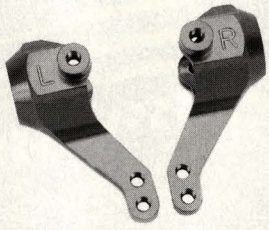


Robinson Racing's rear alloy diff pulley (#RRP1539) retails for $22.50.

Eagle Racing



Eagle Racing's aluminum alloy, purple-anodized front C-Mounts (#1262) retail for $26.95.

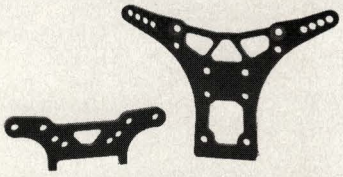


These Eagle Racing aluminum alloy, purple-anodized steering blocks (#1261) retail for $26.95.

Eagle Racing

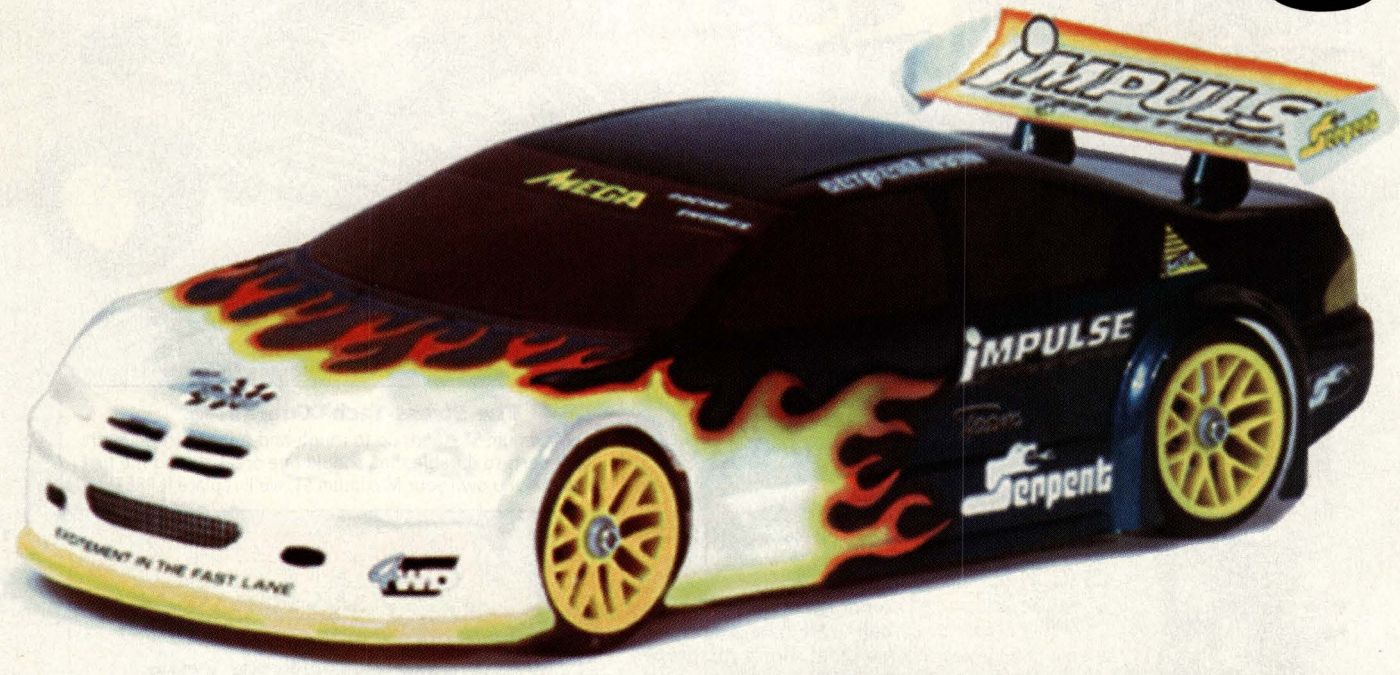


Eagle Racing's front purple-anodized, aluminum alloy suspension arms (#1263) retail for $26.95.



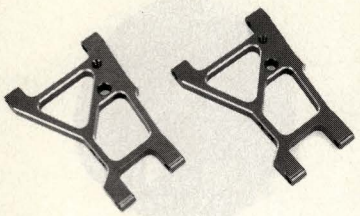
These new 3mm-thick graphite plate shock towers from Eagle Racing (#1257-front/1258-rear) fit as direct replacements. The front shock tower retails for $16.95 while the rear tower retails for $18.95.

This Touring



Visit the Serpent website at www.serpent.com

Eagle Racing



Eagle Racing's rear purple-anodized aluminum alloy suspension arms (#1263) retail for $26.95.



Eagle Racing's purple-anodized, aluminum alloy, rear hub carriers (#1264) retail for $26.95.

HPI



HPI's new purple anodized 15FE Heatsink Head for the Nitro Star 15 (#1703) lets the engine run cooler. Retail price is $45.00.

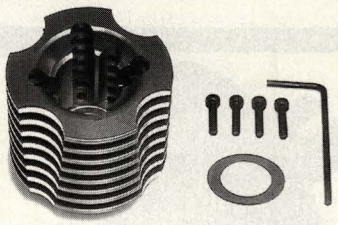


This Large Bore SS Carb (#1666) from HPI has two needle adjustments and fits the 15FE and 12E HPI engines. Retail price is $53.00.

HPI



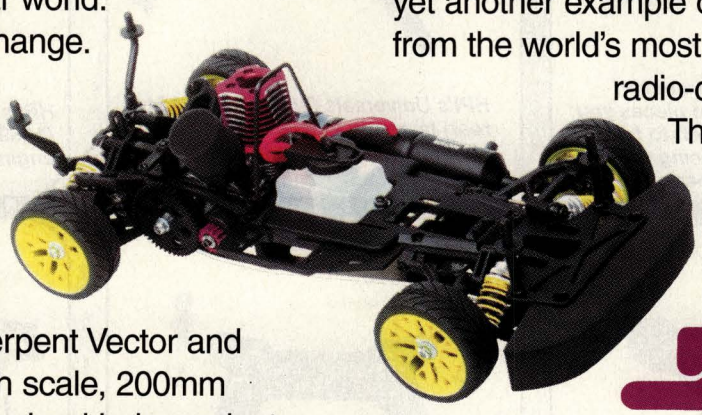
This SC Carburetor (part #1687) has two needle adjustments and a large bore barrel. Retail price is $55.00.



HPI's Nitro Star 12 aluminum Heatsink Head (#1702) fits the 12E engine only. Retail price is $45.00.

Car Bites!

Until now, things have been quite pleasant in the gas touring car world. But that's about to change. Now there's a Serpent to contend with. The all-new Serpent Impulse harnesses the world championship technology of the Serpent Vector and Impact M2 to a 1/10th scale, 200mm touring car. With a 4-wheel independent suspension that's based on the award winning Impact M2 design, front and rear steel-gear differentials, unique externally adjustable double-piston shocks, and a CNC machined 7075-T6 aluminum chassis, the Serpent Impulse is yet another example of race-car artistry from the world's most successful maker of radio-control automobiles. There's a snake on the grid. Now we'll see how fast the rest of the field can run.

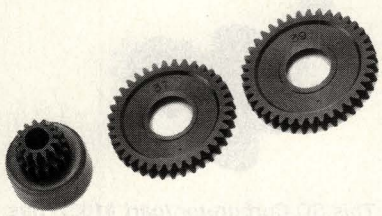


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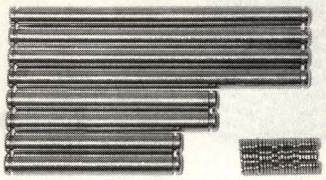
BUYER'S GUIDE

HPI



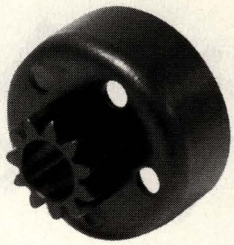
This Two-Speed Second Gear set (#A818/or A819) retails for $13.00 a set.

HPI

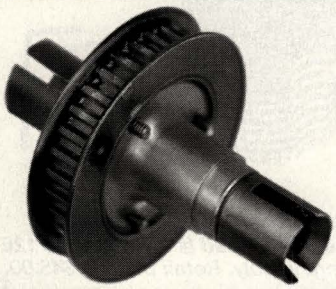


HPI's Stainless Steel Hingepin set (#A261) makes the car's suspension action smoother. Retail price is $17.00.

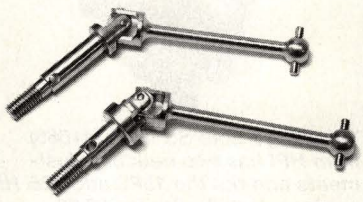
HPI



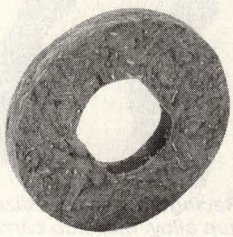
HPI's 11-Tooth Clutchbell (#A811) lowers the car's gear ratio for more acceleration for cars without two-speeds. Retail price is $7.00.



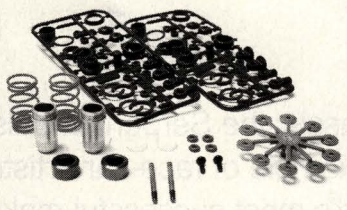
HPI's 39-tooth Super Front One-Way Differential (#A959) uses four one-way bearings for increased reliability. Retail price is $49.00.



These Narrow Universals (#A5110-front/A511-rear) increase efficiency and fit a narrow setup. Retail price is $34.00.



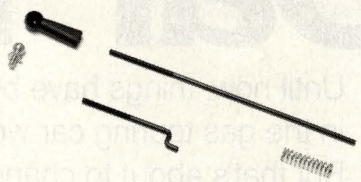
This Fiber Brake Disc (#A844) from HPI provides more consistent braking action and longer wear. Retail price is $14.00.



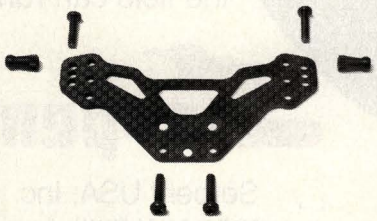
This Super Shock set from HPI (#A111) includes all the pieces you need to make the switch to hard-anodized aluminum racing shocks. Retail price is $32.00 per pair.



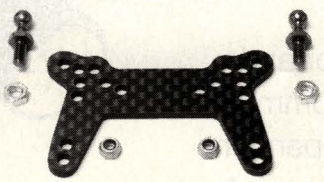
HPI's Universals (#A513-front/A514-rear) increase efficiency and fit a standard setup. Retail price is $34.00.



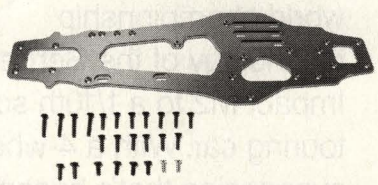
HPI's new Slide Carb Linkage Set (#A896) is for all slide carb-equipped engines. Retail price is $3.00.



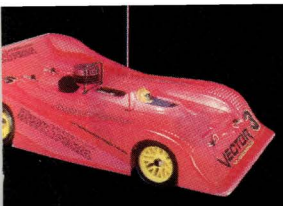
HPI's rear Woven Graphite Shock Tower (#A218) has three shock mounting holes (the plastic unit only has two). Retail price is $18.00.



This front Woven Graphite Shock Tower (#A570) from HPI provides more shock mounting positions for more tuning options. Retail price is $10.00.



This 3mm-thick anodized aluminum Super Chassis set (#A903) from HPI comes with all the countersunk screws you'll need. Retail price is $95.00.



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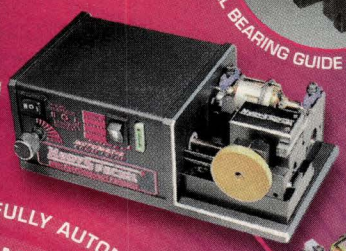










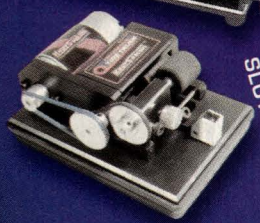


















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R/C CAR BACK ISSUES



❑ APR. '98
HPI, RS4 MT; Team Associated RC10B3; Tamiya TA03F David Jun Special; Team Losi XX Kinwald Edition; Tamiya M02L Mercedes SLK; Tamiya TAO3R Nissan R390GT1; how to clear big jumps; rebuild your tranny; *R/C Car* glossary; JR R-1 vs. Airtronics M8; Tekin BC112c digital peak charger; Novak Rhino DC peak charger; Trinity IFMAR off-road worlds video; Comp Art truck tire washer; KO Propo EX-11 Presto radio; HPI RS4 Pro Electric touring car (part 1); Team Losi XX-4 4WD off-road buggy (part 1) OFNA Z-10 pro electric touring car.

❑ MAY '98
Kyosho Nitro Mini-Cooper; Tamiya Blazing Star; Yokomo YR-4 MS USA version; Traxxas 4-Tec; Mugen Prime 12; Team Losi XX-4 Racing Truck; Innoventive Technologies CVEC tuned pipe; Motor Saver filters; PC/RC EFR; Reedy International Race of Champions; how to build battery packs; Kyosho Rally cars; KO Propo EX-1 Mars FM radio; PROTOForm Volvo S-40 touring body; Tekin DIS-350 battery discharger; Racers Edge diff building board; Team Associated RC10T3 (Part 1); HPI Nitro Mini (Part 1); Tamiya M02l.

❑ JUNE '98
Kyosho GP-10 MK. II Spider; Schumacher Cat '98; OFNA Racing Nitro Z-10 HPI RS4 Mini; Kyosho Inferno DX II; SRP Spectre; Bennett vs. ESP Clods; '98 Team Losi Winterchamps; Airtronics anti-lock brake booster; Cross Racing JOMO Nissan Skyline GT; GM Racing Super Glue; Tekin G-10 PRO ESC; Hitec Lynx FM Radio; Schumacher '98 Spec S.S.T. 2000 (part 1); Team Associated RC10B3 (part 2); Team Losi Double-X Kinwald Edition (part 2).

❑ JULY '98
MRC Nitro Thunder King; Traxxas Nitro Sport; Kyosho ATV Quad rider; OFNA Pirate 10 SE Porsche; Kyosho Formula 10; Team Losi XX-T 'CR' Graphite; Team Losi XX-4 (part 2); Tamiya M02L (part 3); Futaba 3PJ FM/PCM radio system; Roland Digital Group Sitka; Schumacher gauge set; Dirt Bagz Battery Caddy; Robinson Racing bearing cleaner; GM Racing V-12 ESC.

❑ AUG. '98
HPI Nitro RS4 Racer; Tenth Technology StreetWise Stadium Truck; Thunder Tiger Twister; Yokomo MX-4; Team Associated Nitro Dual Sport; Team Associated Nitro Dual Sport; inside the Silver State Nitro Challenge Winners; Setting your suspension; 12 ways to go faster!; inside the Pro-Line Cactus Classic; Factory Works Motor Centering Kit for Losi vehicles; MIP Thorpe Wrenches; Futaba Magnum Sport and Magnum Junior Radios; Progressive Suspension EDC Shocks; Schumacher CAT '98; Team Associated RC10T3.

❑ SEP. '98
Trinity Switchblade 12sj; Schumacher Fireblade USA; Tamiya Golf VR5; FSR Bullet; Kyosho SuperTen McClaren; GTR F1; Thunder Tiger Mirage V-Spec; which scale is for you?; how to care for your modified motor; project Dirt Oval Nitro Sport; MIP 4-N-1 Clutch; RPM Tire Gluing JIG; Hitec CG-330 Charger; Trinity Touring Car Tire Tamer; OFNA starter box; Dynamite Glow Tuning Screwdriver; Team Losi XX4 (part 1); Team Associated RC10GT (part 1).

❑ OCT. '98
Kawada SV-10 Alcyon; Tamiya's PIAA Porsche & Mercedes CLK GTR; Schumacher Nitro .21 Xtreme; Kyosho Nitro Blizzard; Tamiya Volkswagon Beetle; ROAR Off-Road Fuel Nationals; understanding swaybars; 10 beginner problems; OFNA car stand; Performance Hobby Jack Stand with Lite Switch; Novak Atom ESC; JR Racing XR2 AM Computer Radio; Trinity Monster Stock Jr. Stock Motor; HPI RS4 Pro; Team Losi Kindwald Edition

❑ NOV. '98
HPI RS4 Rally; MRC Nitro Thunder King; HPI Mini Pro; Team Associated L3; Tamiya Ferrari F310B F1; Tech Racing Voggerd GT; Kibrough/BSR Oval Shootout; Mark Pavidis' new Mugen MBX-4; building a track; turn marshalling rules; Tamiya Championship Series; RPM Ride-Height gauge; Dynamite Ultra-Start starter box; Tekin Pro Motor Dyno; Traxxas Nitro Sport.

❑ DEC. '98
Kyosho TF-3 Type-R; Tamiya M0-3 Cooper; Kawada SV-10 Alcyon; Tenth Technology Streetwise Mercedes; Tamiya TGX-Mk. 1 TS; painting Lexan bodies; roll center; Novak Pit Wizard; 12 uses for fuel tubing; '98 ROAR mod Nats; Driving the ROAR off-road winning cars; JR-Propo R1 Radio; Schumacher CCD charger/discharger; Kyosho MP-5; Schumacher Fireblade USA.

❑ JAN. '99
Traxxas Nitro 4-tec; Kyosho QRC-SV Mooneyes Street Van; Thunder Tiger TA02 Nitro Conversion; OFNA Nitro Z-10 Pro; Tamiya TA03R Mobil 1 NSX; Team Kinwald Pro Shock bushings; RPM Bearing Blaster; Tamiya tire gluing jig; Racers Edge shock piston drill set; IFMAR OnTrack World Championships; Dynamite's New 12 S and 12 SPD Engines; ROAR On-Road Fuel Nationals; off-road tire tuning; HPI Viper Cup; First Annual Labor Day Shootout

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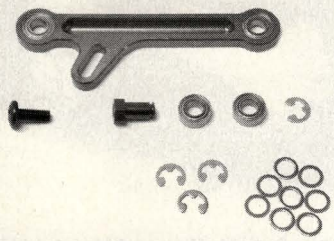
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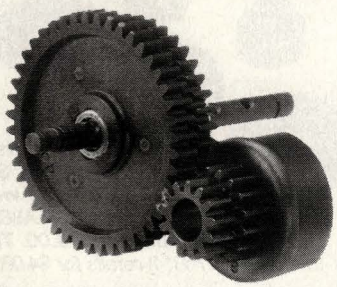
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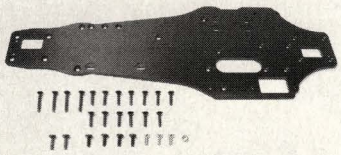
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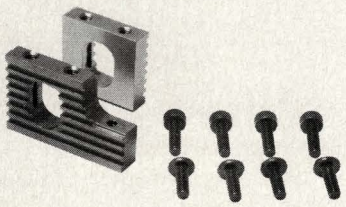
HPI's Gear Brace Set (#A907) reduces slop in the gear and pulley shaft. The kit (which includes the ball bearings and belt tensioner) retails for $34.00.



The 2-speed Transmission from HPI (#A910) has an adjustable shift point and it retails for $69.00.

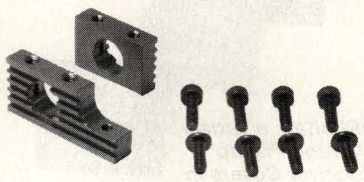


HPI's 2.5mm-thick, purple anodized Heavy-Duty Main Chassis (#A914) comes with all the necessary countersunk hardware. The chassis retails for $34.00.

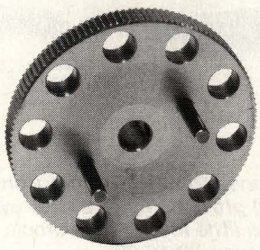


HPI's 20mm Heatsink Pull-Start Engine Mount (#A915) is finned to dissipate heat. Retail price is $45.00.

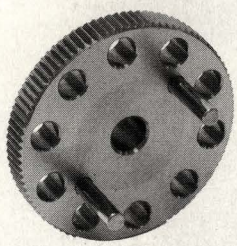
HPI



HPI's 15mm Heatsink Non-Pull-Start Engine Mount (#A920) is finned to dissipate heat. Retail price is $45.00.



This 2-pin, 40mm, Light Flywheel (#A925) provides more RPM and faster straightway speeds. It retails for $20.00.

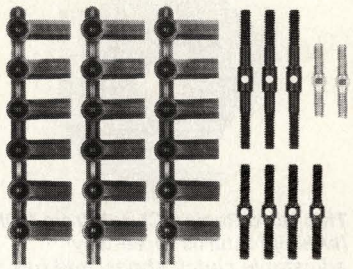


This 2-pin, 32mm, Light Flywheel (#A926) provides more RPM and faster straightway speeds. The flywheel retails for $20.00.

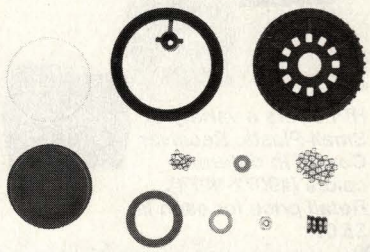


HPI's Oil Catch for Nitro Star Engines (#A928) fits around the one-way bearing on the crankshaft and keeps oil off the chassis and brake disk. Retail price is $17.00.

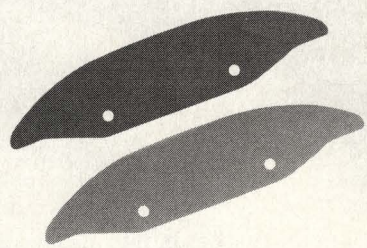
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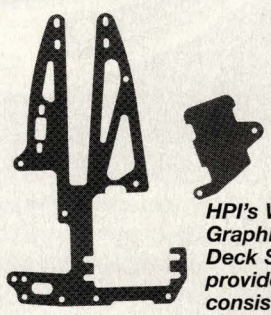
This HPI turnbuckle set (#A502) fits either narrow or wide versions of the car. The retail price is $15.00.



Get a more responsive, better-handling sedan with a HPI Ball Differential (#A905). Retail price is $35.00.



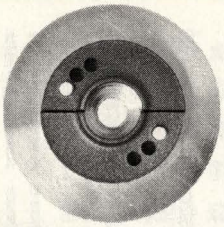
Precut foam bumpers (#6274-gray/6275-blue) are a must for racers. Retail price is $5.00.



HPI's Woven Graphite Upper Deck Set (#A930) provides more consistent suspension action. Retail price is $21.00.

HPI Nitro RS4
BUYER'S GUIDE

HPI



This Nitro Racing Clutch from HPI (#A885) features three-way adjustable clutch shoes, and has a loop-style spring for smooth power transfer. Retail price is $15.00.

HPI



HPI offers a variety of Large Plastic Receiver Covers in different colors (#9075-9077). Retail price for each is $5.00.

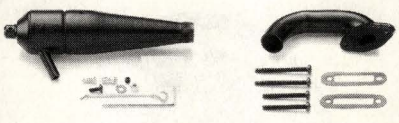
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HPI's Side Muffler and Manifold kit (#A869) replaces the older style can-type muffler. Retail price is $22.00.



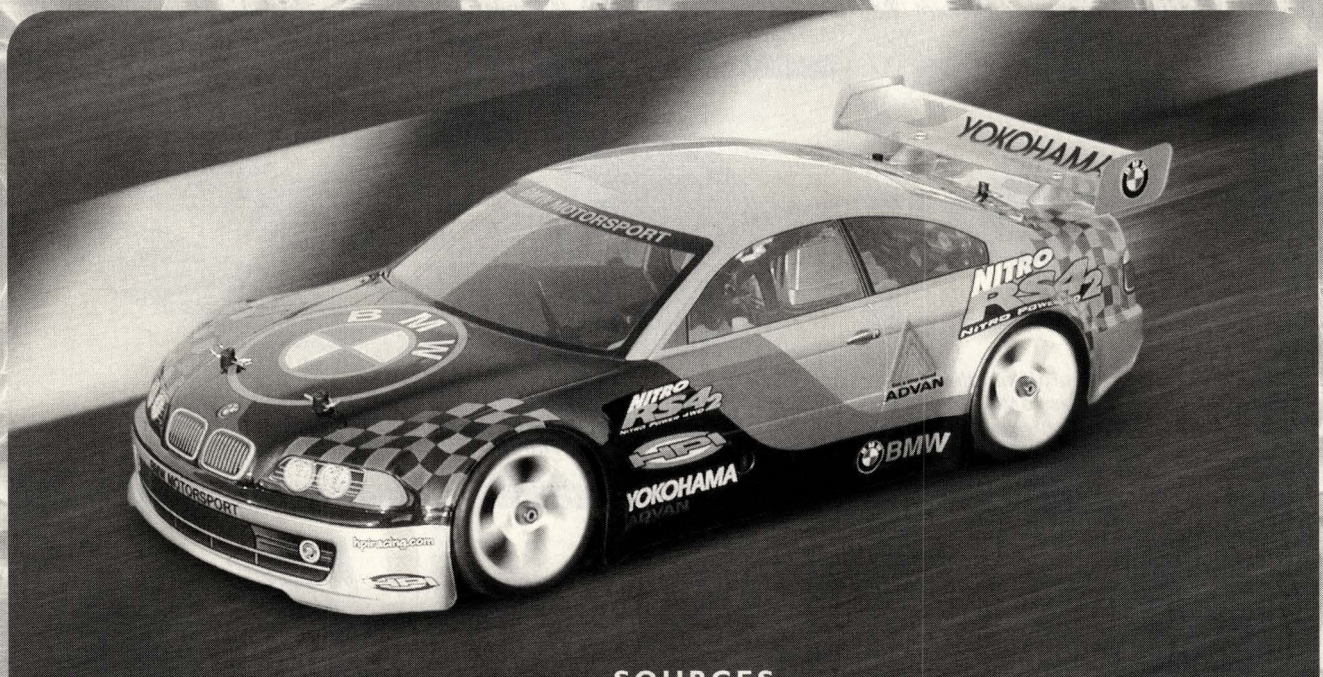
HPI offers a variety of Small Plastic Receiver Covers in different colors (#9072-9074). Retail price for each is $5.00.



This Tuned Pipe/Header kit from HPI (#A940) provides more power overall and is a little louder than stock. Retail price is $65.00.



HPI offers a Heavy-Duty Gear Set and an adapter with a one-way bearing (#A882). The adapter retails for $19.00. The 44-tooth gear (#76814) retails for $4.00. ◆



SOURCES

Alien/Wolf Pack Radicals, distributed by Bruckner Hobbies, 2908 Buckner Blvd. Bronx NY 10465 • (800) 288-8185
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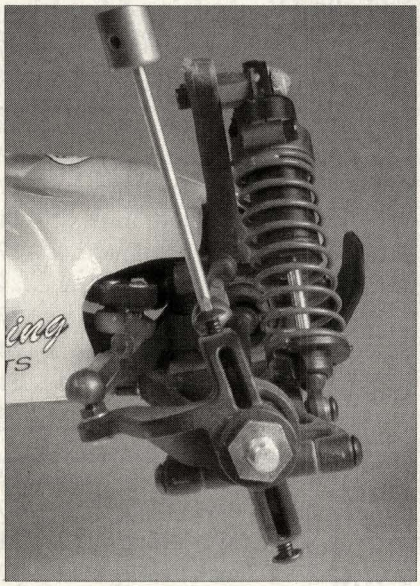
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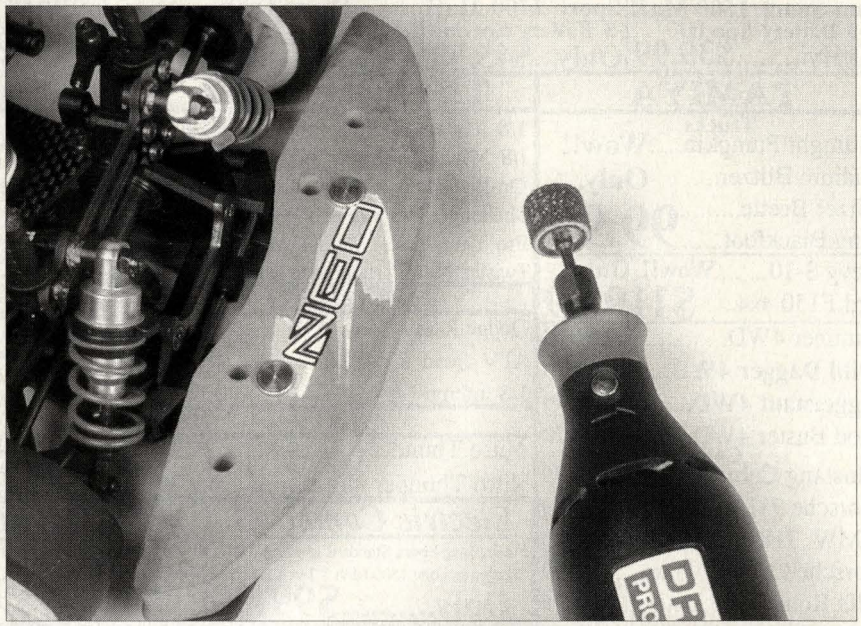
Proper kingpin alignment

Most 4WD cars use a pair of screws that act as kingpins for the front steering arms. This is because these cars have driveshafts that go to the front wheels, so it would be nearly impossible to use a conventional one-piece kingpin such as those used by off-road buggies and trucks. When you install two-piece kingpins, make sure you do both at the same time—don't install one kingpin and tighten it down before moving on to the next. If you "start" each kingpin first, there's less chance that you'll cross-thread one of them or cause the steering hub to be out of alignment with the upright.



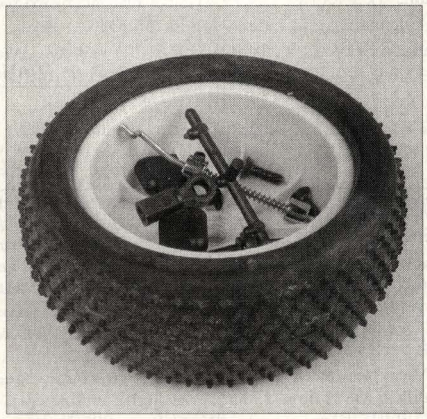
Keep it together

When you work on your car or truck, there's usually some heavy-duty disassembly involved—it can't be helped! The next time you need to take your chassis apart, save yourself some aggravation by partially re-installing screws, nuts, etc., into their respective parts. This way, all the right pieces will already be grouped together and you'll be far less likely to lose a screw or nut, or worse, rebuild the chassis using the wrong hardware in the wrong location!



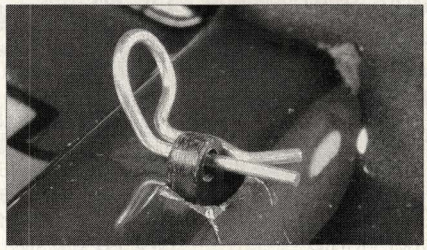
Slim and trim

Most on-road touring sedans can benefit from the addition of a large, crash-absorbing foam front bumper. But in most instances, the foam bumper is too large to fit underneath the front end of the car body. You'll need to trim the bumper, and the best way is to use a rotary tool such as a Dremel and a round sanding-drum attachment. The drum will allow you to carefully shape the foam bumper to perfectly match the inside of the body without causing ugly, jagged cuts.



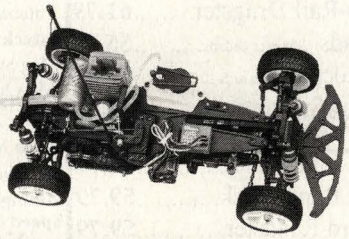
Tire-d of lost parts

The next time you take apart your car or truck, store all the loose hardware and small pieces inside an upside-down off-road wheel and tire. These seem to always be laying around on our workbench, and they make great little parts holders in a pinch. Just don't forget to take out the parts before you use the wheel on your off-roader!



Easy clip removal

Removing small or hard-to-access body-mounting clips can be a tough job. To make it easier to grab and remove body-clips, simply place a 90-degree (or whatever degree you need) bend in the clip using two pairs of needle-nose pliers. Now, you should be able to get a grip!



Limit your travel

Although this isn't mentioned in the instruction manual, HPI Nitro RS4 owners can install 3mm setscrews into the rear suspension arms to adjust the arms' down-travel. A 3x8 or 3x10mm setscrew should do the trick. Just thread the setscrew into the pre-drilled hole that's located near where the arm meets the front of the rear bulkhead. Thread the setscrew inward until it contacts the chassis plate, and use this adjustment to fine-tune and limit the rear arms' down-travel. ◆

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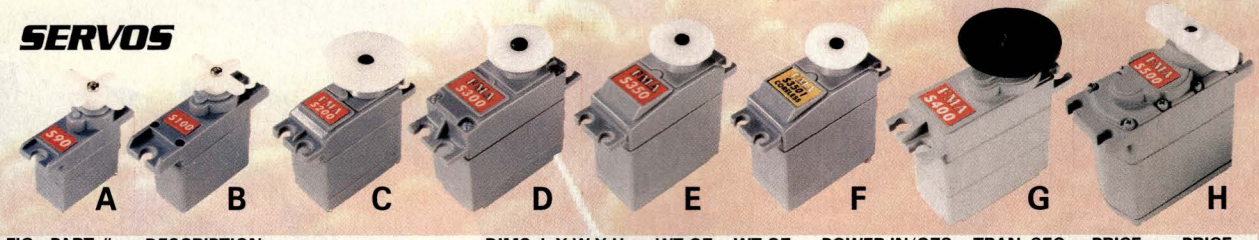


FIG.	PART #	DESCRIPTION	DIMS. L X W X H	WT OZ.	WT OZ.	POWER IN/OZS.		TRAN. SEC.	PRICE	PRICE
A	S90	SUB MICRO BB	0.86 X 0.43 X 0.78	0.32		19.0		0.09	$24.95	
B	S100	MICRO BB	1.06 X 0.50 X 0.97	0.49	METAL	25.0	ALL	0.15	$21.95	METAL
C	S200	MINI DOUBLE 2BB	1.22 X 0.63 X 1.18	0.85	GEAR	44.5	AT	0.23	$21.95	GEAR
D	S300	STANDARD BRONZE BUSH	1.59 X 0.79 X 1.50	1.55	VERSION	38.0	4 VOLTS	0.15	$10.95	VERSION
D	S301	STANDARD 2BB	1.59 X 0.79 X 1.50	1.55		38.0	UNLESS	0.15	$14.95	
E	S350 (M)	2BB ADD M FOR METAL GEAR	1.60 X 0.79 X 1.50	1.58	1.94	47.0	STATED	0.23	$19.95	$21.95
E	S355 (M)	2BB ADD M FOR METAL GEAR	1.60 X 0.79 X 1.69	1.69	2.01	100.0		0.33	$19.95	$21.95
E	S360 (M)	2BB ADD M FOR METAL GEAR	1.60 X 0.79 X 1.69	1.69	2.01	69.0		0.21	$19.95	$21.95
F	S3501 (M)	CORELESS 2BB M FOR METAL GEAR	1.60 X 0.79 X 1.50	1.59	1.83	83.0		0.10	$44.95	$47.95
F	S3551 (M)	CORELESS 2BB M FOR METAL GEAR	1.60 X 0.79 X 1.50	1.59	1.83	108.0		0.16	$44.95	$47.95
F	S3601 (M)	CORELESS 2BB M FOR METAL GEAR	1.60 X 0.79 X 1.50	1.59	1.83	98.0		0.12	$44.95	$47.95
G	S400	GIANT SCALE 2BB	2.14 X 1.04 X 2.03	4.00		180.5	6.0V	0.20	$24.95	
H	S500	GIANT SCALE FET AMP 2BB	2.48 X 1.27 X 2.22	5.40		333.0	6.0V	0.22	$44.95	
H	S550	360 DEG SAIL WINCH	2.48 X 1.27 X 2.22	5.40		333.0	6.0V	1.32	$54.95	

RAPID CHARGERS



Timer-controlled rapid charger for glow. Affordable and compact, charges at 1.2A for 15 to 20 minutes. Heavy-duty, all-metal enclosure, quick-connect dummy glow plug for interconnect. A must-have for any R/C enthusiast running glow-powered engines.

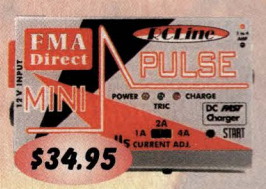


The VERSAPULSE is an affordable, yet highly flexible AC/DC rapid charger with delta peak cutoff. Charges any 4 to 10 cell pack using AC input or a 4 to 7 cell nicad pack using +12V DC input. Self-limiting, variable charge rates from 0.5A to 5.5A, a rugged plastic enclosure, cooling fan and heat sink, fuse and reverse polarity protection make this charger a great value!

Charges 1 to 12 cell nicad or glow. Operates off of +8V to +15V D.C. power source (i.e. a car battery). Peak detect, perfect for electric power packs or as a field charger! Aluminum case, fuse and reverse polarity protection. *THE ONE CHARGER THAT DOES IT ALL!*



Peak detection at an affordable price makes the MINIPULSE a great value! Operates off of a +12V D.C. power source (i.e. a car battery). Charges *any* 4 to 7 cell nicad battery pack at either 1A, 2A, or 4A. Great for charging flight packs and 6 or 7 cell power packs FAST! Packaged in a heavy-duty, all-metal case with fuse and reverse polarity protection.



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HPI RS4MT Baja Bug

Beetle mania!



Don't you hate how we try to fit everything in our lives into neat little categories? It's the same with R/C: we have on-road cars, off-road trucks, carpet cars, oval cars, and so on ad nauseam. Fortunately, there are companies such as HPI that provide us with R/C kits that defy categorization. Take, for example, the new RS4MT Baja Bug. It's a street truck that can tackle the roughest terrain imaginable. It's also a rugged off-roader that can hold its own on twisty pavement. In other words, this is a truly versatile machine that will go just about anywhere you wish!

Monster truck chassis

The RS4MT, the monster truck chassis upon which the Baja Bug is based, shares many design features—believe it or not—with HPI's super-popular RS4 touring car chassis. First and foremost is the truck's efficient twin-belt AWD (all-wheel-drive) system, which smoothly transfers power to all four wheels through a pair of toothed rubber belts and gear differentials.

In addition to providing brisk acceleration, the Bug's AWD system makes this a vehicle that anyone can drive well, regardless of their skill level. Without the need for special tires and suspension settings, the Bug simply hooks up well on just about any surface, thanks to its four driven tires.

Part of the Bug's competence must also be credited to its long-travel suspension and large-volume oil-filled shocks. Each of the Bug's suspension arms is nearly four inches long, providing the chassis with



exceptional ground clearance and suspension travel. But when you want to do a little on-road racing, HPI has thoughtfully placed additional holes in the shock towers and suspension arms that allow you to re-position the shocks to lower the Bug's ride-height without screwing up the damping of the shocks. In essence, you can change from off-road to on-road suspension without having to change the shocks' oil or springs.

Effective, long-travel suspension and a silky-smooth drive train would be enough to sell us on the RS4MT chassis' attributes, but as with all HPI kits, there are many more goodies designed into the package.

Even though it shares its basic drive train with the RS4 touring car line, the MT version gets a completely different, molded-tub chassis that provides a greater measure of protection against dirt and debris. Also, the tub can ably handle saddle-pack batteries through clever molded battery-straps. Stick packs—the most popular style of battery, especially with the sport set—can also be easily installed through a trick door in the side of the chassis tub.

Bug bits

Because of its excellent instruction manual and intelligent engineering, the Baja Bug kit goes together easily enough for even an absolute beginner. Scott Madrigal, one of our kit builders who works part time at Hot Rod Hobbies (our local shop and track), complained about the Bug's Phillips head screws, citing that they were difficult to thread into the plastic parts. He would like to see all kits come with Allen-head screws, but we explained that it's more logical for sport-level kits to have Phillips screws, as a novice builder is much more likely to have the proper-size Phillips screwdriver than a correct Allen wrench. To make it easier to install the self-tapping Phillips screws into the plastic,


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you can coat the screws' threads with silicone or Teflon ball-diff lube.

Scott also thought the kit's green shock oil was too thin. We agreed with his decision to fill the shocks with Associated's 30wt silicone shock oil right off the bat. This thicker oil makes the Bug more stable and less likely to bottom-out and bounce.

We're very familiar with the RS4's drivetrain, and we know that it's capable of handling a hot modified motor with ease. With this in mind, we installed a Team Orion hand-wound 16-turn motor (fast enough for our needs without being too hairy and uncontrollable). "Fueling" the mod-motor is a set of Orion matched Sanyo 2000MAh Nicads, plugged into Novak's brand new Dually programmable speed control using a set of Deans Ultra connectors. We called our trusty Futaba Magnum Jr. AM radio system into use for this project, and used a Multiplex Profi 3BB ball-bearing servo to handle the steering of the Bug.

Bug bashing

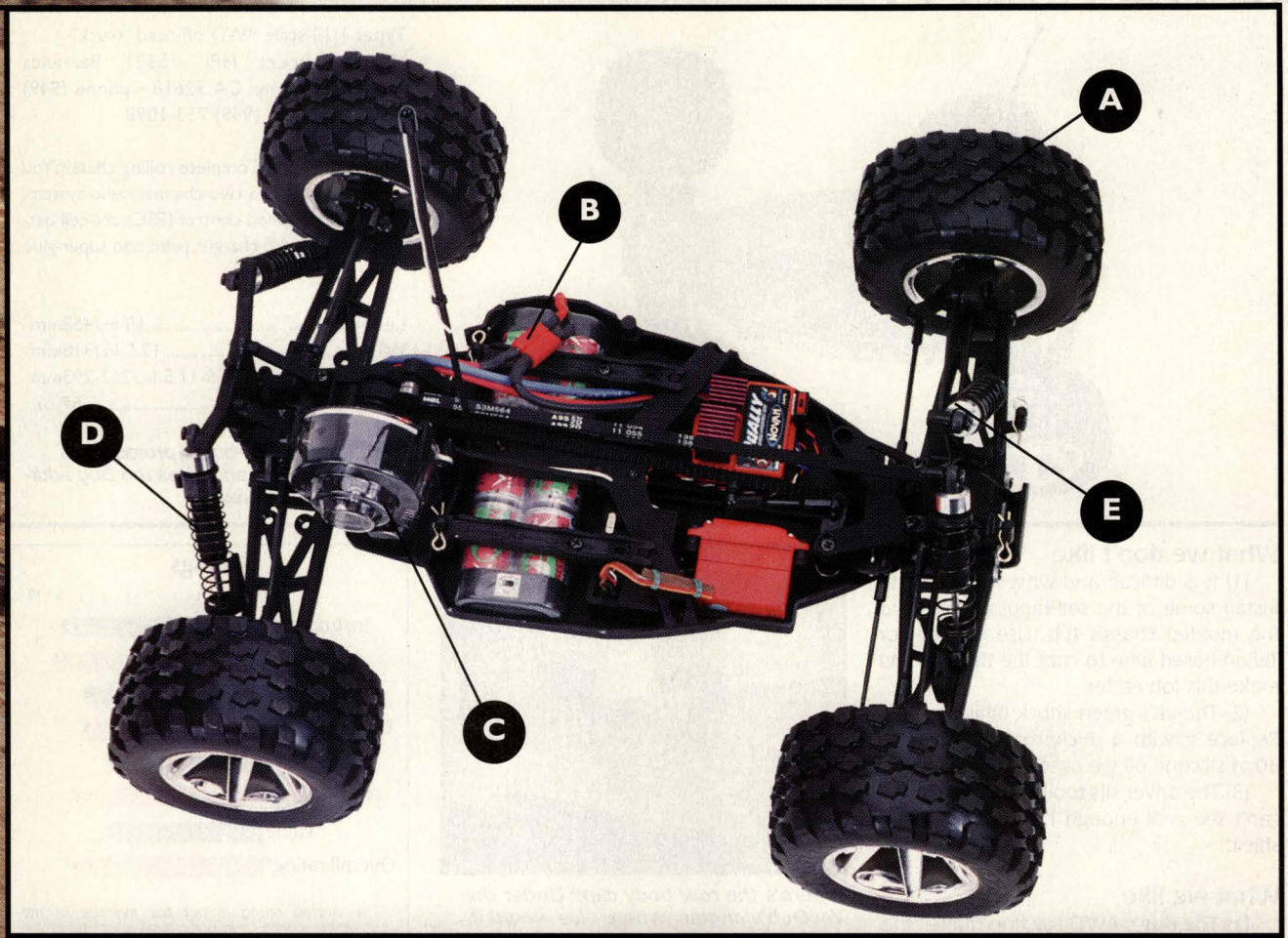
We found a great place to test the Baja Bug—a desert-like "bowl" with rolling hills in the middle bordered by steep cliffs. The surface of the bowl was covered with fine, dried-up grass broken up by sporadic outcroppings of desert weed.

The first thing we did was tackle the cliffs. The Bug really surprised us by being an excellent hillclimber. Despite having dual-purpose on- and off-road tires, the Bug was really great at scrambling up the sides of the cliff. With all four tires scratching at the dirt, the Bug made slow but steady progress. Two-wheel-drive trucks can't do this nearly as well. When we'd make it as high as possible, we would turn the Bug and try to drive along the cliff as far as possible before gravity would pull us back down to the "floor" of the bowl. The addition of the modified motor makes all this type of driving a lot more fun, and the Bug's drivetrain showed absolutely no sign of strain from the added horsepower.

After spending some time going up the cliffs, we decided to try going down them! We stood on top of the fifteen-foot-high sheer drop-off and let the Baja Bug fly at about one-quarter throttle. Yes, this is cruel and unusual R/C punishment, but no less than what you would do to it, no doubt! The Bug proved pretty darn tough and made it down the cliff several times, emerging unscathed at the bottom (sometimes on its wheels, sometimes on its lid).

Next came the high-speed test. Basically, we stood on top of the cliff—a natural drivers' stand—and blasted the Baja Bug through the bowl at full throttle. We were astounded by the Bug's top speed, which was ballistic, and by its run time. We estimated nearly six minutes using 2000MAh cells; the new Panasonic 3000MAh cells should easily provide eight to ten minutes of running. We should also add that we used the kit-included pinion gear, which is intended to provide a gear ratio suitable for stock motors. To us, the gearing seemed pretty spot-on for our 16-turn mod motor.

At full speed, the Baja Bug was nearly unstoppable, blasting across the desert floor at a speed we estimated to be around 25mph! We would plow through the light brush, which would launch the Bug into the air, and power up the sides of the bowl like a high-banked dirt oval track. Really, the performance of this kit is a pleasant surprise and not what you'd expect from a sport-level kit.

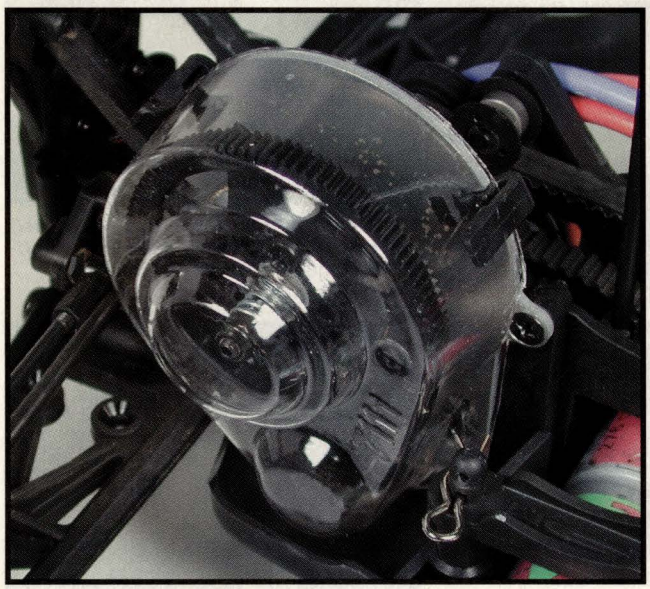


A: The Bug gets a set of Pro-Line Dirt Hawg tires that work remarkably well on- and off-road.

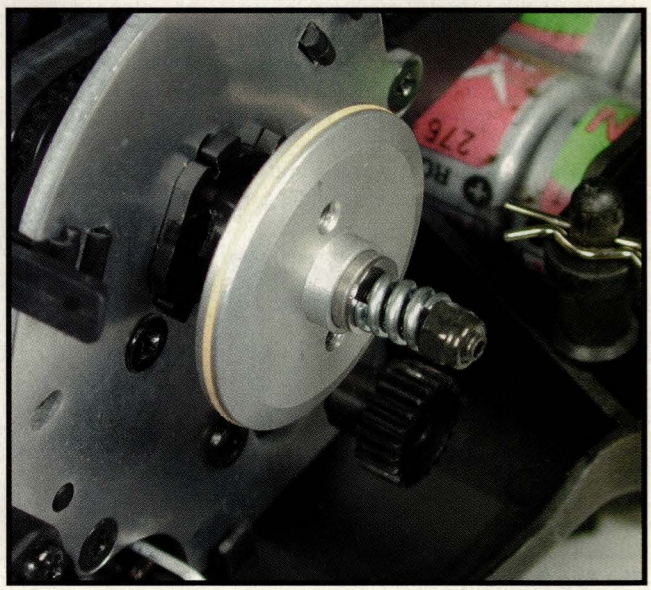
B: The RS4MT's unique battery hold-down system allows the use of stick or saddle-style battery packs.

C: For added traction and durability, the Baja Bug comes with an adjustable slipper clutch protected behind a Lexan gear cover.

D: Large-volume oil-shocks come standard and work well. The rear shocks have special dirt guards to protect the shafts from flying debris.

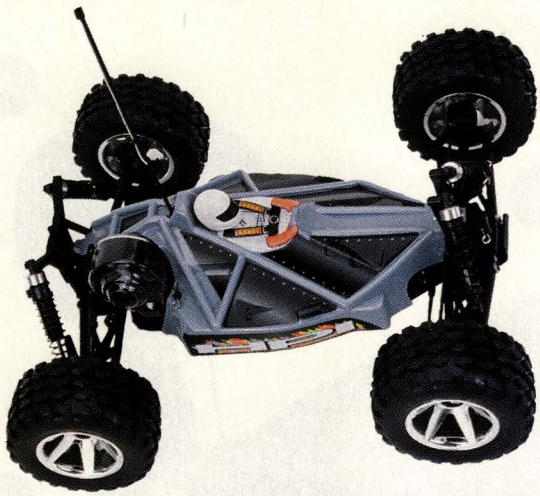


The Baja Bug's drive gears and slipper clutch are encased in this easily removeable Lexan gear cover. Undo two plastic clips to remove the cover—no tools needed!



The Bug's slipper clutch protects the drive train from off-road stress and shock. The clutch can be adjusted to provide the right amount of slippage for your conditions.

HPI RS4MT BAJA BUG



Type: 1/10-scale 4WD off-road "truck"
Manufacturer: HPI, 15321 Barranca Parkway, Irvine, CA 92618 • phone (949) 753-1099; fax (949) 753-1098
Price: $ 239
What you get: Complete rolling chassis. You must purchase a two-channel radio system, electronic speed control (ESC), six-cell battery pack with charger, paint and super-glue for the tires.

Length.....18 in./458mm
Width.....12.5 in./318mm
Wheelbase.....10.5-11.5 in./267-293mm
Weight.....67 oz.

HPI's neat "under-body" protects the chassis from dirt and gives the Bug additional scale features.

What we don't like

(1) It is difficult and wrist-wrenching to install some of the self-tapping screws to the molded chassis tub. Use silicone- or Teflon-based lube to coat the threads and make this job easier.

(2) The kit's green shock oil is too thin. Replace it with a thicker oil such as the 30wt silicone oil we used.

(3) The driver sits too low in the car and can't see well enough through the windshield!

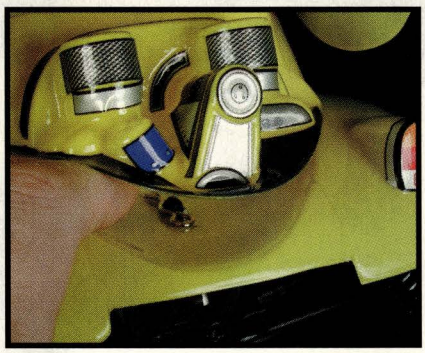
What we like

(1) The Bug's AWD traction makes this one of the best sport-level kits available. With ample traction on nearly any surface, the Baja Bug is supremely easy to drive.

(2) The race-proven RS4 drive train is very durable and super-efficient. Despite the large wheels and tires and the weight of the vehicle, run time is very impressive and top speed is quite high.

(3) All the clever little features HPI throws into the mix, such as the battery door, the easy-to-remove gear cover and the rear shocks' splash guards.

(4) The long-travel suspension and oil-filled shocks provide excellent handling on pavement and on dirt.



Where's the rear body clip? Under the VeeDub's engine, where else would it be? Access is a tad cramped, but this is a cool design feature.

What we really think

HPI's RS4MT chassis is the Swiss Army Knife of the R/C world. It's a kit that does nearly everything well, although it doesn't particularly excel in any one area. But as a kit intended for sport-level drivers and hobbyists, you'd be hard pressed to find something that's this interesting, easy to build and performs as well. Plus, the Bug body just looks so funky mounted on this big-wheeled chassis. ◆



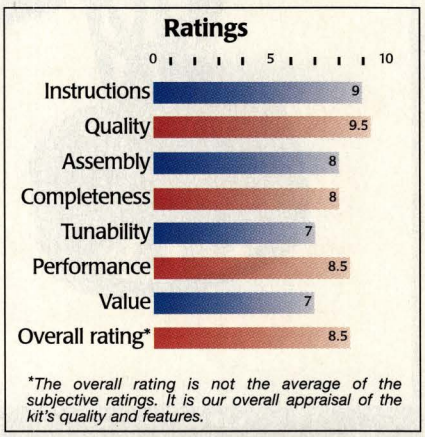
HPI has given the Baja Bug's body shell a healthy dose of scale features, including this molded "engine" and a large, off-road-style rear wing.



The Bug will accept either stick or saddle-pack batteries. Stick packs are inserted through this "door" in the side of the chassis.



The inclusion of Pro-Line's multi-purpose Dirt Hawg tires is welcome. They work fantastically on virtually any surface!



**The overall rating is not the average of the subjective ratings. It is our overall appraisal of the kit's quality and features.*

SOURCES

Futaba Corp. of America, P.O. Box 19767, Irvine, CA 92723-9767 • (949) 455-9888; (949) 455-9899 fax
Multiplex USA, 14751 Calvert St., Van Nuys, CA 91411 • (818) 785-2401; fax (818) 785-3946
Novak Electronics, Inc., 18910 Teller Ave., Irvine, CA 92612 • phone (949) 833-8873; fax (949) 833-1631
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Make your RC10GT stand out from the crowd with one of these new aluminum parts from GPM. Both the rear shock tower and the rear bulkhead are direct replacements for the original. The shock tower features a "GT" logo, while bulkhead dramatically improves strength



RGT30

HPI PRO II

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DPRS2078	Delrin Differential Pulley	20.00
DPRS2080	Delrin Differential Hub	25.00
PRS2008a	Lower Front Arm Mount 0 Deg A352(6)	25.00
PRS2008b	Lower Front Arm Mount 2 Deg A352 (5)	25.00
PRS2009a	Front Upper Arm Mount 0 Deg A352 (1)	20.00
PRS2009b	Front Upper Arm Mount 2deg A352 (2)	20.00
PRS2010	Drive Washer With Pin-4pcs Set	15.00
PRS2011	Rear Upper Arm Bulk A352 (4)	20.00
PRS2012	Front Gear Box A340 (6,5)	50.00
PRS2013	Rear Gear Box Set A470 (1,8)	50.00
PRS2015	Light Spur Gear Adapter A498	18.00
PRS2017b	Gear Box Side Plate A341 (3)	25.00
PRS2018	Motor Plate W/Extra Heat Sink Fin	20.00
PRS2019a	Bushing C-Hub 8deg A461 (5.6)	25.00
PRS2019b	Bushing C-Hub 10deg A461 (4,3)	25.00
PRS2020a	Bearing C-Hub 8 Deg. A461 (5.6)	40.00
PRS2020b	Bearing C-Hub 10 Deg. A461 (4,3)	40.00
PRS2021	Front Knuckle Arm Set A461 (1,2)	25.00
PRS2022a	Rear Knuckle Arm 1deg A401 (4,3)	25.00
PRS2022b	Rear Knuckle Arm 2deg A401 (1,2)	25.00
PRS2024	Servo Posts With Screws A452 (2)	10.00
PRS2028	Front Shock Tower A341 (6)	15.00
PRS2030	Rear Shock Tower A341 (2)	20.00
PRS2048	Bearing Steering Set A393, 72001.2	40.00
PRS2051	Rear Bulk Head Set A341 (1)	20.00
PRS2054	Upper Front / Rear Arm A371 (1)	20.00
PRS2055	Front Arm (190mm) A452 (1)	30.00
PRS2056	Rear Arm (190mm) A452 (7)	30.00
PRS2200	Urethane Bumper With Mount	5.00
PRS2311	/Steel Rear Anti Roll Bar Set	30.00

Super Nitro

GSN4014	Graphite Upper Chassis Plate	45.00
GSN40163	3mm Graphite Chassis Plate	95.00
GSN40164	4mm Graphite Chassis Plate	135.00
GSN4028	Graphite Front Shock Tower 4mm) A481 (9)	20.00
GSN4030	Graphite Rear Shock Tower (4mm) A481 (8)	20.00
SN4008	Front Lower Suspension Mount A411 (7)	25.00
SN4009	Front Upper Suspension Mount A411 (2)	25.00
SN4010	Wheel Drive Hub A454	15.00
SN4012	Front Gear Box A340 (5,6)	50.00
SN4013	Rear Gear Box A470 (1,8)	50.00
SN4014	Upper Chassis Plate A481	30.00
SN4015	Rear 'Y' Brace A481 (10)	30.00
SN4015c	Solid Carbon Clutch With H.T. Spring A808	12.00
SN4016	Main Chassis Set 3mm	50.00
SN4016v	Main Chassis Set 4.5mm	70.00
SN4019	Front Bushing C Hub (10 Deg) A461 (3,4)	25.00
SN4020	Front Bearing C Hub (10 Deg) A461(3,4)	40.00
SN4021	Front Knuckle Arm Set A461 (1,2)	25.00
SN4022	Rear Knuckle Arm Set A340 (1,2)	25.00
SN4026b	Mid. Belt Tensioner (Bearing) A481(11)	30.00
SN4028	Front Damper Mount A481 (9)	20.00
SN4030	Rear Damper Mount A481 (8)	20.00
SN4037	New Composite Brake Disk A810 (A)	15.00
SN4039	Front Pulley Shaft Mount A470 (5)	25.00
SN4039a	Brake Adapter A810 (B)	10.00
SN4039c	Carbon Brake Disk A810 (A)	20.00
SN4039d	Duel Brake Disk & Pad System	25.00
SN4039s	Stainless Steel Brake Disk & Kevlar Pad	12.00
SN4040	Main Gear Shaft Mount A470 (1,8)	25.00
SN4040b	Main Gear Shaft Mount With Tensioner	30.00
SN4041f	FRP Brake Pad (A842)	15.00
SN4048	Steering Kit W/ Ball Bearings A390	40.00
SN4054	Upper Fr. Arm (2) A351 (4)	25.00
SN4055	Front Lower Arm Set A454 (1)	25.00
SN4056	Rear Lower Arm Set A454 (5)	25.00
SN4057	Upper Re. Arm (2) A351 (1)	25.00
SN4080n	Engine Mount (Non Pull/Pull)	25.00
SN4100	40mm Fly Wheel	20.00
SN4112	Roll Bar Handle Set	25.00
SN4139	Brake Lever (A841)	15.00
SN4155	Shock Body & Cap For Stock Shock	20.00
SN4157	Rear Camber Mount A411 (5,6)	20.00
SN4160	Tie Rod Set (6)	30.00
SN4200	Urethane Form Bumper	10.00
SN4204	Servo Mount (2)	8.00
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SN4260sf	Hardened Steel Universal Fr	25.00
SN4260sr	Hardened Steel Universal Re	25.00
SN4300j	Hi-Out Put Manifold	25.00
SN4311	Adjustable Torsion Sway Bar Set.	30.00
SN4318	18t Belt Pulley 4pcs A430	30.00
SN4570s	Steel Main Gear 5x64 Shaft A830	18.00
SN4575s	Steel Pulley Shaft 5 X 75 Shaft A834	18.00
SN4815	12 Fin Heat Fit HPI .15 (Stock Eng.)	40.00

Z10 Nitro 4WD Sedan

HN120	Front Bearing C Hub	40.00
HN121	Front Knuckle Arm Set	25.00
HN122	Rear Knuckle Arm Set	25.00
HN1312	Fr/Re Gear Box Set	25.00
HN148	Alloy Steering Kit w/ Ball Bearings	45.00
HN154	Alloy Upper Fr./Re. Arm Set	25.00
HN155	Alloy Front lower Arm Set (200mm)	25.00
HN156	Alloy Rear lower Arm Set (200mm)	25.00
NZ108	Front Lower Suspension Mount	25.00
NZ110	Lower Rear Suspension Mount	25.00
NZ114	Upper Deck Plate	30.00
NZ115	Rear Brace Set	25.00
NZ115T	Alloy Pulley (15T) 2pcs set	20.00
NZ116	3mm Main Chassis Set With Cooling Slot	50.00
NZ120T	Alloy Pulley (20T) 2pcs set	20.00
NZ123	Mid Belt Tensioner	20.00
NZ1250S	Harden Steel Universal Fr /Re.	25.00
NZ1311	Adjustable Torsion Sway Bar Set	30.00
NZ137	Composite Brake Disk	15.00
NZ138	Mid Pull Shaft Mount	25.00
NZ139C	Carbon Brake Disk	20.00
NZ140	Rear Pulley Shaft Mount (2)	25.00
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HPI Nitro & Nitro II

GNRS4016	3mm Graphite Chassis Plate	95.00
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NRS4015	Rear 'Y' Brace	30.00
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NRS4016V	Rib Main Chassis Set 4.5mm	65.00
NRS4019R	Front Bushing C Hub10deg.(RTR)	25.00
NRS4020	Front Bearing C Hub	40.00
NRS4021	Front Knuckle Arm Set	25.00
NRS4022	Rear Knuckle Arm Set	25.00
NRS4023	Front Belt Tensioner	20.00
NRS4023B	Front Belt Tensioner with Bearing	25.00
NRS4024	Steering Servo Mount	8.00
NRS4026B	Mid. Belt Tensioner (Bearing)	30.00
NRS4028	Front Damper Mount	15.00
NRS4028M	Front Damper Mount W/Body Mount	20.00
NRS4028P	Pro Front Damper	20.00
NRS4028R	Front Damper Mount (RTR)	20.00
NRS4029	Front Body Mount Plate	15.00
NRS4030	Alloy Rear Damper Mount	20.00
NRS4039	Front Pulley Shaft Mount	25.00
NRS4039A	Brake Adapter	10.00
NRS4039D	Stainless Duel Brake Disk & Pad System	25.00
NRS4039C	Carbon Brake Disk	20.00
NRS4039S	Stainless Steel Brake Disk & Kevlar Pad	12.00
NRS4040	Main Gear Shaft Mount	25.00
NRS4040B	Main Gear Shaft Mount W/Belt Tensioner	30.00
NRS4041F	FRP Brake Pad (A842)	15.00
NRS4048	Steering Kit w/ Ball Bearings	40.00
NRS4055	Front lower Arm Set (200mm)	25.00
NRS4055R	RTR Front Lower Arm Set (200mm)	30.00
NRS4056	Rear lower Arm Set (200mm)	25.00
NRS4080N	Engine Mount Pull or Non Pull	25.00
NRS4100	40mm Fly Wheel 2 or 4 clutch	20.00
NRS4112	Roll Bar Handle Set	25.00
NRS4139	Brake Lever (A841)	15.00
NRS4155	Shock Body & Cap for Stock Shock	20.00
NRS4157	Alloy Rear Camber Mount	10.00
NRS4200	Urethane Form Bumper	5.00
NRS4201	Plastic Rear Body Post 45mm (2)	4.00
NRS4201L	Plastic Rear Body Post 60mm (2)	4.00
NRS4311	Adjustable Torsion Style Sway Bar Set.	30.00
NRS4318	Alloy 18T Belt Pulley 4pcs	30.00
NRS4570S	Steel Main Gear Shaft	18.00
NRS4575S	Steel Pulley Shaft	18.00
NRS4815	12 Fin Heat Fit HPI .15 (Stock RTR Eng.)	40.00

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ADP100	Rear GT Shock Reservoir (2)	35.00
ADP101	Front GT Shock Reservoir (2)	35.00
DP100	Fine Tune Shock 100mm	45.00
DP90	Fine Tune Shock 90mm	45.00
RGT03	Front Bumper (Stock) (7324)	20.00
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RGT07	Front Nose Plate (7305)	20.00
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RGT32	Rear Bulk Head (7526)	25.00
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R/C Hi-Tech Raceway, 3303 Meridian St., Huntsville, AL 35811 (205) 539-1347

R/C Thunder, 1530 Schillinger Rd., Mobile, AL 36675, (334) 645-2787

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Fairbanks R/C Club, 510 Juneau Ave., Fairbanks, AK 99701 (907) 456-5494

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Hobbytown Mountain Raceway, 1500 E. Cedar Ave., Cedar Hills Shopping Center, Flagstaff, AZ 86004, (520) 214-9887

Hobbytown Raceway, 13802 N. Scottsdale Rd., Scottsdale, AZ 85250 (602) 948-3946

Hobbytown Raceway, 1915 East Baseline Rd., Gilbert, AZ 95234, (602) 892-0405

Hobbytown Raceway, 1102 E. 22nd St., Tucson, AZ 85704, (520) 882-8888

Hobbytown USA, 5030 E Ray Rd., Phoenix, AZ 85044, Linda McFarland, (602) 598-5282

Kiwanis Park R/C Track, 855 S. Magnolia Ave., Yuma AZ 85364, (520) 539-7148

Scottsdale R/C Raceway, 3023 N. Scottsdale, Scottsdale, AZ 85251 (602) 945-2186

Speedway Hobbies, 2710 N. Steve's Blvd., Ste. 8 Flagstaff, AZ 86004 (520) 714-1566

ARKANSAS

Alison Offroad RC Raceway, 6320 Thibault Rd., Little Rock AR 72206 (501) 490-1227

Arkansas R/C Car Association, 101 W. 52nd St., N. Litle Rock AR 72218 (501) 753-1286

Airport Speedway, 1521 Airport Loop, Rogers, AR 72756, (501) 636-7123

Grand Slam Superspeedway, 5300 S. Zero St., Ft. Smith, AR 72703 (501) 648-1994

Hobbytown USA, 356 E. Joyce Fayetteville, AR 72703, (501) 571-3730

Sparks R/C Raceway, 7194 Greene 721 Rd., Paragould, AR 72450, (501) 239-3606

Grand Slam Hobby, 5300 South Zero, Ft. Smith, AR 72901, (501) 648-1994

CALIFORNIA

Castle Hobbies, 14918 Camden Ave., San Jose, CA 95124, (408) 377-3771

Hobby Central Raceway, 34255 PCH, Unit #107, Dana Point, CA 92629, (619) 513-0373

Hobby Central II, 13461 Community Rd., Poway, CA 92064 (619) 513-0373

Hobbytown, Parktwon Plaza Shopping Center, 1350 S. Park Victoria Dr. #21, Milpitas, CA 95035 (408) 945-6524

Hot Rod Hobbies, 25845 San Fernando Rd., Saugus, CA 91350, (661) 255-2404

Jake's Performance Hobbies, 6650 Commerce Blvd., #21 Rohnert Park, CA 94928, (707) 586-3375

Lucerme Valley Raceway, 32800 Old Woman Springs Rd., #4, Lucerne Valley, CA 92356 (760) 248-7305

MnM Hobbies, 4225 Prado Rd., Ste. 103 Corona, CA 91720, (909) 272-3545

Nor-Cal Speedway, 519 Bush St., Woodland, CA 95695 (530) 668-5678

ProCar West, Sante Fe Springs, CA m2rcracing

Race Prep Raceway, 20115 Nordhoff Chatsworth, CA 91311, (818) 709-6800

Racer's Haven, 7401 White Ln. #12 Bakersfield, CA 93309, (805) 835-0441

Ripon R/C Speedway, 701 N. Acacia Ave., Ripon, CA 95366 (209) 599-5160

Sacramento R/C Racing, 6201 27th St., Sacramento, CA 95824, (916) 454-4044

Showtime Speedway, 3709 Abbot DR., Bakersfield, CA 93312, (805) 5890493

Simi Valley Ground Pounders, 392-C - East Easy St., Simi Valley, CA 93065, (805) 584-8211

So. Cal Raceway, 19118 Brookhurst St., Huntington Beach, CA 92646, (714) 963-7484

Ultimate Hobbies, 2378 North Orange, CA 92865, (714) 921-0424

COLORADO

S&T Raceway, 323 Auburn Dr., Colorado Springs, CO 80909, (719) 574-2910

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Davis Hobbies II, 45A Welles St., Glastonbury, CT 06033, (860) 633-3056

K&N Speedway, West St., Stafford Springs, CT 06076 (860) 684-9896

R/C Madness, 640 Enfield St., P.O. Box 64, Enfield, CT 06082, (860) 741-6501

Xtreme Radio Control, 469 Danbury Rd., New Miford, CT 06469, (860) 354-4703

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Hobbystop Speedway, Rd. #4, Box 100, Rte. 13, Seaford, DE 19973, (302) 629-3944

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Broward County R/C Race Club, Mills Pond Park, Ft. Lauderdale, FL (954) 525-3304

Burton's R/C Raceway, 4215 Mustand Rd., Lakeland, FL 33803, (941) 665-1322

Coral Springs Roadrunners, PO Box 9632 Coral Springs, FL 33075, (954) 925-8284

Farmer's Hobby & Raceway, 5006-3 E. Broadway, Tampa, FL 33619, (813) 248-3314

First Coast Speedway, 6410 Waltho Dr., Jacksonville, FL 32211, (904) 743-2161

Ft. Myers R/C Club, Lee Civic Center, Ft. Myers, FL (941) 936-1528

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Kissimmee R/C Racing, Osceola Square Mall, 3831 West Vine St., Ste/ 60, Kissimmee, FL 34741, (407) 944-4913

Means R/C Raceway, 1550 Pondell Rd., Nortrh Ft. Myers, FL 33903, (941) 772-2251

Monster Hobbies, 616 Southeast 10th St., Deerfield Beach, FL 23441, (954) 428-9118

NORRA, 3300 Santa Barbara Blvd., Naples, FL 34104, (941) 324-9021

Ocala R/C Car Club, 2610 SE 8th St., Ocala, FL 34470, (800) 324-8882

PBG Motor Park, 6351 Barbara St., Palm Beach Ga®dens, FL 33418, (561) 627-2608

Pro Hobbies Speedway, 715 N. Lake Pleasant Rd., Apopka, FL 33712, (407) 886-4615

Port St. Lucia Racing, 3626 SW RIvera St., Port St., Lucie, FL 34953 (561) 336-8711

Randy's RC Raceway, 7744 Glenwood St., Clermont, FL 34711, (352) 242-0557

River City R/C Club, 9711 Sharing Cros Dr., Jacksonville, FL 32257, (904) 268-1948

Sarasota RC Speedway, 8475 Cooper Creek Blvd., University Park, FL 34201, (941) 358-7047

Tampa Bay RC Club, PO Box 10224, St. Petersburg, FL 33733, (813) 526-0744

Tropical Racers, Tropical Park, Palmeto Expressway & SW 40 St., (Bird Road), Miami, FL

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Anthony's Victory Lane, 129 East Hwy. 80, Pooler, GA 31322, (912) 748-0847

Dalton Raceway, 3036 Parquet Rd., Dalton, GA 30720, (706) 226-6699

Emerald City R/C Speed, Hwy. 80 East, Dublin, GA 31027, (912) 272-3856

Hobbytown Raceway, 2301 Airport Thruway, Columbus, GA 31904, (706) 660-1793

Racer's Edge, 1530 Hwy. 19 N., Thomaston, GA 30286

Sandy Cross Speedway, Rt. 1 Box 1071, Hwy. 51, Royston, GA 30662, (706) 245-9573

Stinger Speedway, 3769 Maysville Rd., Commerce, GA 30529, (706) 335-9044

Sugar Bowl Speedway, 5272 Nelson Brogdon Blvd., Sugar Hill, GA 30518, (770) 945-6709

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Maui Racing Association, 230 Hana Hwy., #11, Kahului, HI 96731, (808) 873-0376

Team PRC Racing Club, 176 Mamo St., Hilo, HI 96720, (808) 935-3561

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Adams R/C Raceway, 7201 S. Adams, Bartonville, IL 61607, (309) 633-9300

AJ's, 10211 Keslinger Rd., DeKalb, IL 60115, (815) 756-2772

Depot Hobby Raceway, 180 S. Seminary St., Galesburg, IL 61401, (309) 342-9323

H&H Raceway, 9346 Virginia Rd., Lake in the Hills, IL 60102, (847) 458-1777

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Outlaw R/C Speedway, 1614 Broadway, Mattoon, IL 61938, (217) 234-6229

Quad Cities Raceway, 541 1st Ave., North Silvis, IL 61282, (309) 751-9663

Shiloh Eagles Speedway, 308 N. Virginia AVe., Belleville, IL 62220, (618) 277-6030

SIRCAR Raceway, 1200 N. Marion, Carbondale, IL 62901, (618) 549-5885

Stanton Hobby Shop, 4718 N. Milwaukee, Chicago, IL 60630, (773) 283-6446

Wep Raceway, RR #2, Box 44, Lawrenceville, IL 62439

INDIANA

Bremen Racing, 308 N. Bowen, Bremen, IN 46506, (219) 546-3807

GM Raceway, 1651 W. Franklin St., Elkhart, IN 46516, (219) 293-1827

Hardesty Raceway, 11 East Plymouth St., Hamlet, IN 46530, (219) 867-8600

Hobby Barn Raceway, 1950 Springhill, Terre Haute, IN 47802 (812) 299-5773

Hobbytown USA, 5385 E. 82nd St., Indianapolis, IN 46250, (317) 845-4106

P&T Hobbies & Raceway, RR2 (Hwy. 60), Mitchell, IN 47446, (812) 849 6666

R/C World of Indiana, 2246 West U.S. Hwy. 36, Lynn, IN 47355, (765) 874-2464

Summit Area Radio Cars, 7000 Red Haw Dr., Ft. Wayne, IN 46805, (219) 492-2271

IOWA

Hobby Haven, 7672 Hickman Rd., Des Moines, IA 50322, (515) 276-8785

Manly R/C Club, Box 23, Manly, IA 50456 (515) 454-2025

Outback Speedway, 403 State St., Gutherie Center, IA 50115, (515) 747-3064

Radio Control Raceway Park, 2100 First Ave. N., Ft. Dodge, IA 50501, (515) 576-3780

Wild Bill's Raceway, 901 W. Jones, Knoxville, IA 50138, (515) 842-5973

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Hobbytown USA, 2016 W. 23rd, Lawrence, KS 66046; Kevin Decembes, (785) 865-0883

R/C Superdome and T.Q. PRO Shop, 14 E. Avenue A., Hutchinson, KS 67501 (316) 665-6633

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Baton Rouge Velodrome, 7122 Perkins Rd., Baton Rouge, LA 70815, (504) 665-5616

Indy Speedway & Hobby, 3753 General DeGaulle Dr., New Orleans, LA 70131 (504) 367-1891

Pontchartrain Hobby Shop, 3755 Pontchartrain Dr., Slidell, LA 70458, (504) 649-1199

MAINE

Clay Bowl R/C Hobbies, P.O. Box 61, Greene, ME 04236, (207) 946-5003

R/C Speedway & Hobbies, 87 Main St., Fairfield, ME 04963, (207) 453-4588

MARYLAND

Countryside Raceway, 406 Pamela Rd., APt. C, Glen Burnie, MD 21061, (410) 761-6196

Doug's Raceway, 2935 C ain Hwy., Waldorf, MD 20601, (301) 843-6220

Hobby Town USA, 8223-11 Elliot Rd., Easton, MD 21601, (410) 820-9308

JR's Race Place, 2935 Crain Hwy., Waldorf, MD 20601, (410) 947-2766

The Track, 16806 Oakmont Ave., Gaithersburg, MD 20877, (301) 417-9630

MASSACHUSETTS

C&C Hobby & Raceway, 562 Russells Mills Rd., South Dartmouth, MA 02748, (508) 997-4131

Hi-Tech Hobbies, 1681 Broadway (Rt. 138) Raynham, MA 02767, (508) 880-5373

Megadrome Raceway, Rt. 8 Curran Hwy. North Adams, MA 01247, (413) 743-7223

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Hobbytown USA, 2252 S. Main St., Ann Arbor, MI 48103, (734) 996-2444

House of Hobbies, 2863 West Shore Dr., Holland, MI 49424, (616) 786-3686

JT Superspeedway, Golden Ave., Battle Creek, MI 49015, (616) 965-0116

Larry's Performance R/C's, 43665 Utica Rd., Sterling Heights, MI 49221, (810) 997-4840

Lazer RC Speedway, 2858 N. Wilmoth Hwy., Adrian, MI 49221, (517) 263-2806

Motor City Speedway, 16025 23 Mile Rd. Macomb Twp., MI 48042 (810) 677-2311

N.M.R.C.C. Raceway, Hobby Toy, Main St., Gaylord, MI 49735, (517) 732-3963

Ovaitt's R/C Speedshop, Cherryland Mall, 1732 S. Garfield Ave., Traverse City, MI 49686, (616) 947-6670

R&L Hobbies & Racing, 9782 Portage Rd., Portage, MI 49002, (616) 323-3686

Rodgers R/C Raceway, 7463 Ridge Rd., Britton, MI 49223, (517) 451-8301

Village R/C Raceway, Praire Ronde St., Decateur, MI 49045, (616) 423-7878

MINNESOTA

Car Town USA, 2822 Peidmont Ave., Duluth, MN 55811, (218) 727-6248

Duey's Hobbies & R/C Raceway, 6600 Cahil Ave., Inver Grove Heights, MN 55076, (651) 450-1721

Fun City, 9100 Park Ave., Elk River, MN 55330, (612) 441-8365

Northwoods Hobby Raceway, 2638 Hwy. 25 North Brainerd, MN 56401, (218) 829-9257

Ray's Raceway Park, 105 3rd Ave. NE., Glenwood, MN 56334, (320) 634-5246

R/C Racing World, 235 Main AVe., North, Harmony MN 55939, (507) 886-5931

Southside Speedway, 2241 Marion RD., SE Rochester, MN 55904, (507) 281-3233

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Joe McFaden Hobbies, 5531 Fox Meadow Dr., Meridian, MS 39307 (601) 483-7000

Small Cars Unlimited, 820 Cooper Rd., Jackson, MS 398212, (601) 372-FAST

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Real Blue Vue Speedway, 12019 E. 47th St., Kansas City, MO 64133, (816) 358-0238

Real R/C Raceway, 24204 State Rte. 58, Pleasant Hill, MO 64080

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Goodyear Speedway, 4021 North 56th, Lincoln, NE 68510, (402) 464- 5172

OTWG Carpet Raceway, 55129 849th Rd., Norfolk NE 68701, (402) 644-7922

RC Motorsport Off-Road Raceway, 5600 Mass Rd., Omaha, NE 68164, (402) 593-6133

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Carolina R/C Speedway, 4148 Calhoun Memorial Hwy., Easley, SX 29640; Craig Prahl, (864) 295-1209; *ww.carolinarc.com*

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The Grove Racing Center, 939 S. Anderson Rd., Rockhill, SC 29730, Mike Durham or Don Faris, (803) 327-4121

Hobbies and More, 1570 S. Main str., Darlington, SC 29532; Jerry Pollard (803) 393-0355

J&M R/C Hobbies, 5341 Dorchester Rd., Evanston Plaza, N. Charleston, SC 29418; Mike Smith (843) 552-9449

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Midway Hobby and Raceway, 707 Sulphur Springs Rd., Greenville, SC 29611; Allen A. Dodson, (864) 246-6335

ORA Atomic Racing, 373 Boyd Pond Rd., Aiken, SC 29803; Bill Felak, (706) 855-0846 or (803) 642-0314

SOUTH DAKOTA

Boomerans Raceway, 105 N. Main, Hartford, SD 57033; Ed Smithback (605) 528-7345

TENNESSEE

Hobby Town USA, 2000 Mallory Ln., Franklin, TN 37067; Bobby Mills, (615) 771-7441

MSA R/C Racing, Rt. 12 Box 489 F, Crossville, TN 38555; D.R. Findley (931) 456-0027

W.O.W. Raceway, 59 Luray Rd., Beech Bluff, TN 38313; Kelly Bean, (901) 427-7874; *windix60@pipeline.com*

TEXAS

215 Speedway, 1814 County Rd. 215, Abilene, TX 79602; Clyde Gardner (915) 673-2351

Big Mike's R/C Raceway, 1405 W. Cotton St. Longview, TX 75604; (903) 297-7814

Comanche Trail RC Park, City Park, Big Spring, TX 79720; Allen Nichols (915) 263-4241

Discount Hobbies, 1722A West Anderson Loop, Austin, TX 78757; Tony Bermudex, (512) 458-2324

Drycreek Raceway, 5903 Co. Rd. 2297, Quinlan, TX 75474; Micky Alphin (903) 883-4060

Hal's Hobby Raceway, 1440 Bessember, El Paso, TX 79936; Carlos (915) 591-2213

Hobbycraft Speedway, 819 N. Main St., Corsicana, TX 75110; Keith Hoffman (903) 872-6761

HobbyTown USA, 999 E. Basse Rd., Suite 177, San Antonio, TX 78209; Joe Sena, or Clark Baisdon, (210) 829-8697

Issac's Race Track, 18177 Gulf Frwy., Webster, TX 77598; Issac Ben-Ezra, (281) 488-8697

MBRC Off-Road Raceway, 204 D & E Valley Ln., Kennedale, TX 76133 (817) 292-5055

Performance Raceway, 1106C Witte Rd., Houston, TX 77055; Jorge Tabush or Terry Schmid, (713) 464-4458

Star/Car Raceway, Debbie's RC World, 200 Commerce Parkway, Virginia Beach, VA 23454; Debbie, (757) 340-6681

Hobby Hangers Speedway, 14014D Sullyfield Cir., Chantilly, VA 20151; Kwang or Billy, (703) 631-8820

Olde Towne Hobby Shoppe, 9105 Center St., Manassas, VA 22110; Arnie Levine, (703) 369-1197

Shamroc Raceway, 106 Cheviot Pl., Stephens City, VA 22655; Scott Janow, (540) 869-3551

The Toteyard, 6494 Toteyard Dr., Dayton, VA 22821 (540) 828-3476 *toteyard.com.home*

WASHINGTON

Alfie's, 108 South K St., Aberdeen, WA 98520; (360) 533-6638

A-Main Raceway, 14011 NE 3rd Ct., Vancouver, WA 98685; Monty Coleman, (360) 571-8404

Burien Toyota R/C, 15025 1st Ave. South, Seattle, WA 98148 Ray Meek, (800) 654-6456

Cedardale Raceway, 16733 Cedardale Rd., Mount Vernon, WA 98273; Joe Madonia, (360) 659-0072; *getchell@halcyon.com*

Four Season R/C Racing, 2941 Sleater Kinney Rd. NE Olympia, WA 98506; Gary Brown (360) 491-2430

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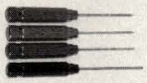


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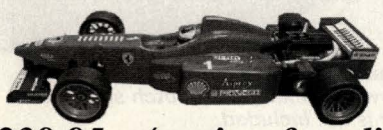
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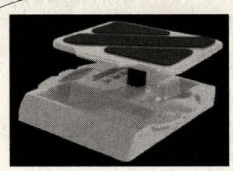
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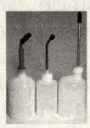
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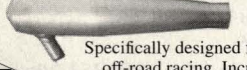
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Product Test

CEN 2-Speed Automatic Transmission

Give your Nitro RS4 a second gear!

What it does

CEN's replacement transmission for HPI's Nitro RS4 series of cars provides higher top-end speeds while retaining "off-the-line" punch. With the many gearing combinations available, an optimum setup can be found for most any track.

What it has

The kit comes with a machined and lightened steel clutch bell, two replaceable machined and color-anodized aluminum pinions (14-tooth and 18-tooth), 38- and 42-tooth molded spur gears, spur hubs, second-gear clutch, replacement layshaft, motor flywheel, clutch shoes, pilot shaft, bearings, and installation hardware.

It also comes with an additional, stiffer second-gear clutch spring for fine tuning the shift point.

What we don't like

(1) The instruction sheet covers installation for Kyosho SuperTen and PureTen Spider series and CEN's own GX1 series of cars, as well as the HPI version. All of this is covered in one large diagram, with vague details on what order the parts go back on the layshaft.

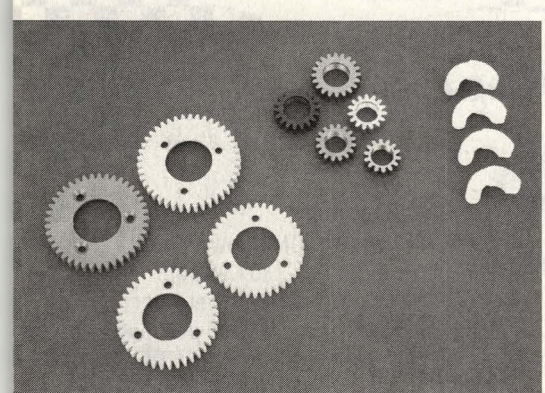
(2) The clutch shoes that came with the kit felt a little "grabby." Fortunately, new Teflon shoes have been developed that promise smoother engagement and extended wear.

What we like

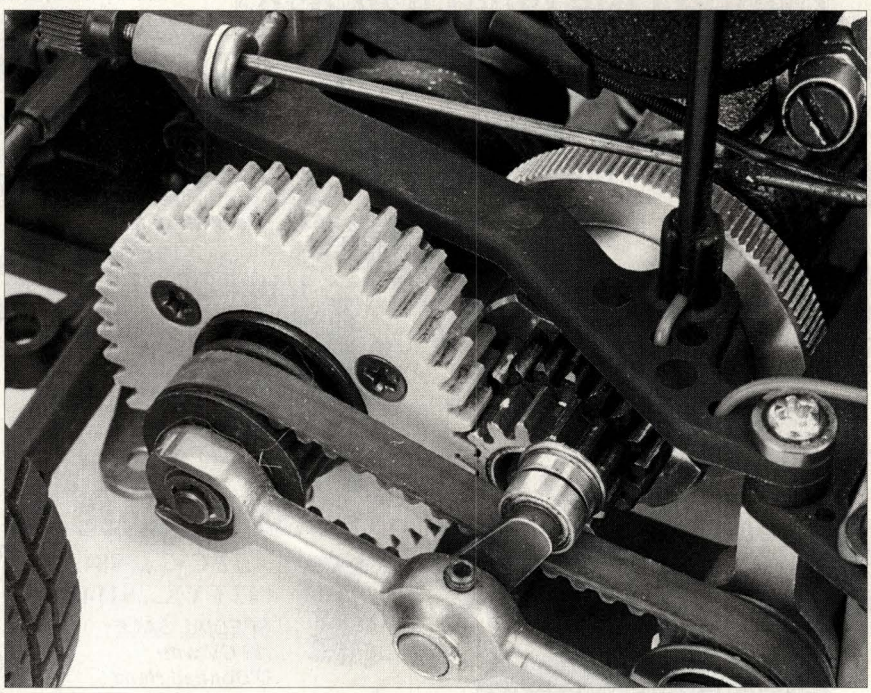
(1) The inclusion of an additional gear clutch spring is a nice touch.

(2) Even though we thought the stock gearing (14/42 and 18/38) felt perfect with the HPI Novarossi 12R-SC engine, a large variety of gears is offered for tuning it to your favorite tracks.

(3) The replaceable pinions that screw onto the clutch bell are not only convenient, but also cost effective.



CEN offers an assortment of replacement and optional spur and pinion gears. They're all color-coded for easy identification. Also shown are two pairs of their new high-wear clutch shoes.



This two-speed is strong enough to handle the massive power of this HPI/Novarossi engine. The kit includes the flywheel, clutchbell, clutch shoes, and the two-speed unit. The gear brace/tensioner is not included.

What we really think

As mentioned above, we tested the CEN 2-Speed with the famed HPI/-Novarossi engine in an NRS4 Racer kit (or what started out as that kit). Installation of the new layshaft required referring to HPI's manual as well as the diagram that came with the 2-Speed. Once we figured out how to get it together, everything fit perfectly.

The next task was to install the replacement clutch bell on the engine. We did need to shim the flywheel a little bit further out on the crankshaft to align the pinions properly with the spurs. The next step was to fire it up and try it out. Our initial setting on the shift point was a little bit too tight, so it shifted later than we wanted. After a few of minutes of playing with the shift point, we finally settled on getting it to shift at about what felt like three-quarters of the way through the rev range. Eighteen tanks later, the shift point held fast, though we could definitely feel some wear on the clutch shoes.

Other manufacturer's two-piece clutch shoes should fit just fine with CEN's clutch bell and flywheel, so there are other options, as well as CEN's new shoes. Oh, and top speed in second gear was way too fast for any track smaller than an 1/8-scale layout. This setup can only be described as "obscenely fast" (and fun).

We figure that if CEN's 2-Speed can hold up to the power of the HPI/Novarossi engine and our abuse, it has to be a good product. The instruction sheet could use a little work, but if you are pretty intimate with the workings of your HPI, that shouldn't be a problem. ◆

info

Manufacturer: CEN Genka Trading Corporation, 1800 E. Miraloma Ave., #F, Placentia, CA 92870 • phone (714) 792-1923

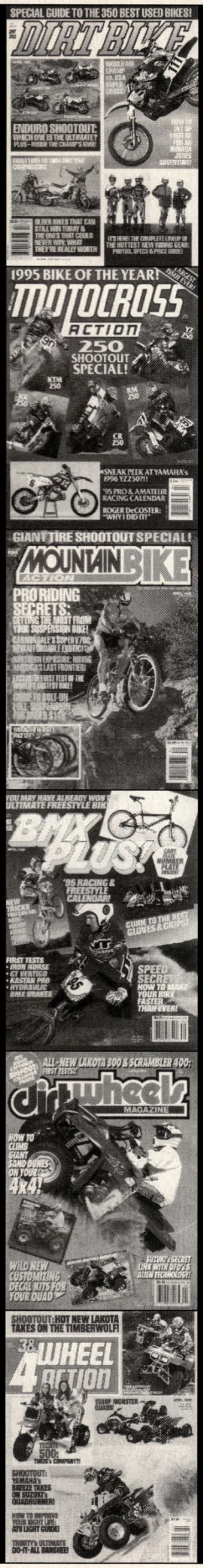
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INSIDE

ROAR ON-ROAD NATIONAL MODIFIED WINNING CARS



Joel Johnson's Trinity Revolver 22 and his Trinity Switchblade 10 were dialed-in at the ROAR On-Road Nationals held in Ripon, California over the weekend of August 20-23rd. Joel went out and TQed both the 1/12 scale and 1/10 scale pan car Mod classes, then went on to win both titles. Chris Tosolini was equally as dominant in the Touring Modified class. Chris dominated qualifying and finished six seconds ahead of second place with his Fantom-powered Schumacher SST '99. What we have here are the three machines that took the titles–pavement purists, enjoy!

Joel Johnson's Trinity Revolver 22

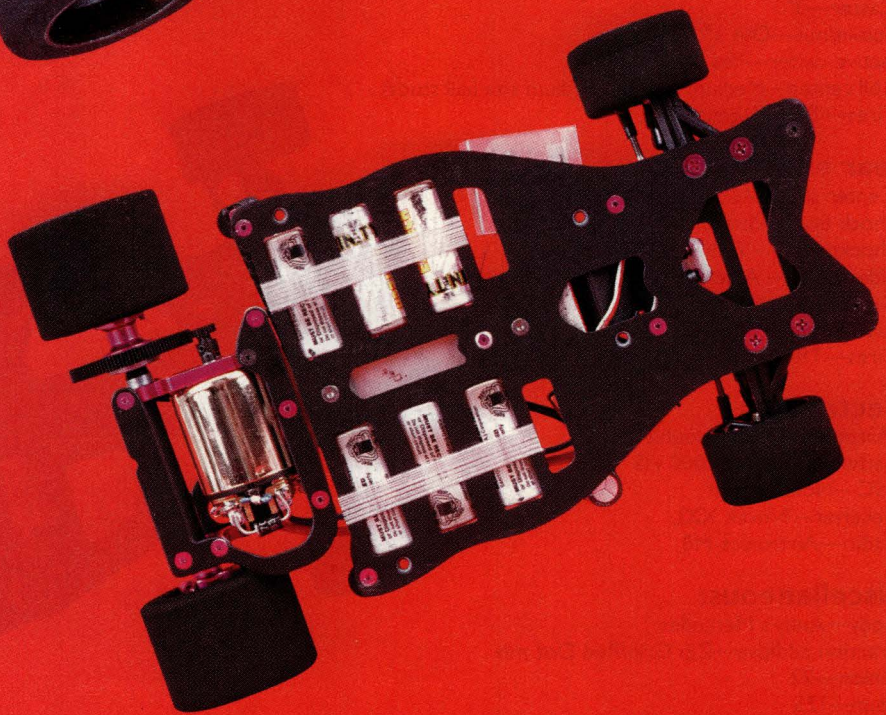


Front end:

Springs—Assoc .020
Damping—Trinity Purple Stuff
Axles—Trailing
Ride height—3mm
Camber—1°
Caster—3°
Toe-in/out—Out 1°
Active caster—Yes
Roll center—Low setting (small ball studs)
Tires—TRC Purple

Rear end:

Center shock—Assoc. VCS (40wt)
Shock body—Stock
Shock spring—Blue (Assoc.)
Side tube damper—Trinity medium silicone
T-plate—.063 (thin)
Ride height—3mm
Roll center—Stock
Tires—TRC Pink



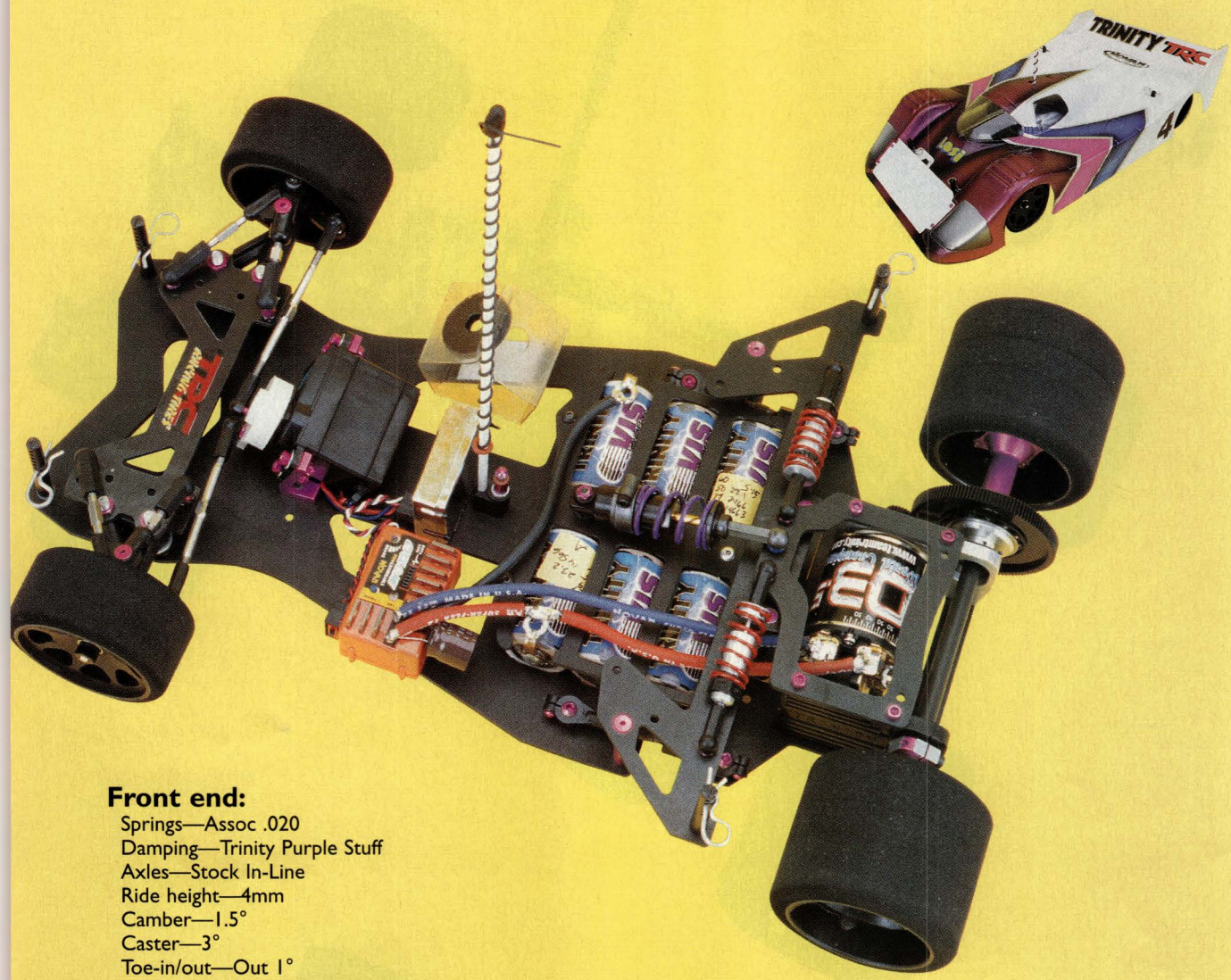
Electronics:

Motor—Trinity D3.5 13-double
Batteries—Trinity 2000 VIS
ESC—Novak Atom
Receiver—Novak XXL
Radio—Airtronics M8

Miscellaneous:

Body—Andy's Mercedes
Traction additive—Zip Grip
Pinion—24
Spur—108
Additional mods—Rear cross brace for body mounts

Joel Johnson's Trinity Switchblade 10

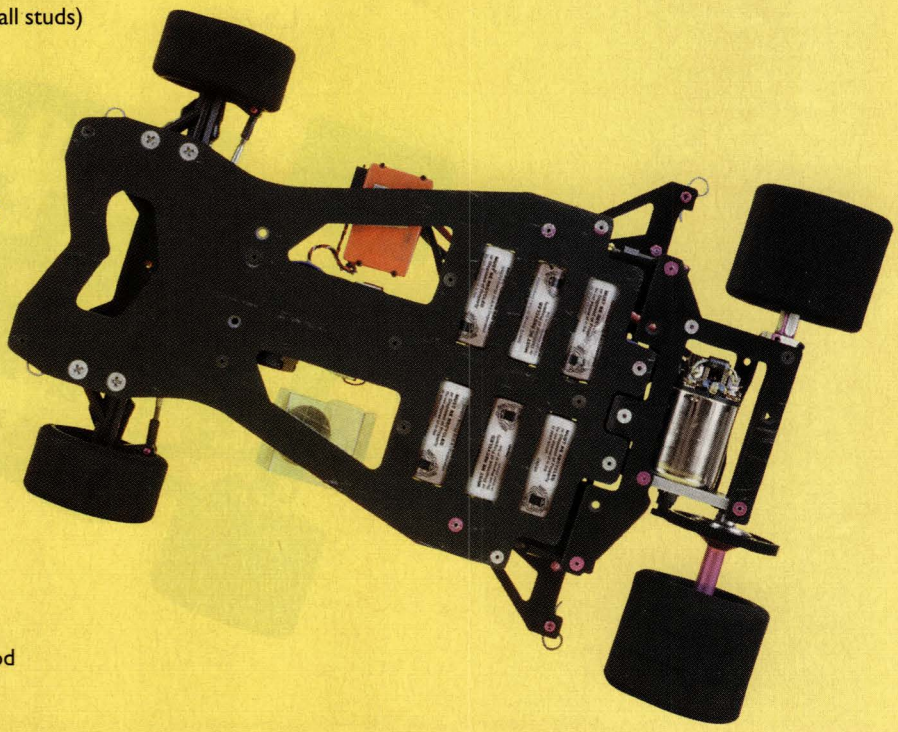


Front end:

Springs—Assoc .020
Damping—Trinity Purple Stuff
Axles—Stock In-Line
Ride height—4mm
Camber—1.5°
Caster—3°
Toe-in/out—Out 1°
Active caster—Yes
Roll center—Medium setting (medium size ball studs)
Tires—TRC Magenta

Rear end:

Center shock—Losi (IWC) 56 piston 50wt
Shock body—Stock
Shock spring—Trinity Congo
Side shocks—Assoc. VCS (40wt) Red Spring
T-plate—Stock
Ride height—4mm
Tires—TRC Pink



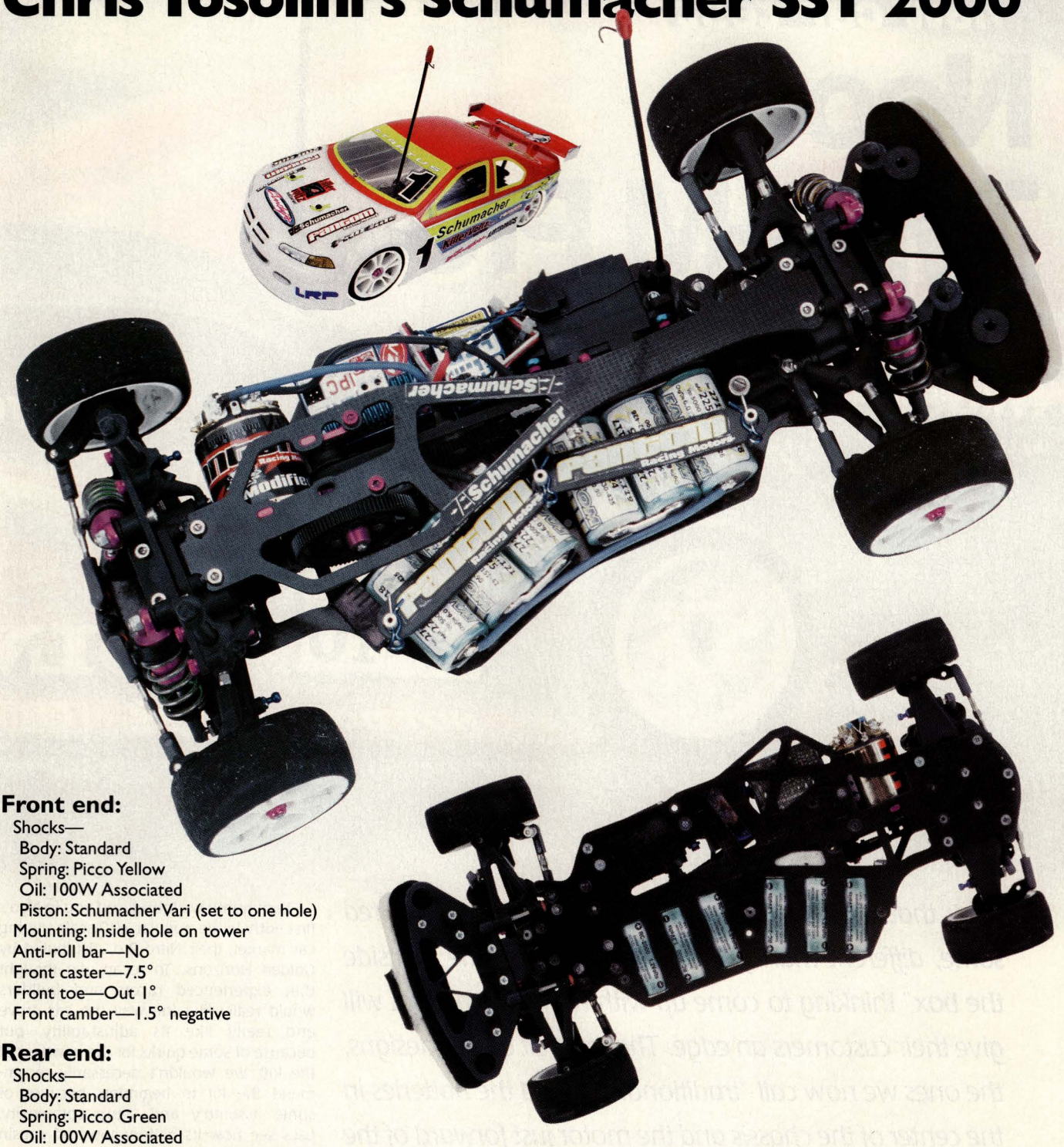
Electronics:

Motor—Trinity 11-double
Batteries—Trinity 2000 VIS
ESC—Novak Atom
Receiver—Novak XXL
Radio—Airtronics M8

Miscellaneous:

Body—Andy's Mercedes
Traction additive—Zip Grip/Red Dot mix
Pinion—22
Spur—125
Additional mods—Losi shock only extra mod

Chris Tosolini's Schumacher SST 2000



Front end:

Shocks—
Body: Standard
Spring: Picco Yellow
Oil: 100W Associated
Piston: Schumacher Vari (set to one hole)
Mounting: Inside hole on tower
Anti-roll bar—No
Front caster—7.5°
Front toe—Out 1°
Front camber—1.5° negative

Rear end:

Shocks—
Body: Standard
Spring: Picco Green
Oil: 100W Associated
Piston: Schumacher Vari (set to one hole)
Mounting: Inside hole on tower
Anti-roll bar—No
Anti-squat—1mm shim in rear
Rear camber—1.5° negative
Rear toe—2° negative

Electronics:

Motor—Fantom Factory Modified (9x2)
ESC—LRP V7.1
Batteries—Fantom 2000mAh
Receiver—LRP Phaser (27mHz)
Servo—Airtronics 94257

Miscellaneous:

Body—Andy's Stratus (new)
Gearing—87/20 (48-pitch Kimbrough spur)
Chassis—Side saddle carbon fiber
Tires—
Front: Pro-Line 1092 S3 (Yokomo 26mm medium inserts)
Rear: Pro-Line 1092 S3 (Yokomo 26mm medium inserts)
Driveshafts—
Front: Plastic (U1917)
Rear: Steel Blade

- Fiberglass upper deck
- '98 Suspension mounts for more camber change
- Rear hubs have been cut to lower the roll center
- 4mm rear belt (U1527)
- Lunsford titanium turnbuckles
- Schumacher titanium hinge pins
- 3-piece alloy rear transmission housing (U2034)
- Misc. aluminum screws
- Schumacher aluminum spur gear adapter ◆

Neo Type-M Pro

Taking the middle road

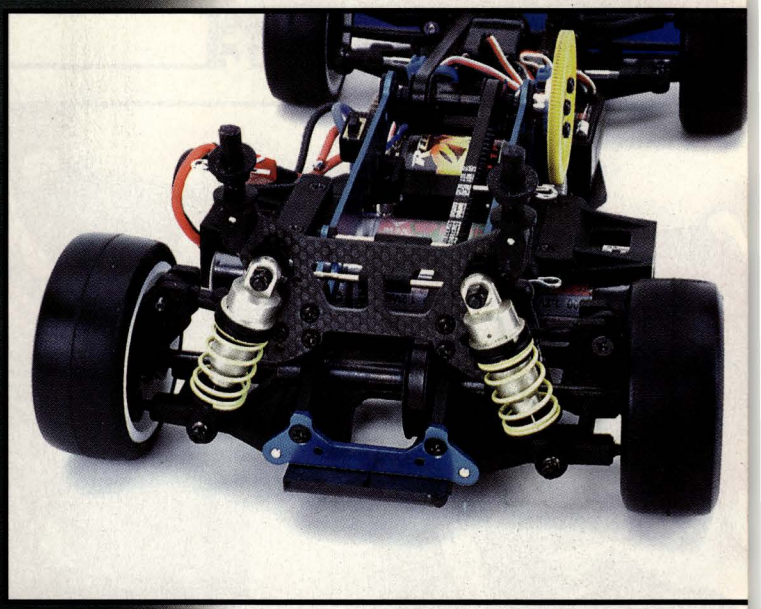
by Lito Reyes



Now that the electric touring car market has matured some, different manufacturers are doing some "outside the box" thinking to come up with new designs that will give their customers an edge. The first belt driven designs, the ones we now call "traditional", placed the batteries in the center of the chassis and the motor just forward of the rear axle line. Then Tamiya and Team Losi decided to try the battery farther back and the motor either in front of or just behind the front axle line. But now the latest spin on the belt drive design puts the motor smack dab in the middle of the two axle lines. This mid-motor design is how the Neo Type-M Pro does its business.

Last month we introduced you to Neo's first entry in the popular 1/10-scale touring car market, their Nitro Pro, distributed by Golden Horizons. To recap, we thought that experienced racers and builders would really like the way the car drove and really like its adjustability, but because of some quirks (or the newness of the kit), we wouldn't necessarily recommend the kit to beginners because of some assembly and setup complexity. Let's see how its battery-powered cousin fares.

As mentioned above, the key design feature of this car is the true mid-mounted motor. Although there really is little weight balance advantage to this design—after all, the motor and batteries just switch places—the benefit is that equal length belts are used between the front and rear portions of the drivetrain. "How can the belt length be an advantage?" you might ask. Well, with the traditional belt design, there is a short belt from the spur layshaft to the rear differential and a long belt to



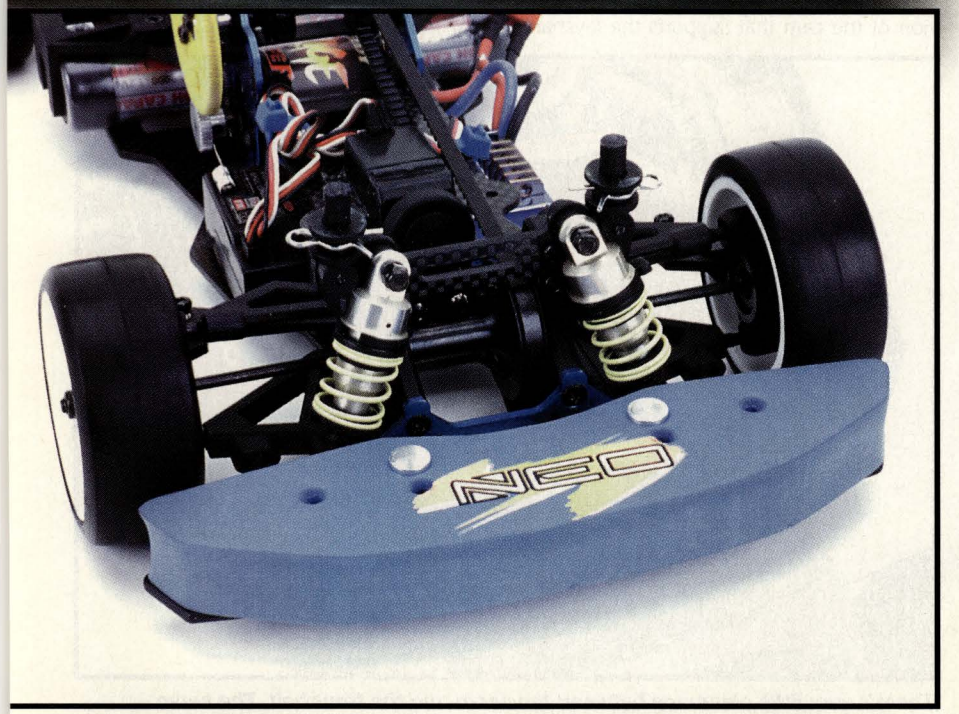
The gold-anodized aluminum shocks can be assembled with either adjustable pistons or standard fixed pistons. Hiding within the rear uprights are CV-style universal driveshafts.

the front differential. Unless the front belt is as tight as an archer's bow, (which would create lots of drag and wear on the drivetrain), the rear differential gets more torque and quicker response than the front belt, due to some lashing of the longer front belt.

Once the car gets going, things pretty much even out, with both belts getting equal torque. But as soon as the car is off the throttle, some backlash with the front belt will occur, causing the front wheels to spin more than the rear wheels for a split second. All of this front end backlash happens very subtly, but the effect is that the front and rear tires don't always have equal amounts of power.

Notice how different TA-03s and Street Weapons with their longer rear belts drive in comparison to an RS4-series or YR-4-series cars that have longer front belts. Much of the difference in the way they feel can be attributed to weight distribution, but if you lift the car and look at how the front and rear wheels react, you'll see what we're explaining. With identical front and rear belts, the torque is being split 50/50.

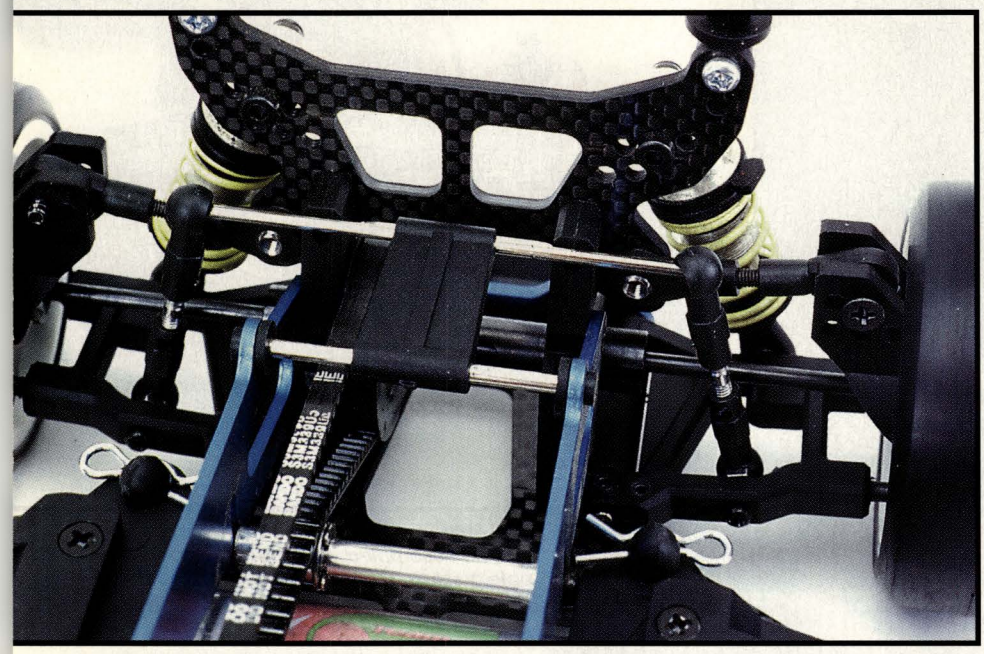
The chassis design is pretty basic–a woven carbon graphite lower deck with a mixed vertical and flat three-piece upper deck. The front of the upper deck is also made of woven graphite and attaches to the front bulkhead and middle braces. The middle and rear upper deck is made of a



This foam bumper comes standard. In fact, the Type-M Pro is so loaded, the only options are springs.

Test Gear

- Airtronics M8 FM Radio
- Futaba 9401 Steering Servo
- Hitec 04MI FM Receiver
- LRP IPC SR speed control
- Reedy Rage Type R Plus stock motor



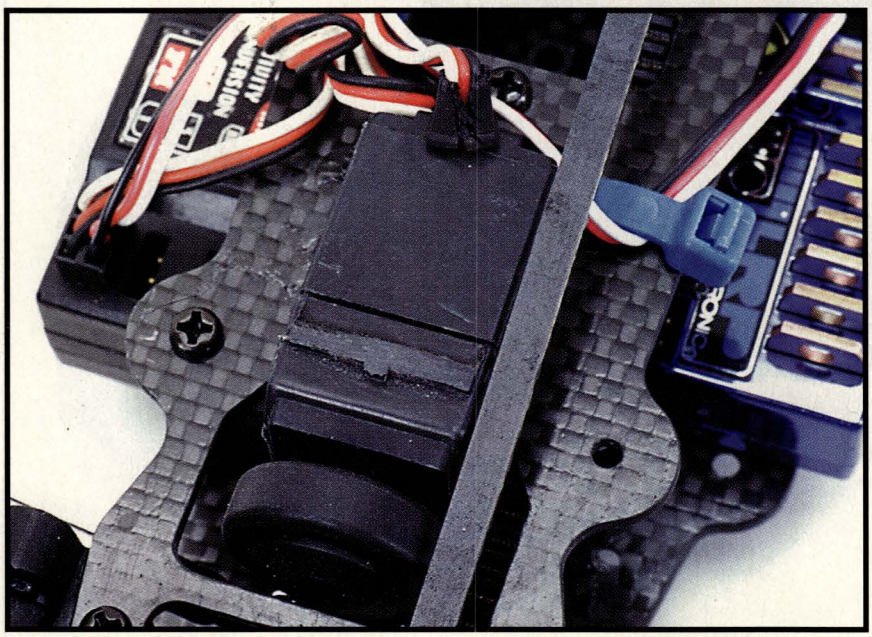
Front and rear swaybars come standard. The graphite shock tower offers a choice of six mounting holes.

pair of vertically-mounted aluminum plates that are anodized a nice medium blue color. These plates are secured to the rear bulkhead, the same middle brace that the front deck is mounted to, and are tied together by a belt tensioner post.

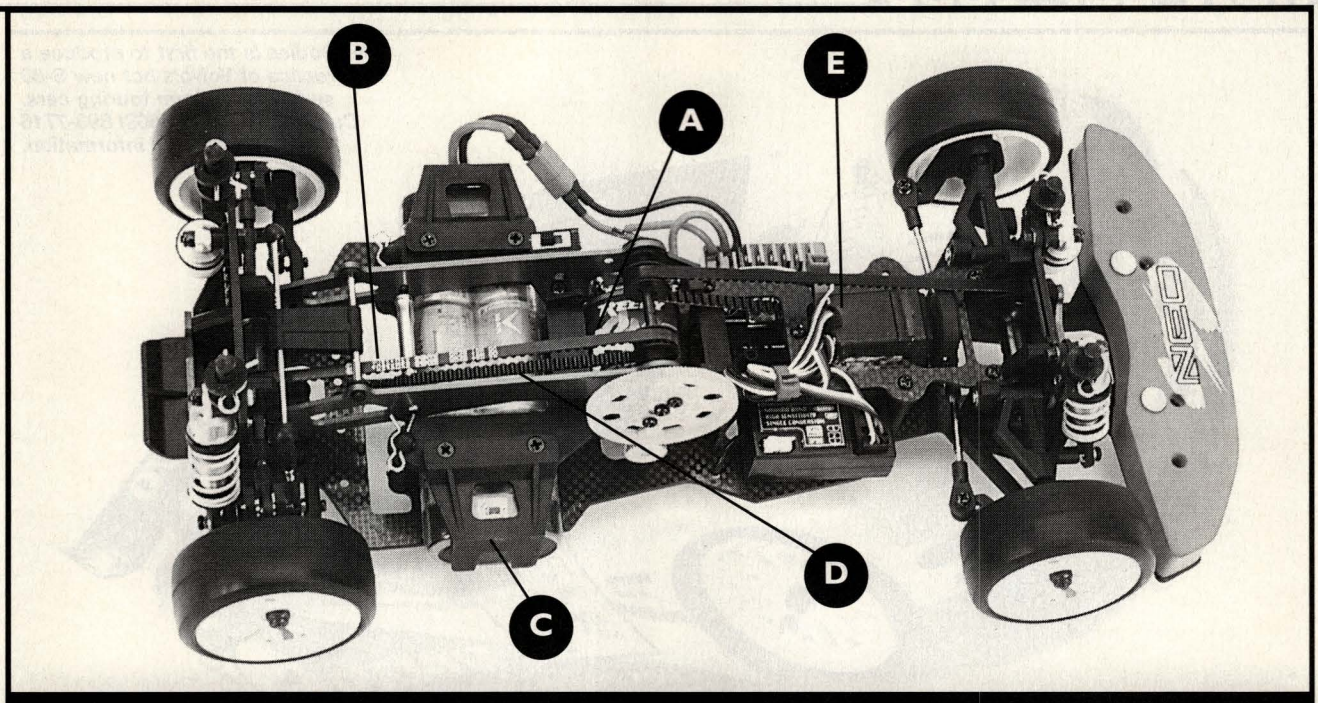
The chassis accepts both stick packs and saddle packs, though using saddles requires additional chassis preparation, on top of the standard sanding and CA sealing of the edges. There are cutouts for six saddle cells, but the two rearmost cutouts need to have a mounting ear cut off with a rotary tool or filed down. The size of the cutouts was set to perfectly fit a Sanyo RC2000 cell with only the factory shrink-wrap. Since most racers cover their saddle-pack cells with an additional layer of shrink wrap, the Neo's "Perfect Fit" cutouts need to be filed slightly for the cells to rest evenly in their places. Both the saddle packs and stick packs are secured by a hinged hold-down system. When using saddle packs, the hold-downs need no modification, but to use stick packs, the hold-downs need to be cut along a pre-scored line for them to fit. The hold downs fit over a composite post and are secured with a body clip. Opening the battery holders required bending up the plastic holder as much as half an inch. I felt like I was going to accidentally break one of them, but Kogae Scales, Golden Horizons' Marketing Director and Team Manager (and current Canadian National nitro touring car champion) assured me that they tested many different materials before settling on a plastic that wasn't too brittle or too flexible before deciding which one to use.

The right-side upper plate also acts as the motor mount. Since it is a large piece and is made of aluminum, it dissipates heat pretty well—even with an over-geared stock motor. Mounted between the two rear upper plates is the spur layshaft, which has two identical pulleys for the front and rear belts. The rear belt passes over the motor and battery pack with the help of a ball-bearing belt tensioner before getting to the differential. The front belt has a straight shot to its differential, but tension can be set by changing the key position of the cam that supports the layshaft. This cam actually balances the tension between the front and rear belts, with the rear belt getting that additional bearing tensioner. The drivetrain is pretty smooth, but the stock setting for the front belt is a little tight. I would suggest moving it back a couple of notches to balance the tension to the rear belt a little. When all four chassis plates are assembled, the structure formed is one of the stiffest in its class, letting the suspension components do their job.

Like the Nitro Pro, the Type-M uses a pillow-ball suspension system. Even though this type of suspension has been used in road cars for many years, it is gaining a resurgence in popularity due to the adjustability and precision of the design. To paraphrase what Frank wrote last month, pillow-balls have fewer pivot points (with similar range of motion as a hingepin-based design), so there is less slop. The front blocks have upper and lower balls, while the rear uprights have two lower balls and a more typical tie rod camber link on top. The pillow-balls thread into stiff fiber-filled composite arms that are suspended from the bulkhead by hingepins which are secured by set screws. In front, there are also molded upper arms, which can be spaced towards the front or rear of the car to change caster angle. The pillow-balls are capped with aluminum threaded inserts to eliminate any play in the ball. There is a very fine line between binding the ball and having it so loose that the joint has slop, so a bit of care is required when setting up the suspension. Also, because of the infinite amount of adjustability, it could be



There's very little clearance between the servo and the front belt. The servo mounting ears have to be removed from at least one side of the servo. We went ahead and cut off the other one because we can't stand anything out of balance.



A. Mid-chassis-mounted motor

B. Equal-length drive belts give equal torque to differential

C. Molded battery holders handle stick or saddle packs

D. Aluminum vertical chassis brace doubles as a heatsink motor mount

E. Quick and responsive direct steering

pretty easy to throw the setup way out of whack with just a couple turns of the Allen driver.

Great "CVD"-style driveshafts come standard with the Type-M. Neo designed them so they don't require a set screw to hold the cross pin. Instead, the cross pin fits inside the inner upright or steering block bearing. Nice touch! And by the way, the kit comes with a full set of ball bearings for every component that rotates.

The shocks that come with the kit are made of gold-anodized aluminum and have threaded shock bodies. Strangely enough, though, threaded collars are not included in the kit. Instead, a variety of spacer clips are used to pre-load the shock springs. A choice of externally adjustable piston valving or fixed-hole pistons comes standard with the Type-M. Since the adjustable pistons are not indexed in any way, getting two shocks set with the same dampening is very much a hit-and-miss affair. Korgae suggests using the adjustable pistons to find a ballpark setting during practice for quick changes, and then finding equivalent oil and piston combination for racing, where consistency (no pun—really!) is more important.

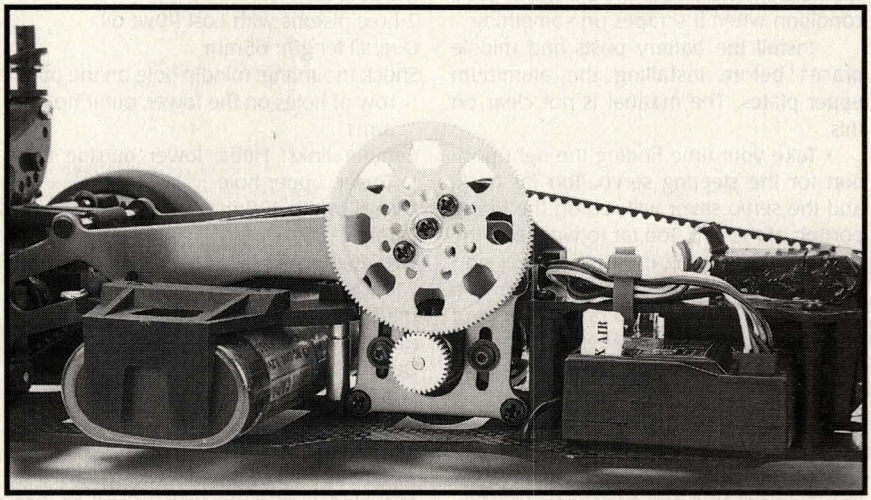
The early production kit we received had white silicone bladders that seal the top of the shocks. Unfortunately, they are hard to install and hard to bleed consistently. Early into production, though, Golden Horizons changed to a black-colored bladder made of a stiffer material. They ask that if you received any of the white bladders, just send them to Golden Horizons and they will exchange them for the newer black bladders.

The steering servo is center-mounted and standing up in a cutout in the front upper deck. The steering tie rods attach directly to a servo saver mounted straight on the servo. This direct steering is much more slop-free and precise than bellcrank-based setups.

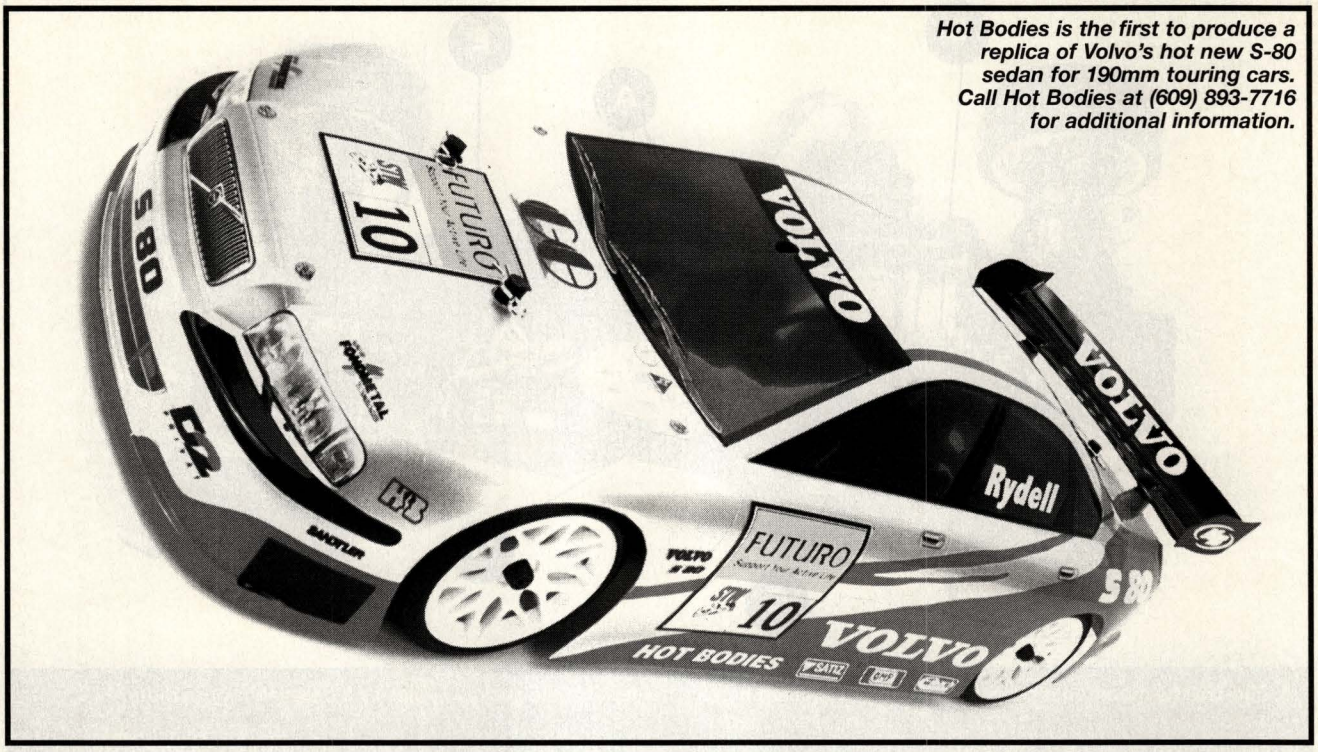
A great set of 24mm slick tires and white mesh wheels come with the Type-M. No inserts are included, though. We recommend firm molded inserts for these tires. Once broken in, they grip and wear very well. Golden Horizons will soon be releasing a whole line of tires in multiple compounds. A 64-pitch spur gear and a lightweight aluminum pinion are also included. And last, but not least, a set of front and rear swaybars come packaged in the kit.

Building Notes

• If you use the adjustable pistons, tap the upper piston piece with a 3mm tap.



The mid-mounted motor gives the chassis a different weight distribution than rear-mounted motor cars. More importantly, it lets the front and rear differentials get an equal amount of torque from the motor.



Hot Bodies is the first to produce a replica of Volvo's hot new S-80 sedan for 190mm touring cars. Call Hot Bodies at (609) 893-7716 for additional information.

This will make adjustments easier. While you're at it, making some starter threads in all parts that use machine screws will make assembly a little easier.

• When assembling the differentials, don't set them up like an Associated Electrics diff. Once the screw starts threading on the nut, check diff slippage every half turn. DO NOT tighten them all the way or you will snap the screw (trust me on this one—the spring is very strong).

• File or sand the edges of all woven graphite parts before installation, and be sure to seal the edged of the lower chassis plate as well. These steps will prevent splinters and help keep the chassis in good condition when it scrapes on something

• Install the battery posts and middle braces before installing the aluminum upper plates. The manual is not clear on this.

• Take your time finding the right position for the steering servo. Too far back, and the servo saver will rub on the upper portion of the belt. Too far forward and the tie rod will get hung up on the lower portion of the belt. Also use some Shoo Goo or similar RTV compound on the edges of the servo case. No matter where you mount the servo, clearances are pretty tight, and a servo that squirms on the mount might move right in the path of the front belt.

• Be careful not to overtighten the pillow balls. I've seen an A-arm crack because of this.

• See my notes above for a bit of belt tension advice.

Here is a setup that Korgae tells us works as a great baseline setting:

FRONT END

1-hole pistons with Losi 50wt oil
Overall length 6mm
Front caster: 2 spacers behind the upper arm (Less caster)
Lower position in upper arm mount. (where the hinge pin goes)
Overall width 190mm
Camber: -1.5
One-degree of toe-out
Diff tight (just tighter than the rear)
Limiting inside:1.50mm spacer
Outside limiting: 1mm + one O-ring
Sway: Yes

REAR END

2-hole pistons with Losi 90wt oil
Overall length: 65mm
Shock mounting: middle hole on the upper row of holes on the tower, outer hole on arms
Camber links: Hubs: lower outside hole, Tower: upper hole
Overall width 190mm
Camber -1.5
Two-degrees of toe-in (or 1.5mm difference between the two pillow balls)
Diff tight but slightly less than front
Limiting inside: 2.5mm spacer
Outside limiting: 2mm + one O-ring
Sway: No

What we don't like

(1) The manual is pretty bad. It is just a set of exploded diagrams with no text or order of assembly. This is the only part of the kit that we would really consider sub-standard.

(2) The servo saver that come with the Type-M only fits 25-tooth spline servos (Futaba, FMA).

(3) The hingepins that are included don't have any flat spots pre-filed for the set screw. A rotary tool needs to be taken to them to fix them.

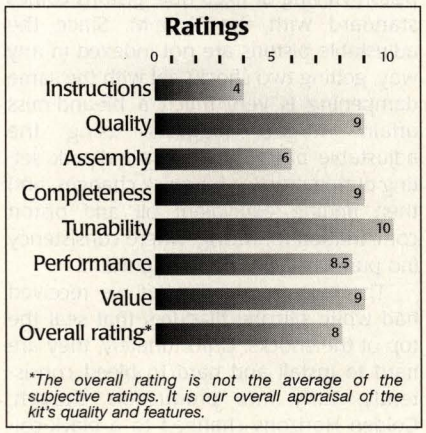
(4) No tire inserts are included. These tires really need them to work properly.

(5) I'm going to keep saying this: We want turnbuckle tie rods!

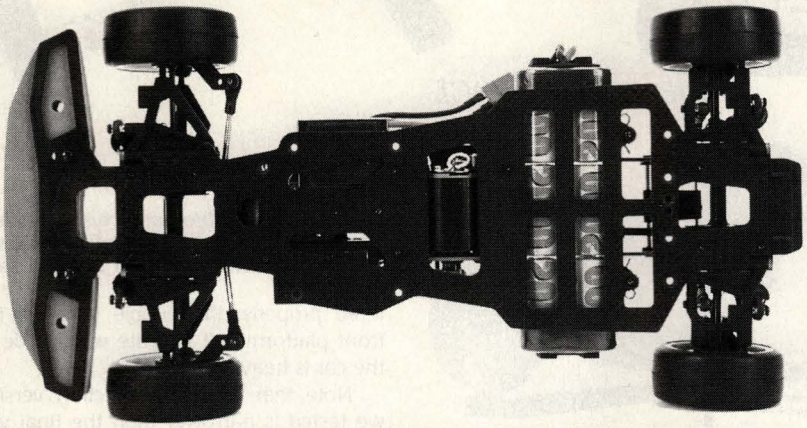
What we like

(1) The adjustable pillow-balls are strong, precise, and have no slop. It's pretty hard to beat this design.

(2) The overall adjustability is great. Camber, caster and toe in the front, camber and toe in the rear, and lots of shock positions add up to a lot of setup options.



**The overall rating is not the average of the subjective ratings. It is our overall appraisal of the kit's quality and features.*



Type: 1/10-scale electric-powered 4WD touring sedan

Manufacturer: Golden Horizons Enterprises Co., 311-939 Howe St., Vancouver BC Canada V6Z 1N9 • phone (604) 331-2526; fax (604) 331-2528

Price: $275

What You Get: Complete rolling chassis kit. *Required Items: two-channel radio system with one servo, body, polycarbonate paint, CA adhesive for the tires*

Length	360mm
Width	190mm
Wheelbase	258mm
Weight	1400g

(3) The adjustable shocks are convenient. They may not be as precise as changing pistons, but you can get them pretty equal and it still is quicker and less messy than disassembling them.

(4) Lots of components that would be optional on others kits come standard with the Type-M.

(5) The kit tires are great. They work well on a variety of surfaces—even in the nitro-powered version of this car.

What we really think

We feel pretty much the same about the Neo Type-M Pro as we do about the Neo Nitro. It is a great car that handles well, drives fast , and has more tuning and setup options than most of the cars on the market. But because of the poor manual, novices should maybe look elsewhere, or have an intermediate to experienced hobbyist assist. The parts quality is great and the design is nice, but keep focused during assembly. ◆

SOURCES

Airtronics, 1185 Stanford Ct., Anaheim, CA 92805 • phone (949) 978-1895; fax (949) 978-1540

Futaba Corp. of America, P.O. Box 19767, Irvine, CA 92723-9767 • phone (949) 455-9888; fax (949) 455-9899

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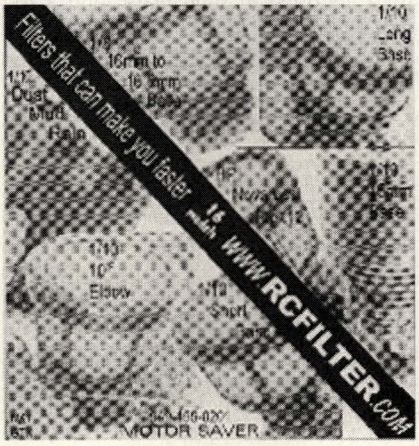
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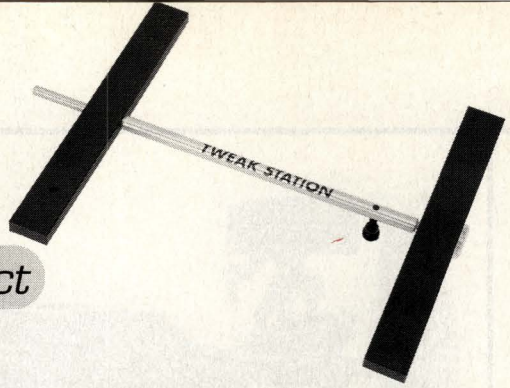
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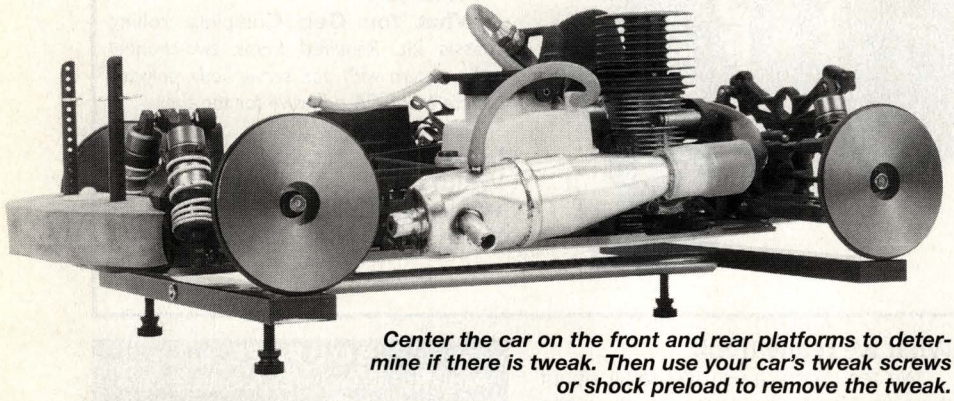
Product Test

MIP Tweak Station

Balancing act



Here it is, assembled and ready to use. The rear platform (on the left) is adjustable for cars with different wheelbases.

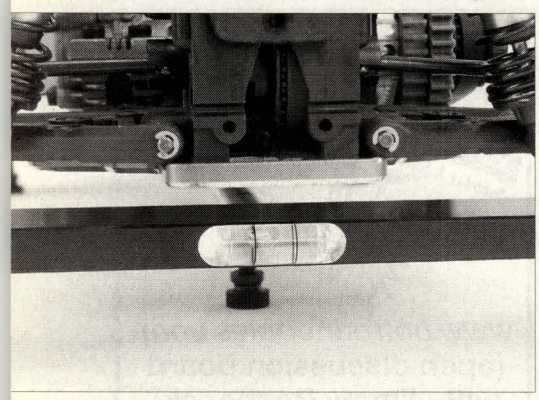


Center the car on the front and rear platforms to determine if there is tweak. Then use your car's tweak screws or shock preload to remove the tweak.

What it does

This long-awaited product from MIP was made to assist in eliminating "tweak" from a chassis. Ideally, for neutral handling, a car will have equal weight distribution between a pair of wheels on either end of the car. For example, each of the rear wheels should be carrying the same amount of weight. If they don't, then the car is said to be "tweaked". One symptom of a tweaked rear end on a rear-wheel-drive car would be if the car skids to one side or the other when the brakes are locked during a high-speed straight line run. The wheel that has less weight on it will likely break traction first, and car will spin away from that side.

There are two traditional methods for determining tweak. The first way is to suspend one end of the car from the centerline of the chassis using an hobby knife or some other stylus and lower it to the table to see which side touches first. Well, this procedure is imprecise and sometimes not easy to do. The second way is to place each of the wheels on its own scale to measure the amount of weight on each wheel. Four scales can be unwieldy and accurate ones are expensive. MIP's Tweak Station provides a stable, portable, adjustable, and calibrated platform for determining the weight balance of your car.



Tell Lito that he had better check his setup. That last crash must have been pretty good...

What it has

The Tweak Station consists of two platforms made from machined aluminum, both anodized in satin black, and a rod made from stainless steel stock. Incorporated into the front platform is a bubble level. The rear platform has two plastic thumbscrews used to adjust it to any solid surface to be completely flat and level.

Here's how it is assembled and calibrated: First, place the steel rod though the hole in the rear platform (set to the approximate length of the car) and rest the platform on the work surface with the thumbscrew "feet" on the bottom. Next, rest the front platform on the rear platform and use the thumbscrews to adjust the left and right sides until the bubble on the level indicator is centered. Now, rest one end of the front platform on the center of the rear platform and the rest of it on the center rod. Use the rod's thumbscrew to adjust the height until it the bubble indicates it is level. After the rear platform and rod are leveled in both dimensions, the front platform hangs on the thick end of the rod, suspended by ball bearings. If the front platform doesn't balance itself naturally, you can use the adhesive lead dots that are included to balance it perfectly.

For accuracy, we installed a set of dummy wheel disks on the car before placing it on the Tweak Station. Both platforms have marks scribed on each side to make it easy to center the car. Once the car is resting on the platforms and centered properly, the bubble level on the front platform will indicate which side of the car is heavier, if at all.

Note that the pre-production version we tested is narrower than the final version. When released, the final product will be slightly wider to accommodate a wide array of vehicles from 1/12-scale pan cars up to 1/10-scale buggies.

What we don't like

(1) The thumbscrew on the steel rod that acts as the front "foot" of the Tweak Station is a little small. If the thumbscrew were wider it wouldn't be so prone to being knocked over, requiring the levels to be checked again.

(2) The instructions only cover assembly and don't give any tips on how to use the Tweak Station to set up your car.

What we like

(1) The materials used are very high quality, well finished, and durable. Although it looks good enough to keep on a shelf, it should survive the "toolbox torture test" quite nicely.

(2) The ball bearing-supported platform balances well and very accurately, once set up with the adhesive lead weights.

What we really think

MIP's Tweak Station does what it claims to do, and does it well. Chassis balance problems can easily be identified with it so problems can be eliminated. If you are serious about your chassis setup, the Tweak Station is a cost-effective and convenient alternative to multiple-scale setups.◆

info

Manufacturer: MIP, 830 W. Golden Grove Way, Covina, CA 91722 • phone (626) 339-9007; fax (626) 966-2901
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Price: $45.00
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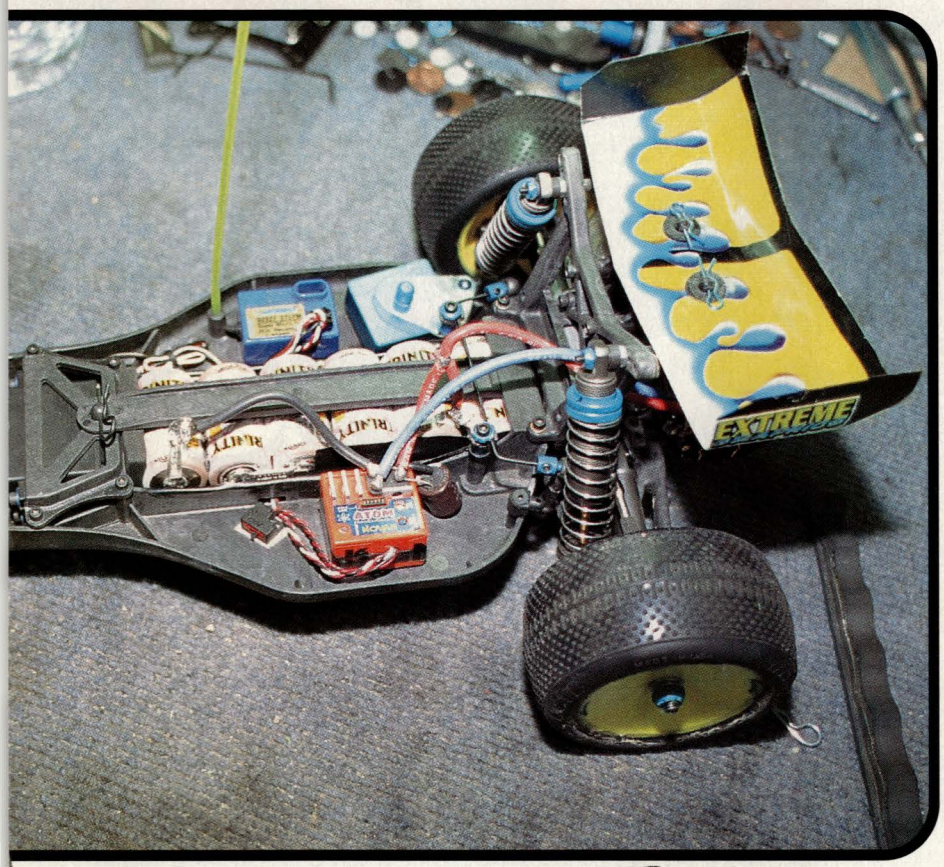
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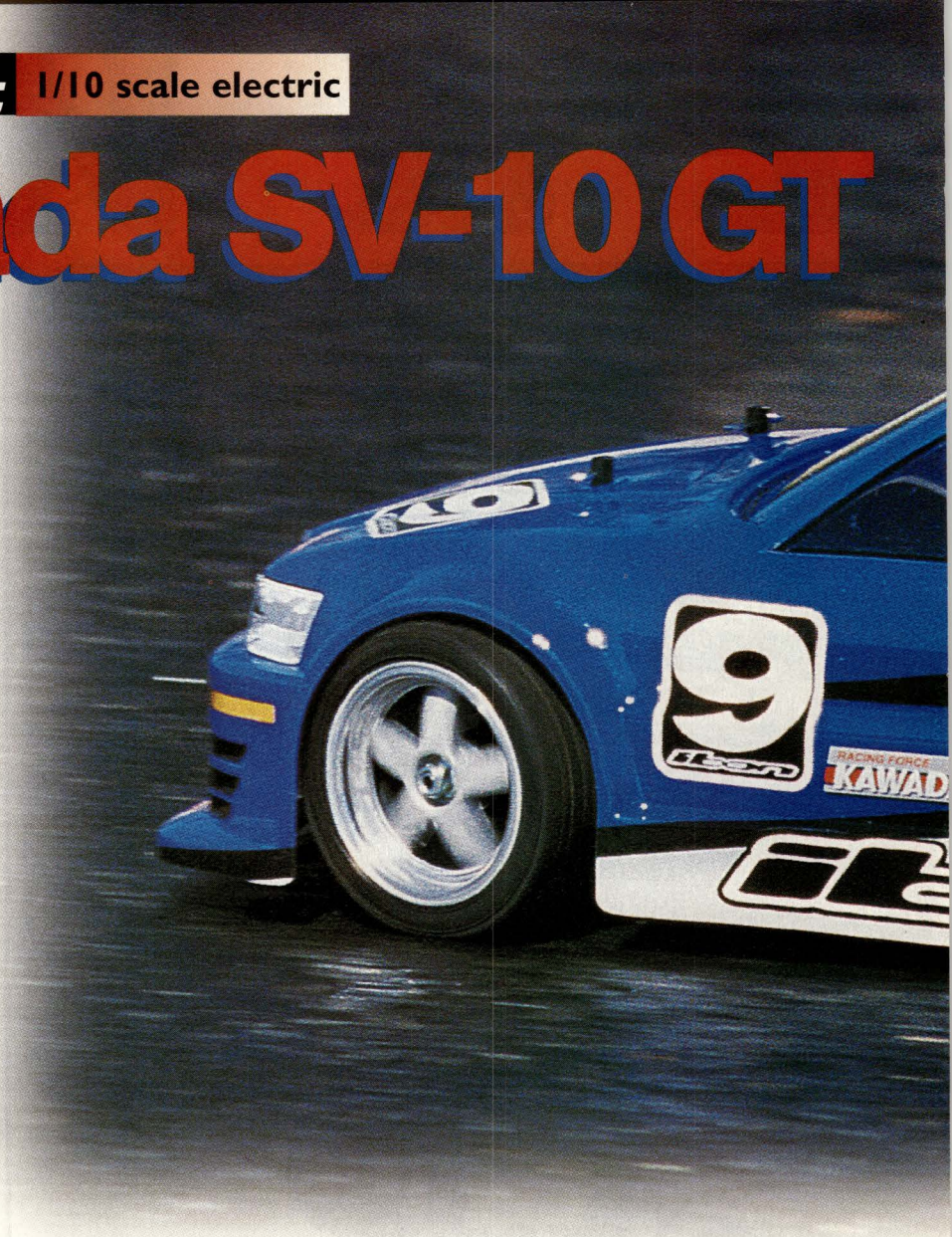
TLRC

Kawada SV-10 GT

High-voltage Lexus!

by Lito Reyes

When Kawada released its pro-level SV-10 Alcyon last year, it became a modest success with touring car fans who dared to venture away from the big name manufacturers such as Yokomo, Losi, HPI and Schumacher. The Alcyon boasted some clever innovations and refinements, such as Kawada's twin vertical chassis stiffeners, quickly adjustable front and rear caster setting, and center-mounted single bellcrank steering. It wasn't until former Kawada factory driver Greg Degani earned a National title with the car that people really started to take notice of this Japanese company that is still pretty new to our shores.



In an attempt to get a share of the popular "sport" touring car market, Kawada has released a new version of the Alcyon, named the SV-10 GT, aimed at the budget-minded hobbyist. Downgrading the expensive components (e.g., replacing woven graphite with fiberglass) places the SV-10 GT in a competitive price range without sacrificing all of the characteristics of the high-line version.

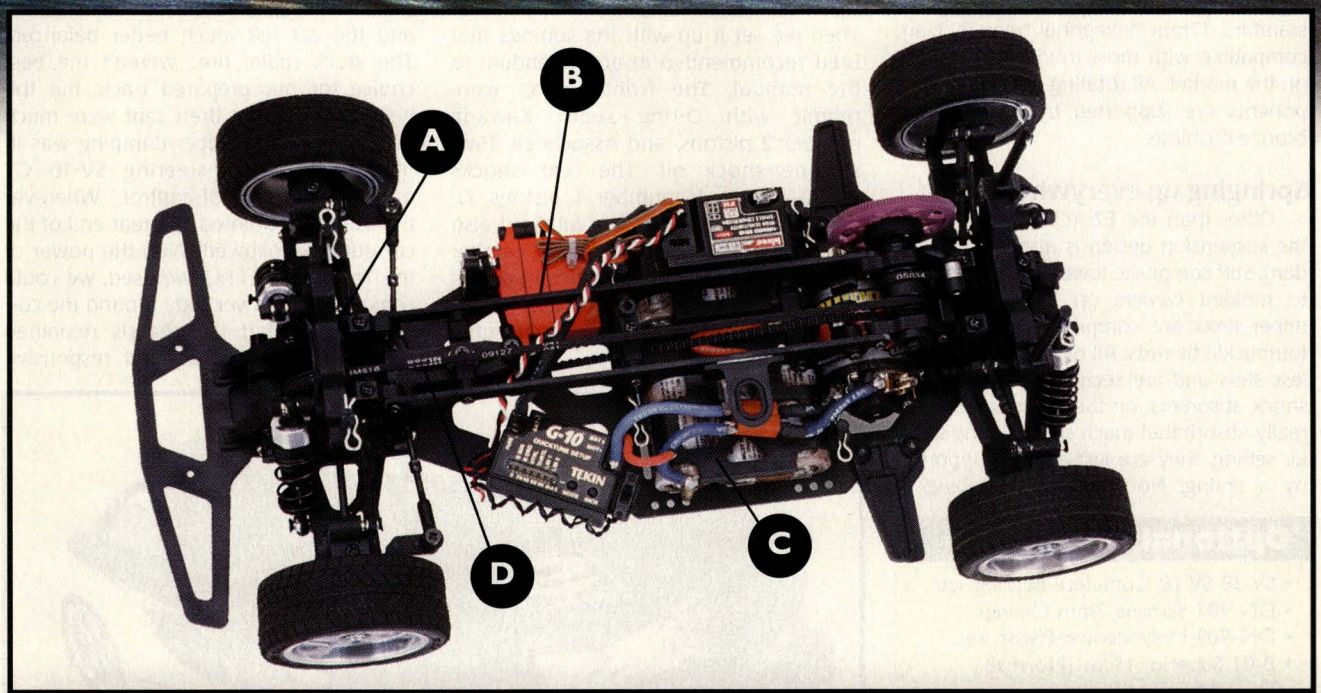
What's a V.O.L.T.?

The main design feature that differentiates the SV-10 from the other double-deck belt driven chassis out there is what Kawada calls its V.O.L.T. (Vertical Overarch Ladder-Style Twin Frame) design. Basically, instead of having a lower chassis plate stiffened by an upper deck mounted parallel to the lower chassis, the lower deck is stiffened by a pair of plates that mount perpendicular to the lower piece, much like the ladder frame on a full-sized truck. The two upper plates extend the length of the car and mount to the molded-composite front and rear bulkheads (replacing the machined aluminum pieces found on the Alcyon). The main benefit of the V.O.L.T. design is that there is absolutely no fore/aft chassis flexing, even with the not-so-stiff fiberglass material that the chassis plates are made of. It does still allow torsional flex, which can be beneficial on a bumpy track.

Another design feature of the SV-10 series is the simplicity of making front and rear caster adjustments. Kawada calls this their EZ-Adjust skid system. Basically, the two screws on either bulkhead can be removed to let the inner hingepin blocks pivot up and down. The blocks can be locked into one of three positions (0, 2, or 4 degrees) by re-installing the two screws. This adjustment method is much easier to perform than adding shims or replacing carriers like you have to on other cars. With the adjustable front caster, you can alter steering response, and with the rear caster (also known as "anti-squat") you can control the amount of traction the rear tires have on acceleration.

Test Gear

- Hitec Lynx 3D FM Radio
- Multiplex Profi 3BB Servo
- Tekin G-10 ESC
- Team Orion 11x3 Motor

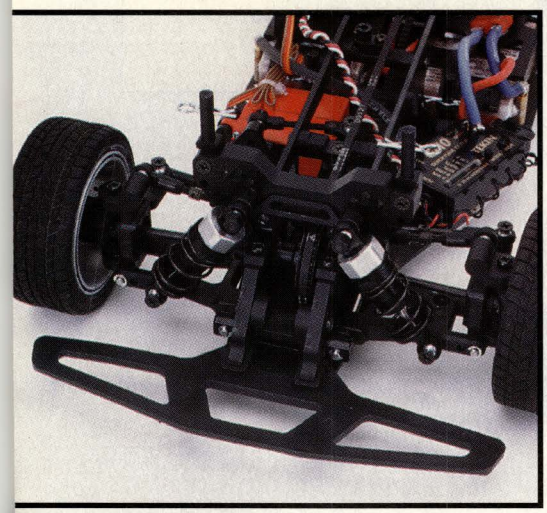


A. Front caster adjustment

B. V.O.L.T. vertical upper deck plates for fore/aft strength and rigidity

C. Molded battery hold-down cradles

D. Centered single-bellcrank steering



Just reposition one screw on each side of the bulkhead to change the front caster angle. A large (but easily bent) front bumper provides crash protection.

The drivetrain is the tried-and-true mid-rear motor, two-belt design that is so popular among touring car designers. It is simple, pretty efficient, and easy to maintain. Both belts have tensioners that are adjustable as the belts age and stretch. Smooth ball-bearing differentials are driven by the belts, and connect to standard dogbones on both ends. The differential outdrives have clever retainer clips that prevent the dogbones from falling out in the event of a nasty crash (those never happen, now do they?). The dogbones drive axles on all four corners that have standard 12mm hexagonal hubs that are compatible with most touring car wheels on the market. All rotating drivetrain components are supported by long-wearing bronze bushings.

Springing up everywhere

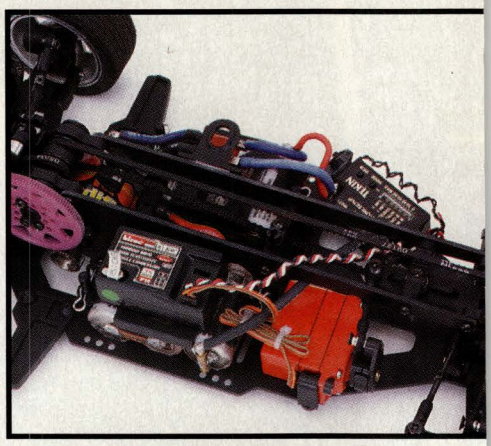
Other than the EZ-Adjust skid system, the suspension design is also pretty standard. Stiff composite lower arms are mated to molded carriers on both ends. The upper links are comprised of adjustable turnbuckle tie-rods. All hingepins are stainless steel and are secured by E-clips. The shock absorbers, on the other hand, don't really absorb that much shock. In the stock kit setting, they are just a shaft supported by a spring. No means of damping is included in the kit. Fortunately, about $12 worth of parts is all that is required to turn the stock shocks into smooth oil-filled dampers. Firm springs are included for the rear and softer ones go up front.

Setting it up

Brett Sisley, a Kawada factory representative, was kind enough to send a few upgrades with our SV-10 GT kit: a full set of ball bearings, a set of Kawada's belted narrow radial tires and wheels, a set of 3mm O-rings, and a set of shock pistons. The use of the bearings is obvious; they greatly reduce drag and friction in the drivetrain, resulting in higher speeds and longer run times. The temperature-rated tires and wheels help in tuning for different running conditions. The O-rings and pistons allowed us to convert the stock "shocks" into real oil-filled shocks.

We installed all of the ball bearings when building the kit, so we wouldn't have to completely tear it down later on. But we did try the manual's recommended settings first (including the "shocks"). Since the SV-10 GT accepts saddle-pack configured batteries, we used those, although it will take stick packs with ease. With 0-degrees of caster up front and 0-degrees of anti-squat in the rear, the driving experience could best be described as twitchy and bouncy. The chassis would bounce through bumps and steering was a little too sharp. It was driveable, but not at the level of other competitive sport kits. Then we set it up with the settings that Brett recommended in an addendum to the manual. The front shocks were rebuilt with O-ring seals, Kawada number 2 pistons, and Associated 35wt silicone shock oil. The rear shocks received Kawada number 1 pistons, O-rings, and Associated 20wt oil. Brett also suggests modifying the front camber link's length and mounting position, and changing the rear hub positions.

Last, but not least, we reset the camber to 2-degrees negative in the rear and 1-degree negative in front, and changed the front caster angles to 2 degrees and the rear to 1 degree. Lastly, I also added a set of Kawada's machined aluminum Superior Hubs to all the axles (though expensive, I swear by them and use them on almost all of my touring cars).

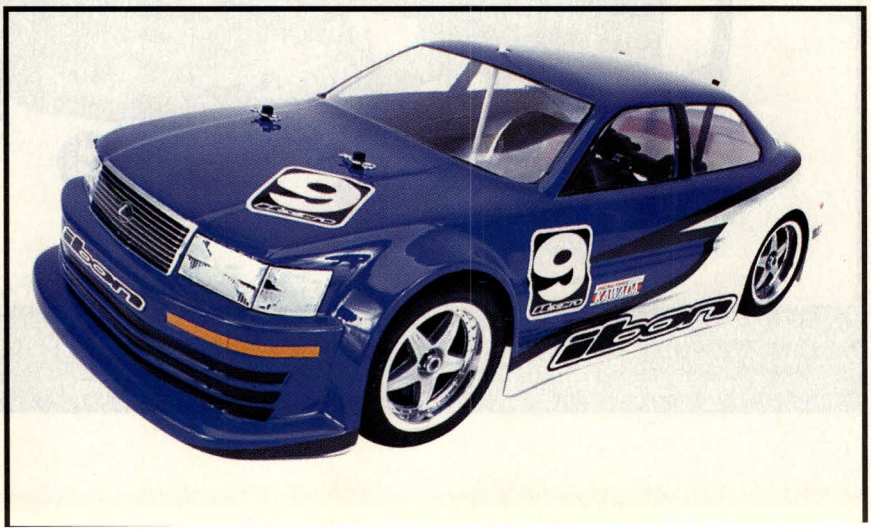


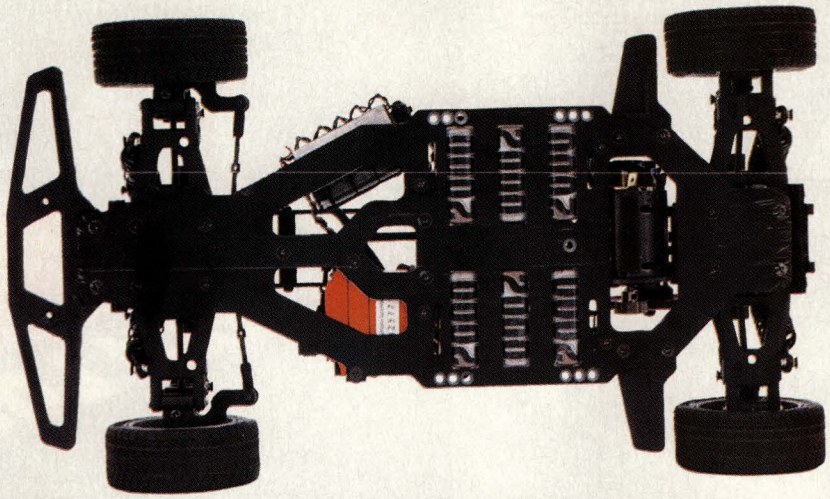
The fiberglass vertical upper plates really do resemble a pickup truck's ladder frame. Kawada suggests mounting the receiver on top of the steering servo. We though it was a little more convenient to put it on the battery holder. Stick pack holders are also included.

With these changes in place, we took the SV-10 GT back to our secret road course test track to run a few more packs. Now the chassis was much more comfortable to drive. The smooth drivetrain (with bearings) gave the car lots of punch and the car felt much better balanced. The stock radial tires weren't the best choice for our prepared track, but the belted radials that Brett sent were much better. Now that proper damping was in place, the snappy-steering SV-10 GT didn't feel so "out of control." Wherever the front tires pointed, the rear end of the car dutifully followed. With the power of the Team Orion 11x3 we used, we could coax it into a power slide around the corners at will, but the chassis remained completely controllable and responsive

Optional Gear Used

- SV-38 SV-10 Complete Bearing set
- DN-907 Silicone 3mm O-rings
- DN-909 Molybdenum Piston Set
- B-01 Superior Hubs (Normal)
- TU-83M Belted Radial Tires (Narrow/Soft)
- TU-371 8-Spoke Mesh Wheels (Narrow/Ivory)





Type: 1/10-scale electric 4WD touring sedan chassis

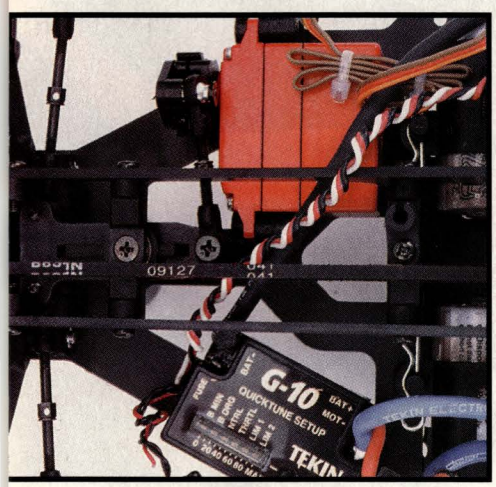
Manufacturer: Kawada USA, phone: (425) 656-0688; fax (425) 656-0690

Price: $229.50

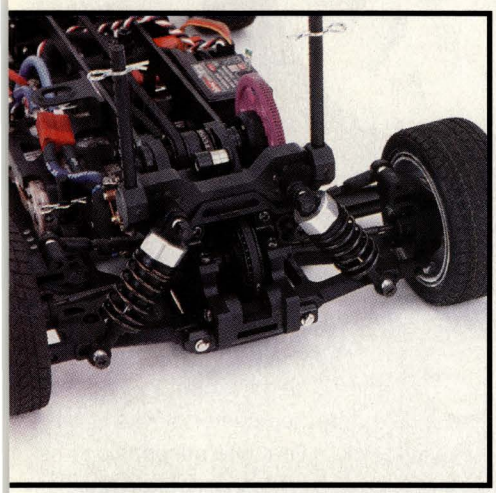
What You Get: Complete rolling chassis kit. *Required Items: two-channel radio system with one servo, polycarbonate paint, CA adhesive for the tires*

Length	18.5 in/470mm
Width	8 in/205mm
Wheelbase	10.1 in/258mm
Track (F/R)	7 in/176mm
Weight	1550g

Kawada's V.O.L.T. chassis design provides exceptional fore/aft rigidity even with the Sport kit's fiberglass main chassis.



The single-bellcrank steering guarantees the proper Ackerman angle. Look, turnbuckle tie rods! Woohoo!



Without oil, the rear shocks spring and bounce the rear end over bumps. A set of pistons and a few O-rings are all that are needed to turn them into high-performance shocks. Notice the easily accessible rear belt tensioner, just in front of the rear shock tower.

whether driving it "on the edge" or "smooth as silk."

What we don't like

(1) Many other "sport" touring cars are now coming with ball bearings as standard equipment. We feel that the precedent has been set, and those companies that don't include them should really take note.

It would cost very little for Kawada to include the additional hardware required to make the shocks oil-filled. There are only a couple more steps required to make them oil-filled, and it makes a world of difference in the SV-10 GT's handling.

(2) The parts' organization could use some help. Though the parts trees are labeled nicely, many building steps require parts from multiple trees and bags.

(3) The motor mounts to one of the fiberglass stiffener plates. There is no heat dissipation and the plate could be weakened by the stress of an electric motor's torque. Even a stamped aluminum mounting plate would be a benefit, and should be cheap to produce.

(4) The SV-10 GT is 200mm in width, which makes it illegal to race in programs that strictly follow ROAR and NORRCA electric touring car guidelines.

What we like

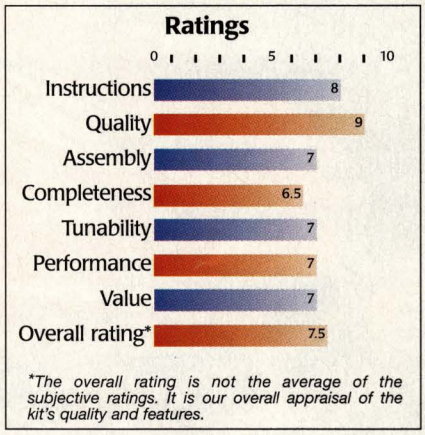
(1) The camber adjustments cannot be any easier. I'm surprised more manufacturers don't do it this way.

(2) There is almost no steering slop. The single bellcrank design is simple and very effective.

(3) The battery mounting system is flexible (in a good way). It can accept stick pack in three different positions or saddle packs. Either way, the battery retention system is easy to use.

(4) The chassis shows lots of potential. With the few upgrades we did, the SV-10 GT has become a car that I would be happy to race on a weekly basis.

(5) The LS-400 body looks very sharp and the satin and chrome-finish wheels look great.



What we really think

In its completely stock form, the SV-10 GT is a good solid car that is great for playing around the cul-de-sac. With a few hop-ups, though, it can be turned into a car that should be very competitive on the club racing level. Though still considered an "exotic" manufacturer, Kawada has produced a car that should appeal to a wide range of hobbyists. ◆

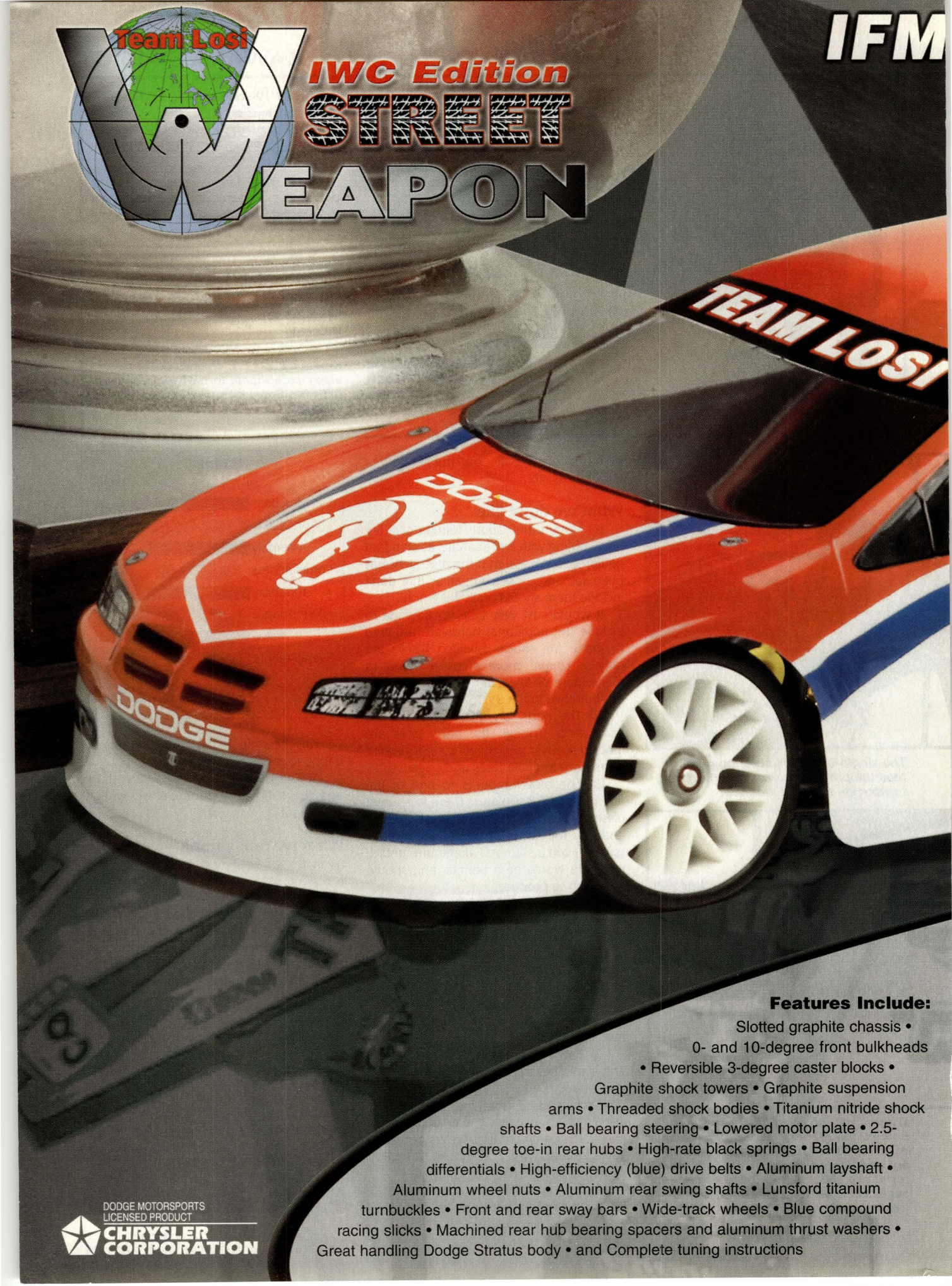
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What's the IWC stand for? It stands for IFMAR World Cup - the event that Team Losi Street Weapons dominated. Not only did Team Losi win the team competition, but Street Weapons swept the top three positions. David Spashett took the win, followed by Josh Cyrul and Joel Johnson. As if that weren't enough, Ryan Coxall also brought home the victory in the independent class with a Street Weapon.

The IWC Street Weapon has proven to be a winner on any surface. It has won ROAR National Championships on both carpet and asphalt, indoor and outdoor. From parking lot to purpose-built track, there's no stopping the IWC Edition Street Weapon.

The IWC kit includes everything found on these winning cars in one convenient package. Take a look at the list to the left for just a taste of what you'll find packaged in the kit. There's nothing else left to add as an option. Basically the only thing that we couldn't include from the winning package was IFMAR World Champion David Spashett. But with a competition-pounding package like this, you'll be driving the IWC Edition Street Weapon to the winner's circle in no time.

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