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HPI RS-4 SPORT 2

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NITRO TUNE & PAINT

The pros show you how

PLUS...

Tests, News, Race Coverage, Gossip, and more

pg. 77

TEAM FACTORY B3

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June 2000
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Issue 5.9

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FACTORY Team

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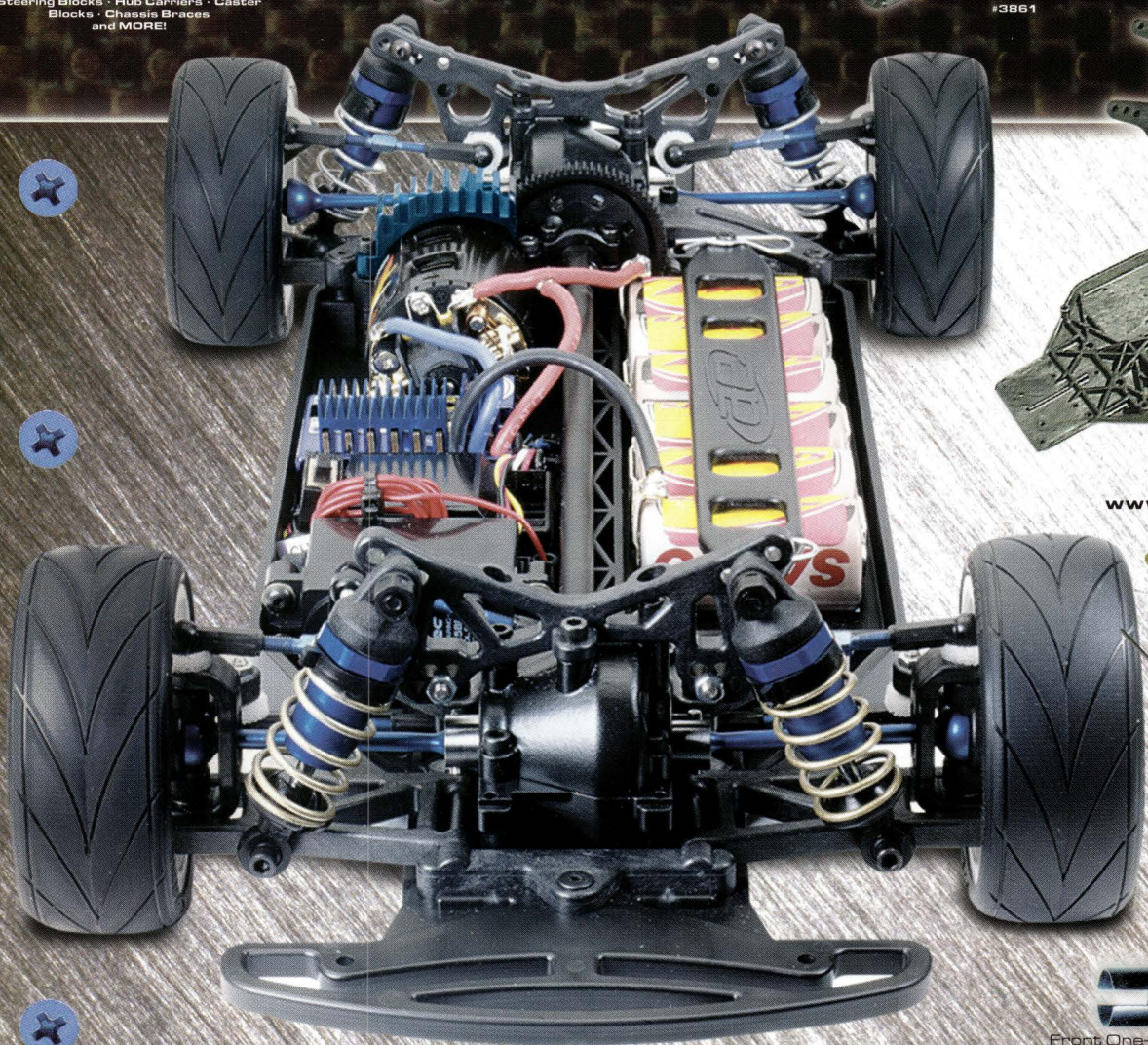



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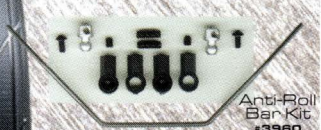





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- *New super-rigid Alloy chassis, blue anodized*
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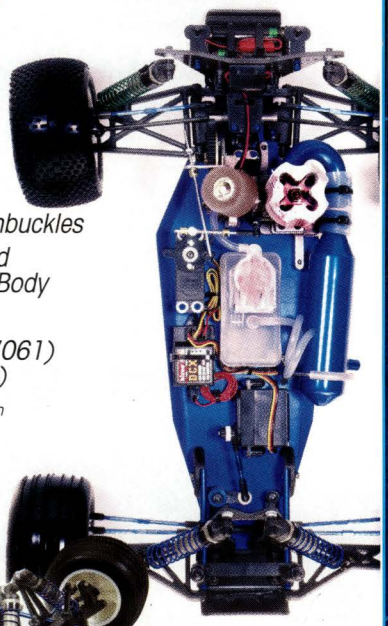
- *Pro-Line Racing Tires, and #3078 F150 Ford Truck Body*
- *MIP CVD's*
- *Available in Pull-start (#7061) or Non-pull Start (#7060)*



RC10GT Factory Team Kit #7060 shown with items not included in kit: .12 to .15 size engine, 2-channel radio gear and servos.



•Factory Team GT Kit: #7061 (pull-start) #7060 (non-pull)

FACTORY Team GT

RC10GT

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- New super-rigid Alloy chassis, blue anodized
- Tuned pipe and manifold
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- Pro-Line Racing Tires, and #3078 F150 Ford Truck Body
- MIP CVD's
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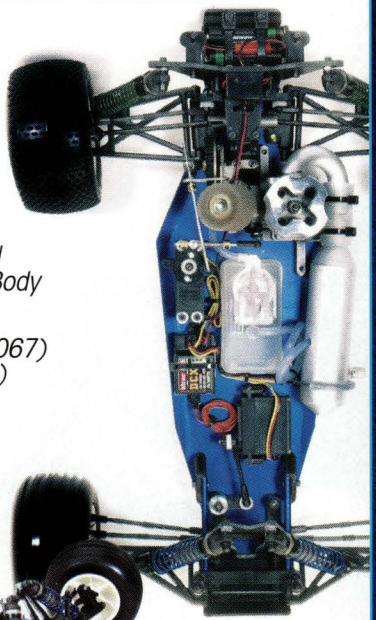

RC10GT Team Kit #7068 shown with items not included in kit: .12 to .15 size engine, 2-channel radio gear and servos.



•RC10GT Team Kit:
#7067 (pull start)
#7068 (non-pull)

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- Fully assembled, just add fuel and radio system batteries!
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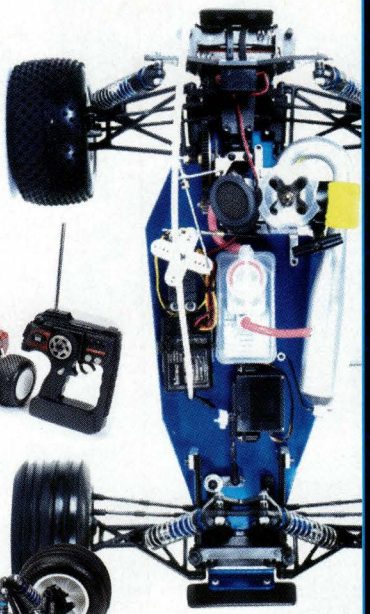

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Complete with .15 engine and 2-channel radio

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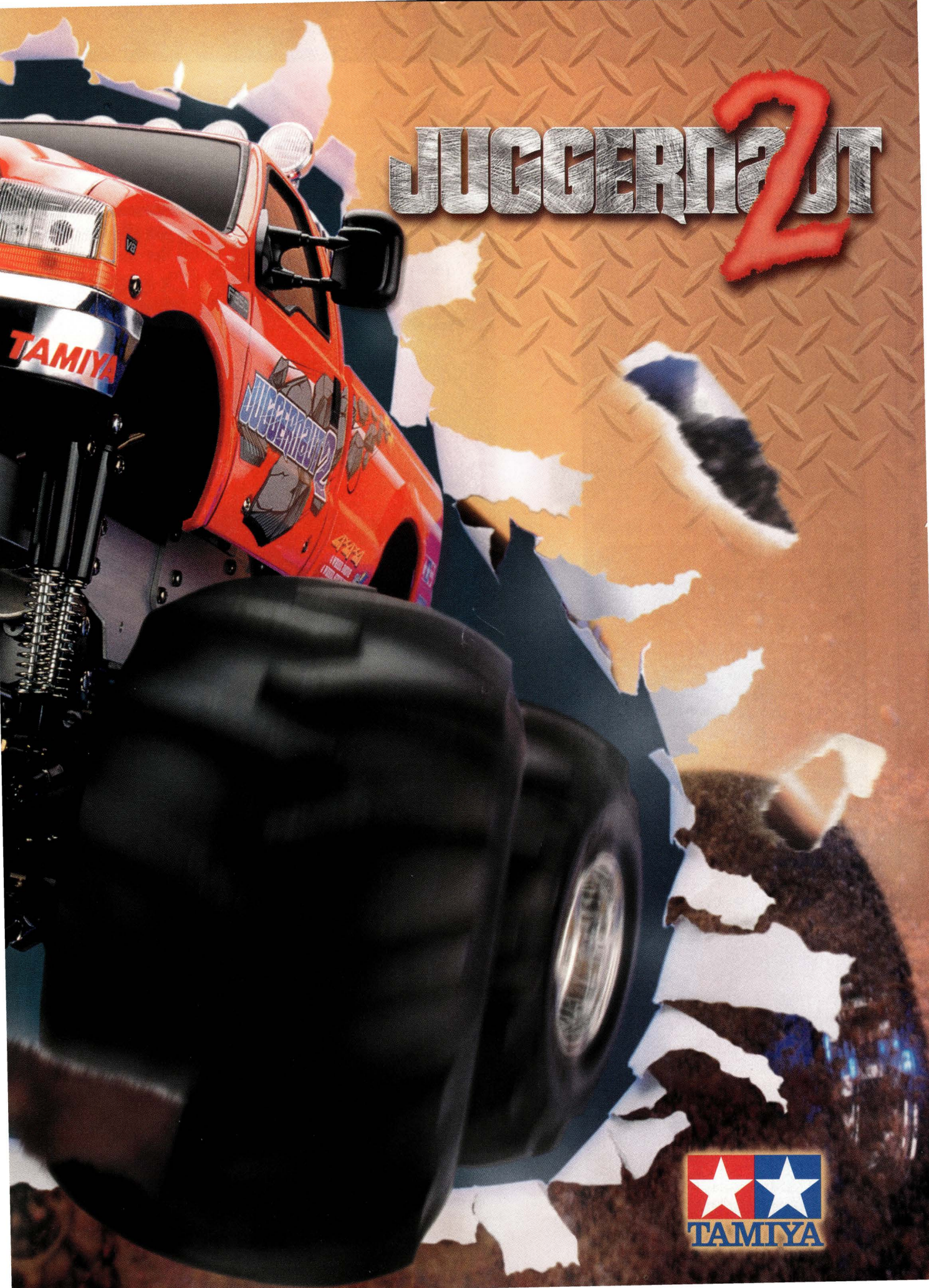
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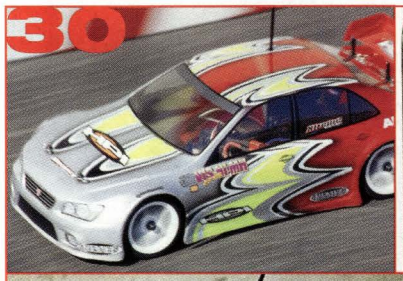

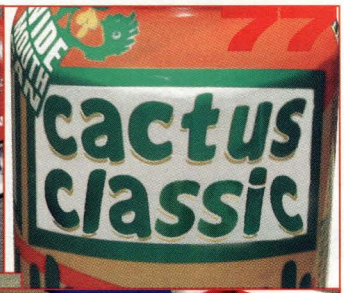









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ATTENTION!

There's dirt on our logo. How'd that get there?



Other stuff in this issue: Rodman's Jacuzzi water, junkies, cats running for their lives, and much, much more.

Cover Photos by: Elliot Crabtree



Here you go hun.

The Winning Combination

TEAM LOSI RACING TIRES

TEAM LOSI XXX

'2000 Winter Champs Winner
* Modified Champion
* TQ Modified
* TQ Stock

Matt Francis
'2000 Champion
Mod. Truck

Driver	Model	Fronts	Rears
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2nd Brain Kinwald	XXX-T	8-Rib	Taper-Pin
6th Adam Drake	XXX-T	8-Rib	Taper-Pin
8th Jason Ruona	XXX-T	8-Rib	Taper-Pin
9th Mark Francis	XXX-T	8-Rib	Taper-Pin
10th Rick Hohwart	XXX-T	8-Rib	Taper-Pin

"The Winning Combination"

XXX-T Wins Winter Champs in First Race!

A-7635 Taper-Pin

A-7507 8-Rib

A-7880 Tire Glue

Now Available in "Pink" compound!

TEAM LOSI

Always Racing Towards The Future

Take the Plunge!

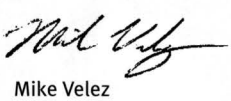
Greetings. The other day I was sitting at my desk hard at work (well, actually I was on the web checking out uhhhhh, errrr, hockey web sites, yeah that's it, hockey sites) when I received a phone call from a guy that was in need of some help. He just bought an RC10GT RTR on the web, and he didn't know that there was such a thing as R/C car racing until he picked up a copy of *Xtreme*. When he saw the Track Directory in that particular issue, he was surprised to see that there was a track about a half-hour from home. He called the track, got the race schedule, and headed down there on a race day to check things out. At first he was stoked to see the guys racing with trucks that looked a lot like what he had at home. He was happy, until he actually talked to one racer that said he would need about another $400 worth of gear to actually race. Our first timer Joe, let's call him Joe, was completely bummed to find out that his truck was not raceable according to the guy at the track. Luckily, Joe called us so that we could set him straight. With Joe's GT RTR, all he needs is a couple of days worth of practice and some solid advice and he's got a vehicle that's more than capable of competing in a novice club race. I'm not particularly plugging the GT RTR, but a number of RTR kits have what it takes to compete in their given class at a novice club race. I'm sure that the guy at the track that gave Joe that bad advice didn't do it on purpose. He had probably been racing for a couple of years and was racing in a sportsman or pro class, not remembering what it was like when he first got into racing.

If you're new to the R/C hobby, don't be intimidated when it comes to racing. Racing is by far the most exciting, stimulating, and entertaining aspect of radio controlled cars. And, when it comes to racing for your first time no matter how good you think you are on the street, it's a whole different ball game on a track. During your first four or five times racing, you'll be more concerned with just keeping your car on all four tires than who's in the lead. For the average racer, you'll easily be into racing for a few of months before the kind of gear you have becomes an issue. This is an old analogy, but if you were to put Brian Kinwald's Triple-XT in the hands of a novice and gave Brian a bone stock beginner kit, I'd bet the farm on Brian. Skills are so much more important than what type of batteries you have or whether or not you've got an RTR or total Team kit. Practice is what makes a difference.

If you're new to the hobby, take the plunge. Find your local track and go racing. Don't worry about winning the race; just have fun. Hell, it might take six months before you win a race, but I guarantee you'll get nervous, have butterflies in your stomach, get an adrenaline rush, and have fun every time you're on the track, win or lose. I've been racing for fifteen years and my knees still shake when I'm in the lead (although, it's been quite some time since I've been in the lead). Basically what I'm saying is go RACE!

Issue Notes

This issue's got a little bit of something for everyone. – reviews of sport kits like the HPI RS4 Sport 2 and Tamiya TB-01 all the way up to reviews of Associated's Factory Team B3 and Kyosho's GP Ultima ST Type-R. We've got a killer how-to on Nitro Tuning by Regan LeBlanc and a painting article with the help from one of the world's top body painters. Also this month we've got tons of great race coverage and a How it Worx article on oil that will help everyone. Plus, there's an offer for tons of free stickers. It's a great issue if we do say so ourselves. Hope you like it.



Mike Velez
Publisher/Editor/Racer

Xtreme R/C Cars

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SHAFT-DRIVE 4WD NITRO MONSTER TRUCK

The full-time shaft-driven 4WD Nitro RS4 MT can handle the most extreme terrain you can throw at it! And, you can easily drop it down for high speed on-road driving. Either way, the Nitro MT delivers unstoppable 4WD traction and soaks up bumps with long-stroke suspension. Our all-new shaft drive system delivers the power to all four wheels, and the sealed diffs allow you to keep running... rocks and dirt can't stop the Nitro MT!

A tough nylon upper deck forms the backbone of the Nitro RS4 MT and features a swing-out radio tray for easy cleaning. After a long day of running your Nitro MT, cleaning is easy – just pop off two body clips, disconnect the servo arms and swing out the radio tray! Hose down the chassis with Nitro Cleaner and the Nitro MT looks like new again. It doesn't get any easier than that!

Our powerful Nitro Star 15FE engine is one of the easiest-to-tune engines ever, with just one carb adjustment and many improvements made in the past several months for more power and strength! Need even more power? The Nitro MT accepts all popular .12 engines.



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DUAL CHAMBER TUNED PIPE



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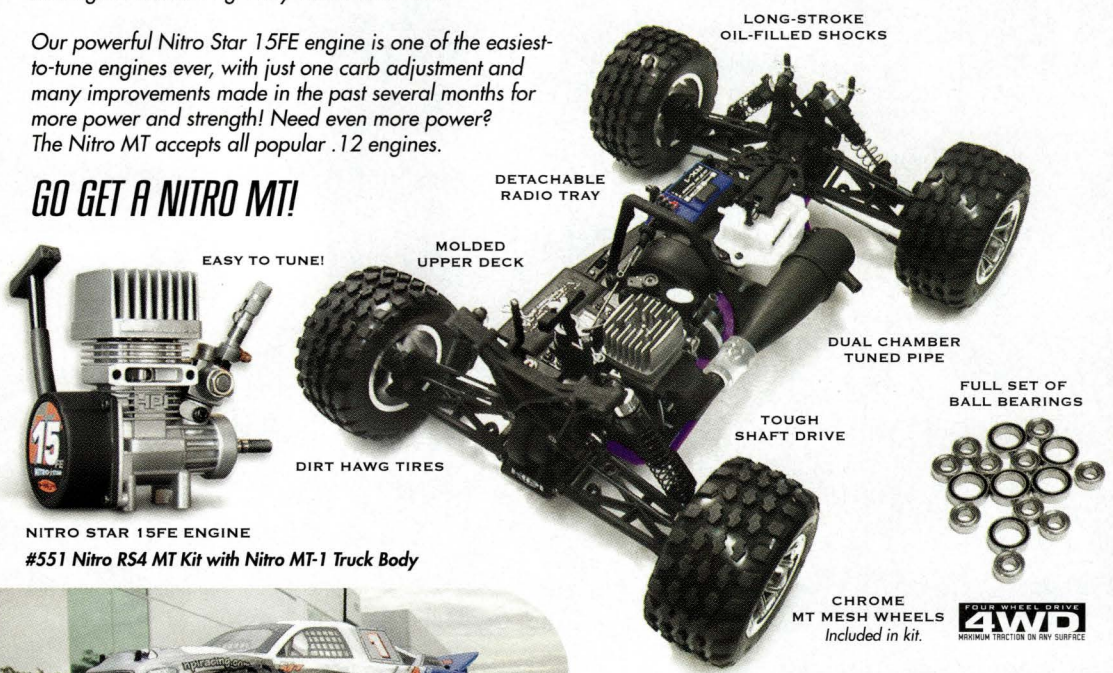

#551 Nitro RS4 MT Kit with Nitro MT-1 Truck Body



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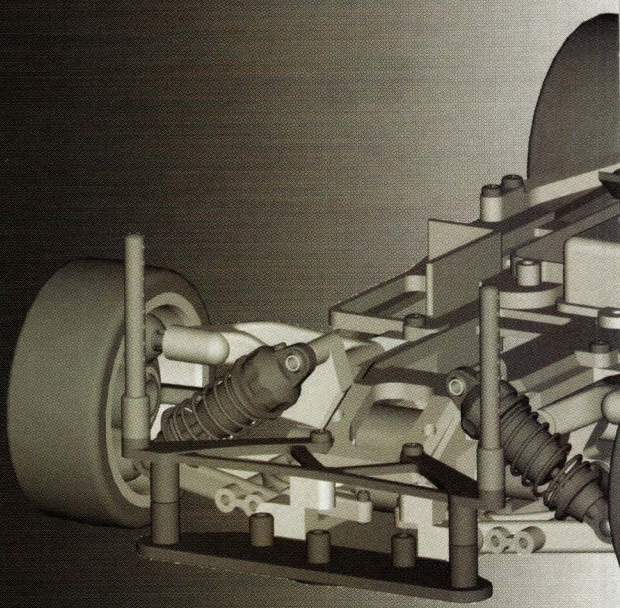
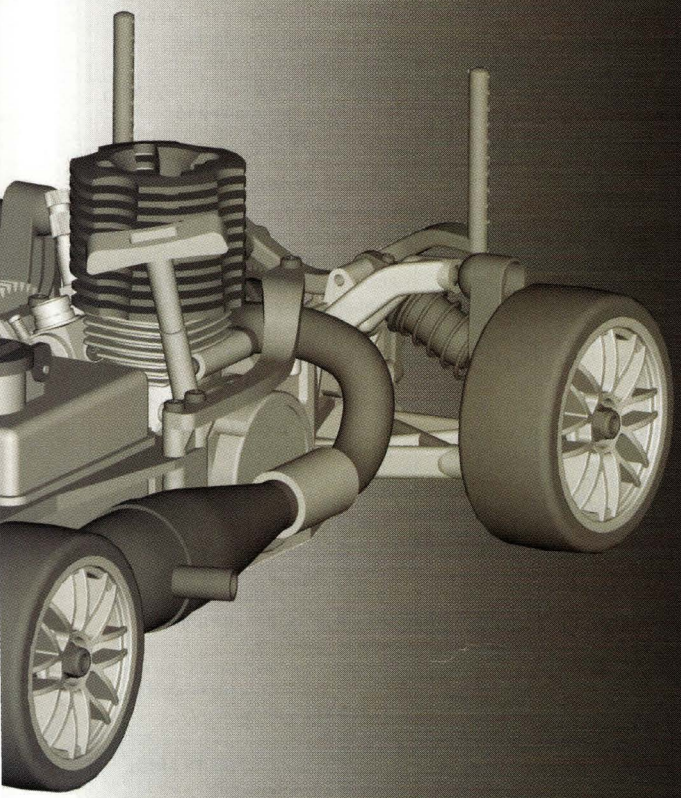


GT



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NITRO TOURING

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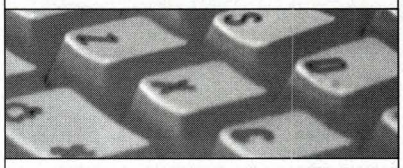


We're tired of doing all the writing. Help us please. Get off your duff and type us an email or letter. Whether you want to tell us how great the magazine is and how you like the babe pics or you want to tell us how much we suck, fire us an email or letter. You can even ask a question or two. If we know the answer, we'll probably publish your letter, or make fun of you.

Convenience or Construction?

I just read the Editorial in the March 2000 issue and was very surprised to find that Mike Velez denotes his disapproval of RTRs. Why? Surely he realizes that not everyone interested in R/C has the time, or even the inclination, to build from the ground up. Convenience, to some, is pure bliss. I like to repair and upgrade my Chevy Tahoe (not R/C...haha), but I sure am glad that I didn't have to build it from scratch. For those of us out here who work 9 to 5 and come home to a family life and more, RTRs are an appealing product. As far as repair and maintenance goes, I'd rather have a professionally-finished R/C that I can examine before I tear it down so that I can be sure of the what, where, and how things are supposed to be. I'm sure that knowledge comes even more extensively when built from the kit, but again we are talking about a convenience issue. Finally, the industry spends tons of dough on economic analysis and marketing to find out who is buying what. They wouldn't be making RTRs if there wasn't a market for them. PS: Our prayers are with Devin and all of her family.
Michael Sweeney
Stillwater, Oklahoma

Michael, I didn't bash RTRs or their owners. I hope my editorial didn't come off like that; I didn't mean for it to. I'm glad that the RTR market has exploded like it has. We definitely haven't ignored that segment of R/C in *Xtreme*. In my editorial, I simply raised the question of whether or not consumers getting into R/C for the first time via an RTR realize what they have on their hands. If the R/C industry offers RTRs and kits, it sounds like there's something for everyone. That's great. Given the fact that you took the time to write us, you're more than just a passive consumer. That's what I like to see. You've answered some of the questions I raised in the Editorial. I hope you continue to have fun and enjoy whichever car(s) you own. And thank you for your warm thoughts and prayers for Devin.

Relax a Little

Concerning the frequent use of the term "rides" in your magazine: how does one "ride" their R/C model car? Sounds silly, doesn't it? The time, effort, and money that people put into these small engineering marvels warrants a more sophisticated description than dumbed-down kid language. Please take it seriously.
Chuck
via the web

Chuck, back away from the keyboard. You're wound up just a little too tight. Things okay at the office? Did somebody switch your normal brew to decaf? Of all the useless juvenile commentary we put in every issue, this is what you take issue with? Take a look at your letter. "Sounds silly, doesn't it?" R/C cars are a hobby, a diversion from everyday stress. Relax.

The Point of Points

I just read last month's Editorial. For years, my son raced BMX and was a member of the ABA. My son Tommy is competitive by nature, but the recognition of being the points leader at our local track went a long way in teaching him some solid values. He realized early on that hard work, effort, and dedication had their rewards in gaining respect from his peers. My son has since gotten out of BMX; unfortunately he suffered a severe knee injury during a race. He and I both race gas off-road locally, although in R/C we both have a much more lax attitude towards racing than we did in BMX. I can't pinpoint the exact reason why that is, but after a day of racing all we have to show for it is a good time and a couple of race bucks. We're pleased with we get out of the hobby, but some recognition for our hard work and effort might be nice. I would completely support some type of points system in R/C racing, as I'm sure thousands of other racers would that share my sentiments. Well, I hope this is the insight you're looking for. Keep up the good work, Tommy and I really enjoy it. Thanks for the chance to voice my opinion.
Michael McNeil
via the web

Thanks for the letter. Sorry to hear about Tommy's knee. I agree with your take. Maybe if this topic remains on people's minds some changes might come about in the near future. Express your opinion to others at your local track and on the web. If the public wants it, it will happen.

Got Jungle Karma?

Whatttzzzzz Upppppppp? I was rummaging through some back issues and read that you guys are Jungle Clones. That's Hugggeeeee. No wonder I like *Xtreme* so much; it' s got Jungle Karma. On to my takes. First take: What's up with the idiots that bash Traxxas on Tech Talk? Have you ignorant idiots seen or driven the TMAXX? This is the biggest, baddest monster truck to hit the market in the last ten years. You guys need to realize there's more to this hobby than racing? Second take: To Hitec, nice ad in last month's issue. Now I've got to glue a bumper to my cat or something. That way the neighborhood kids don't probe it or take its temperature with the front of their cars. Can I get some "Team Steamy Pile" decals for my car?
Mark in C-bus.

Rack him. Not our huge email of the month, but enough get racked. Those of you who listen to the Pimp in the Box will think this is funny. Those of you who don't listen should. www.jimrome.com

All Charged Up

After four years, I still see no mag that can compete with yours. (Well, maybe some naughty ones ?!) How about some inside info on the contentious RC2400 issue. We have recently tested some TEAM packs (3 of them) on a Turbo Thirty at 20 amps discharge. The average discharge voltage was looowww. I am aware that these cells were withdrawn from the market at some stage, but are on sale again. How about a test article. I know you guys say it like it is, so test some and call a spade a spade. Let the R/C community know if these cells are any good, and if not, it may save a lot of racers out there some money. Maybe you are aware (via your agents at the FBI or those grey blokes in the mother ship orbiting the planet we call home) of some new developments regarding this issue. We have actually returned the cells to the dealer and received a refund.

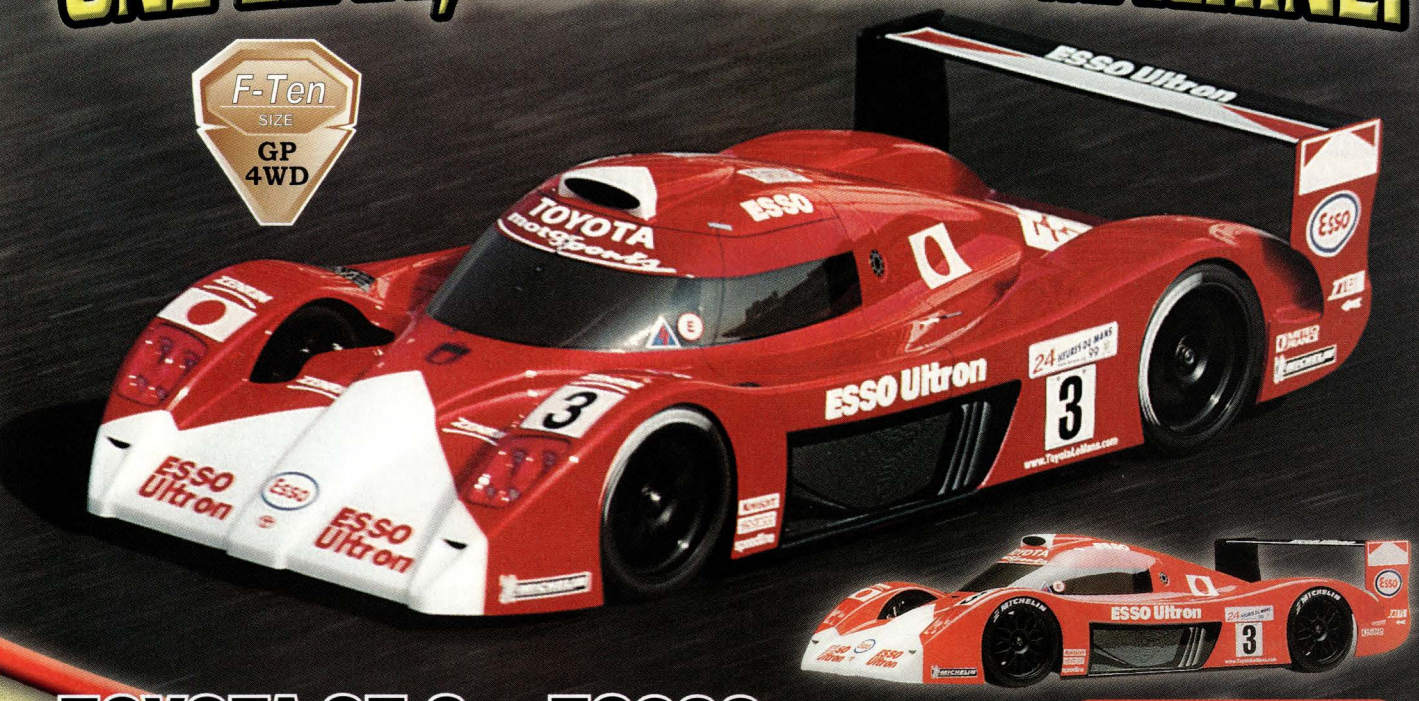
Anyway, you guys keep up the good work. Included is a funny so enjoy.

I've got a joke for you:
After marrying a much younger woman, a 93-year-old man visited his doctor and announced they were expecting a baby despite the doctor's previous reassurances that they would not need birth control. "Let me tell you a story," said the doctor and he began, "An absent-minded fellow went hunting but instead of a gun, he picked up an umbrella. Suddenly a tiger charged toward him. Pointing his umbrella at the tiger, he shot and a bullet killed the animal right on the spot."
"Impossible!" exclaimed the old man, "Somebody else must have shot the tiger!" "Exactly," replied the doctor.
Cheers from sunny South Africa.
Brendon van Rensburg
Wool Testing Bureau S.A.

The 2400s weren't that bad, but definitely didn't live up to expectations. The voltage output on the 2400s is in-line with Ni-MH 3000s, but the 2400s don't have the same run time. The advantage of the 2400s is that they are more durable and charger-friendly than Ni-MH batteries. The second production batch from Sanyo should be hitting the market soon. We're told this second batch we're told will have higher voltage numbers. The bad thing about batteries is that the magazines don't get samples until they've hit the market. When a company like Sanyo does a production run, they produce hundreds of thousands if not millions of cells at a time. We get the cells at the same time as everybody else. By the time something would go to print, it would be months after they're in mass release and the initial purchases. When the second batch hits the market we'll pass some information along.

ONE LEAN, MEAN RACING MACHINE.

F-Ten SIZE GP 4WD



TOYOTA GT-One TS020

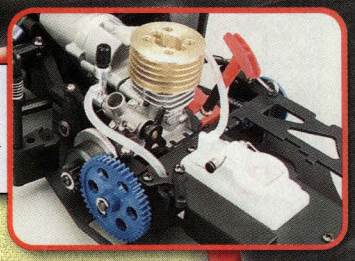
It's lean, it's mean... it's nitro R/C racing, at its F-10 finest. The Toyota TS-020 from Kyosho cuts through the competition with distinctive speed and style, its scintillating performance a perfect match for its low-slung looks.

Got a twisty track to conquer? With the TS-020's sure-footed 4WD traction and handling, you've got it covered. Long travel, double wishbone suspension arms add rigidity — working with innersprung oil-filled dampers at all four wheels to stabilize the ride — and the fuel tank is positioned lower to improve the car's CG. The front caster, front/rear camber and toe-in are all adjustable, for maximum flexibility. Sturdy disk brakes provide superior stopping power.

The muscle for this awesome on-roader is courtesy of Kyosho's GS-11R engine. A built-in recoil starter fires it up quick and easy, and a race-proven, 3-belt drive system with 16 ball bearings delivers smooth, efficient power transfer. Topping it all off is a super-sleek GT-1 body that looks fast even when standing still.

So if you're looking for a nitro machine that's engineered for excitement — in both profile and performance — take a look at Kyosho's F-10 Toyota TS- 020. It's the high-tech, low-riding lightning bolt that's licensed to thrill!

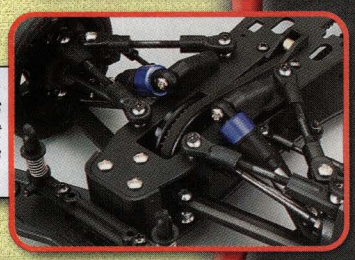
For the location of the dealer nearest you, please call 1-800-682-8948 and mention code number 2332X.



The fuel tank is positioned lower for a more stable center of gravity; the included Kyosho GS-11R engine with convenient built-in recoil starter delivers plenty of muscle.



Long travel, double wishbone suspension arms add rigidity, and work with innerspring oil-filled dampers at all four wheels to stabilize the ride. The front caster and front/rear camber are adjustable for flexibility, and the rods also adjust for easy toe-in.



Full-time 4WD is provided by a race-proven, 3-belt drive design with 16 ball bearings, for smooth, efficient power transfer. Sturdy disk brakes offer superior stopping power.

Other models in the F-10 GP Sports Series include the classic-styled, open-wheel Formula Sports and the open-cockpit, Can Am design of the Proto Sports. All three racers share the same high-performance chassis.



KYOSHO® THE FINEST RADIO CONTROL MODELS

www.kyosho.com

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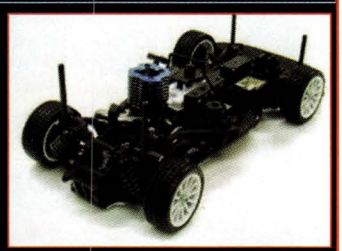
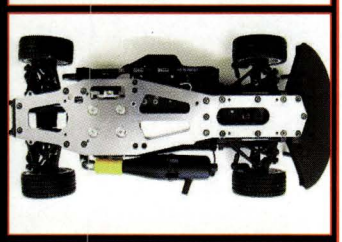
YOKOMO GT-4 NITRO TC UNCOVERED

Crappy pictures, but we got'em!











Check out these pictures we found of Yokomo's new nitro touring car that has yet to hit the market. The new nitro car will be called the GT-4. It's a four-wheel drive touring car that uses a .12 to .15 size engine. Little details are known as of yet. Here's what we do know. The chassis is a 3mm thick aluminum chassis with large cut outs. The front and rear diffs are geared differentials. But, unlike other sedan-geared diffs, Yokomo uses a planetary gear design. The kit will come with a molded tuned pipe, ball bearings, tires, wheels, low-friction racing shocks, disk brake, and fiber reinforced molded parts. The suspension arms take the shape of those found on some competition 1/8-scale on-road kits. It is unknown whether the car will come with or without an engine. As soon as we get better photos and/or more information, we'll pass it along.

Correction!!!

In the May Issue we did a Hook-Up of the Associated TC3, and in the Quick Reference guide at the end of the article the front and rear spring combinations are swapped. The reference chart should read: for the stock setup red springs in the front, gold springs in the rear; For the modified setup purple springs in the front, red springs in the rear. We apologize for the mix up.

Pro-Line Treads Again



Pro-Line's ready to unleash three new tire designs. One is intended for racing circles while the other two are designed for the sport market. First up is the "Crime Fighter" – don't ask about the name. The new tire is designed for 1/8-scale off-road competition on hard-packed to blue-groove track conditions. The Crime Fighter will be available in either XTR or M2 compound with foam inserts. Also in the works from Pro-Line are some new 1/8-scale off-road wheel designs, but no pictures yet.

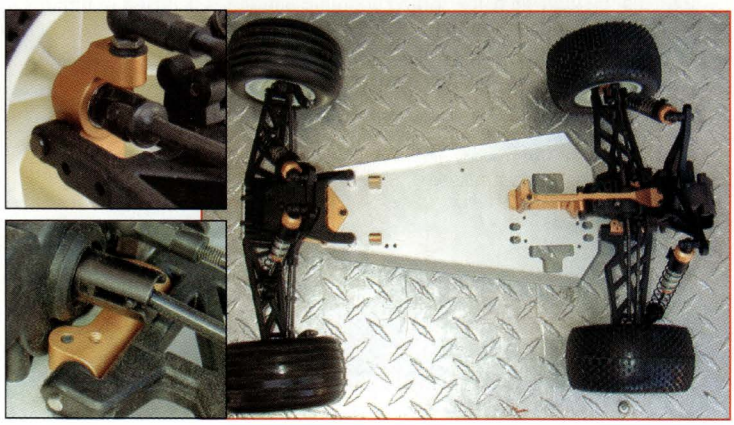
The second new tire design is the "Dirt Works" 2.2". This tire is the perfect replacement for the older Dirt Hawg design. The Dirt Works uses a different tread design and will work on just about every 1/10-scale truck on the market.

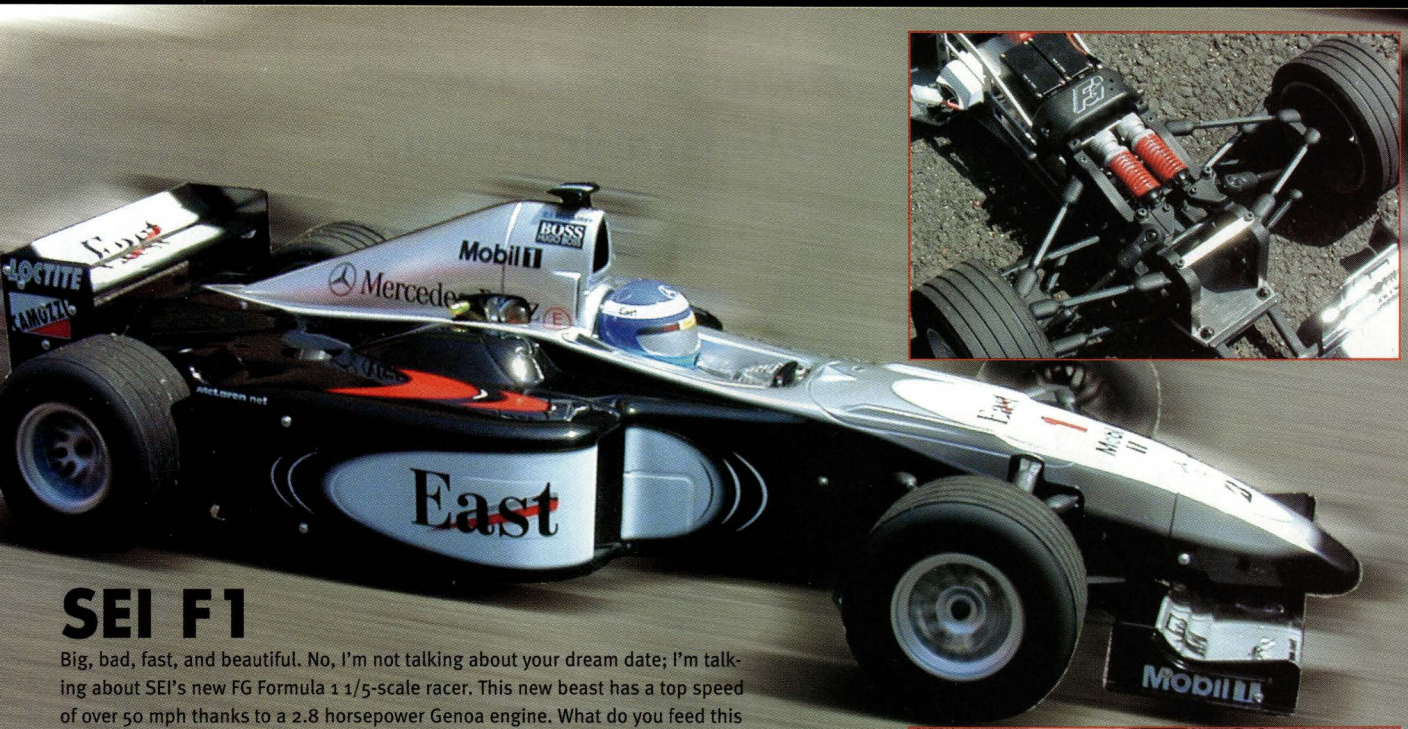


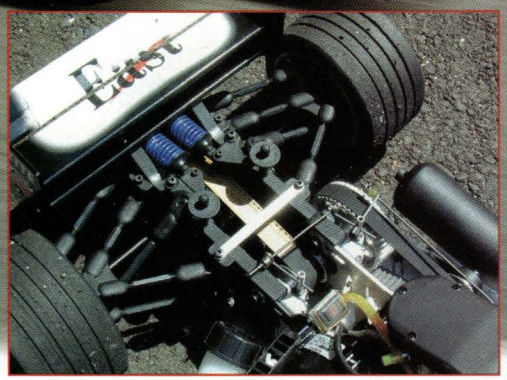
The third new tire is the Masher 2000 2.2". The Masher 2000 turns just about any truck using a 2.2" wheel into a monster truck. Look for all of these new tires on the market very soon.

Trinity Aluminum for Kyosho

When Kyosho's new GP and EP Ultima ST Type-R trucks hit the market, you knew it wouldn't be too long before a number of aftermarket hop-ups hit the market. Trinity is jumping on the Kyosho wagon with an full line of machined aluminum anodized upgrades for the two Kyosho trucks. All of the new Trinity pieces are anodized gold to match the stock shock collars that come with the stock trucks. Some of the upgrades include rear suspension mounts that will be very useful since these are a weak spot on the stock trucks. Look for these aftermarket items to hit the market in the very near future.







SEI F1

Big, bad, fast, and beautiful. No, I'm not talking about your dream date; I'm talking about SEI's new FG Formula 1 1/5-scale racer. This new beast has a top speed of over 50 mph thanks to a 2.8 horsepower Genoa engine. What do you feed this beast? Premium unleaded with a shot of lubricant on the side. The suspension system is modeled after a full-size Formula 1 car. In-board shocks use rocker arms for full-scale appearance. The tires are semi-pneumatic with foam liners. The tire design gives the appearance of a tall sidewall, but, in reality, the sidewall isn't that tall at all. Initially, the 1/5-scale Formula 1 will come with choice of an "M" body (which is a McLaren) or an "F" body (which is a Ferrari). Authentic detail decals are sold separately. There's also an optional detailing kit that includes side mirrors, antennas, etc. So now that we've filled you in on all the good stuff, you're probably wondering how much will this beauty set you back. Beauty and engineering doesn't come cheap. You can have this kit – 95% built – for $1699. All that's left for you to do is install the radio gear, paint the body, and fire it up.



New Losi Nitro Truck?

At the recent Silver State Nitro Challenge in Las Vegas, NV (see full race coverage beginning on page 70), Team Losi had a number of drivers using different "developmental prototypes." That was the buzzword Team Losi representatives used at the race. We can't tell much about the prototypes, but they did host some unique features in the drive train. The front suspension of the truck look as if it used some Triple-XT components including the arms. The tentative name given this basic prototype version was Triple-XNT. We hope to shed some more light on the new trucks next month or very soon on *Xtreme On-Line*. NEWS FLASH! *Triple-XNT just won the NORRCA Gas Nationals.*

Losi Rally Coming

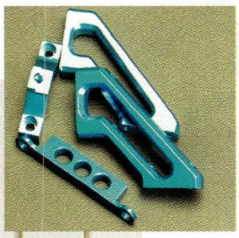
It's official. Team Losi is coming out with a rally car of their own. The Rally Weapon will be based on the Street Weapon chassis, but will feature longer shocks for increased ground clearance along with some other minor suspension tweaks. All of the parts that make the Rally Weapon a rally car will be available separately should you decide to convert your Street Weapon. The kit will come outfitted with a Ford Focus body and should be available in stores for around $170. Look for a review shortly.



Take the SEI F-1 and mix it with the Hitec ad and you're talking some serious prison time.

What's going on in Utah?

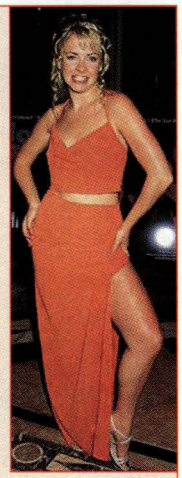
What's there to do in Utah? You've probably asked yourself this question hundreds of times. Well, there's a lot more to do than go to Jazz games and get ready for the Olympics. In fact, the guys at Racers Edge have been hard at work lately. New from Racers Edge is a complete line of CA's designed especially for gluing tires. The new Pro-Stick tire glue will be available in three different compounds. Also new from Racers Edge are new machined, anodized parts for the Losi Triple-X buggy and Associated B2, B3, and T3.





babe of the month

Melissa Joan Hart





Claim To Fame: Melissa's latest claim to fame is playing our favorite little witch in ABC's *Sabrina the Teenage Witch*. But before that Melissa had a number of two-bit parts and even appeared topless in a TV commercial. No, it wasn't for some liquor company in Japan; it was for bathtub toys when she was four. Too bad.

Good Witch, Bad Witch? Until recently Melissa was just like any other teenage witch (actually she's nearly 24). But after the October '99 issue of *Maxim* magazine, we gained a new appreciation for Melissa. Melissa got in some hot water thanks to a provocative, steamy photo shoot that raised more than a few eyebrows. Our personal favorite shot from that photo shoot is the one of Melissa on the staircase.

What she likes: Chocolate ice cream and back rubs.

What she doesn't like: Guys that don't stop bugging her and don't have a career (that leaves us out).

Why she's Babe of the Month: She's hot. What more do you want? She has a belly-button ring and likes lingerie. Call the Justice of the Peace. I think we have a winner.

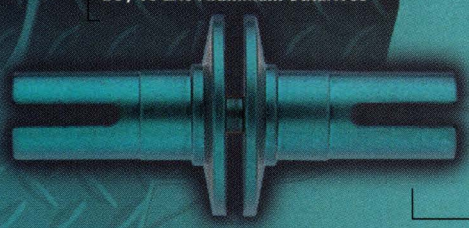
Unequaled Precision

Absolute Series Spurs



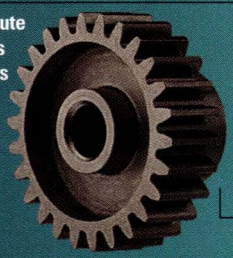
Available in 48P in 80T thru 91T, this is the quietest spur you can buy! RRP 1780 - RRP 1791

B3 / T3 Lite Aluminum Outdrives



Blue anodized and 40% lighter than stock ball diff outdrives. RRP 1502

Absolute Series Pinons

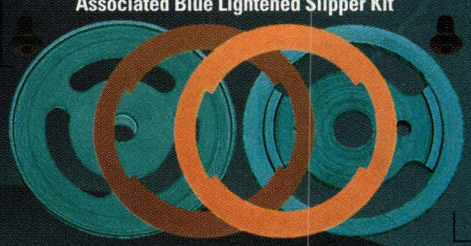


Available In 48P in 16T thru 28T sizes. Super hard, lightened and cut unmatched precision. Great with any spur, but with an Absolute spur, even on-off noise is gone! RRP 1416 - RRP 1428.

Unsurpassed Reliability

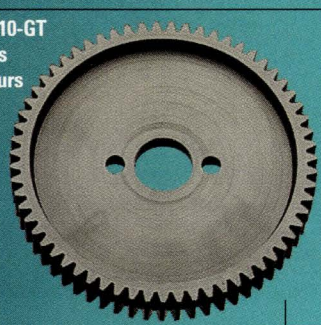
Outstanding Performance

Associated Blue Lightened Slipper Kit



The rear plate is hard anodized to reduce wear and the front plate is color treated. The front plate is designed to hold the slipper pad forcing the pad to slip on the rear plate. When pad shows sign of wear just flip it over for a new surface. Metal parts are CNC machined for a flawless fit. RRP 1515

RC10-GT Gas Spurs



Super tough and precision machined from heat-resistant plastic, these spurs mesh flawlessly with our Clutch Bells. 32P spurs in 54T thru 67T, RRP 2261 - RRP 2267, and 32P bells in 14T (New) thru 24T, RRP 2214 - RRP 2224.

www.robinsonracing.com

HPI Stuff

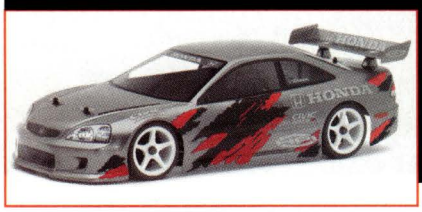






HPI will soon be releasing some new hop-ups for their new Nitro MT. Two of the three hop-ups strengthen the drive line. The new heavy-duty final gears, which replace the metal gears inside the front and rear transmissions, can handle more horsepower than the stock gears. The Universal dog bones for the Nitro MT are stronger, but more smoother running than the original pieces. The third new item on deck for the Nitro MT is this graphite upper deck. The graphite deck is stronger and lighter than the plastic piece it replaces and looks pretty good as well. The new items are due soon along with the two new bodies you see here. The silver, black, and red body is the new Honda Civic Coupe Si body in 190mm. The other body is a Dodge Stratus body in 200mm for nitro touring cars.





Ad(s) of the Month

Last month's issue saw two Epic ads debut. In fact we couldn't decide which one would take Ad of the Month honors, so we called it a tie. First up was Hitec's "Terrorize" ad. This ad had everything; that crazy rave guy that likes to show off his nipples and a cat running for one of his nine lives. Although we love animals, and don't condone chasing any animals with your R/C car, that's a pretty damn funny ad, especially the little cat at the bottom.



Our other winner was Traxxas' killer two-page T-Maxx ad. How would you have liked to have been the guy that had to prep that rig for the photo shoot? You roll into work on Monday, and ask the boss what's up for today. He hands you a brand new T-Maxx and says, "Go find some mud and get this truck covered in it." Sound like a dream job? Hey, it sounds kind of like our jobs.



Superb Quality

RC10-GT Steel Combo



Precision machined one-at-a-time from a single piece of steel and then hardened this 65T spur and 15T bell combo will last and last. The extra-hardened clutch bell fits ALL Associated and MIP shoes. RRP 2365

Associated Titanium Stealth Top Shaft



CNC Machined from a single piece of titanium, this super hard, super light top shaft will fit any Stealth transmission. No serious racer should do without this part. RRP 1512.

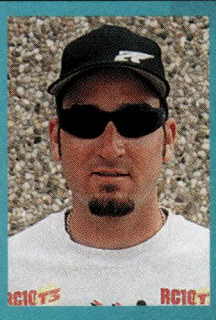
Intelligent Innovation

RC10-GT Hardened Steel Idler Gear



Cut from solid steel stock, this gear is lightened and then hardened for super quiet precision and extra long life. Jamin' tranny grease is included. RRP 2213

Thoughtful Design



1999 World Cup and National Champion

"I only care about performance, and that's why I run Robinson Racing gears and slipper clutches exclusively."

— Richard Saxton

RC10-GT Hardened Diff Gear



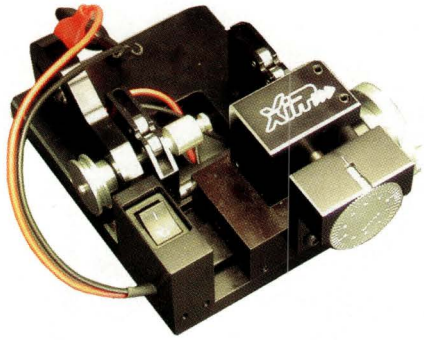
Hard anodized, precision machined aluminum diff gear. RRP 1513

ROBINSON RACING PRODUCTS

4968 Meadow View Drive · Mariposa, CA 95338 · Voice 209.966.2465 · Fax 209.966.5937

Xipp's Coming Down With Something

Xipp is pushing the low price limit on lathes. Their new X-Mod Super Lathe has a street price of $99 and comes with ball bearing guides, a built-in switch, and a small design. The new lathe will cut either modified or rebuildable stock motors. An optional 55-turn motor, carbide V-blocks, and a diamond bit are all optional. Look for an X-rating on the lathe soon.



Orion Gets New Digs

Orion has moved. Please make a note of their new contact info. The new address is: 22601 La Palma Suite 103, Yorba Linda, CA 92887. The new phone and fax are: 714-694-2812, fax 714-694-2815.

RPM, Lunsford, and Robinson Racing Get Ready For T-Maxx

What's exactly in the works is not yet known. But, we have it on good authority that three of the best known and respected aftermarket companies in the biz are getting ready to unleash some products for the Traxxas T-Maxx. Don't hold us to it, but we're guessing RPM will probably address some durability issues such as bumpers, skid plates, or suspension arms. Look for drive-line enhancements from Robinson Racing, and look for plenty of titanium hardware from Lunsford. Again, we don't know exactly which parts each company will offer, so check back soon for more release info when it becomes available.

Sedan Titanium from Lunsford Racing

Bring your sedan up to speed with the awesome PUNISHER line of titanium turnbuckles and precision pin kits.

#4071 STREET WEAPON Turnbuckle & Pin Kit $43.25
#4173 HPI RS4 PRO Turnbuckle & Pin Kit $43.25
#4272 YR4M2 Turnbuckle & Pin Kit $41.50
#4371 SST2000 Turnbuckle & Pin Kit $47.00
(A trick billeted aluminum wrench is included in every combo kit)

HEY! Your brother plays with your car and accidentally gets it demolished by a passing street sweeper truck. Oh, what to do? Locate your injured Punisher turnbuckles, if any, and return them for guaranteed replacement.

Lunsford Racing, 2500 Three Lakes Rd., Suite "A" Albany, OR 97321 541-928-0587
Website address: www.lunsfordracing.com

PiggyBack Reservoir Kits

If you're serious about Off-Road Racing...

1/8 Scale Now Available

Piggyback Reservoirs are machined from 6061-T6 aluminum, polished and anodized in six great colors*. Featuring a unique closed cell foam insert for volume compensation, these reservoirs increase oil capacity and eliminate oil aeration. This results in more consistent performance during long races and fewer rebuilds.

1/10 scale Piggyback Reservoir Kits are available to upgrade Progressive Suspension EDC shocks and stock Associated™ Shocks.

1/10 Scale Piggyback Reservoir Kits
PBR-1001 ..... Set of 2 ..... SRP $32.50
PBR-1002 ..... Set of 4 ..... SRP $62.50

1/8 scale Piggyback Reservoir Kits are available to upgrade stock shocks for the following vehicles:
Thunder Tiger Mirage & EB-4
Kyosho MP-5 & MP-6
Mugen Super Athlete & MBX-4
OFNA Blazer
Ultra & Ultra Worlds GT

1/8 Scale Piggyback Reservoir Kits
PBR-2001 ..... Set of 2 ..... SRP $58.75
PBR-2002 ..... Set of 4 ..... SRP $114.95
(blue and black anodized only)

For use with MIP Hard Body (Shock Bodies)
PBR-2003BK Set of 2 SRP $58.75
PBR-2004BK Set of 4 SRP $114.95
(black anodized only)

*1/8 scale kits are available in Blue or Black. 1/10 scale kits are available in blue, black, gold, purple, silver, and red. Please note color when ordering.

Progressive Suspension USA, Inc.
11129 Ave. G Hesperia, CA 92345
760-948-4012 • Fax 760-948-4307
Web site: progressivesuspension.com
E mail: info@progressivesuspension.com

1/8 SCALE
4WD GAS POWERED
RACING BUGGY

MBX-R

NEW



● Features ●

●3 Differential Shaft Drive 4WD ●4 Bevel Gears ●Steel Conical Gear ●Steel Spur Gear ●Differential Case (Nylon) ●Separate Al.Suspension Mount ●F/R Lower Arm ●Front Universal Joint ●F/R Anti-Roll Bar ●F/R Tension Rod ●Double Disk Brake ●F/R Damper w/Dust Rubber ●F/R Damper Spring ●A70-75(T6) F/R Damper Stay ●Al.Engine Mount ●A70-75(T6) 1/8 Inch Chassis ●3-pcs Clutch & Flywheel ●Fuel Tank w/Filter ●Fuel Tank Guard ●Fuel Filter Holder ●Fuel Pipe Holder ●Air Filter ●Box type Receiver Case ●Stone Guard ●Battery Holder for 6V5N-600mAh Receiver Battery ●Adjustable Wing Stay ●Nylon Wing ●Light-weight Spoke Wheel ●Ball-raced

● Dimension ●

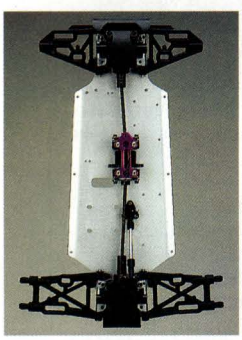
Length	: 480mm	Tread(F/R)	: 266/266mm
Width	: 307mm	Gear Ratio	: 10.95:1
Height	: 182mm	Drive	: Shaft Drive 4WD
Wheel Base	: 326mm	Weight	: 3390g

Other items needed to operate this model:
2 Channel radio with servos, 3.5cc R/Exhaust Engine with muffler, tire & inner foam, starter, and fuel.

● Suspension Mounts

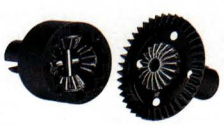
All new front and rear machined Aluminum suspension mount, which are hard-anodized purple. These mounts are stock items in this kit.





● Drive Train

Very efficient 4WD shaft driven system with excellent performance and high reliability. Chassis is made out of A70-75(T6)1/8inch. Aluminum. The front of the chassis has a 10-degree kick up.



● Differential

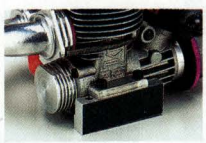
All new differential design. New high quality molded plastic differential housings with high durability and very easy maintenance. Each differential is a 4 bevel gear design with new heavy duty conical and spur gears.

● Suspension Arms

All new design front and rear lower suspension arms. Full Bump Stop adjustability for both upward and downward travel. This is the first time this option is available on a stock off road kit. This feature makes for excellent performance for all track conditions.

● Engine Mount

All new machined Aluminum engine mounts hard-anodized purple. This is a stock feature in this kit.





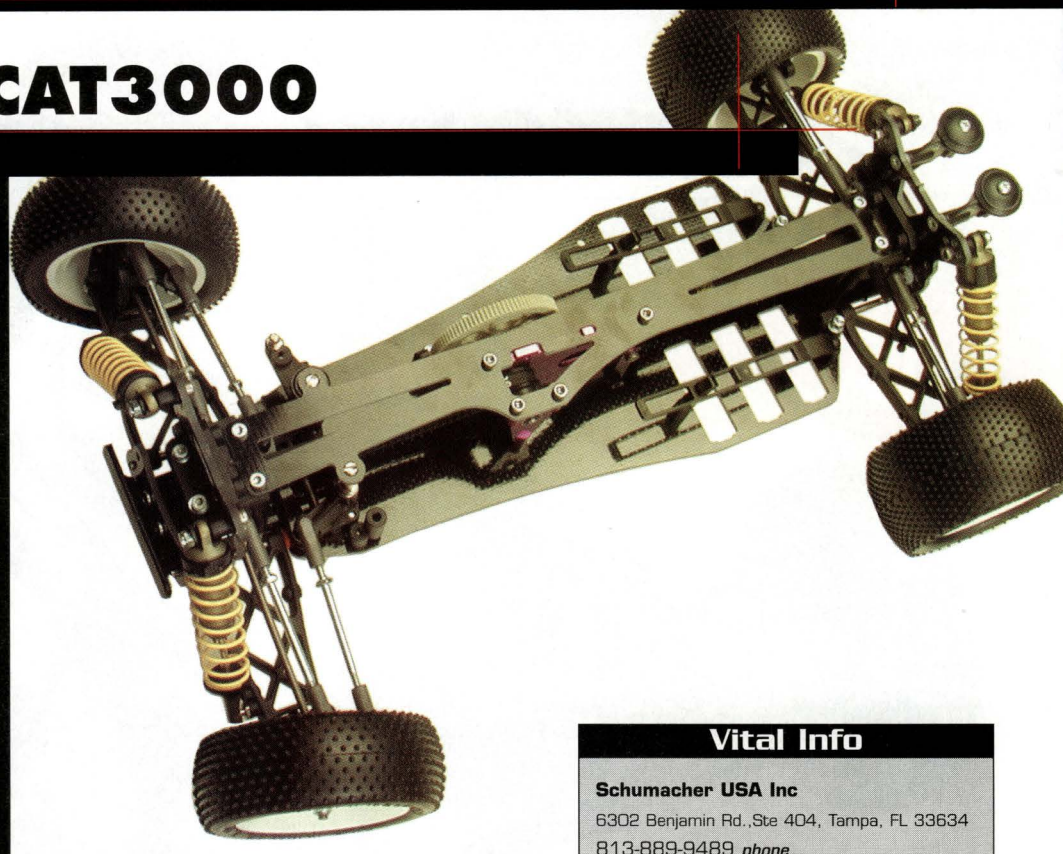
● Fuel Tank

All new fuel tank cap design with an angled pressure fitting for better pressure line arrangement and for better sealing when the tank is closed. The tank also has a built in filter. An all-new molded splash guard and fuel line clips(4 pieces)all included with this kit.

MUGEN SEIKI Racing®

Mugen Seiki Racing Ltd.
17971 Sky Park Circle, Suite G
Irvine, CA 92614
Phone: 949-475-9505 Fax: 949-475-9511
http://www.mugenseiki.com
e-mail:support@mugenracing.com

Schumacher CAT3000



In the world of electric off-road racing, no class is more challenging than 4-wheel modified. Racers can mount tons of horsepower onto these sleds because these cars can handle it. Having that much power at your disposal is addictive. Ask anyone who's raced this class, they know. Unfortunately the 4-wheel class of racing is nearly as popular as it once was. But, with cars like the XX-4, MR-4 BC, and now Schumacher's Cat 3000 the class is getting more attention, at least from manufacturers.

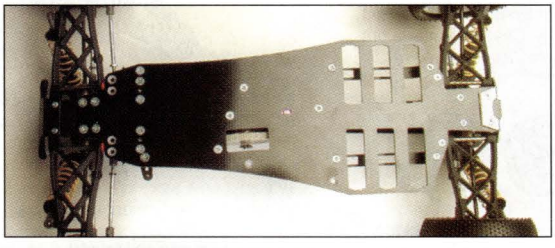
Although, they've yet to win a World Championship, one brand that has always been competitive in the 4-wheel drive class has been Schumacher. Earlier this year we got a glimpse of the CAT 3000 in Florida at the Winter Champs. A few months have past and now we've got a CAT 3000 of our own. Before we give it the full treatment we thought we'd give you our first take on this new racing machine.

New Features

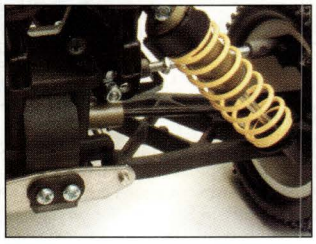
The most notable change on the 3000 versus earlier versions is the chassis layout. Schumacher has taken much of what they've recently learned from the Axis sedan and incorporated that new found knowledge into their off-road flagship. The CAT 3000 places a 6-cell saddle battery pack at the rear of the car, just in front of the rear suspension arms. The motor is placed right at the center of the car. From the motor a large spur gear sits just in front of center. The spur drives two belts, one to the front diff, one to the rear. Both the front and rear diffs are adjustable ball differential with lightened outdrives. The car also features a front on way clicker type device.

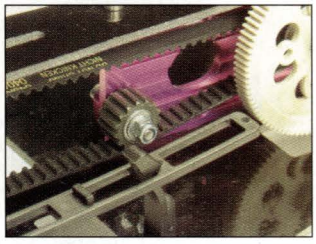
Both the front and rear shock towers, and the lower and upper decks are made of Schumacher's C/F fiberglass. Besides those items, most of the car's suspension components are molded from fiber reinforced plastic.

From the looks of it Schumacher has put together a nice little car. It possesses all the features you'd expect from a racer; Ball bearings, coated shock bodies, plenty of adjustments, universals, etc. It will be nice to see how this new CAT shakes down on the track. The forward placement of the motor should greatly effect how the car handles and jumps. Weight transfer is important on a 4-wheel drive car. Having much of the car's weight near the center of the car is important. The closer to 50/50 weight distribution, the better a car will handle and feel. Stay tuned for a review in an upcoming issue. Until then . . .



Below: The chassis places the battery pack very close to the center -line of the chassis.





Far Left: Fiber reinforced arms and suspension components are standard

Left: A gear pulley keeps tension on the rear belt.

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Elizabeth Hurley
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Although she's not getting any younger, she does have some classic retro lines that make her irresistible.

Who Wants to Be a Millionaire?
When you think TV Hollywood comes to mind. But, when you think TV you should think Britain. Every twenty years or so the geniuses in Hollywood go to Britain, watch a little teley and rip everything off. Classic sitcoms like All in the Family, Sanford and Son, and Three's Company were all rip offs of British sitcoms. The ratings juggernaut that is Who Wants to Be a Millionaire was also originally a British show. Hard to believe, huh?

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#2653C fits Nitro Stampede & Nitro Rustler Front
#2654C fits Nitro Stampede & Nitro Rustler Rear



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#2651W fits Stampede & Rustler Electric Front
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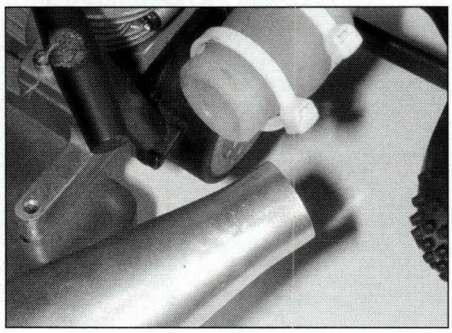
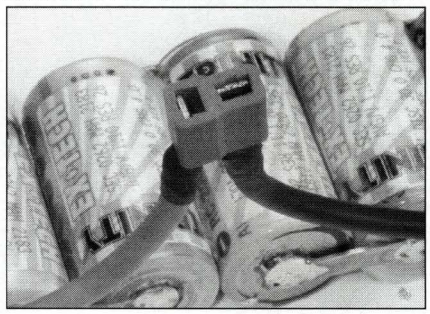


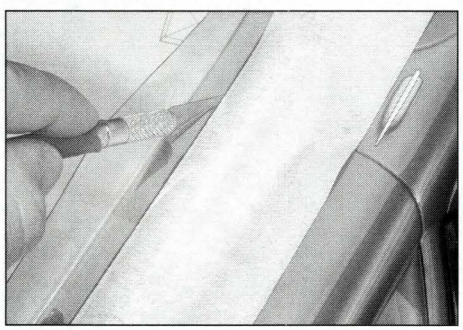
Don't Slip

Has this ever happened to you? You're driving your nitro car around when all of a sudden the high-pitch sound of the engine turns to a low bog. The most likely cause is that the pipe has separated from the exhaust manifold. Typically the pipe will slip out of the rubber coupler holding the pipe to the manifold. To prevent this from happening, take some rough sand paper and rough-up the outside of the pipe and the manifold that will be held onto by the coupler. After you insert the pipe and the manifold into the coupler, tighten a couple of tie-straps over the coupler. The tie-straps and the roughened surface will help keep both the pipe and the manifold in their places.

Know which is which

This might seem like a simple one, but it sometimes goes overlooked. When installing plugs, like Deans Plugs or other types, on your battery pack be sure that the female end is always on the battery pack. If you're not sure which end of a plug is the female end, well you need to have a talk with your father about that. Always place the female end on the battery pack so that if by accident the plug comes in contact with some metal, you won't have a roasted battery pack on your hands. Also, always use shrink-wrap around any exposed wires that might be soldered to either end of a plug connection. Exposed wires could lead to a battery short or damage to an ESC or charger.



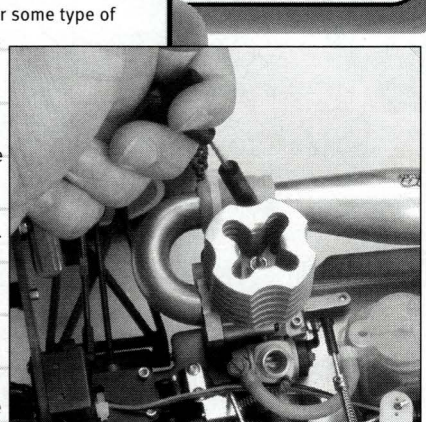


Cut the shaking

Sometimes when it comes to cutting body lines, things can get a little shaky. Instead of worrying about a steady hand you can guide you scissors using some masking tape. Simply run the masking tape on the outside of the body along the line you want to cut. You can apply and reapply the tape until you've got it right. Once the tape is exactly how you want it, cut the body using the edge of the tape as your guide. When you're done, peel the tape off of the body.

Lock your doors, not your engine.

Want to save your pull-start from breaking? Of course you do. If you own a nitro car with a pull-start or some type of electric starter, you need to know when to stop trying to start the engine. If you've primed the engine and can't get the engine to turn over via the pull-start or starter, you've flooded the engine. That means that there's too much fuel in the engine, and that fuel can't be compressed. What you have inside your engine is called Hydrolock. If you continue to pull the pull-start or trigger your starter motor, you'll end up either breaking the pull-start or burning up your starter motor. To prevent engine flooding, pay attention to the change in sound when fuel enters your engine. Before you prime the engine, tug on the pull-start a couple of times. Once fuel reaches the engine you'll notice the pull start cord will pull easier and the engine will sound lubricated. If your vehicle's fuel tank has a primer button, prime the engine just until you see fuel enter the carb through the fuel tubing. If you're car doesn't have a primer bottom, pull the pull-start a couple of times while placing your finger over the exhaust stinger. You'll see fuel enter the carb through the fuel tubing. Once you see and hear fuel enter the carb, remove your finger from the pipe and start the engine just as you normally would. If you've already locked or flooded the engine, stop pulling the pull-start. Loosen the glow plug a little and pull on the pull-start a couple of times. This will expel the excess fuel out of the engine. Once the engine cranks over easily, tighten the glow plug and try starting again.



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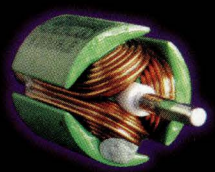

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When Your RTR Needs the ER

Repairing your RTR is easier than you think.

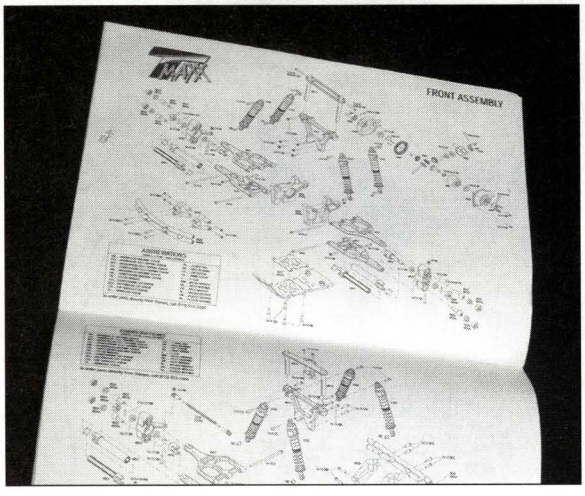
by Allen Dean



The popularity of ready-to-run (RTR) cars to new hobbyists in the R/C world is overwhelming. But, so many of you might not have a clue as to where to begin if should you run into problems with your RTR. Should your fun be put on hold thanks to a broken part, don't just lug everything down to the hobby shop. Stop and repair your car yourself; it's easier than you think. Unfortunately, most RTRs don't come with a detailed instruction manual, but they do come with enough documentation to get you through a simple rebuild. In this month's Starting Box, we'll show you how to reverse-repair your RTR and get your vehicle out of the hospital and back on the road in no time.

Diagnosis

If your breakage or problem is pretty straightforward and you can see what needs to be replaced, consult the schematic that came with the kit. This schematic is the large blow-up illustration that typically shows each individual piece of your car. From there, match up your broken part to its counterpart on the illustration, then call the local hobby shop and see if they have that piece in stock. If the piece is not in stock, it can usually be ordered for you. If your local hobby shop can't seem to get the part for you, call the manufacturer directly. At this point you would put things on hold until you get your replacement in hand.



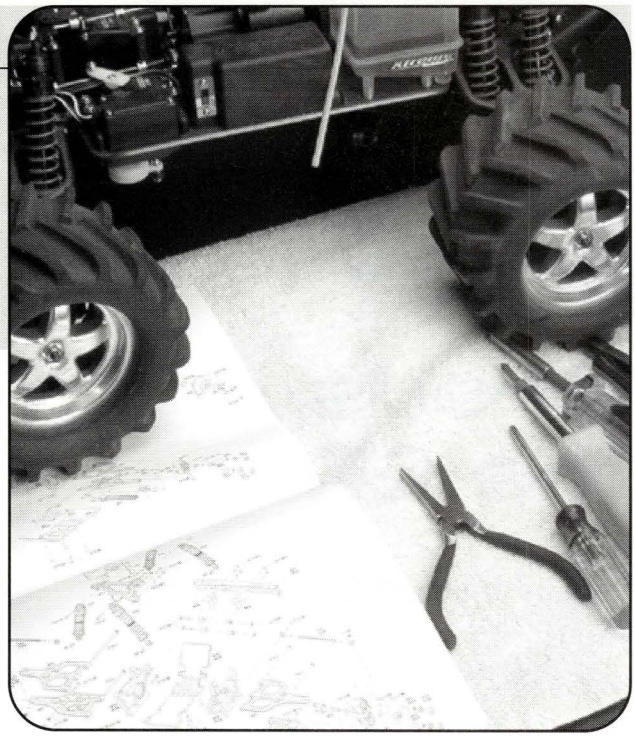
If something internal turns as bad as Dennis Rodman's Jacuzzi water, you'll have a bigger problem diagnosing what's actually broken or wrong. Go straight to "Pre-Op" and then "Surgery" to find the problem.

If you don't find a schematic along with your car's instruction manual consult any illustrations or photos you can find in the manual.

Check your car's manufacturers' web site for PDF files of schematic print outs.

Pre-Op

If you've got your replacement piece(s) in hand and are ready to replace or if you need to do some disassembly in order to diagnose the problem, you're ready for Pre-Op. Photocopy and take a good look at your RTR's schematic, and have it and a pen or pencil handy. See what type of hardware is used and what types of tools you'll need to disassemble the car. Identify what type of screws and nuts is used and have your Phillips, Allen, and straight-edge drivers ready. Before you dig into things, spread out a large towel on your work bench on which to place parts after you remove them.

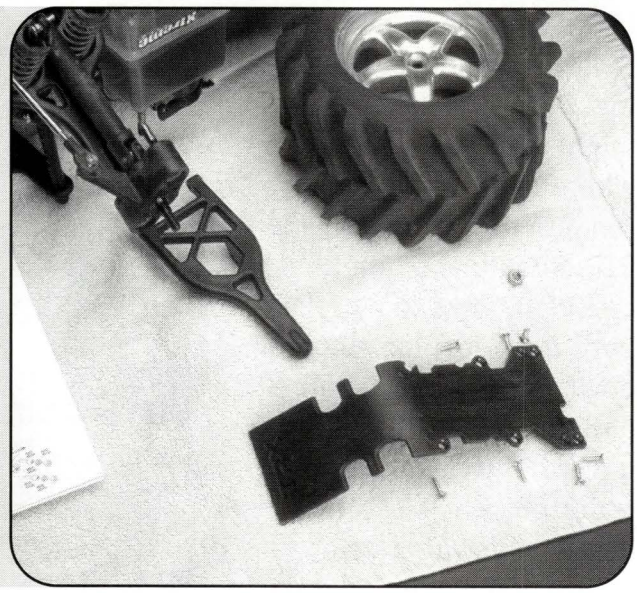


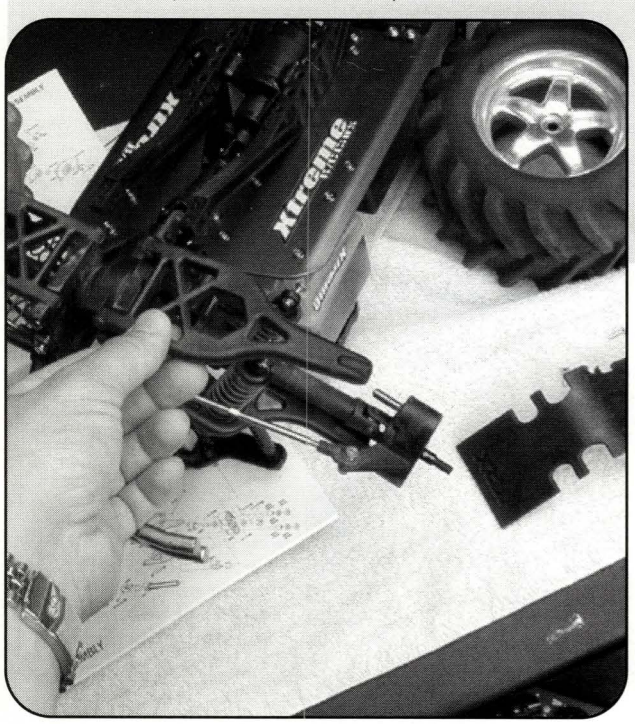
Surgery

When it comes time to take things apart realize that you need to keep perfect track of what you're removing and where it needs to go when it comes time to rebuild. Every time you remove a piece or assembly, set that piece or assembly aside on one spot on your towel. On the copy of the schematic, indicate that part or assembly as item number one. Then, remove the next piece or assembly. Again, set that aside on a different spot on the towel and mark that on the schematic as item number two. Repeat this process until you get down to the piece being replaced or to the area of the car that needs further diagnosis. It's important that you keep each piece, nuts and screws included, separated. When it comes time to rebuild you must make sure that you're replacing the correct screw in the right slot.

When you get down to the piece that's broken, pay attention to how it was held in place and its original direction. If it's a suspension component, it might be something that's sold in pairs. In that case make sure that you're replacing the correct piece with respect to which side of the car the piece is supposed to be on.

If you had to get to this point in disassembly just to diagnose which piece(s) need to be replaced you should leave things just as they are until you have the new replacement part. If you need the space and must move things until you're ready to rebuild then use envelopes or Tupperware containers to keep all of the assemblies separated.







Dennis Rodman's Jacuzzi water was quarantined by the Newport Police.

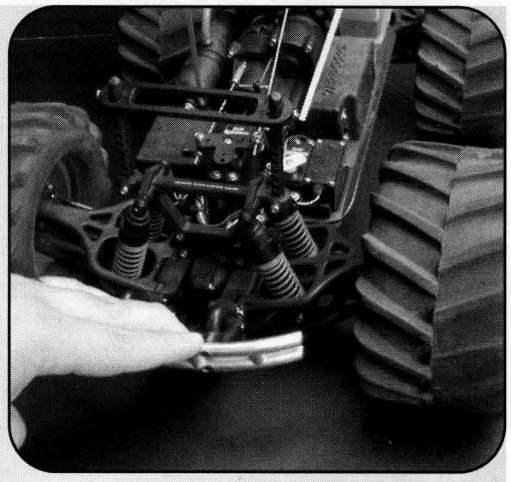
Post-Op



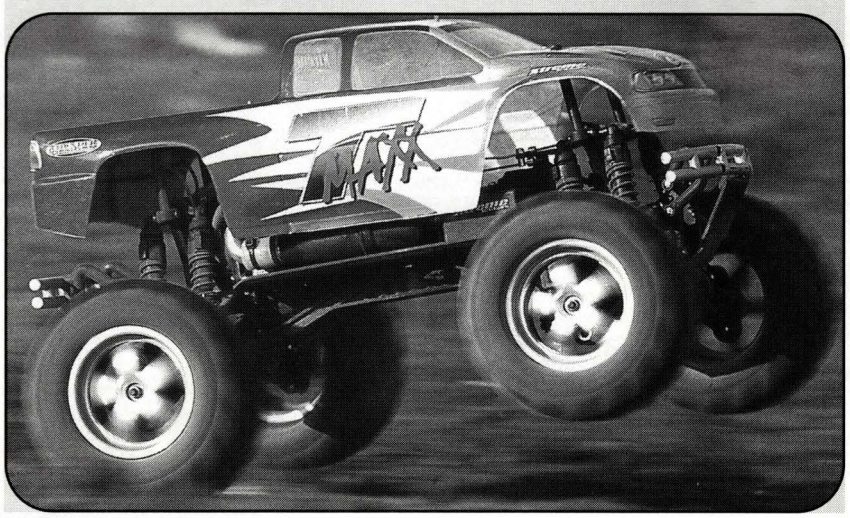
Once you've replaced the injured part begin reassembling the car. Using your schematic, put things back together in reverse order of how you removed them. Work with one section at a time. Since you kept everything separated, you should have no problem identifying the proper screws and hardware when rebuilding. Replace only one section at a time. After replacing a part, stop and compare the part of the car you're working on to the photos on the car's box or against the illustration on the schematic. If you get too far ahead of yourself, you won't know when you've made a mistake or how to correct it.

You should never have any extra screws or pieces when you finish putting the car back together. If after rebuilding you do find yourself with some extra pieces remove things again, look at the schematic and figure out where the extra parts go.

Recovery



Just because you've put everything back together and don't have any extra screws doesn't mean it's time to hit the road again. Before you fire that engine up, give the car a thorough once over. If it was a suspension piece you repaired, move the suspension up and down through its full range of motion. Make sure there isn't any binding. If you repaired a piece in the drive train, set the vehicle down on the ground and roll it back and forth a few times. Things should freely spin and you shouldn't hear any unusual noises. If something seems amiss, stop and take the time to open things up again to take another look. Failure to properly reassemble the drive train can cause some heavy-duty damage. Once your car passes both of these tests, you're ready to get back to having fun.



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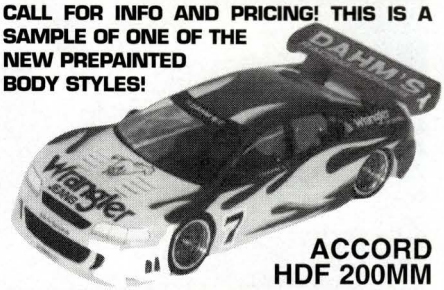

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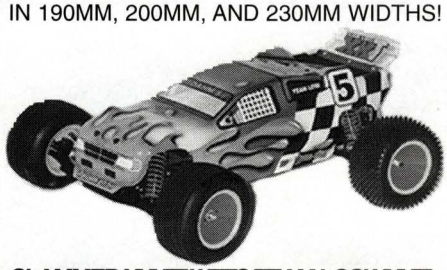

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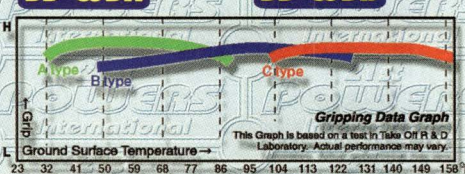

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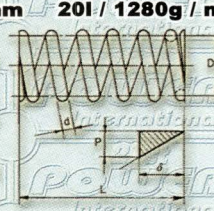

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HPI RS4 Sport 2

by Terrence Raymundo



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THE HITS

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THE MISSES

- Metal gear diffs are heavy.
- Doesn't include a motor.

THE LAST WORD

The Sport 2 is well capable of performing just as good as its Pro 2 brother. Other than a few minor details, it has the same features as the Pro 2 and is a perfect machine to start your racing career!

With the introduction of HPI's Sport 3 years ago, HPI opened up the world of high performance racing to those in the entry-level scene. With the exception of a fiberglass chassis and a few other minor differences, the Sport had the same basic features of their full-race spec RS4 Pro. The suspension designs and basic chassis layout were the same, so those with a Sport had the beginnings of a full race machine. Well, here we are in the year 2000, and HPI's new top dog is the RS4 Pro 2 (reviewed in Issue 4.8). Being true to the entry-level and budget-conscious racers, HPI followed up their Pro 2 with an all-new HPI RS4 Sport 2.

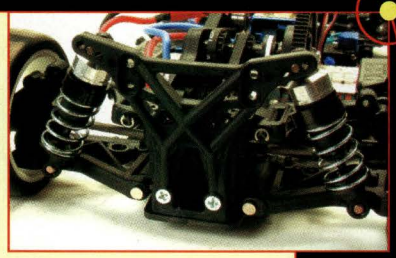
This month's color scheme is our Purple Rain/LA Lakers special.

Features

Chassis

The HPI Sport 2 uses upper and lower decks with the same dimensions as the Pro 2, but in fiberglass instead of graphite. Like the Pro 2, the upper deck is really thin – not in material specs, but in actual surface area. Both pieces feature cutouts for weight savings, and the lower deck is countersunk for a smooth and hang-up free underside. Molded battery holders flank the lower deck, with a simple but effective latching system that keeps your batteries in place. The lower deck also gives the option of using saddle pack batteries by way of cell cutouts. Items A-372 and 6152 are necessary to use sadle packs. In fact, the lower deck is visibly a copy of the Pro 2 graphite piece, only in fiberglass as mentioned earlier.

Suspension



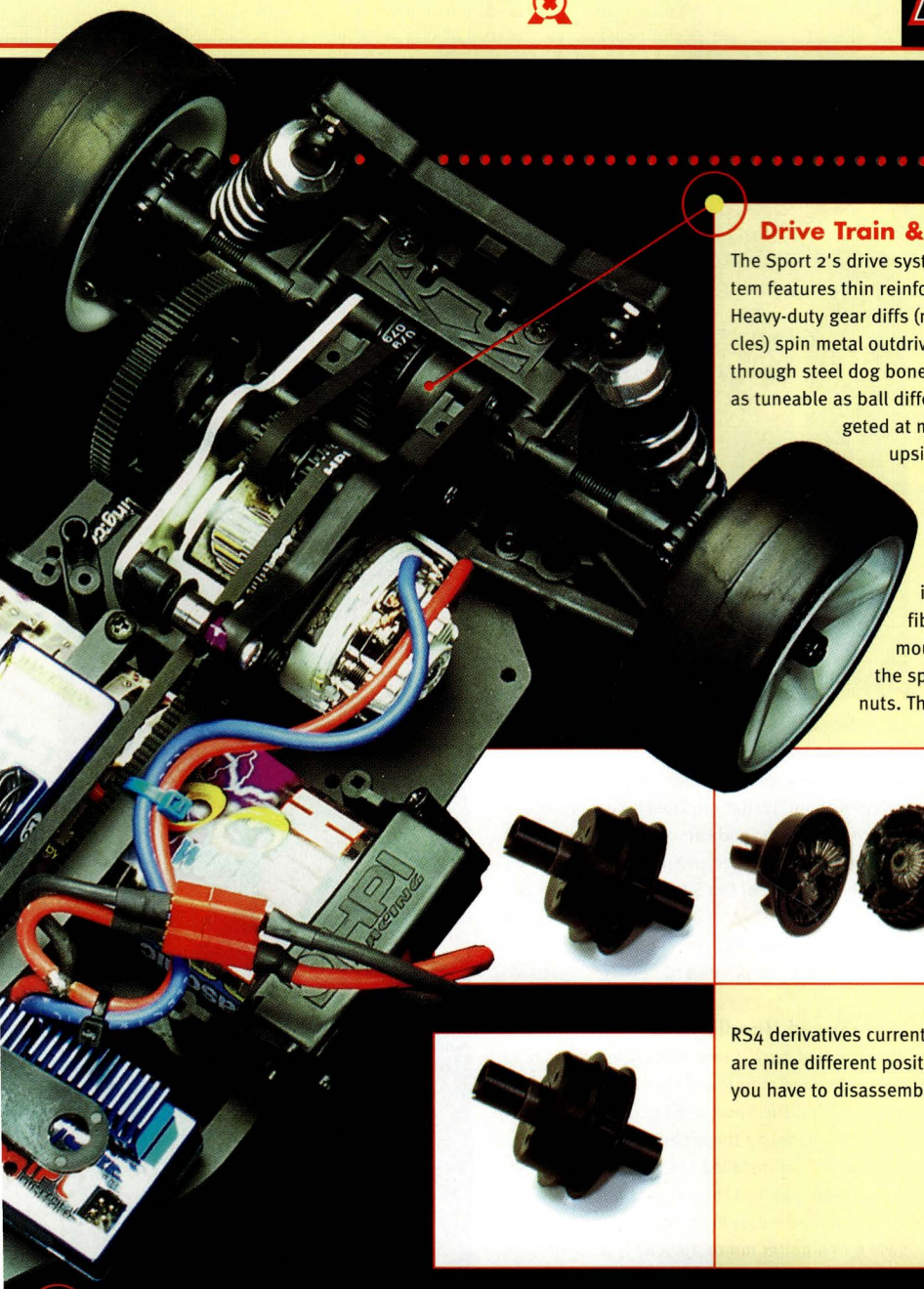
The Sport 2's suspension is all-new compared with the original Sport. Thick front and rear shock towers are molded out of strong, fiber-reinforced plastic. The upper arms are identical front and rear. They use an adjustable ball-end and A-arm design with threaded rods for camber adjustability. The lower arms are longer than before, and like the Pro 2 they move the front and rear track outward to the current 190mm legal width limit for touring cars. Steel hinge pins and e-clips hold the entire suspension system all together. There are two metal braces that reinforce both the front and rear lower suspension arms. Another feature inherited from the Pro 2 are built in "tweak" screws. These screws run through the inner ends of the lower suspension arms and reach down to built-in tabs on the lower chassis.

The upper arm design has four different positions up front and four different positions in the back. These different positions let the Sport 2 owner fine-tune their suspension setup. The Sport 2's front caster can be altered from eight, ten, or twelve degrees by changing the lower arm mount, upper arm mount, and front hub carriers. (Extra suspension pieces are included in the box.) Rear toe-in can be set at either one or two degrees depending on which rear hub you use (two sets are included, too).

Coil-over, oil-filled, bladder and silicone O-ring sealed shocks are found on all four corners of the Sport 2. These shocks are similar to the Pro 2's but use molded shock bodies. On both ends of the Sport 2, the shocks can be attached to the shock towers and lower suspension arms in six different positions. HPI silver springs are standard equipment, and unfortunately so is the standard shock oil which is more like gear oil than dampening fluid. Toss this stuff and pick up some silicone oil before you start building.



The Sport 2 uses plastic body shocks. Here's a list of some of our favorite plastic bodies...

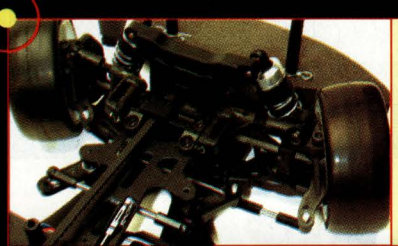


Drive Train & Transmission

The Sport 2's drive system is straight off of the Pro 2. The two-belt system features thin reinforced belts running to each end of the chassis. Heavy-duty gear diffs (not unlike those found on the other sport vehicles) spin metal outdrives, which in turn transfer the motor power through steel dog bones and axles. As for the geared diffs, they're not as tuneable as ball differentials. But, given the fact that this kit is targeted at novice consumers, the gear diffs do have the upside of being basically maintenance free.

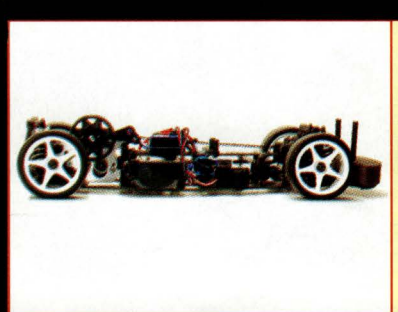
An aluminum motor plate serves as a mounting point for the motor of your choice. Unlike some other sport chassis I've tested, a motor is not included with the Sport 2. However, HPI includes a pinion gear to match the included fiber-reinforced 48-pitch spur gear. The spur gear mount is a molded one-piece affair, which holds the spur gear securely with a pair of screws and hex nuts. The Sport 2 features a complete set of ball bearings. With this addition alone, the Sport 2 has all the basics it needs to take on other racer kits head-to-head.

Two separate belt tension adjusters are built into the Sport 2 chassis. The main, front belt tensioner is mounted on an aluminum post, attached to the molded left-side motor plate. The rear belt tension is adjusted through two offset rings located in the rear bulkhead, just like most of the current RS4 derivatives currently on the market. Also like the other RS4s, there are nine different positions with which to adjust rear belt tension, but you have to disassemble the rear bulkhead to get to them.



Steering

The Sport 2's steering system has two chassis-mounted bell cranks that feature an adjustable servo saver built-in to the right-side steering crank. A thumb dial is used for easy tension adjustment. The left side bell crank is mounted on a post that connects both upper and lower chassis plates for more stability. A Z-bend steel rod connects the two bell cranks, and an adjustable turnbuckle joins the bell cranks to the steering servo of choice.



Wheels, Tires, and Body

HPI tosses in their new Toyota Altezza sedan body (the upcoming U.S. version of the actual car is the Lexus IS200/IS300) complete with a full sheet of Castrol Racing decals, window masks, and painting instructions. A Dodge Stratus body is also available. HPI's 0 offset, 5-spoke, 26mm wheels and belted slick tires with one-piece foam inserts are also included. Using the kit-included 0-offset wheels brings the total width of the Sport 2 to 190mm - exactly the limit under current touring car regulations. Even 1mm offset wheels might merit a DQ if your local track is that picky.

Pamela Anderson-Lee, Britney Spears, Demi Moore, Chesty Feilds, Cher...

TESTING

Sporty Driving

I took the Sport 2 through the paces at a smooth parking structure in Los Angeles, CA. It was a nice, smooth concrete surface with little dust. Temperatures were mild, but it was very breezy - so much that the track surface was colder than it looked! I usually take my standard five practice laps, but since I own a Pro 2 I checked the steering trim then went straight to the drive test.

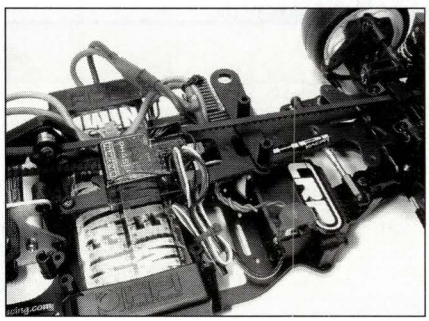
Acceleration

When building the Sport 2, I initially thought that the heavy gear differentials would affect the Sport 2's acceleration, but thankfully the Sport 2 still took off from a standing start like a roadrunner. The kit included gearing was slightly on the conservative side, so after one pack of driving the Sport 2, I swapped my stock P2K motor to a hotter 12 turn Speed Gems modified motor. Since I was sticking with the kit setup, I left the chassis as is. With just a hotter motor, the Sport 2 would launch forward, never swerving or showing any type of torque steer. Acceleration was very stable, all four wheels sending the Sport 2 forward in a straight line. Coming out of the turns, I noticed a slight squat when pulling the trigger. However, if I didn't look at the Sport 2 I almost would have missed it, because right from the start the Pro 2 is very quiet! When accelerating, all you might hear is the tires fighting for grip on dusty surfaces.

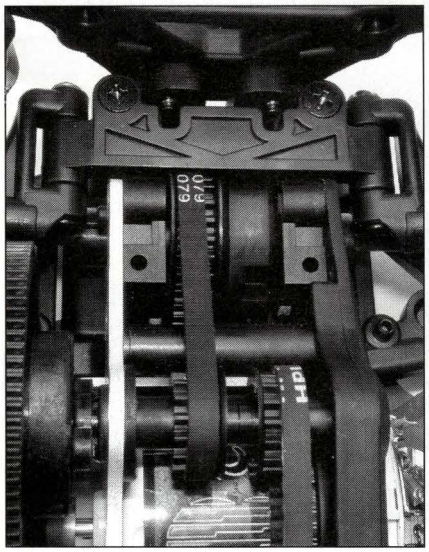
Top Speed

Top speeds were limited by the kit gear ratio, but after throwing in a modified can, the Sport 2 was like a bullet. It seemed comfortable with a lower gear ratio than usual for a modified motor, and yet with a higher terminal speed the Pro 2 would still seem like it could handle more. Remember how I mentioned that the Sport 2 was rather quiet? The entire drive system design doesn't cause much noise even at higher speeds, you can only hear the motor and a faint hum.

Below: You can start off using stick packs in the Sport 2 and move to saddle packs later.
Right: The rear shock tower uses a webbed design for added strength.



The Sport 2 uses a simple, conventional drive system.



Low-Speed Handling

Low-speed handling was good. The Sport 2 would follow every movement of the steering wheel without hesitation. The kit suspension settings for caster and camber worked well. If you blasted the trigger mid-turn on a low-speed line, the rear end of the Sport 2 wouldn't let go of the pavement. Let off and the front end would lead the way, bringing the rest of the chassis exactly where you pointed it.

High-Speed Handling

After the first pack, I swapped pinion gears to match the mod motor, and then went out again. Sure enough, the Sport 2 mimicked its Pro 2 brother in handling the high-speed stuff. With the Speed Gem installed I realized how soft the suspension was. But then again I did have a 12-wind modified motor in there. Whenever you switch to a hotter motor, usually it calls for some suspension adjustments. However, even with more sway, the Sport 2 kept its line unless you tapped the brake. Braking while turning caused the car to spin on the unprepared surface.

THE SPECIFICS

Item Info
Part# 264 (RS4 Sport 2 with Toyota Altezza body), MSRP $259.
Estimated street price: $140 - $150
Manufactured in Japan.

Chassis Type
Fiberglass double deck design with saddle-pack cutouts, molded battery holders, and countersunk lower deck.

Wheels and Tires
HPI Racing 5 spoke 26mm wide 0-offset wheels, one-piece white. HPI Racing B15 40 belted slick racing tires. One-piece foam inserts.

Transmission Type
Twin belt four-wheel drive, with metal-gear differentials, steel outdrives, axles, and dogbones, and full ball bearings.

Suspension Design
Independent, with molded upper and lower arms. Threaded upper rods for camber adjustment, extra front suspension mounts and rear hubs for different settings.

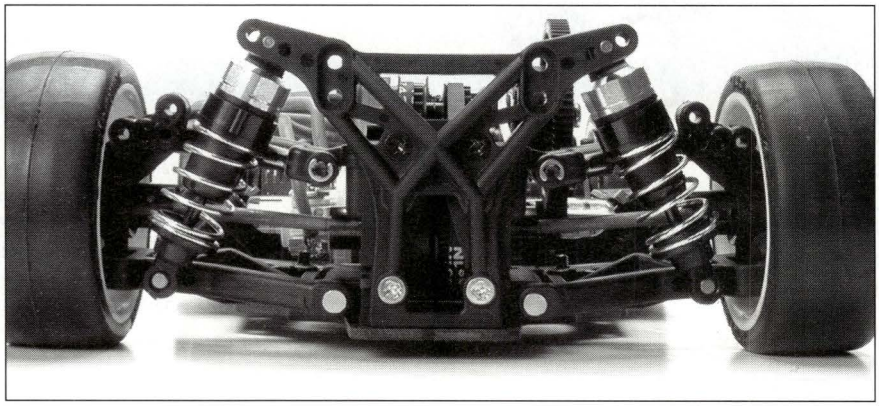
Suspension Dampening
Coil-over, oil -filled shocks with molded shock bodies, aluminum caps, o-ring and bladder seals, and silver springs.

Vehicle Type
Electric-motor powered, four wheel drive touring sedan.

Other Items Needed
Electric motor, Electric Speed Controller (ESC), 6-cell stick or saddle pack battery, 2 channel radio with one servo, paint for the body and CA glue for the tires.

Test Gear
Futaba Magnum Sport, Trinity Speed Gems 12-Turn motor, Trinity 3000 mAH stick packs, LRP V7.1 ESC, All settings are factory spec as stated in the instruction manual.

Main Competitoon
Yokomo MR-4 TC, Tamiya TA-03 series, Kyosho EP-10 series, Associated TC3 Racer, Kawada SV-10 Sport, Traxxas 4-Tec.



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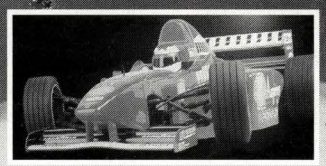

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Tight Turns

If I slapped on the race body off of my other sedan, I could have sworn I was driving my Pro 2. Other than a slightly soft suspension setup (thanks to the kit silver springs and stock oil weight), the Sport 2 was taking the curves and the tight turns quite well. The B15-40 tires worked very well for kit tires. These are also the same tires HPI includes in their Pro version.

Braking

Much like acceleration, the Sport 2's braking was straight and true. I noticed that if I were to jam the brakes at high speeds while turning, the rear end would ease its way around in to an oversteer situation. Again, this is with a kit suspension setup. Under regular driving conditions, you might see this trait as more steering. However, under heavy braking the overall weight of the chassis moves forward onto the two front wheels enough that you might have the inside rear wheel spinning in the air. Some stiffer front oil might take care of this, but if your driving style suits the Sport 2's braking response, why change anything?

Maintenance

There shouldn't be anything unusual to be done when taking care of your Sport 2. The shocks and wheel carriers are easy to get to, and the upper deck is narrow enough not to get in the way of any chassis-mounted electronics. Due to the open, double-deck design of the Sport 2, you might want to dust off the chassis with a soft brush (or compressed air) after running a battery pack, especially if you run parking lot where there's a lot of dust waiting to cling to everything. The gear diffs aren't fully enclosed from the elements, but they shouldn't have to be accessed due to their non-adjustability, but if down the road you have to adjust belt tension, be prepared if it is the rear belt. To adjust rear belt tension, you're going to have to disassemble a healthy portion of the rear bulkhead.

Damage Report

The Sport 2's chassis setup handled most bumps with ease. The front end design looks a lot stronger than the previous version, especially in the upper arm area. Throughout my testing I was lucky enough to drive with all four wheels on the ground most of the time, but there was one incident where I got too happy with the trigger during and plowed the Sport 2 into a grass and gravel island in the middle of a parking lot. Other than some scratches on the lower deck, the Sport 2 was okay, and I continued my test drive until I ran out of battery power. After about 15 battery packs over three test sessions, I didn't notice any unusually worn or broken parts on the chassis. Everything still felt nice and tight, but not so tight that things were binding, and if the Sport 2 shares the same reliability as previous RS4's, than the Sport 2 should be on the bright side of things for a long time.



The sterring links on the Sport 2 use threaded rods to adjust length.

Value

All of the performance advantages and trick designs incorporated into the Pro 2 found their way into the Sport 2, and that made the Sport 2 perform almost identical to the Pro 2. In fact, a majority of the parts found inside the Sport 2 boxes are shared with the Pro 2! This brings the Sport 2 as close to race-ready-out-of-the-box as possible. The extra suspension pieces included with the Pro 2 are also included with the Sport, as well as HPI's excellent B15-40 belted slick tires. All of this for a street price of $140 - $150 makes the Sport 2 a very good deal.

Conclusion

All in all the Sport 2 didn't feel so sporty; it felt more like a full-on racing machine! If you put the Sport 2 into the hands of your average sportsman driver, I'd bet that they couldn't tell the difference between a Sport 2 and a Pro! Granted, you don't get aluminum shocks or graphite parts, but ball bearings, oil-filled shocks, and those sweet B15-40 tires are standard fare. Then take into consideration that the Sport 2 includes a body for a very low total price, and now you're talking! Whatever other sport chassis are lacking, the Sport 2 has as standard issue. Its heritage and overall design comes from a winner (the Pro 2) and my experience behind the wheel with the Sport 2 was very satisfying. I'm sure this chassis is destined to be in the winner's circle. It's got all of the basics needed to take that checkered flag or keep you happy in fast even if you never see a race track.

If you are looking into getting down with the touring car racing scene and you're looking for your first ride, the Sport 2 from HPI has got to be a great choice!

BUILDING TIPS

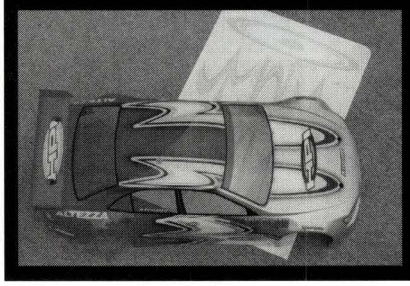
The RS4 Sport 2's instruction manual is nearly perfect. The illustrations are clear and there is text where it is needed. Pay attention to all of the exclamation points "!"; these will keep you on your toes on important sections of the build.

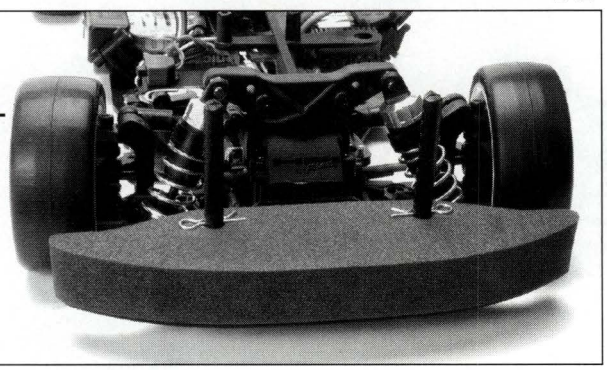
- On step 8, don't forget to insert the tiny O-rings into the axles before putting the dog bones in place.

- On step 15, don't forget to insert the tiny O-rings into the diff outdrives before putting the dog bones in place.

- On step 22, it is ***EXTREMELY*** important that you do not scratch the shock shafts.

Like our custom painted Altezza body? The paint job is actually half decals. The custom paint job uses Team Orion's new Thunder Designs Body Decal kit. The kit sells for $10 and can turn just about any body into a work of art.





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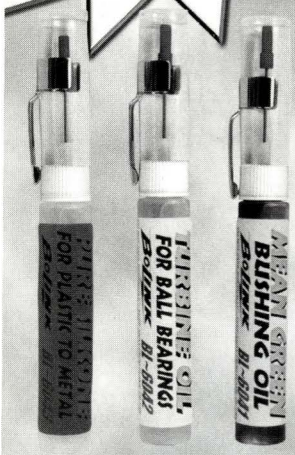

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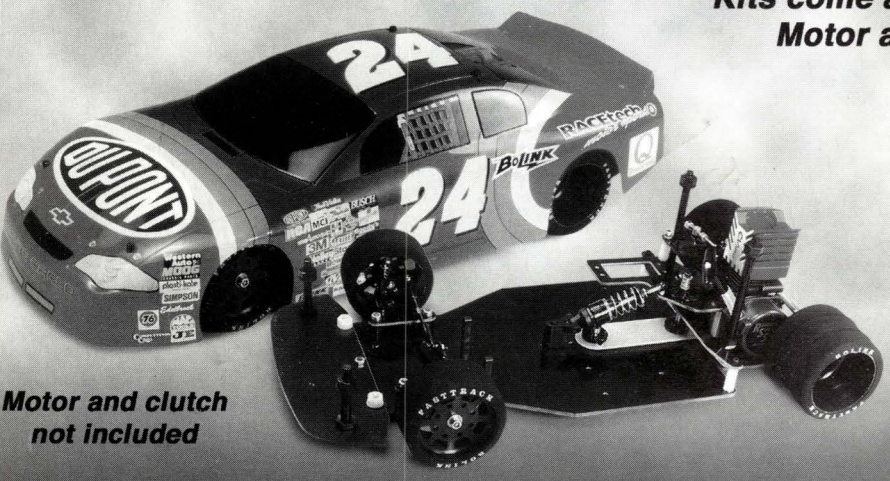

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- Building the test kit gave me some minor problems.

THE LAST WORD

If you're looking for a 2WD buggy, and you're going to race it, you'd be a fool not to give the Factory Team B3 serious consideration. The car is as fast and is lighter than anything currently on the market. It's good enough for Masami and Pavidis; it's good enough for you.

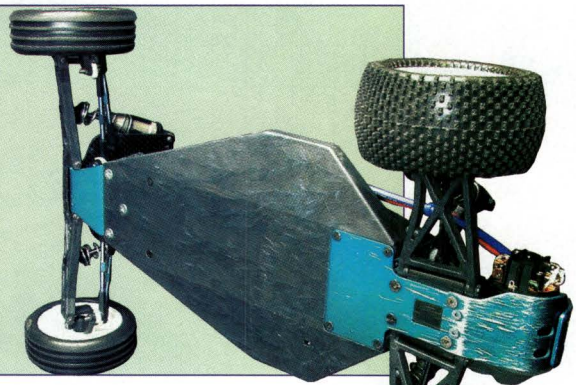
In the world of off-road R/C racing, 2WD buggies are the premier class. In recent years, the 4WD buggies and stadium trucks have gained in popularity, but for some reason it's the rear-wheel-drive machines that garner the headlines. Maybe it's the respect factor; the 2WD machines are by far the most difficult to master. Throw insanely fast 9- and 10-turn modified motors into the mix and things can get downright hairy. Perhaps it's nostalgia; the 'OG' RC10 was the first mass-produced buggy made exclusively for R/C racing. When Team Associated introduced the RC10B3 a few years back, it raised the bar for other manufactures with its great balance of drivability and turn-on-a-dime steering response. A lot has happened since the B3 debuted, but fear not racing fans! The A-Team has pulled out all of the stops with the Factory Team B3. While not a brand new design, it's a lot more than some graphite parts and a new picture on the box. The B3 is starting to show its age, but it's still good enough to put names like Masami Hirosaka and Mark Pavidis at the top of every race they enter. Let's see how the "FTB3" shakes down in a real-world *Xtreme* track test.

Team Associated had six B3's in the A-main at last year's Worlds.

Features

Chassis

Graphite everywhere! The tub, suspension arms, shock towers, and every other integral piece are molded from AE's trick graphite composite. This makes the chassis lighter and stiffer than the standard composite assembly. How much lighter? A bunch. On *Xtreme's* scale, the FTB3 weighed in at 3 pounds and 2 ounces. The car feels light, and the scale does not lie.



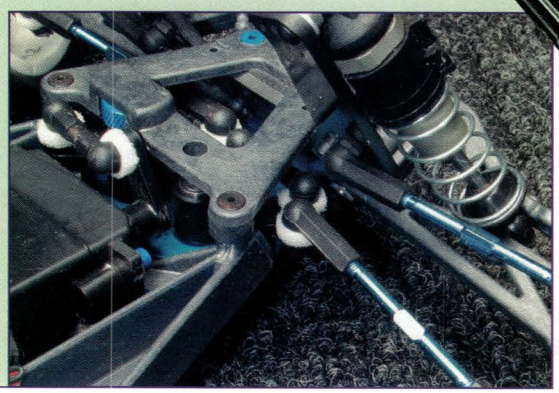
Wheels, Tires, and Body

Pro-Line wide-body wheels provide the Factory Team B3 with a larger footprint and more stability than the standard wheels. They are noticeably wider, and really seem to make a difference on the front of the buggy. The kit tires are, well, kit tires; Pro Line 4-Ribs up front and Bowties in the rear, both in M2 compound. Although the M2 compound isn't the highest traction offering from Pro-Line, it should suffice. The new, lower-profile Deja-Vu body gives the FTB3 an aggressive look on the track. A body clip pulls double-duty on the rear shock tower, fastening the body and the wing. No more walking the track after a race looking for your wing.

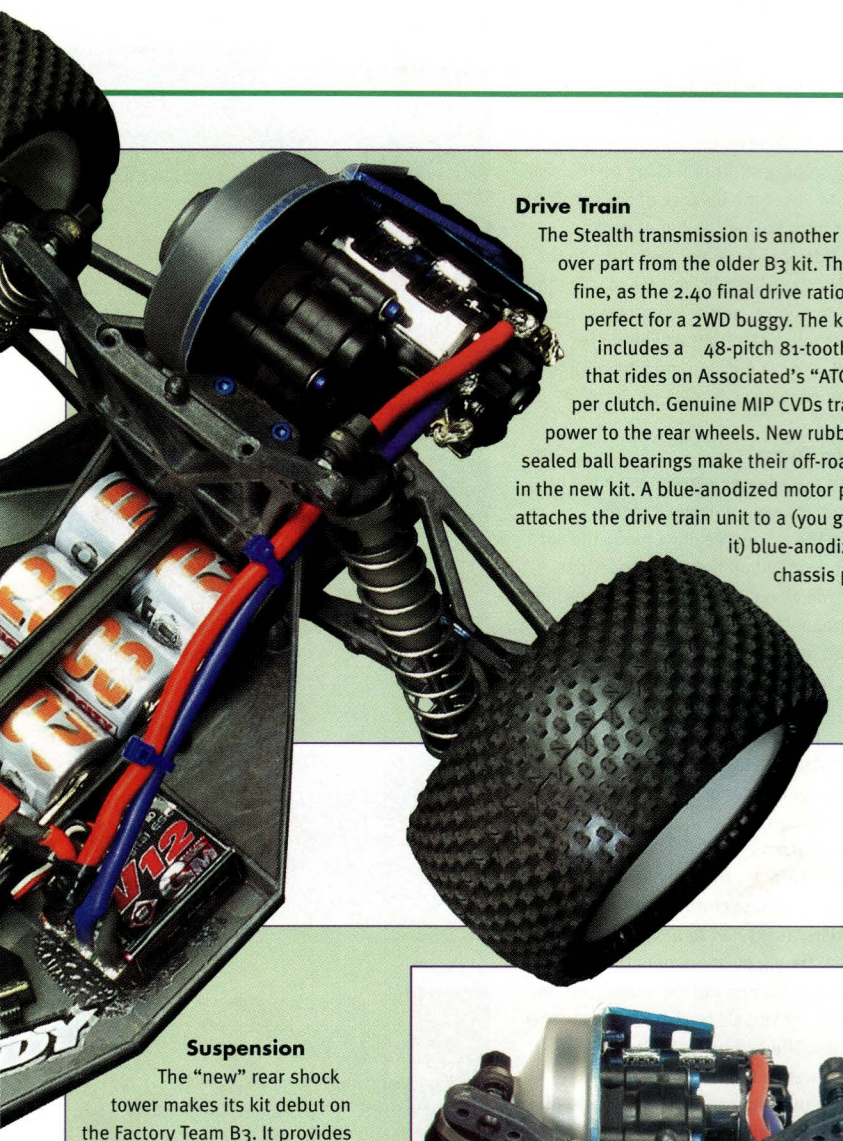


Steering

Although the steering geometry is unchanged, there are some trick parts included in the kit. The blue-anodized front kick-up houses the bell crank and servo saver. The servo saver post and adjustment knob are also blue-anodized aluminum. The right side bell crank rotates on two flanged ball bearings, and the result is precision, slop-free steering. A graphite top plate ties things together and helps stiffen the front end. Standard 30-degree carriers are included in the kit. Factory blue inline front axles are spec'd at each front corner, and a pair of blue nuts (?!) hold the rear wheels in place.



Check out Issue 4.9 for a how-to on anodizing your titanium blue.

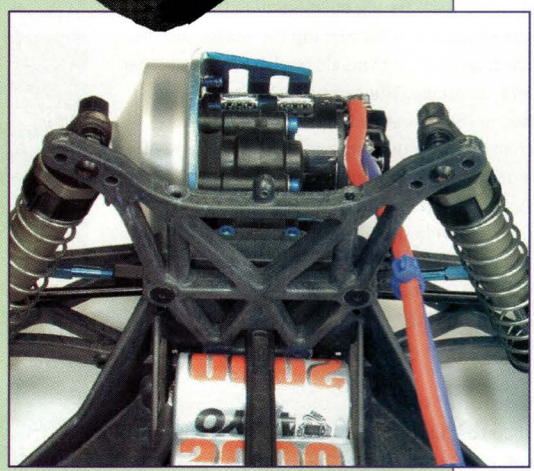


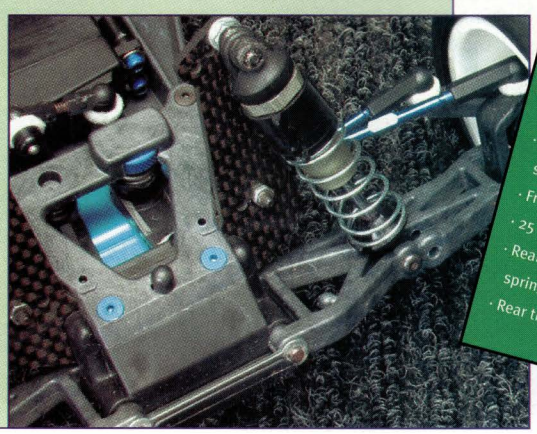
Drive Train

The Stealth transmission is another carry-over part from the older B3 kit. That's just fine, as the 2.40 final drive ratio seems perfect for a 2WD buggy. The kit includes a 48-pitch 81-tooth spur that rides on Associated's "ATC" slipper clutch. Genuine MIP CVDs transfer power to the rear wheels. New rubber-sealed ball bearings make their off-road debut in the new kit. A blue-anodized motor plate attaches the drive train unit to a (you guessed it) blue-anodized rear chassis plate.

Suspension

The "new" rear shock tower makes its kit debut on the Factory Team B3. It provides the rear shocks with more "sag" and a lower profile. AE's smooth, hard-anodized shocks return unchanged from the previous Team kit. However, the kit does include the Unobtanium shock shafts. They are smoother and will last longer than the standard shafts. The graphite suspension arms pivot on titanium hinge pins at all four corners. A complete set of blue-anodized Factory Team titanium turnbuckles round out the suspension. They look cool, and are lighter and stronger than the pedestrian steel units.





BUILDING TIPS

Team Associated vehicles come with some of the best instructions in the business. Each step includes an exploded view of the assembly, and the text is well-written. On the first 500 instruction manuals the word "Demo" is printed across the first couple of pages. Disregard the word; it has nothing to do with the kit. It's a result of the output software the printer used. Who knows. Maybe these manual's will become a collector's item. Here are some pointers to follow when building the FTB3.

• Make sure you use a 4-40 tap to thread any holes in the graphite parts. There's a whole lot of graphite in this kit, so take your time and do it right.

• Attach the rear arms to the suspension mounts before you connect the rear plate assembly to the chassis. It's almost impossible to slide the hinge pin through the mount once the mount on the tub.

• One of the rear turnbuckles in my kit was not threaded. It was machined, just not threaded. I tried several times (unsuccessfully) to get the plastic ball cup started, and started questioning my sanity. Note: I called AE to inquire about the un-machined part. They were very helpful and even thanked me for giving them the "heads up." The defective part was replaced at their cost, and arrived only two days later. Nice going, AE!

Set Up Tips

The kit was assembled using "Mark's Standard B3 Setup." This is a good, all-around setup that should work well at most tracks. I ran my car with these settings and the kit tires, knowing I would probably make some changes as I became comfortable with the car. I consulted local fast guy and painting guru Billy Barr for some tips. We came up with the following setup for our conditions;

- Front shocks: 35 weight oil, #1 pistons and silver springs
- Front tires: Pro-Line Radius Rib M3
- 25 degree front carriers
- Rear shocks: 30 weight oil, #1 pistons and silver springs
- Rear tires: Pro-Line Holeshot M3

Some Team drivers put a 1 oz. weight inside the front bulkhead of their FTB3s.

TESTING

The Factory Team B3 is essentially a standard B3 that's been strengthened and lightened a whole bunch. Having raced a few B3s in the past, I felt I knew what to expect with the new car on the track. I put the car down, set the trim, and went to work. A few things became very clear after two grueling nights of wheel-to-wheel racing.

Acceleration

One of the benefits of low-mass is quicker acceleration. When the tone sounded, the FTB3 was gone. Using a stock motor, I was able to grab full-throttle at will, without losing traction. The car's acceleration was on par with any other, and noticeably better than most. The results were the same when exiting turns, as the B3 squirted from corner to corner. Because of the reduced weight, I was actually able to gear up one tooth on the pinion.

Top-End Speed

"Is that a legal stock motor?" seemed to be the question of the night. On the fast sections of the track, the B3 ran like a junkie full of bathtub crystal meth. Being able to gear up really paid off, and I lost next to nothing on the low end of power. Anything my driving skill lacked, the B3 more than made up for in speed. The track features a stout triple jump, and clearing it can be the difference between winning and placing. The FTB3 cleared it with about three feet to spare, when others chose to tackle the jump with a "double/single" approach.

Jumping

American-style tracks usually feature a little bit of everything, but big air rules supreme. The B3 inspired confidence over everything from rollers to epic table-tops. The car simply did whatever I asked of it, and continued on its way. If the car was a little (or a lot!) off-line, I was able to wait for it to land, and make a quick correction. The front end of the car seemed a little light, but a quick tap on the brake helped bring the car back down to terra firma predictably.

Braking

There was only one section on the track that required heavy-braking, but it became a key passing zone. As long as the wheels were pointed straight, nothing short of locking up the rear wheels would upset the balance of the car. The stiffer silver front springs all but erased any nose-dive under deceleration. Switching to the 25-degree front carriers allowed me to drive the car harder into a turn, and scrub off less speed using the brakes. If the front wheels were turned at all, the car did become a handful to drive if the brakes were applied too hard.

Low-Speed Turns

Using the kit's 30-degree carriers gave the car too much turn-in, even at lower speeds. Switching to the 25-degree units made the car feel absolutely railed on the slower sections. Less caster will also give the car more steering exiting a turn, and this seems to happen quickly. More than once, I nailed the apex of a low-speed turn, and grabbed some throttle, only to watch the back end come around. There's no doubt that the wider wheels and tires give the car a more "planted" feel. This was more apparent in the slower turns than anywhere else.

High-Speed Turns

The car was truly faster than any stock motor powered buggy I had ever driven, and setting up for the faster turns had to be done quickly. Once I got my timing down, nailing the high-speed turns was simple; tap the brake, turn-in hard, let the front wheels track out of the corner and continue. The car did lack the solid feel it had in the slower sections. I made a few changes, with the same results every time. After much scrutiny, I came up with a theory: The Factory Team B3 might need a lighter set up than a standard B3. For future outings, the car will be set up with lighter oil and lighter springs, to more evenly distribute the weight. My advice is to try the kit setup with your choice of tires and make adjustments from there.

Damage, Inc.

The FTB3, like any AE machine, is one tough R/C car. Its use of graphite and titanium make it virtually hack-proof. The only hint of trouble I had with the car was when I hit a half-exposed rock at top speed. The suspension was fully com-

THE SPECIFICS

ITEM INFO
Part # 9043, MSRP $369.95.
Street Estimate $245-255.
Manufactured in USA.

CHASSIS TYPE
Molded composite tub with center running battery tray, separate front and rear mounting plates and bulkheads.

WHEELS AND TIRES
Associated one-piece dish wheels with Pro-Line M2 Bow Ties in the Rear and Pro-Line M2 Radius Rib Fronts

TRANSMISSION TYPE
3-gear rear mounted transmission with adjustable ball differential. Adjustable slipper clutch

SUSPENSION DESIGN
Independent, molded lower arms, adjustable upper control links with titanium turnbuckles, molded rear shock tower, woven graphite front tower.

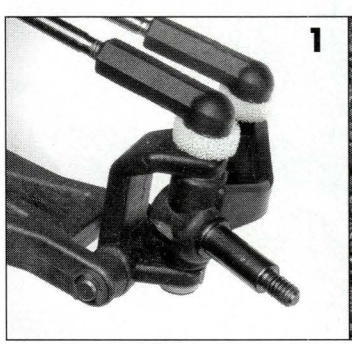
SUSPENSION DAMPENING
Coil-over, oil-filled shocks, molded pistons, aluminum shock bodies, molded shock caps, Unobtanium shafts, and O-ring seals.

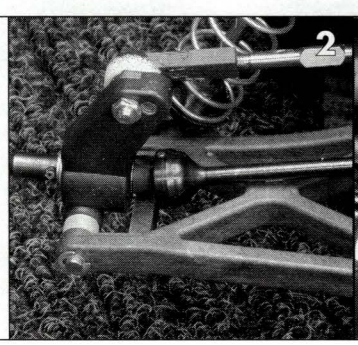
VEHICLE TYPE
Electric motor-powered, rear-engine 2WD 1/10-scale racing buggy.

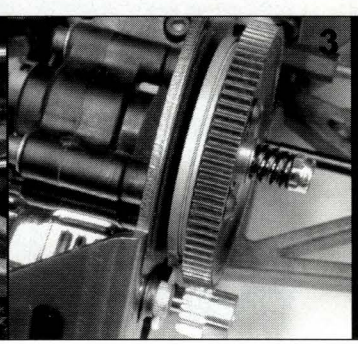
OTHER ITEMS YOU NEED
2-Channel radio system with 1 servo, electronic speed controller, motor, battery, charger, Lexan paint and CA glue.

OUR TEST GEAR
Futaba 3PJS radio system with receiver, Futaba S9405 Servo, GM V12 ESC, Reedy Rage Type-R Stock Motor, Reedy Zapper 2000 batteries, and a sweet Masami paint job by Billy Barr (cr133r@hotmail.com)

MAIN COMPETITION
Team Losi Triple-X, Schumacher Fireblade EVO







1. The front suspension uses a kingpin/ball stud. The front aluminum axles are anodized blue to match the rest of the buggy.
2. MIP CVDs come standard as the rear universals.
3. The ATC slipper clutch keeps the traction on the ground.

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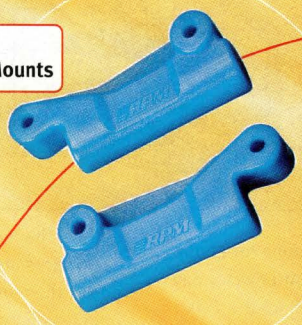
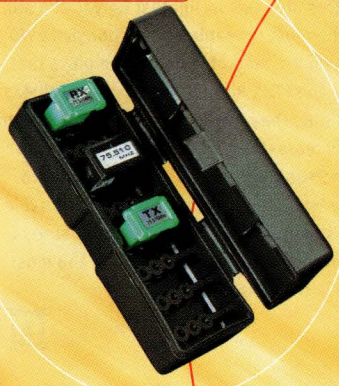
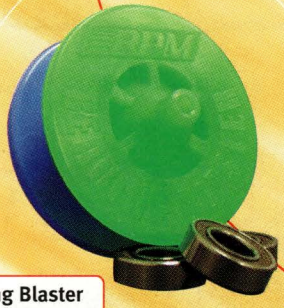


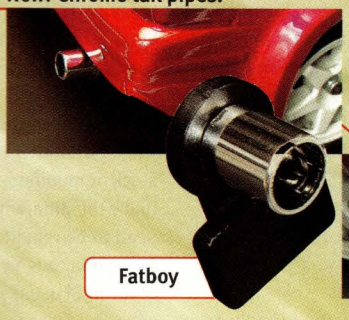
Crystal Case
Holds 4 Pairs (Crystals Not Included)





Bearing Blaster
(Bearings Not Included)

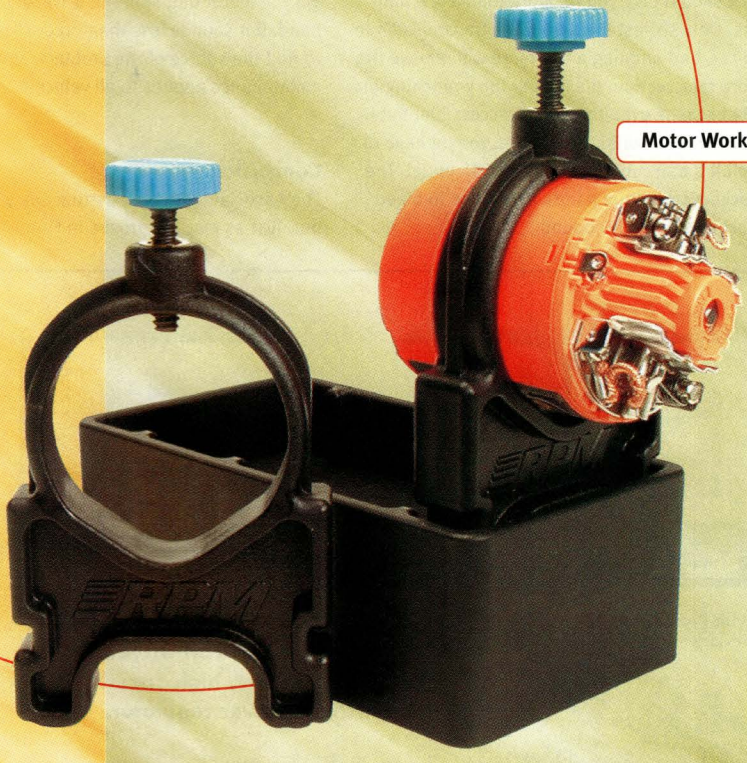
New! Chrome tail pipes.



Fatboy



Slim Twinz



Motor Work Station

RPM CUSTOM TRAXXAS PARTS

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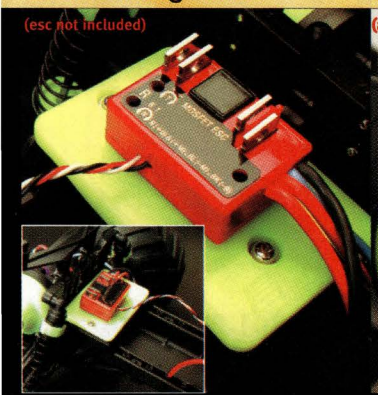

Gear Covers
(also available in blue)



Front & Rear Bearing Carriers
(bearings not included, for electric vehicles only)



Spring Retainers & Clips



pressed, and the rock sent the B3 into a violent end-over-end roll, which ejected one of the dog bones from the outdrive. One edge of the outdrive sustained a dinged corner, but once the drive shaft was popped back in, the car soldiered on. While the anodized blue stuff sure looks nice, anything on the underside of the chassis will quickly become scuffed. If you plan on entering any Concours events, do it before you set the car down. You do not have to purchase the whole "B3 Update Kit" if you only need the shock tower. The part numbers are 9279 for composite and 9280 for graphite. If you do happen to break something on this car, you were probably A) going really fast, or B) doing something stupid. End of story.

Trackside Tuning

2WD buggies are wonderful by their simplicity. Any adjustments you might need to make at the track should take you no more than a few minutes. Only six fasteners hold the transmission in the car, and undoing a few more will remove the entire rear section. It's almost fun wrenching on a B3 because everything is so accessible, but in the interest of editorial balance, you do have to pop off a ball cup to adjust the differential. The shocks also require a little extra time to bleed to achieve perfect rebound.

Maintenance

Common sense goes a long way, and so does a clean car. Racers have plenty of time between rounds to inspect their cars for unusual wear or loose parts. Just about anything that might wear over time can be isolated to the drive train. Depending on your driving style, and if you race stock or modified, eventually the differential will need to be rebuilt. This can be done for about $5, and in roughly 30 minutes. After every day of racing, I usually change my shock oil. This will not only keep it handling smoothly, but help the shafts and seals last longer. While you've got the motor out, spin the drive shafts by hand. If it sounds less than precision, you need to find the source of the problem. This type of maintenance applies to all vehicles.



Conclusion

The Associated B3 isn't getting any younger, but, just as Masami proved in Finland, it can still get the job done. The ultra-trick Factory Team car is the fastest, lightest B3 yet. It's still one of the most tuneable and responsive 2WD buggies on the market. None of the parts that make up the FTB3 kit are really new, but this is the first time they have been offered in kit form. For a few more dollars than the Team Kit, you get over $200 in upgrades. B3's are going to continue winning on both local and national levels. It's still up to you to drive it, but it sure is nice knowing your machine is one of the most capable in the world.

COBRA
TEAM

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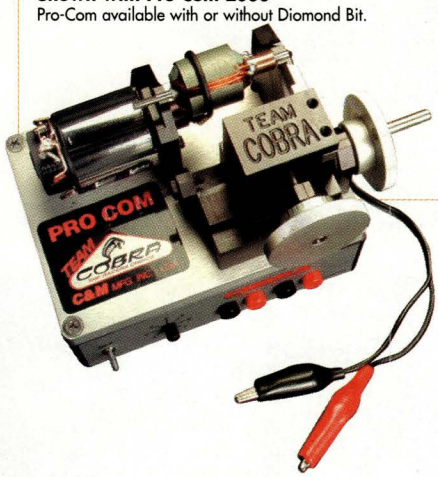

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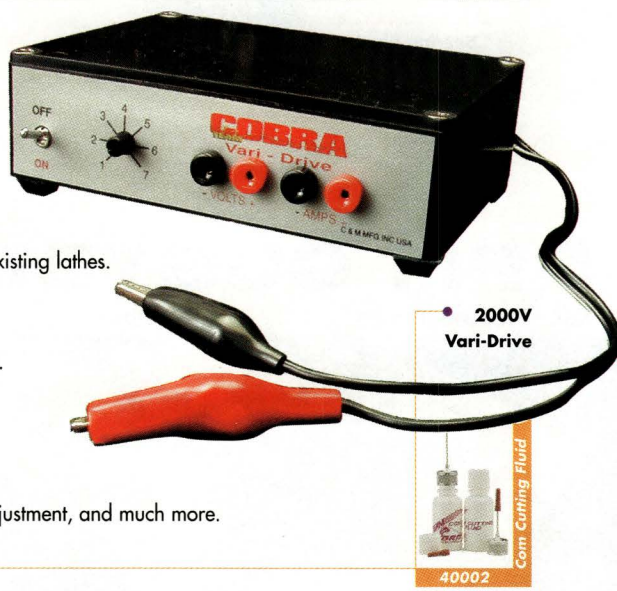

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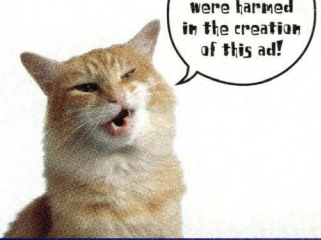

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TAKE 2: Associated GT RTR

by Mike Velez

It's been a couple of months since I first fired up Associated's first venture into the world of RTR. Since then I've had pretty much a positive experience. There have been some annoying problems but nothing major.

One of first things I planned on doing to my GT RTR after my review was to dump the stock bushings in favor of ball bearings. Team Associated's ball bearing kit (#7702) includes two additional bearings for the clutch bell where most other kits don't. While installing the bearings I noticed a number of screws around the truck that had worked their way loose. On all of the metal to metal connections, especially the upper shock mounting screws, I strategically applied some liquid thread-lock to avert problems down the road.

I haven't raced the truck yet, but have just been playing around in front of my house and at a nearby park. With that in mind the up-grades I've made so far have been to basically make the truck run better and more reliable. I haven't gone out and picked up a bunch of titanium, but instead items that will help keep my GT RTR more maintenance free. Here's a list of the additional upgrades I've made so far:

MIP 4-in-1 Clutch:
The stock clutch uses two shoes and no springs. Sometimes the stock clutch never seems to completely disengage. This can cause stalling and make the truck feel like it's always on power. The 4-in-1 clutch uses a spring to keep the clutch action brisk and trouble free. I set the clutch in the trailing position for smooth acceleration.

Bearings are a must for any car or truck, the GT RTR is no different.

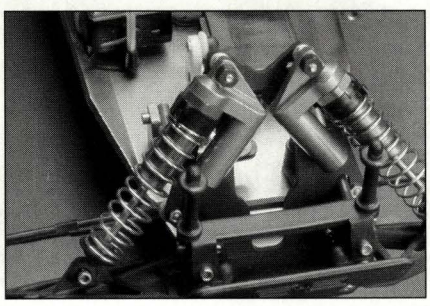




Associated Metal Gear Hub:
Although I haven't had any problems yet, I knew I would. I replaced the plastic brake hub with an aluminum one from Associated. After a while the plastic hub round down giving the truck absolutely no braking.

Progressive Suspension Piggy Back Reservoirs:
Okay, this one's a pricey upgrade, but long term it pays off. The Piggy Back reservoirs are very, very easy to bleed and compensate for oil that might leak over time. This means I can basically build the shock right once and not worry about them for a long, long time. For a vehicle that might not see a track for some time, not having to worry about shocks that might have leaked is a good thing.

The Piggy Back Reservoirs from Progressive aren't cheap, but they sure are nice.

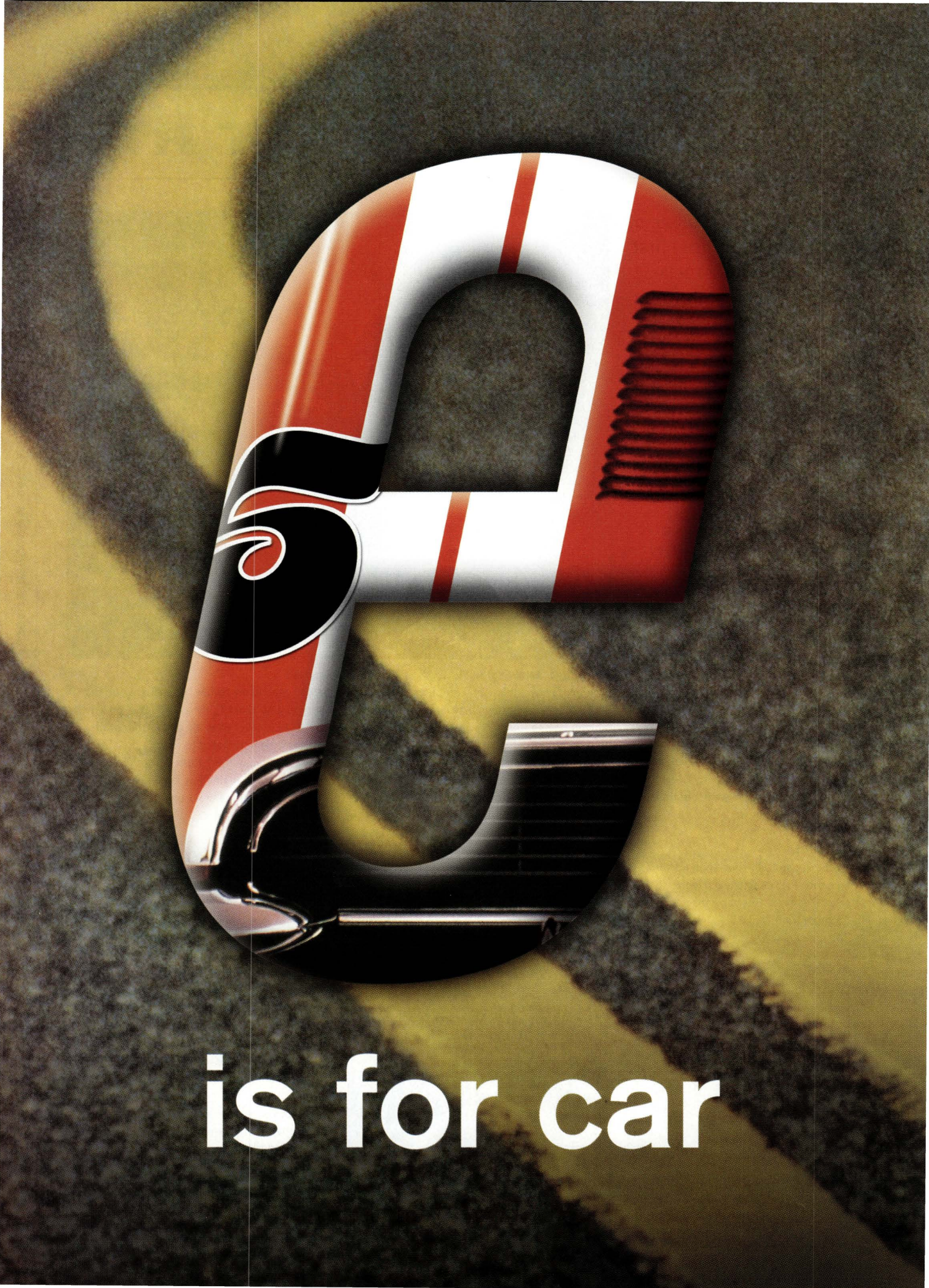


Engine:
As you read in my review the pull-start on the stock engine broke fairly quickly. But, once it was fixed it never gave me any further problems. I've been tempted to replace the stock engine with something from O.S. or Picco, but so far the stock engine has served me well. Considering that the stock engine is an RTR engine it's pretty fast.

Damage Report:
So far the only thing I've broken was a front steering servo. I hit a curb a little too hard and unfortunately the bell-crank servo saver didn't do a very good job of servo saving. I had an old Hitec servo in my scrap box that had been taken out of another car. I simply replaced the gears into the stock servo and was off and running again.

I've also bent a couple of tie-rods, nothing major, I've just bent them back straight. But soon these tie-rods will have to go. At that point I'll probably upgrade to some Lunsford or Factory Team titanium.

In the End
So far the GT RTR hasn't disappointed. It's been a solid performer. The bearings, thread-lock and clutch have made the biggest improvements in performance. I've probably got about 3 hours logged on to the RTR so far and it's still going strong.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Tune your Nitro Engine for Optimum Performance

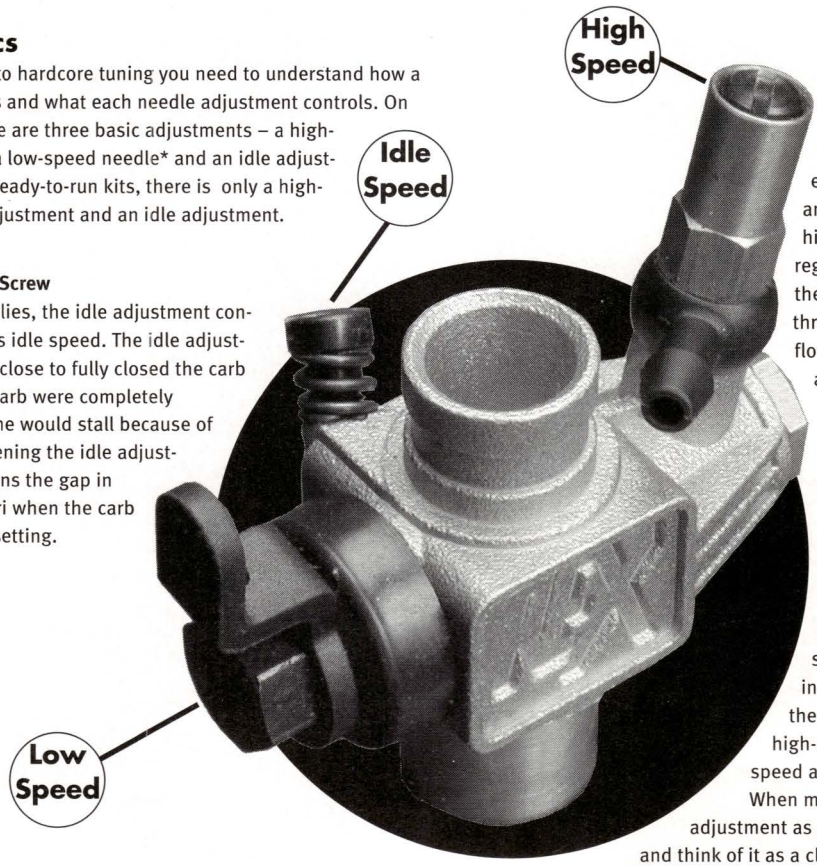
by Regan LeBlanc

One of the nice things about electric vehicles is the fact that they either run or they don't. Gas cars on the other hand can either run very poorly or run well. Adjusting your gas engine so that it always runs great isn't one of the easiest things to do. In this article I'm going to pass along some very important information on tuning your gas engine so that your engine more often than not runs great.



Carb Basics

Before we get into hardcore tuning you need to understand how a carburetor works and what each needle adjustment controls. On most carbs, there are three basic adjustments – a high-speed* needle, a low-speed needle* and an idle adjustment. On some ready-to-run kits, there is only a high-speed needle adjustment and an idle adjustment.



Idle Adjustment Screw

As the name implies, the idle adjustment controls the engine's idle speed. The idle adjustment limits how close to fully closed the carb could be. If the carb were completely closed, the engine would stall because of lack of air. Tightening the idle adjustment screw widens the gap in the intake venturi when the carb is in the closed setting.

High-Speed and Low-Speed Needles

In order to completely understand which needle does what, you should be familiar with how the fuel flows into the engine. From the fuel tank, fuel flows into an inlet located on the same valve as the high-speed needle. The high-speed needle regulates the volume of fuel that flows into the engine at all times. After the fuel flows through the high-speed needle valve, it flows through the low-speed needle valve and into the engine venturi. When the engine is at idle or at low speeds, the low-speed needle reduces the final amount of fuel flowing into the engine. Through an engine's throttle range there is a point where the low-speed needle is completely out of the valve. At this point the high-speed needle takes over the fuel flow regulation. When making adjustments to either the high- or low-speed needles keep in mind that adjusting the low-speed needle has no effect on the engine's top-speed. When adjusting the high-speed needle you're effecting both top speed and low speed.

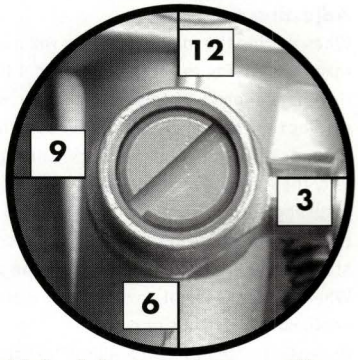
When making needle adjustments I refer to each adjustment as an hour. Look at the top of the needle and think of it as a clock. Now divide the clock into hours. One hour is a 1/12 of a turn, two hours is 1/6, and three hours is 1/4. One hour roughly equals one click. I'll use either term when discussing engine tuning.

Before you Adjust

If you're starting an engine that you put away after a fine run, you should start the engine as you normally would. If you're starting an engine that might have given you problems the last time you ran it or an engine that you're unsure of, consult the engine's instruction manual. Inside the manual you should find some basic starting points for where the needle settings should be. If the manual tells you, for instance, that the high-speed needle should be two turns out, turn the high-speed needle all the way in until it stops then back it out two complete turns. The same goes for whatever low speed setting is advised. Once you have your engine at the recommended starting point you can move on.



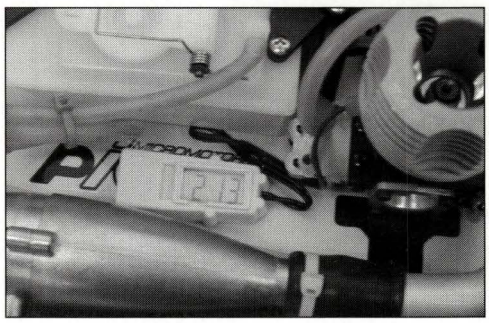
Consult your engine's instruction manual for adjustment starting points.



Think of the top of you needles as clocks. Make adjustments by the hour.

The method I use to tune an engine is to tune it by listening to it and by using a temperature measuring device such as a temp-gun or an MIP Temp gauge. If you don't have either device, I highly recommend you pick one up. You can pick up a MIP Temp-gauge for less than 40 bones.

In order to properly tune any engine, you must get the engine up to operating temperature. A two-minute warm up should do the trick. If right from start-up you notice that your engine sounds very crisp and responsive on the bottom-end, richen the low-speed needle one or two hours. If the engine clears out and reaches top speed quickly while it's still cold, richen the high-speed needle an hour or two as well. If the engine doesn't exhibit either of these traits and sounds cold, but is warming up, simply drive the car around and warm the engine up for a couple of minutes before you begin tuning. Don't baby the engine the second minute; run it as you will be racing\running it, that way you get an accurate running temp.



Knowing you engine's tempurature at all times is critical if you want maxim power.

Tuning

Once the engine's warm the first thing you should do is get a feel for the high-speed needle. Run the engine around and listen to it. If the engine never seems to clear out* on top speed, the high speed needle is too rich*. Lean* the high-speed needle a couple of hours at a time until you hear the engine clear-out on top speed. If the engine revs-up but then sounds like it's starving for fuel or if it loses power, the high-speed needle is to lean. Richen the high-speed needle a couple of hours until you hit the sweet spot and your engine sounds and feels comfortable performance-wise. [RTR Note: If you're running an engine with just one adjustment needle, take a temperature reading at this point. If you're in a safe range you're done. If the engine's too hot, richen the needle a bit.]

Once you're happy with your high-speed setting, take a temperature reading. If your engine's below the indicated temperature range, lean the low speed needle an hour or two. If the engine's temperature is 10 or 20 degrees above the safe range (see .12 vs. .21 sidebar), first richen the low-speed needle a couple of hours. After a minute, take another temperature reading. If the temperature has fallen, but still is above a safe range, richen the low speed needle a couple of more hours. If the temperature hasn't fallen you'll have to keep richening on low-speed needle.

Remember, when tuning an engine the temp is controlled by the bottom-end screw. Think of the low-speed needle as the mixture adjustment and the high speed needle controlling the total fuel volume. The low-speed needle must be set to proper mixture and then engine temperature will be cool; changing top end only changes volume of fuel going in, not the mixture. So, virtually no temperature is controlled by top end adjustments. If when the low-speed needle is set to keep the engine in right temp range and it needs a bit more power on the bottom-end, lean the top an hour or two. It will bring in the bottom-end power and engine should stay in the temp range. Idle temp will dance around depending on outside temp and any breezes. As long as the idle temperature does not just keep rising when sitting the bottom end should be fine.

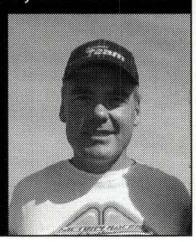


Given the one needle adjustment, it's critical you pay attention to temperature on most RTR's.

.12 vs .21

The basic tuning rules are the same for both motor sizes. For a .12, the comfortable temperature range is between 210º and 220º. For a .21, a comfortable range is between 205º and 230º. Some engines will not run correctly unless hotter than this range, sometimes a lot hotter. If you're engine doesn't seem to run correctly in this range, check the owners manual or contact the manufacturer to see what temerature range they recoemend. Always try to get the performance you're looking for at the lowest temperature possible. If you're engine's fast enough and the power band is how you like it, don't keep leaning it down looking for more speed. The cooler your engine runs the better. A cooler engine will wear longer and give you more life on your glow plugs.

Xtreme R/C Cars is proud to welcome Regan LeBlanc on board as our new Nitro Editor. Regan has been tuning gas engines for years and is the pit/engine man behind the scenes for National Champion, Richard Saxton. Look for nitro articles from Regan every month — only in the pages of *Xtreme R/C Cars*.



Adjusting the Idle

When setting the idle, some guys will make the mistake of trying to set the idle so that their drive line doesn't move when the vehicle is up on a box or the wheels aren't touching the ground. This isn't good. Some clutches, particularly the Associated clutch, may never completely disengage. So if you try to set the idle so low that the clutch doesn't engage you'll just keep stalling. Set the idle with the car on the ground. When the brake is not engaged, you want the car to stay where it is or just creep slightly. If the engine stalls while it's idling, turn the idle screw in an hour or two. If the car wants to start rolling while idling and continues to stall, you have a problem somewhere else and should start troubleshooting (see Issue 5.4 for troubleshooting tips).

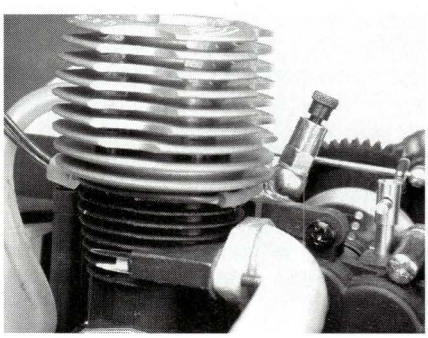
Taking The Temperature

Whether you use an infrared probe or a MIP Temp-gauge, the most important thing to remember is consistency. Always measure your engine at the same place. If you're using a infrared probe, measure directly at the glow plug. If you're using an MIP Temp gauge, wrap the loop around the lowest fin on your cooling head or just below the head around the engine case. Place the temperature sensor as close to the center of the engine as possible.

In this article I mention some temperature ranges. Those ranges are given using an infrared temp gun. If you're using the MIP Gauge, you must take into account that your readings might be slightly lower than with a temp gun because of the measurement point. When you've got your engine running just like you like it, take notes and keep track of the temperature and where you measured it. Because there are so many variables affecting engine temperature – fuel, glow plug, engine type, head type, air flow, etc. – it's good to know your own engine's temperature range.

If you don't have a temperature gauge, you need to know how to perform the spit test. Spit should have the same boiling point as water, 212º F. How the spit reacts on your engine is a great indicator of your engine's temperature.

If you're using an MIP guage, make sure you set the temp probe as close to the glow plug as possible.



Slide Carb vs. Barrel Carb

Both carb types have their advantages. Slide carbs are typically so quick to respond to the throttle servo that low end actually feels like it's on or off. Overall through their entire throttle range slide carbs are typically more responsive. The downside to slide carbs is their fickleness when it comes to setting idle and low-speed adjustments. Barrel carbs aren't as responsive as slide carbs, but are easier to set at low-speed and idle



Basically wet your finger with a fair amount of spit. Dab the spit on the engine head. If the spit just sits there with little reaction, your engine temperature is below 212º. If the spit sizzles quickly and evaporates in just than a couple of seconds, the engine temperature is above 212º. If the spit slowly simmers and is still simmering after a couple of seconds, you've hit the right spot.

Weather Effect

The ambient temperature has less of an effect on an engine's performance than the amount of oxygen in the air. It sounds strange, but on a hot dry day or at high altitudes, you should lean your engine slightly since there is typically less oxygen in the air. This means if you leave your carb alone the engine will feel like it's running rich. Reducing the amount of fuel will compensate for the lack of oxygen in the air. On cool or humid days or at sea-level, you should typically richen the engine to compensate for the increase of oxygen in the air. The engine won't feel rich; you'll just be increasing the amount of fuel going into the engine to keep up with the increase in oxygen. Whenever you experience a great change in temperature, elevation, or humidity you should re-tune your engine and keep tabs on temperature and the engine's temperature range. These are just starting point directions, not hard rules, to go by if you travel and race around the country.

Changing Fuel

If you're changing fuel, here are some things you should consider when tuning. Going to a lower nitro content will increase your engine's mileage, but will generally cause the engine to run slightly hotter. In order to increase your engine's bottom end with a lower nitro content fuel, you might be inclined to lean the low-speed needle. If you do, pay extra close attention to your engine's temperature. To be on the safe side, richen the bottom end just slightly after changing fuel then after warm-up go through the complete tuning procedure. If you're going to a higher nitro content, richen the bottom end just a bit. Increasing the fuel-to-air mixture will keep the engine running cooler on top of the cooling effect of the increased nitro. If you're changing fuel brands, richen the high-speed before you fire up the first tank just in case the new fuel has less lubricant than your old fuel. After warm-up, re- tune the engine to the new fuel.

Watching the Exhaust

At one point in time, looking at the amount of smoke and oil coming from your exhaust was a great indication of whether or not your engine

No matter what fuel you use, you should always see some smoke coming from the exhaust.



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- Full-Bearing



■Technical Date■

- Length……380mm
- Width……198mm
- Wheel Base……260mm
- Tread(F/R)……172mm/172mm
- F.caster Angle……6.2°~14°
- Gear Ratio……1st 7.421:1/2nd5.717:1
- Weight……1,640g

MT12 Engine (Rear Exhaust)



MT12S1 SG-Shaft, Slide Carb.

MT12R2 STD-Shaft, Rotary Carb.

MT12S2 STD-Shaft, Slide Carb.

Cubic Capacity : 2.1c.c. Bore : 13.80m/m
Power : 1.15HP Weight : 215g
Rpm : 36.500rpm Shaft : φ11m/m
Stroke : 14.00m/m

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T0903Manifold for Side Exhaust
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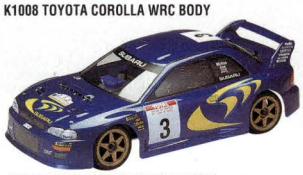
K1014 PEUGEOT 406 STW BODY



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Novice Glossary

Clear-out: Engine in perfect tune; crisp response at any throttle setting; revs freely. It's when the engine just starts to burn all the fuel it's getting without any hesitation or bogging.

Lean: A term used to describe an engine that has a low fuel-to-air carburetor ratio. To lean is to actually decrease the fuel-to-air ratio in a gas engine.

Rich: A term used to describe an engine that has a high fuel-to-air carburetor ratio. To richen is to actually increase the fuel-to-air ratio in a gas engine. (Rich can also be known as Fat.)

High-Speed Needle: The needle valve that regulates the engines overall amount of fuel that can flow into the carb. Also known as the top-end needle.

Low-Speed Needle: The needle valve that regulates fuel flow into the engine at idle and at low speeds. Also known as the bottom-end needle.

General Tuning Tips:

• Always re-tune your engine when you change things like, air-filter, fuel tubing, fuel tubing length, pressure tubing length, pipe, manifold, head, glow plug, fuel, and car body.

• Always make sure that your engine has plenty of air flow. Consult your track's rules or legal dimensions.

was running in a safe range. It isn't that easy anymore. With the great number of fuels on the market, the amount and type of lubricant varies greatly. Synthetic oils don't smoke as much as castor oil, so fuels with a high amount of synthetic oils might smoke just as much as a fuel with a low amount of castor oil. As long as you can see some smoke coming from the exhaust during acceleration you should be safe.

Tuning for a long race

Tune the engine just as you normally would after warm up. A common misconception is that the engine will lean out toward the end of a long race. This isn't true. Once you've warmed the engine up for a couple of minutes, you've reached operating temperature. A properly-tuned engine should maintain operating temperature. If you're running a fairly new engine, you should adjust the idle screw so that the engine idles a little higher than normal. A newer engine will end up breaking-in during a long race. If youre idle isn't set a little higher than normal, you'll run risk of stalling in the corners toward the end of a long race.

Conclusion

Tuning a nitro engine is by no means an exact science. There are so many variables that can affect an engine's performance. With the information I've shared for you here you should be on your way to consistently tuning your engine right every time.

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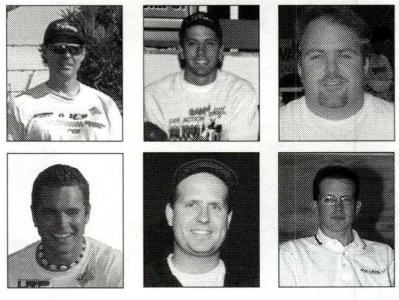

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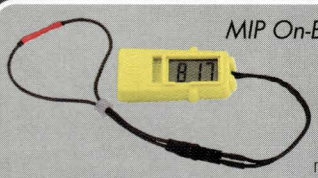

MIP On-Board Temp Gauge™:

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MIP Boost Bottle and Rear Boost Chamber Kits:

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MIP 360 Stinger Kit for Associated, HPI, Losi, and Traxxas:

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MIP Headsink and Buttsink for O.S. .12 engines:

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Kyosho GP ULTIMA Type-R

by Bill Hugins



VITAL INFO

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www.hobbies.net/kyosho/

THE HITS

- Race-ready out of the box.
- Ultra-smooth shocks and handling.
- Uses universal engine mounts.
- Very racer friendly.

THE MISSES

- Rear suspension mounts are weak.
- No setup advice.

THE LAST WORD

As with the EP Ultima, the GP is made to race. It has all the features you'd expect from a race truck along with a couple of new features. Aside from one weak link, the kit's overall quality, material, and build is excellent. The GP has what it takes to be a winner.

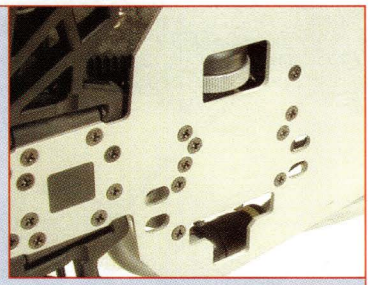
For years two companies have dominated the competitive nitro 1/10-scale off-road racing market with little competition from foreign lands. While all the while Kyosho has been dominating 1/8-scale nitro off-road racing around the world. So if you were Kyosho how would you take on the U.S. companies that have so deeply entrenched themselves into the nitro truck market? First you would not try to reinvent the wheel, instead you would use many accepted ideas and concepts and do everything you could to improve on those basic ideas. Second you would make sure that your offering leaves nothing to be desired in terms of performance, reliability, and price. With all that in mind, how well does Kyosho pull off this tall task? Read for yourself.

Kyosho has won more 1/8-scale off-road World titles than anyone.

Features

Chassis

The GP Ultima is built atop a solid 2mm thick Duraluminum chassis that features raised sides for added rigidity. Like most nitro trucks, a .12 or .15 size engine mounts just in front of the transmission. There are two large cut-outs in the chassis. One cut-out allows access to the flywheel for bump starting while the other cut out allows for pull start engines to be mounted easily with a low center of gravity. In front of the engine sits a plastic radio tray that secures the low-profile 75 cc fuel tank. Just to the side of the fuel tank is a sealed radio box that houses the receiver. The radio tray also holds the throttle servo. In front of the fuel tank and the radio tray is the steering servo. The front end of the truck bolts



onto the chassis just in front of the steering servo. At the very back of the truck is a plastic bumper that holds a 4-cell "AA" Nicad or battery pack to power the radio system.

Steering

The GP Ultima uses a standard dual bell-crank steering setup. One of the bell-cranks uses a spring to act as a servo saver incase of hard jolts. Between the two bell-cranks the drag-link can be lengthened or shortened so that the Ackerman can be adjusted. The steering bellcranks use large adjustable turn-buckles to turn the front steering spindles.

Wheels, Tires, Body, and More

Genuine Pro-Line wheels and tires are included in the kit. The GP comes with "Edge" front tires and "Bowtie" rears, both in M2 compound. The Lexan body is also made by Pro-Line. The truck also comes complete with 19 ball-bearings to round out the truck.

Chad Bradley and Greg Degani both now run the GP Ultima at major race events.



Drive Train

The transmission on the GP is Kyosho's new TR-Pro three gear transmission. The three gear tranny is laid down to lower the truck's overall center of gravity. The tranny's internal gear ratio is a low 3:1. In side the gear box is an adjustable ball differential. The diff uses American standard sized 3/32" diff balls.

When stopping is in order the GP uses a slick looking vented stainless steel disc-brake. The disk is compressed by a cam that engages two fiber pads. Further out on the transmission's top gear is a slipper clutch. A 32-pitch spur gear mounts to the slipper. One thing I don't like on the tranny is how far from the support bearings the spur gear is mounted. After a few of months I wouldn't be surprised if you find yourself replacing transmission bearings or a stripped gear or two.

Once power enters the transmission steel universals get the power to the wheels. Unlike past Kyosho off-road vehicles the GP uses standard cross pins to secure the rear wheels to the axles.

Clutch, Flywheel, and Engine Mounting

The GP uses a two shoe MIP style, spring secured clutch. The clutch can be run in either a leading or trailing style. Leading offers quicker clutch engagement while trailing gives a smoother power transfer. The flywheel is pretty standard. The way the engine mounts to the chassis is pretty neat. The GP uses a universal block system that allows you to mount just about any engine with the same blocks. Along with all the engine mounting gear, the GP comes with an exhaust manifold and Kyosho's Silent Streak muffler.



Suspension

The GP Ultima's suspension system is pretty straight forward. Lower suspension arms with adjustable links are mounted to all four corners. This truck is extremely adjustable. In the rear camber mounting locations can be adjusted inside and out. There are also six possible mounting locations for each rear shock. In the front camber mounting is adjustable on the front shock tower. On the front hub carriers, the camber links mount to a kingpin ball stud. To change the truck's roll center the height of the kingpin ball stud can be raised or lowered. All of the suspension is supported by Kyosho's new "Twin Cap" shocks. These shocks can be built as low-pressure dampers using bottom loading units, or high-pressure dampers using bladders at the top to act as a type of volume compensator. In use if you're running on a smooth, high-bite track you should run the bottom loading option. If the track is very bumpy or uneven try the bladders on top. As are most of the molded pieces on the truck, most of the suspension pieces are molded from fiber-reinforced plastic. Both the front and rear suspension arms use a hinge-pin design that uses no e-clips. That's a good thing. In the rear a set screw holds the hinge pins to the suspension mounts. Up front the inner hinge-pins are held in place by the front bumper.



BUILDING TIPS

Building the GP is pretty straight forward. You'll need a #2 Phillips head screw driver. The GP uses a strange type of screw. The channel in the screw that accepts the driver isn't very deep. In order to get some good leverage on the screws I filed down the tip of my screw driver so that I could get a good grip on each screw.

Step 1: Use a small dab of liquid thread-lock on all the metal posts that you fasten to the chassis.

Step 23: The kit doesn't come with any shock oil. I used Losi 30 wt. in all four shocks.

Step 30: Use a small dab of thread-lock on the on the engine mounts.

Step 33: For more engine power grind down the face plate of the exhaust manifold (see the article in Issue 5.8).

THE SPECIFICS

ITEM INFO
Part #31971, MSRP $349. Street estimate $250-$270. Manufactured in Japan.

CHASSIS TYPE
2mm Duraluminum chassis with bolt-on front suspension.

WHEELS AND TIRES
Kyosho On-Piece dish wheels with Pro-Line M2 Bow Ties in the Rear and Pro-Line M2 Edge Fronts

TRANSMISSION TYPE
3-gear rear mounted transmission with adjustable ball differential and stainless steel disk brake. Adjustable slipper clutch

SUSPENSION DESIGN
Independent, molded lower arms, adjustable upper control links with hex adjusters, molded shock towers.

SUSPENSION DAMPENING
Coil-over, oil-filled shocks, molded pistons, aluminum shock bodies, molded shock caps with bleed holes, steel shafts, O-ring seals, can be built with or without pressure.

VEHICLE TYPE
Nitro engine-powered, rear-engine 2WD 1/10-scale stadium truck.

OTHER ITEMS YOU NEED
2-Channel radio system with 2 servos, .12 or .15 engine, starter box for non-pull start engine, glow plug ignitor, receiver battery pack, fuel.

OUR TEST GEAR
Hitec Lynx 3D radio with DCX receiver and 2 HS-925MG servos, Trinity Picco .12 engine, Mugen Starter box, Trinity Monster Horsepower 20% fuel, McCoy MC9 glow plug, MIP On-board Temp-gauge.

MAIN COMPETITION
Team Associated RC10GT, Team Losi NXT, HPI Nitro Rush.

Article continued on page 63

Some type of setup advice, like what oil to use would have been nice.

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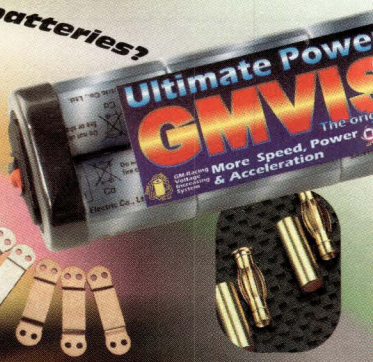

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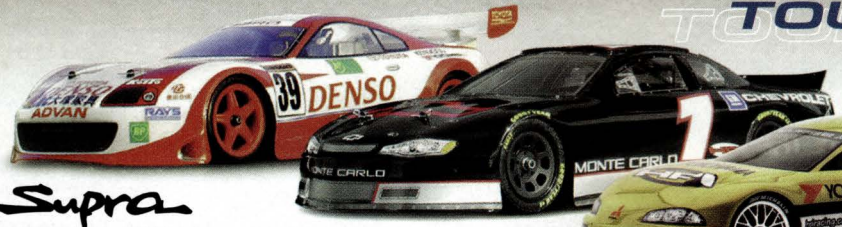

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#7430 Chevrolet Monte Carlo Body (200mm)



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Our regular sized Power Wrenches are available in .050", 1/16", 5/64", 3/32", and 2.5mm.
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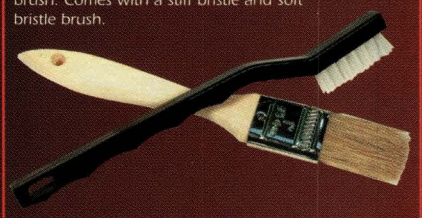

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Tool Center
Keep your tools in order with the tool center. Works perfectly with Racers Edge or any Allen and nut drivers. Anodized in bright blue.



RE7024 **$12.95**

Continued from page 59

TESTING

Acceleration

Off the line the Picco .12 provided plenty of punch and the clutch took it all. Even in the trailing setup, the clutch engaged quickly through the power band without missing a beat. Over jumps the truck accelerated like a modified electric truck.

Top-End Speed

Once the engine was warm and tuned the truck maxxed out with a very fast top speed. Although the pipe wasn't as free flowing as some after-market pipes, it felt pretty good. The truck seemed to top out in speed rather quickly, this is because of the lower transmission gear ratio.

Jumping

The GP was very controllable on big jumps and small jumps. Consistently the truck took off and landed very stable. While in the air, as with most nitro trucks, the truck responds quickly to throttle or braking.

Braking

The stainless steel disk brake constantly stoped my truck on a dime. Even after three straight tanks with little rest in between the GP quickly came to a stop with little brake fade.

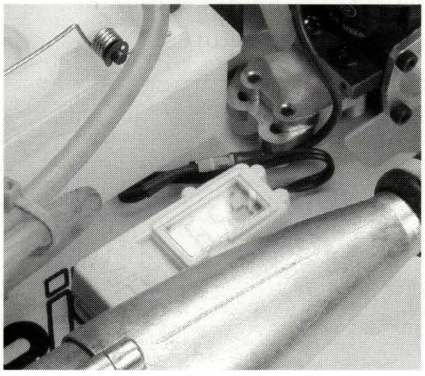
Low-Speed Turns

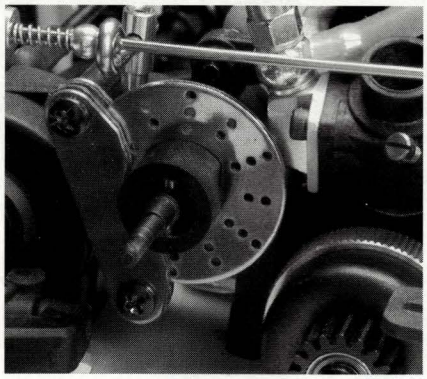
Off power the truck pushed a bit at low speeds but once I was back on the throttle, even slightly, the truck hooked up.

High-Speed Turns

At high-speeds the GP handled like a dream. Going into some turns the truck had a tendency to push a bit, but once I was committed to the turn I was able to throttle out with little problem. On dry dirt the kit tires hooked up adequately. For serious racing conditions some M3 tires might be in order.

The MIP On-Board Temp-Gauge helped me make sure my Picco engine was always in a safe operating temperature range.





The vented disk brake is very sweet looking. When I see vented disk brakes I think of one name, Porsche.

Damage Control

Some large jumps and bad landings took their toll on the the GP. On my second practice day I broke the left rear suspension mount. After talking to a couple of other racers it was obvious that this is a weak link in the truck's suspension. Although I didn't break mine, some of my buddies told me that the rear shock tower was also a problem area. I'd expect after-market companies as well as Kyosho to address these inadequacies shortly.

Trackside Tuning

Wrenching on the GP is very easy. The truck is very straight forward, everything is clearly laid out with. The truck's suspension is an open book. I didn't have enough time to really try too many different setups, but the GP did tune a lot like my RC10GT. Expect a Hook-Up article soon.

Maintenance

After each run I got the truck home and blew the entire chassis off with my air compressor. Aside from my broken suspension mount everything appeared to be pretty much maintenance free. Thanks to open access to just about everything, routine maintenance should be easy.

CONCLUSION

The GP Ultima Type-R is a nice truck. It builds easy, is easy to work on, offers lots of tuning options, and handles as well as anything on the market. Kyosho has done a good job of Americanizing their product to make it more user friendly to customers in the U.S.. Although the truck does have its quirks, it's very solid all the way around. With Kyosho's established foothold in the market parts support should not be a problem. The GP is also reasonably priced. If you're in the mood for gas and are looking to go racing the GP deserves a good long look.

Niftech

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Toughest high pressure, fastest drying motor spray available for off-road and on-road. Safe on plastics- 20 oz. can.
#4500 Retail $5.95



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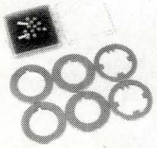

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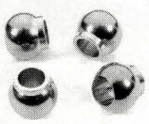

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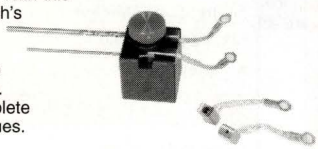

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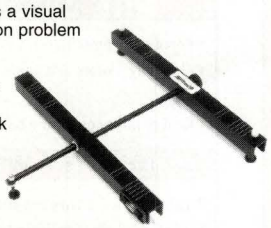

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Tamiya TB-01

Japan Goes Down Under With this Rally Champ.

By Nathan C. Miller



VITAL INFO

Tamiya America, Inc
2 Orion, Aliso Viejo, CA 92656
Phone: 800 TAMIYA-A
Fax: 949.962.2250
www.tamiya.com

THE HITS

- Good looks.
- Sealed drive train.
- Very durable.
- Works well on-road and off.

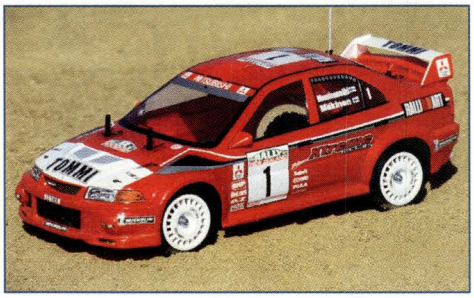
THE MISSES

- Some parts modifications needed.
- Changing motors and gears a REAL chore.
- Kind of pokey out of the box.

THE LAST WORD

A rally car as it was meant to be – brutally tough, realistic-looking, and a surprisingly competent handler. A great first timer's car, or great for the experienced hobbyist who wants something different.

Tamiya has a long-standing tradition of building fun, easy-to-assemble, durable cars for beginners. This tradition is carried on in their new rally car platform, the shaft-driven TB-01, a replica of the 1999 New Zealand Rally Champion. While a casual glance at this car may make you think of another shaft-driven car (cough, TC3, cough, cough), the TB-01 is actually an electric version of Tamiya's gas-powered sedan, the TG-10. While it shares some of its parts with the TG-10, the TB-01 is a rough-and-tumble, go-anywhere machine with many interesting features that distinguish it in the expanding world of rally cars. Let's have a look at some of those features.

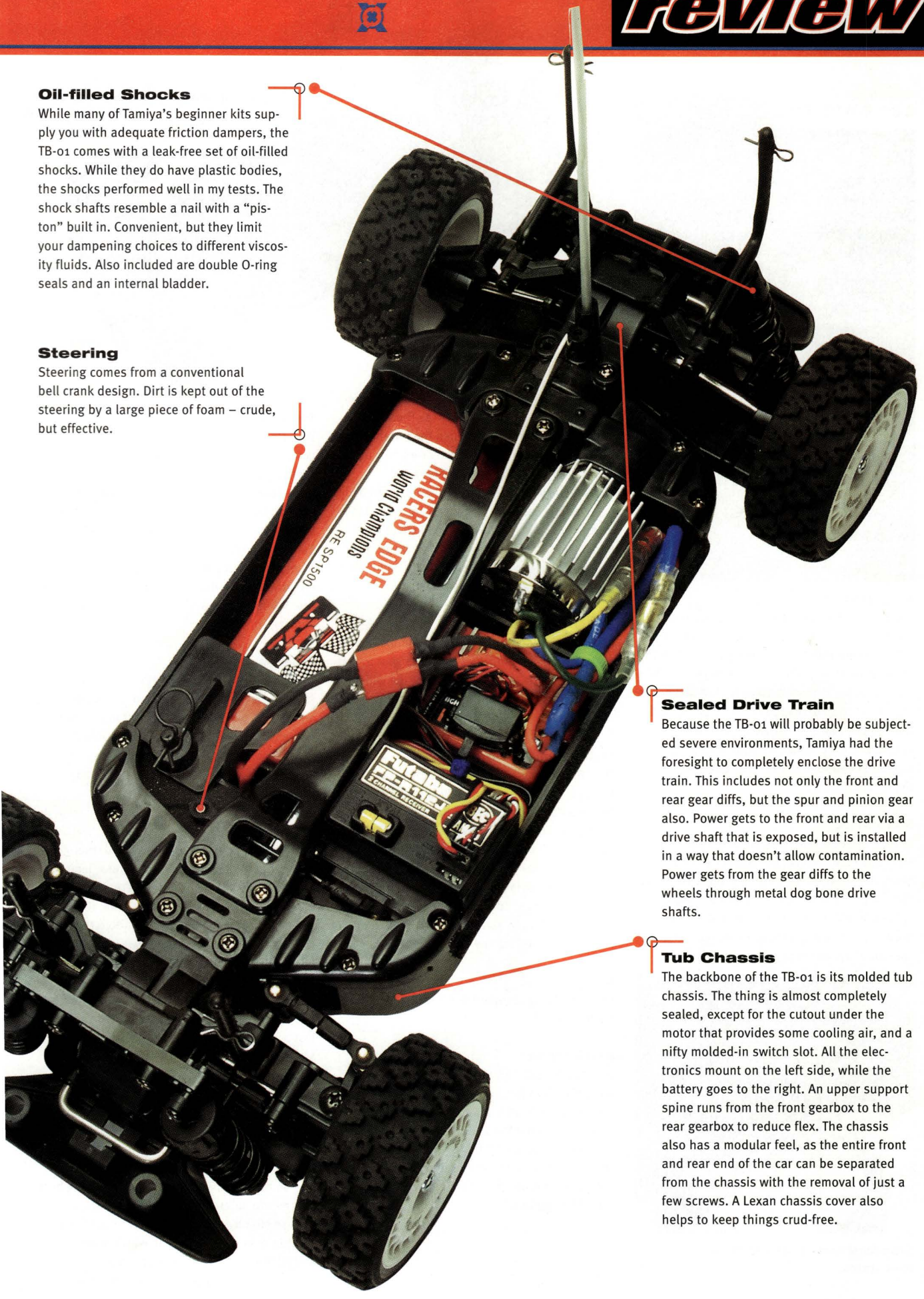


Oil-filled Shocks

While many of Tamiya's beginner kits supply you with adequate friction dampers, the TB-01 comes with a leak-free set of oil-filled shocks. While they do have plastic bodies, the shocks performed well in my tests. The shock shafts resemble a nail with a "piston" built in. Convenient, but they limit your dampening choices to different viscosity fluids. Also included are double O-ring seals and an internal bladder.

Steering

Steering comes from a conventional bell crank design. Dirt is kept out of the steering by a large piece of foam – crude, but effective.



Sealed Drive Train

Because the TB-01 will probably be subjected severe environments, Tamiya had the foresight to completely enclose the drive train. This includes not only the front and rear gear diffs, but the spur and pinion gear also. Power gets to the front and rear via a drive shaft that is exposed, but is installed in a way that doesn't allow contamination. Power gets from the gear diffs to the wheels through metal dog bone drive shafts.

Tub Chassis

The backbone of the TB-01 is its molded tub chassis. The thing is almost completely sealed, except for the cutout under the motor that provides some cooling air, and a nifty molded-in switch slot. All the electronics mount on the left side, while the battery goes to the right. An upper support spine runs from the front gearbox to the rear gearbox to reduce flex. The chassis also has a modular feel, as the entire front and rear end of the car can be separated from the chassis with the removal of just a few screws. A Lexan chassis cover also helps to keep things crud-free.

Like the Sport 2, the TB-01 has plastic bodied shocks...

BUILDING TIPS

• In Step 21, on part E3: It is necessary to remove the seal that is right next to the spur gear. If you don't, it will rub the spur. The plastic is soft enough that I simply cut away most of the offending seal with Lexan scissors, and sanded the rest away with my Dremel.

•I'll say this about every car that uses self-tapping screws: tighten them until they are tight, and no further. Don't try to get that extra quarter twist out of them, or you'll strip the hole they thread into.

•If you plan on adding bearings, do it when you build the car. It saves trouble in the long run.

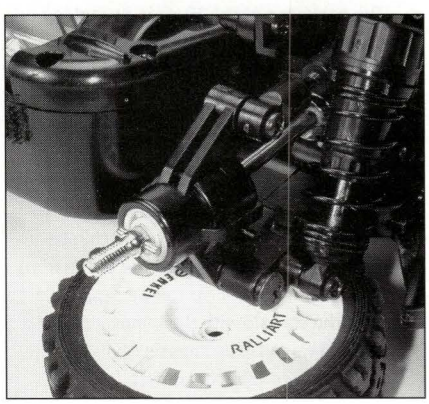
•Pay close attention to which holes you attach the motor to the motor mount with. There are a lot of them, and they are crucial to gear mesh.

Suspension

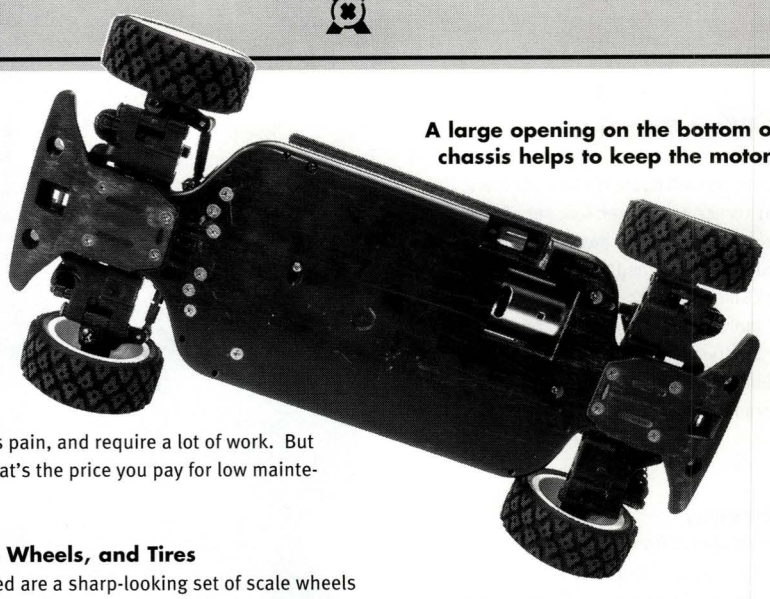
The front and rear suspension is made up of independent lower arms with adjustable upper links – a nice touch on a beginner's vehicle. The lower arms are incredibly burly two-piece affairs that screw together and attach to the bulkheads with a captured U-shaped pin. This pin is held tight by the bumper. The front and rear shock towers are attached to the front and rear gearbox/bulkhead assemblies, and are beefy like the rest of the car.

Shaft Drive

Yeah, more and more cars are getting the shaft, so to speak, but no car has a drive shaft as beefy as the TB-01. This thing is huge! The drive shaft is keyed to accept the spur gear and is splined at either end to drive two identical gearboxes. The only part of this whole set up I don't care for is the fact that gearing changes are a serious pain, and require a lot of work. But hey, that's the price you pay for low maintenance.



Standard cross pins are found on all four axles.



A large opening on the bottom of the chassis helps to keep the motor cool.

Body, Wheels, and Tires

Included are a sharp-looking set of scale wheels and a hefty set of rally block tires. These tires look cool, and really help when the terrain gets rough. They seem to work pretty well over a wide variety of surfaces. Great for rally!

As usual with a Tamiya kit, the included body is incredibly detailed. Bolt-on mirrors, spoiler, and air scoop help add to the realism of the Mitsu shell. With the huge decal package that comes with this car, only a one-color paint job is needed.

Testing-Rally Style!

I decided to take the TB-01 to the commons area of the college I attend. I've used this spot to test rally cars before, mainly because of the wide variety of terrain to choose from – just like the real thing!

Testing Equipment

The TB-01 comes with a mechanical speed control and a 540 motor. I already knew that the MSC would provide reliable, but dull performance, so I tossed it in favor of a Novak Rooster ESC. I did stick with the 540, however, for the fact that this car makes use of plastic bushings in its driveline. Having previously nuked plastic Tamiya bushings, I decided to play it safe. A Futaba Magnum Jr. and a standard servo and receiver rounded out the package.

Setup

I stuck with the standard stock setup, including stock shock oil and springs.

Acceleration

With the included 16-tooth pinion and 61-tooth spur, the TB-01 has plenty of torque. This gearing gets the car up to speed in a hurry. The car shot off the line after a little wheel spinning, and held a nice straight line. The heavy drive shaft didn't seem to hamper things at all. In fact, this car really jumps forward when full throttle is applied.

Top-End Speed

With the low gearing that's included, top speed is respectable, but still a tad on the slow side. Tamiya gives you a couple of optional spur gears, but, unfortunately, no optional pinions. Larger pinions are required to mesh with the smaller spurs. While not exactly a speed demon, the TB-01 was fast enough to provide plenty of excitement. Besides, with a rally car, I'd rather have a little more torque to help plow through the rough stuff, and this car has no shortage of torque!

Braking

Thanks to the four-wheel brakes on this car, stopping is no sweat. Just hammer the brakes and the TB-01 comes to a quick stop in a nice straight line. Because of the soft suspension settings, the front of the car would drop a bit, but not enough to lift the rear or cause any weird handling problems.

Through the Rough

For this test, I ran the TB-01 over and through the roughest stuff I could find – grass, mulch, packed foot trails, uneven concrete, and the occasional discarded beer can or two. (Hey, it's a college campus!) The TB-01 attacked the rough stuff with a vengeance. Grass was no problem, as the thick rally tires seemed to just rip it out by the roots. Steering on the grass was easy, too, even at high speeds. Handling on grass is like the car's on rails – no push, no oversteer, just a very neutral car. The soft suspension soaked up any minor bumps with ease, and the car propelled over any loose sticks on the ground with aplomb. Bored with the grass, I hopped over a few sidewalks and launched the car down a few footpaths. Now this was fun! The packed footpaths are just wide enough to simulate a dirt country road. The car held a straight line on the hard packed paths, but steering here was a little different. The car seemed to push ever so slightly at full throttle. Letting off the throttle then getting back on with the wheels locked pulled the car into a tighter arc. Handling on the loose stuff was a totally differ-

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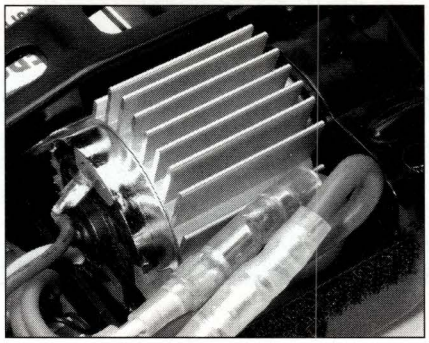


A large finned heat-sink comes standard with the kit.

ent experience, as it seemed like I did most of the steering with the throttle. Turning the wheels either produced a push or the car would start to slide, depending on whether the front wheels got any bite. If they did, a quick shot of the throttle was all that was needed to snap the car the right direction. If not, I would simply let off the throttle until the fronts found purchase, and then nail it. Driving in loose mulch and dust is a blast, as it usually produced a nice rooster tail of dust or bits of mulch.

Much to my pleasant surprise, I never had a problem with the TB-01 getting hung up on anything, even in the really rough stuff. It just plowed right through! A lot of credit for this has to go to the smooth underside of the chassis, and the torquey gearing. This car even did pretty well at climbing hills. While it's no monster truck, the TB-01 did manage to make it up some fairly steep, bumpy inclines. And lastly, no it didn't climb over the beer cans – it punted them out of the way with a neat clunking sound. R/C soccer anyone?

Smooth Surfaces

After running off-road, I decided to hit the pavement. I jumped up onto the pavement, and started by making a few high-speed turns. On the slightly dusty concrete, the TB-01 pushed just enough to notice. Breaking the rear end loose just wasn't possible, no matter how hard I tried. The car would always return to a slight push. Low-speed turns were very tight and retained the slight push the car had at top speed. The turning radius for this car is very tight at low speeds, making U-turns a snap. On the smooth surface, a lot of body roll is noticeable, but it was never enough to lift any of the tires off the pavement. And hey, it looks cool!

I plopped the TB-01 on the track at R/C Avenue in Latrobe, PA for the last part of the test. Compared to the other touring cars on the track, my rally car seemed a bit turtle-like. However, it did handle surprisingly well in stock trim, taking the tight corners at full speed satisfactorily. The stock suspension setup proved to be a major hindrance, though, as the car leaned over very hard in the corners and bogged down a bit. The high side walled tires easily folded under, due to a lack of foam inserts, and this was a problem also. High-speed turns were much easier, and the TB-01 took them easily.

Damage Report

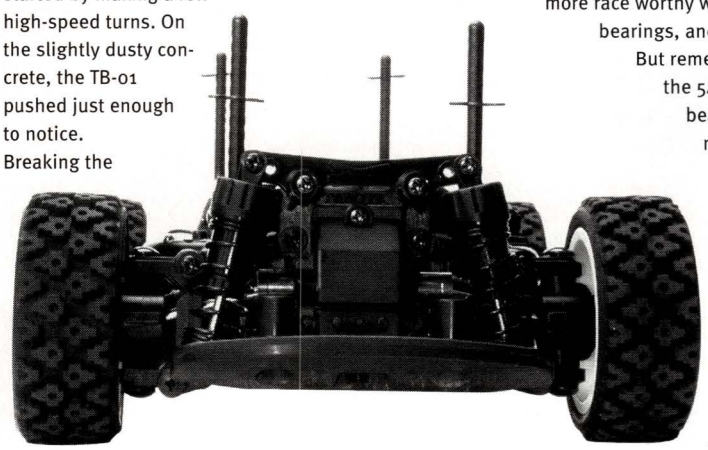
In short, nothing to report aside from the usual scratches. The TB-01 took all I could give it. It was very tough indeed.

Beginner Appeal

This car should be very appealing to the beginner market, mainly because of its multi-role nature. Not only is it a blast on pavement, but it really works well off the beaten path. Added to this are good looks, a fairly complete package, and easy assembly. Some of the younger racers I turned the controls over to at the track really seemed to enjoy this car – it was a struggle to get the controls back!

Raceability

In stock form, I think this car would fare well against the other rally cars out there. The biggest improvements for this car to make it more race worthy would be an ESC, bearings, and a hotter motor. But remember; stick with the 540 until you grab bearings. This car might even make a decent touring car – but it needs a severe diet first. This thing is porky! Look for lighter parts and performance enhancing hop-ups from Tamiya in the near future.



Rally Car: A sedan with dirt tread tires and lots of suspension travel.

Item Info
MSRP $234, ESP $135-145
Part #58257
Manufactured in Japan

Chassis Type
Molded plastic tub with molded upper brace.

Wheels and Tires
Scale rally wheels with block tread tires.

Transmission Type
4WD shaft driven, with gear diffs, metal outdrives, Dog bones and plastic and metal bushings.

Suspension Design
Two-piece lower arms with adjustable upper links with threaded rods.

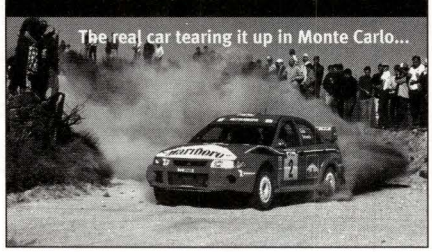
Suspension Dampening
Coil-over, oil-filled, plastic bodied shocks with one piece steel piston/shaft assemblies, air bladder, and double O-ring seals.

Vehicle Type
Electric-powered, mid-motored, 4WD, shaft-driven rally car.

Other items you'll need
2 channel radio with two servos, battery, and charger.

Our test gear
Futaba Magnum Sport radio, Futaba servo and receiver, Novak Fusion ESC, Racers Edge 1500Mah batteries,.

Main Competition
Schumacher SST Rally, HPI RS4 Rally, Yokomo MR4 Rally, Team Losi Rally Weapon



The real car tearing it up in Monte Carlo...

CONCLUSION

Some cars are made strictly for racing. Some are made just to put a grin on your face, and I was grinnin' from ear to ear the whole time I ran the TB-01. Tamiya has come up with a durable, attractive rally car that really works well. This is one car that I think every R/C enthusiast should take a look at, not just beginners. Grab a TB-01, a few buddies, and turn just about any surface into a racetrack. Rally rocks!

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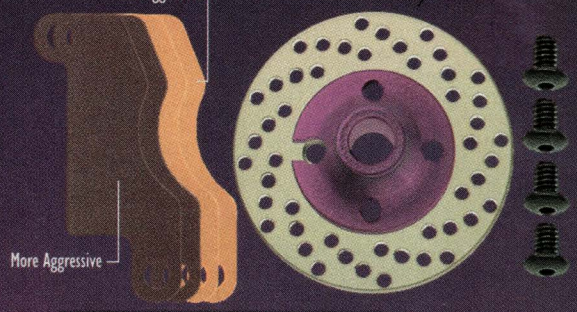
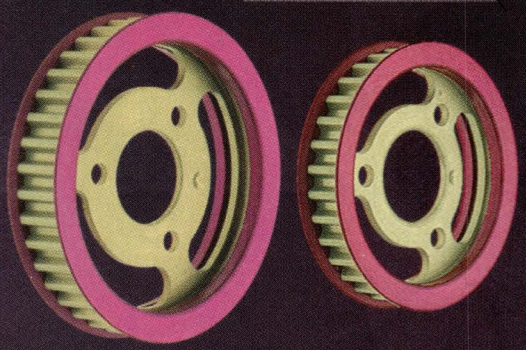


New, variable braking system. Lightweight aluminum. RRP 1575

HPI RS4 Front One Way Diff Pulleys



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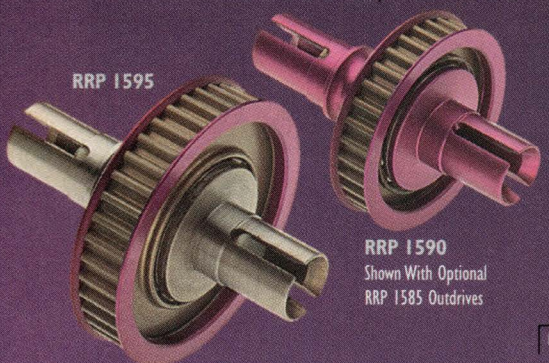
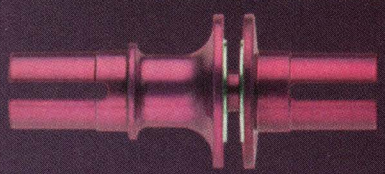
Performance from Precision

HPI RS4 Complete Ball Diff Units



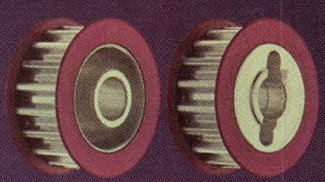
Hardened steel outdrives, ground and polished thrust washers, 2 5x8mm ball bearings, and aluminum pulley.
RRP 1590 for RS4 Electric, and RRP 1595 for RS4 Nitro

HPI RS4 / Pro / Pro2 / Nitro Lite Aluminum Outdrives



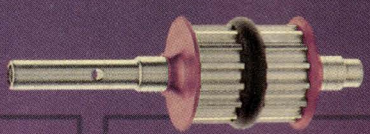
Purple anodized and 40% lighter than stock ball diff outdrives.
RRP 1585

HPI RS4 Nitro Small Drive Pulleys



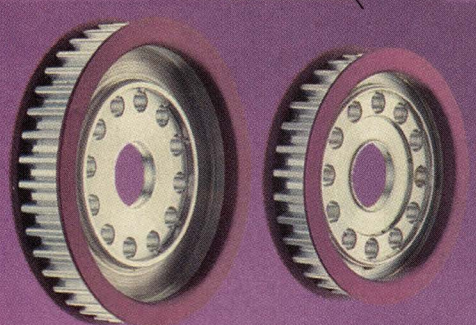
Drive pulleys sold in pairs. RRP 1538

HPI RS4 Top Shaft Pulley



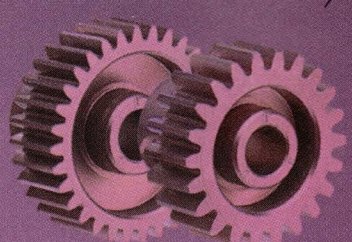
HPI RS4 Top Shaft Pulley: One piece pulley and shaft are precision cut and hard anodized. Purple anodized side flanges are pressed on.
RRP 1527

HPI RS4 Diff Pulleys



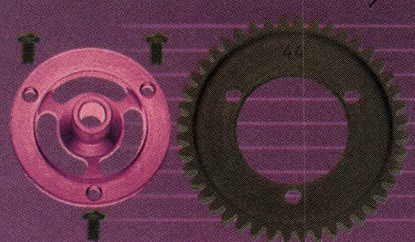
Precision machined, hard anodized aluminum diff pulleys. RRP 1539 fits HPI Nitro sedans. RRP 1528 fits HPI electric sedans.

HPI SuperLite Purple Aluminum Sedan Pinions



They're lightened, hard coated and precision cut.
Available in 48P in 16T thru 28T, and 64P in 24T thru 38T.
RRP 30XX (48P) and RRP 31XX (64P). Only $5.25

HPI RS4 Nitro Lightened Gear Adapter



This lightened gear adapter includes a machined nylon spur that is tougher than the stock gear and will last longer.
RRP 1535

An HPI RS4 Nitro 32 Pitch Conversion Kit is availble. RRP 1536

All performance accessories shown here were produced with precision CNC equipment. They're hard anodized where necessary, and color accents are added to help improve the looks of your machine. We spare no expense on the quality of the raw materials we use so that we can offer you only the finest in high performance drive train components. All RRP products are manufactured here in the USA.

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Silver State

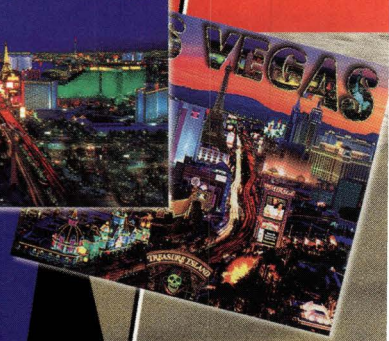
nitro challenge

text by Mike Velez
photos by Elliot Crabtree

When you hear the words "Las Vegas" you think of the usual: slot machines, gambling, hotels, the Rat Pack, sleazy wedding chapels, guys wandering the streets looking for spare change because they bet their kid's college fund on a game of 5-card stud after a three-day booze binge, etc. Well tack on to that list off-road nitro racing! Every year the Silver State Nitro Challenge attracts some of the best off-road nitro drivers in the country. This year's race takes on significant importance since later this year Las Vegas will play host to the IFMAR Off-Road World Championships. This year's race was packed with some exciting moments, some new faces, and some controversy.











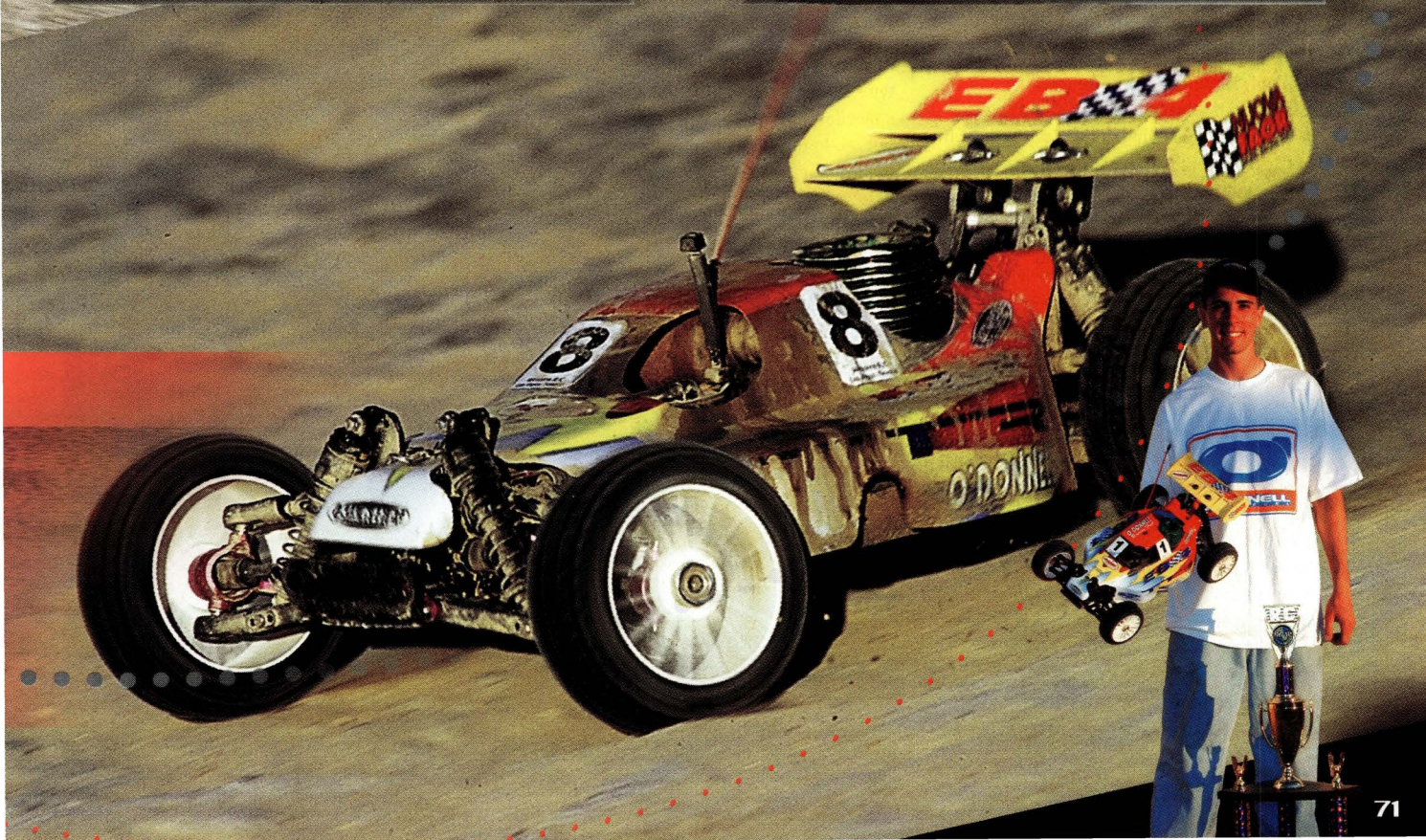
race coverage

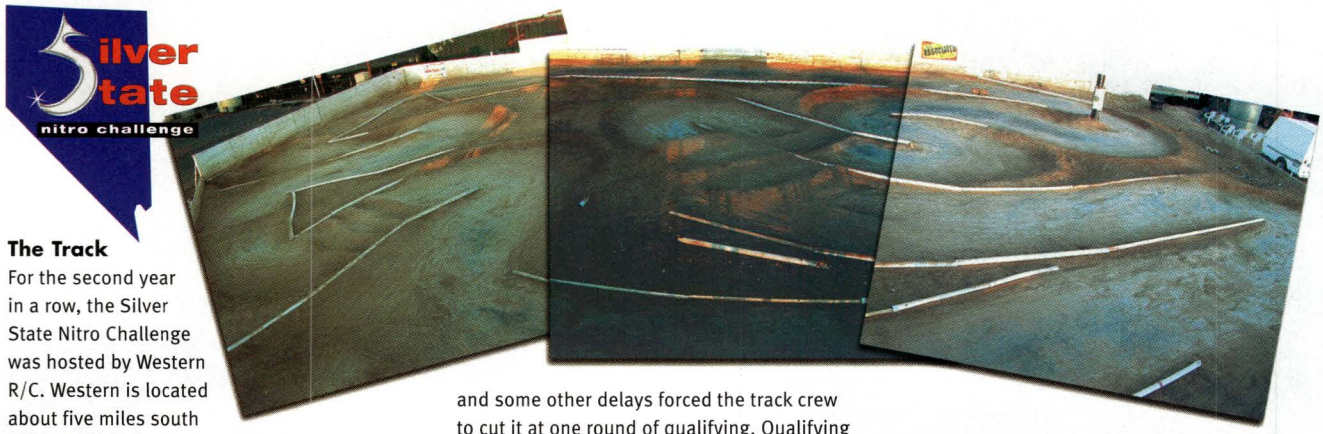












The Track

For the second year in a row, the Silver State Nitro Challenge was hosted by Western R/C. Western is located about five miles south west of the Strip. The track is located within confines of a Volkswagen wrecking yard. It's not as bad as it sounds, but it's not Monaco. The track is a large, dusty, dirt track. The layout includes a variety of hairpin turns, a couple of sweeping turns, some hard 90º turns, and a long straightaway. The track isn't too technical and only mixes in a few jumps – nothing too big, just a long triple and a couple of doubles. It was interesting to see how different racers approached the large berm just before pit lane. Some drivers took it high and throttled down the short straight right after, while some drivers would brake hard to cut the right hand 180º as tight as they could. Although the track wasn't overly technical, it was challenging. As the weekend wore on, large ruts developed in different sections of the track. These ruts became large obstacles that dictated how drivers drove the track.

Format

Qualifying races were seven minutes long. Although four rounds of qualifying were scheduled, only three were run. The total lap and times of each driver's best two rounds were used to figure qualifying order. Each main, with the exception of the lowest mains, was set up with eight drivers. The first and second place finishers in the lower main were given the option to bump up into the next highest main. The final 1/10-scale truck and 1/8-scale buggy A-mains were each one hour long, and the 1/8-scale truck A-main was 20 minutes long.

Qualifying

Friday was reserved for two rounds of qualifying. On Friday and earlier during practice drivers and pitmen donned motocross goggles to deflect the sand and dust as the desert winds whipped across the track. The winds were so fierce that off the jumps some cars would actually be flipped over on their lids. On Friday during the second round of qualifying, the track was extremely fast. The wind had dusted off the loose dirt and the occasional wet-down by the track crew created a wicked blue-groove. Saturday was scheduled for two additional rounds of qualifying, but computer problems and some other delays forced the track crew to cut it at one round of qualifying. Qualifying order was determined by adding each drivers two best lap counts and race times.

In the 2WD Truck Class, 13-year-old Jared Tebo schooled the field by posting a qualifying time seconds ahead of a second qualifier Mark Pavidis. Jared's only been racing for about a year but thanks to his parents Jared makes the hour and a half trip to his "local" track to race two or three times a week.

Last year's winning driver, Richard Saxton, managed to put his EB-4 on the pole in the 1/8-scale buggy class for the second year in a row. Although Richard put up some killer times in 1/8-scale, he was absent from the A-Main in truck.

Mains

1/10-Scale Truck

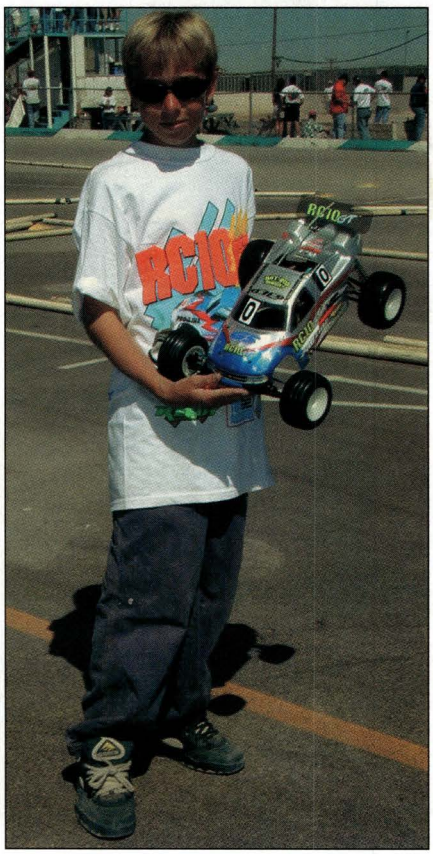
Billy Easton and Scott Hughes both managed to bump up into the A-main by finishing first and second in the Truck B-Main. Thanks to their bump-ups, they started the race from the back of the pack. A kind of Motocross/LeMans-type start was used; the trucks were evenly spacedout then let go just before the sounding buzzer. In this type of a start, especially with the way the first turn was positioned, being on pole doesn't have the same advantage it normally does.

I have a feeling if more people knew about the free cash deal, 1/8-truck would have been a much more popular class.



This proved to be true as seventh qualifier, Andy Smolnik, jumped out into an early lead. Andy held the lead until lap 5, when Mark Pavidis moved into the lead. By lap 11 there was a brutal three-way battle for first place between Pavidis, Jason Rouna, and Hughes. There was some nasty paint swapping between once-teammates and roommates Rouna and Hughes. When things settled down and a pit stop put some room between the battling drivers, it was Hughes who emerged in the lead. After lap 17, Hughes was in comand of the lead. By lap 31, Easton managed to work his way from one of the two bump-up spots and into the second place position. Late in the race, Easton had a sniff at first thanks to a flame-out by Hughes with less than three minutes to go in

Jared showed all the factory guys how to TQ a big time event.





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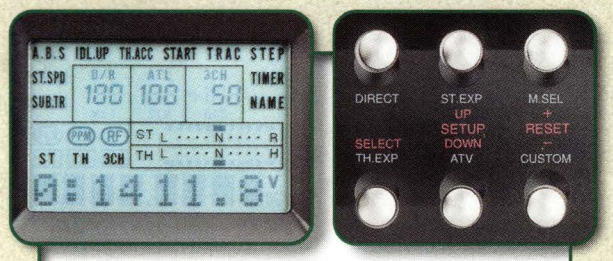

The large LCD screen with adjustable contrast offers easy visibility. Even during a race, the touchpad provides fast, push-button access to all programming.

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- *Tilt mixing*

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Silver State nitro challenge

The Winners...

1/8-Scale Buggy

F	Q	Name	Car	Engine	Fuel	Pipe	Tires (F/R)	Body	Radio/Servo
1	4	Billy Easton	Thunder Tiger	O'Donnell TOP	O'Donnell	O'Donnell	Champion	Jammin	Airtronics
2	2	Adam Drake	Kyosho	Picco	Trinity	Picco	Kyosho	Kyosho	Airtronics
3	1	Richard Saxton	Thunder Tiger	HPI Nova Rossi	O'Donnell	Nova Rossi	Champion	Pro-Line	JR Racing
4	10	Mike Dunn	Mugen	Jammin	O'Donnell	TOP	Pro-Line	Mugen	KO(not sure)
5	3	Greg Degani	Kyosho	O.S.	O'Donnell	Nova Rossi	Pro-Line	Kyosho	Futaba
6	5	Greg Waller	Kyosho	RB Conepts	O'Donnell	RB Concepts	Pro-Line	Kyosho	Airtronics
7	8	Jay Halsey	Mugen	Jammin	O'Donnell	TOP	Pro-Line	Mugen	Airtronics
8	7	S. Hale	Thunder Tiger	Fiorni	FSR	Nova Rossi	Champion	Thunder Tiger	JR/Airtonics
9	6	D. Henry	Kyosho	O.S.	O'Donnell	Kyosho	Pro-Line	Kyosho	Futaba
10	9	Jeremy Kortz	Kyosho	O.S.	Thunder Tiger	Kyosho	Kyosho	Kyosho	JR Racing

1/10-Scale Truck

F	Q	Name	Car	Engine	Fuel	Pipe	Tires (R/F)	Body	Radio/Servo
1	9	Scott Hughes	Associated	Mugen Nova Rossi	O'Donnell	Associated	Pro-Line/Pro-Line	Pro-Line	KO Propo
2	10	Billy Easton	Associated	Nova Rossi	O'Donnell	Associated	Pro-Line/Pro-Line	Associated	Airtronics
3	2	Mark Pavidis	Associated	Mugen Nova Rossi	O'Donnell	O'Donnell	Pro-Line/Pro-Line	Pro-Line	Airtonics
4	6	Austin Dvorak	Associated	Nova Rossi	O'Donnell	Associated	Pro-Line/Pro-Line	Associated	Airtronics
5	7	Matt Francis	Losi	Nova Rossi	O'Donnell	Losi	Pro-Line/Losi	Losi	Airtronics
6	4	Jason Rouna	Losi	O.S.	Trinity	Associated	Pro-Line/Losi	Losi	Airtronics
7	1	Jared Tebo	Associated	Picco	O'Donnell	Associated	Pro-Line/Pro-Line	Pro-Line	Airtronics
8	3	Andy Smolnik	Associated	Nova Rossi	O'Donnell	Associated	Pro-Line/Pro-Line	Pro-Line	Hitec RCD
9	8	Ryan Cavalieri	Losi	O.S.	O'Donnell	Associated	Pro-Line/Losi	Losi	Airtronics
10	5	Sheldon Ko	Associated	Nova Rossi	O'Donnell	Associated	Pro-Line/Pro-Line	Pro-Line	Airtronics

1/8 Scale Truck

Pos.	Name
1	Jim Williams
2	Chris Smith
3	Felix Racoma
4	Dean Sexton
5	Tom Macomber
6	Jay Schaffer
7	Caillen Kanekoa



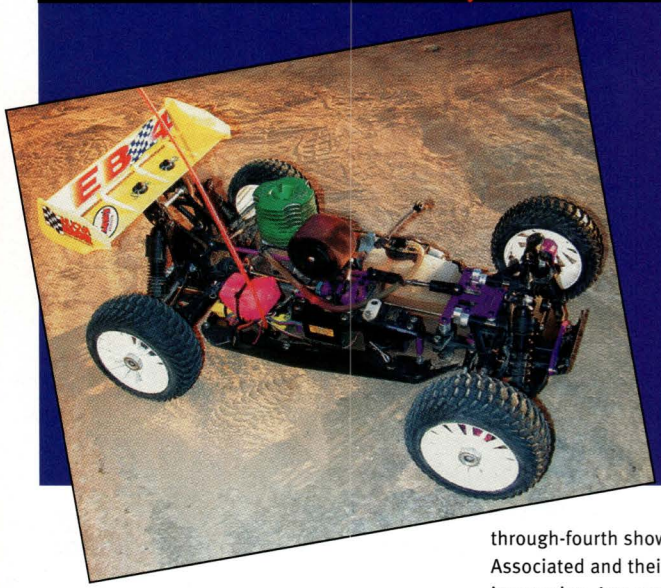
1/10 TRUCK



1/8 TRUCK



1/8 BUGGY





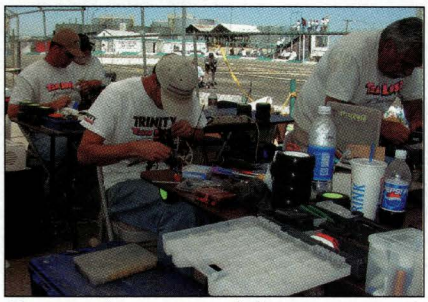
the race. Hughes' temporary pitman, Regan LeBlanc, managed to get him back on track and still keep the lead.

Through the rest of the race, Pavidis and Austin Dvorak battled for third with Pavidis eventually taking the position. The first-through-fourth showing for Team Associated and their new Factory Works GT was impressive. Any questions about the new flat chassis' performance were laid to rest with the sweep. Team Losi's prototype test trucks (tentatively named the Triple-XGT) placed respectfully with a fifth & sixth place finish. During the race, TQ Jared Tebo ran into some front steering servo problems, while Ryan Cavalieri lost a spur gear thanks to a clutch bearing that blew out.

1/8-Scale Buggy

Mike Dunn and Dave Henry bumped up from the B-Main to round out the A-main in the 1/8-scale buggy class. But, at the start of the race it was

I got a ticket on the way to Vegas. Damn radar detector...piece of junk.



Matt works on one of the new test trucks as he gets ready for the A-main.

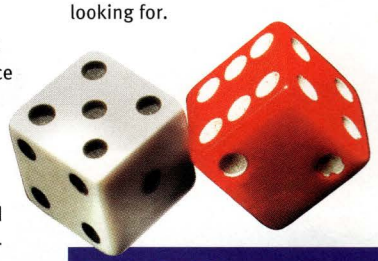


Barbeque, check. Tires, check. Coolers, check. Pit table, check. Motorhome with private toilet, check.

all Richard Saxton. his first couple of laps were some of the fastest run the entire race. Saxton led the pack all the way until the 48th lap of the race. That's when his rig flamed out the first time. At this point in time, Billy Easton was not far behind in the second place position, and Adam Drake was in third. After the flame-out, Saxton had to battle with Easton for the lead. Saxton grabbed the lead back from Easton for a quick lap and then tragedy struck again in the form of a second flame-out. By this time, both Easton and Drake were out ahead by a couple of laps with Mike Dunn not too far behind in third. Driving ballz out didn't help Saxton's cause much; his erratic driving style late in the race would cost him any ground he could make up during the race. We later found out that a badly worn clutch shoe was the cause of Saxton's flame-outs. Easton put it in cruise control through the end of the race. He kept calm and composed and wrapped up the race in style. Drake did the same in the second spot, despite a hard push at the end to try and capture the lead. Who finished in third is a controversy. The timing tape shows Saxton finishing in third, while a unresolved protest by Dunn remains. Check out the winners' chart to see how the rest of the pack ended up.

1/8-Scale Truck

With only seven entries in this class, the real story isn't how the race went down, but who scored some major cash. When you think of winning money in Vegas you think of rolling the bones at the craps table. But as we understand it, second place finisher, Chris Smith, scored big. An advertisement placed by Megatech states that a contingency award of up to $10,000 would be paid to the first competitor running a Megatech engine to win either first, second, or third in the A-main of a qualified event, the Silver State being one of the events listed. I'm not a lawyer, but I'll play one here. The ad isn't specific to which class at the event. I think that Megatech meant to say the 1/8-scale buggy race, since this is the class that garners the recognition because of the number of entries. But, they failed to be specific in their ad. We'll see how this pans out in the months to come. We'll see if Chris gets his cash or if this goes to court. I'm sure the next time an ad like this appears it will be VERY specific. What the seven drivers should have done was all run the Megatech engines and split the total of $20,000 that was supposed to be distributed to 1st, 2nd, and 3rd. Memo to other manufacturers that might try this kind of contingency promotion: it's a cool idea, but be specific. I'm sure this isn't the type of press Megatech was looking for.

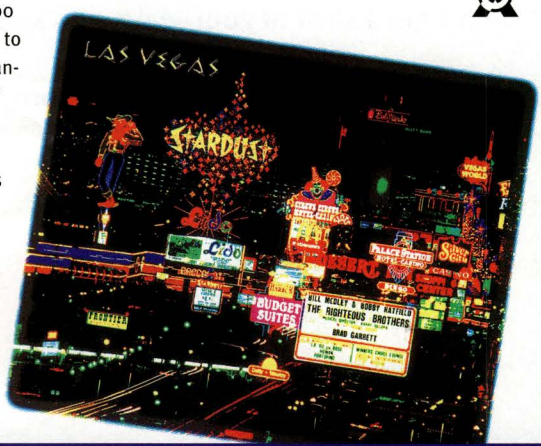




Oh yeah, the race. I almost forgot. Jim Williams lead for all but one lap of the 20 minute A-main. At that point Dean Sexton held the lead for that one lap. Jim finished in first followed by Chris Smith, and Felix Racoma. But as you can see the real winner was Chris.

At the End of the Day

By late Sunday afternoon everyone there had had their fill of racing. Although there weren't any Cinderella stories as far as drivers rallying from the H-Main to win the A-Main, the fact that Scott Hughes and Billy Easton bumped up from the B-Main to win the Truck A-Main was very cool. Taking a peek at the future of Losi's masked gas prototype was pretty interesting. The truck features some new innovations that we'll shed some light on soon. In 1/8-scale, our hats go off to Billy Easton. Last year Billy bumped all the way from the F-main to the B-main only to break while in the lead. While some expected Richard Saxton to dominate at his local track, this year's race outcome ensure that the Worlds in October will be very interesting. Until then...



Quick Tips

Give yourself better odds the next time you're in Vegas.

(Information comes courtesy of The Complete Idiot's Guide to Gambling Like a Pro, Alpha Books, $16.95.)

BLACKJACK

Best Bets: Look for favorable games. Ones that pay 2 to 1 on blackjack, allow doubling after a split, or require the dealer to stand on all 17's. Fewer decks means better odds.

Worst Bets: Never buy insurance. You'll win 4% more money in the long run by not buying insurance. The only exception is taking even money on a blackjack.

CRAPS

Best Bets: The Pass and Don't Pass lines. (Play one at a time.) Back up one of these even-money bets by "taking odds" and you drop the house edge to less than 1%.

Worst Bets: Stay away from the "field" (which yields a house edge from 2.8 to 5.5 percent), "big 6" and "big 8" (9%), and especially the hard ways (9%–11%).

ROULETTE

Best Bets: All roulette bets—single numbers, combos, black or red, etc.—yield the house an identical 5.26% edge.

Worst Bets: The one exception to the 5.26% edge rule is the five number combo 0, 00, 1, 2, and 3, which gives the house a 7.29% edge.

SLOTS

Best Bets: Machines with guaranteed high payoffs (e.g., "97.6% Payout!"). Also, popular machines and higher-denomination machines (e.g., $5 slots) are often set to pay out slightly better, since they cover their costs more quickly.

Worst Bets: All slots; the house edge can be 20% or more and is based on whatever the casino wants to make.

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Hard Drive

Race Secret

COOL RACER, FRIDAY, GOT SPEED?

GOT SPEED?

From: COOL RACER (fastguy@gotspeed.com)
To: JOE RACER (joeyr@racenut.com)

YO JOEY,

Bro, at the next club race, get ready to see how it's done. I got the new "SPEED SERIES" body from DEANS. That's right they're finally here!!!

Here's the view I'll be seeing during the race. You'll see it in the pits. Sorry dude, I didn't get a shot of your view, you know THE BACK OF MY TRUCK!

Gotta charge bro – Gotta make room on the shelf for this weekend's trophy.

Later,
Cool Racer



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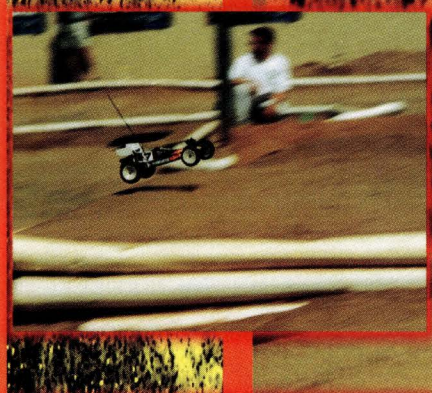
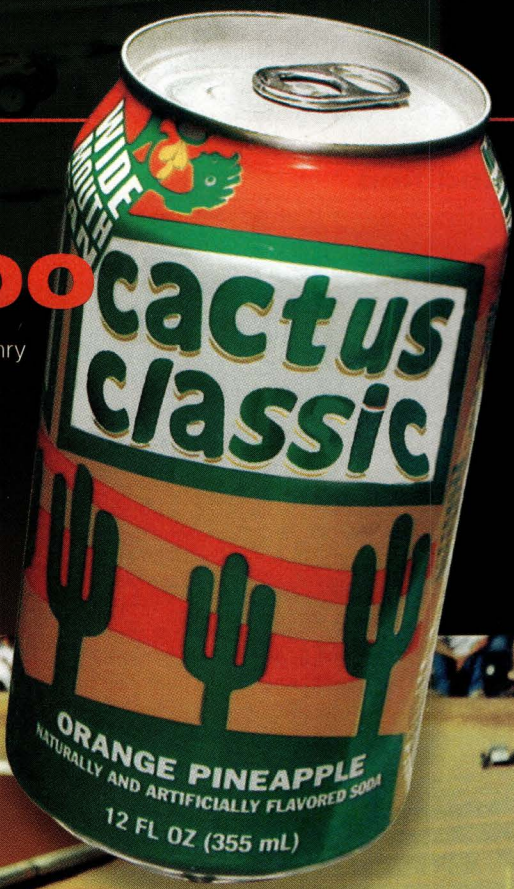
The Pro-Line 2000

by Mike Henry









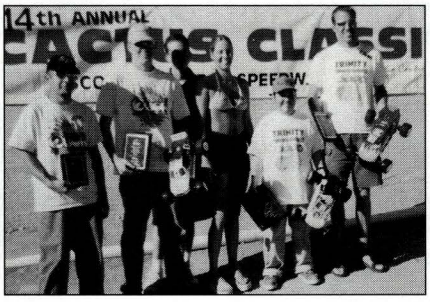
While most of the country is still thawing out from the long cold winter, Scottsdale Radio-Control Speedway, near Phoenix, AZ plays host to the annual Pro-Line Cactus Classic. There were more than 430 entries, including some of the fastest drivers in the world. The Team Losi racing machine came loaded with a seemingly endless list of world-class drivers: Kinwald, the Brothers Francis, and Brian Dunbar to name just a few. The Associated camp also came strapped, hoping for a good finish amongst a sea of Losi XXX products; Jim Gard, Scott Hughes, and Modified Truck TQ holder Jimmy Jacobson were a few of the Associated hot-shoes that made the trip to Scottsdale.

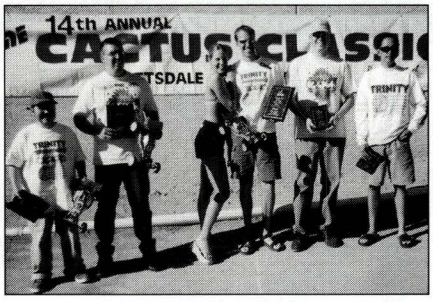
Team Losi was hoping to use the Cactus Classic to prove the potential of the XXX buggy and the fresh-from-the-mold XXX-T to the rest of the world. With a ton of factory drivers and a solid winning history on blue-groove tracks, how would Losi do against the venerable Associated vehicles? The dust would settle after three intense days of qualifying and racing.

We like cactus, we like Pro-Line, and we like racing. We like the Cactus Classic.

Modified







The Track

The track at SRS featured technical rhythm sections, a very long back straight, and a way-tough, off-camber, peri-style jump. There were a few excellent passing zones on the track, but racers seemed to favor the sharp 180-degree turn that led to the start/finish line. The surface was hard-packed and swept, and began to develop a nice blue-groove after the first day of racing. Traction was plentiful, but racers were still doing everything they could to try to take advantage of the conditions; traction compounds, as well as Simple Green, were used to help soften the rubber for better bite. A few racers were spotted "flashing" their rear tires. This was done by spinning the tire and soaking it with motor spray, then spinning the tire again and lighting it on fire. (Don't try this at home!!!) The jury is still out on how well this worked, but it sure looked cool! Whatever the top drivers did to find traction seemed to work, as witnessed by the bumper-dragging wheelies on the starting grid.

Starting Grid

Team Losi dominated the A-Mains in the Modified classes, taking 26 of the 30 spots on the starting grid. Jimmy Jacobson put his Associated T3 on the pole for the Modified Truck A-Main. Losi scored another victory in the "tire race." Almost all of the A-main drivers relied on Losi rubber to get them around the track. The X-2000 and T-2000 were the primary choice, but there were a few cars running on Taper Pins (all in the soft red compound). Kinwald brought some of his new "Inside Out" tires, but stuck with the standard-construction rollers for the Mains. With the concrete-like surface at SRS, it's safe to say racers were going through sets of rear tires like water.

Mains

All of the Modified A-Mains were run in triple A-main fashion, with points being accumulated after each of the three races. The 2 Expert Stock A-Mains were run in single main format.

4WD Modified

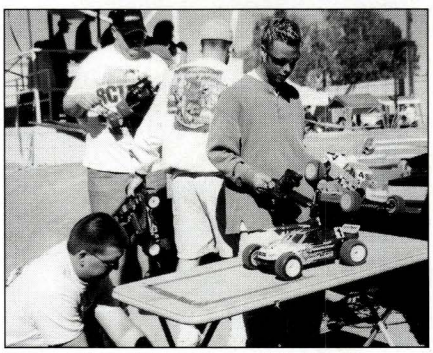
TQ-holder Matt Francis led most of the first main, with Cactus favorite Brain Kinwald stuck to his rear bumper the entire time. Kinwald drove a conservative race and waited for Francis to make a mistake. Francis put his XX-4 in a tube on the last turn after time expired, allowing Kinwald to motor home for the victory.

Ten XX-4s lined up for the second main with Matt Francis on the pole again. Jimmy Jacobson jumped out to an early lead, and held on for two laps. Mark Francis, playing catch-up from the 4th spot, broke after just two laps, leaving a bunch of parts dangling from the front end of his XX-4. Kinwald quickly reeled in Jacobson and led the final 12 laps, running a blistering 15 laps. With the win, Kinwald locked in first place and sat out the third Main.

With the winner already determined, the nine remaining drivers hoped to make the final main one to remember. The top three on the grid remained that way throughout the 4-minute race. TQ-holder Matt Francis lead the way, but Jimmy Jacobson was not to be counted out. He ripped off the fastest lap of the weekend, breaking into the 16-second zone on Lap 9. It looked like it was going to be a boat race of a win for Francis, until he rolled his car on the last lap. Jacobson grabbed the lead for two turns, but Francis stole it back at the last second, taking the victory.



When the commute sucks, take the bus to work.



Ya, it's legal. Trust me, it's legal.

2WD Modified

Nine Losi XXXs made up the 2WD Modified field, with Matt "TQ" Francis on the pole. Jimmy Jacobson was driving the lone Associated buggy, but made a strong showing qualifying 5th. Brian Kinwald jumped out to an early lead, and it looked as if he were in typical form. His hopes for a 3-way sweep came to a crashing halt when he broke after seven laps. Mark Francis inherited the lead and never looked back, taking the first of three mains.

The second main for the 2WD Modified drivers was fast and clean, with all of the top five drivers going 14 laps. The lead pack freight-trained around the track, with Matt Francis and Brian Kinwald matching each other lap for lap. Kinwald was glued to Francis' bumper for the entire four minutes, waiting for Matt to make to make a single mistake. But Francis didn't choke, and finished a mere one second ahead of Kinwald. The points were tallied, and it was still anyone's race after two mains.

The final Main of the 2WD class did not disappoint, as Matt Francis and Kinwald ran 1 and 2 from start to finish. Kinwald, like so many times before, was Francis' shadow for the entire race, waiting to capitalize on a mistake. Kinwald tried to stuff it in on Francis a few times, but Francis held him off, winning the main and the class.

Truck Modified

Jimmy Jacobson scored an early victory by putting his Team Associated T3 on the pole ahead of seven XXX-Ts. Jacobson drove a flawless race, leading from flag-to-flag, and running almost six seconds faster than his TQ time.

1/10 SCALE

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1/4 SCALE

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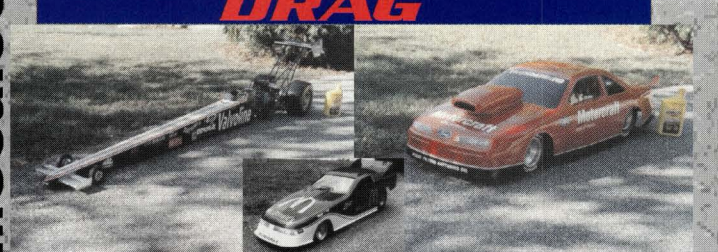
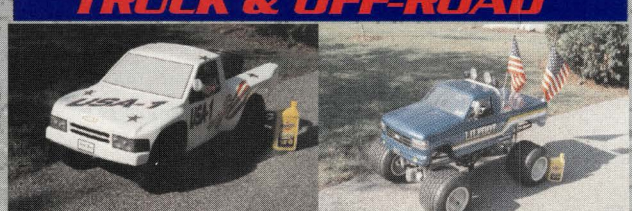


TRUCK & OFF-ROAD



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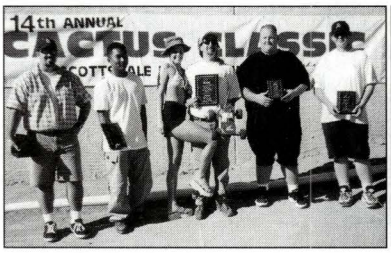
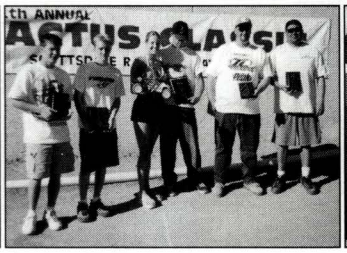
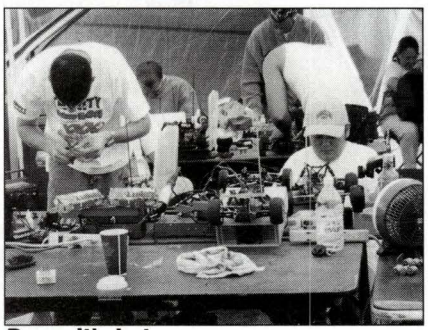
Stock







Damn it's hot.

Travis Amezcua and Brian Dunbar rounded out the top three.

Brian Kinwald jumped out to an early lead in the second Main and never looked back. Kinwald kicked it up a notch, knowing he would have to finish the last two races near the top if he wanted a chance at the title. Matt Francis also got back on track, holding down second position for the entire four minutes, and first-main winner, Jacobson, finishing third.

Jacobson looked like the man to beat entering the final main of the weekend. He started his T3 from the pole for the last time, and led the first two minutes of the race by a safe margin. By the 2:30 mark, things were starting to get interesting as Kinwald and Matt Francis started swapping second and third place. Francis stuffed his truck in a tube, and Kinwald was right there to collect second place. He attached his XXX-T to the rear of Jacobson's truck and patiently waited for a window. Kinwald got his wish on the last lap as Jacobson got a wee bit sideways on the back straight, and Brian snuck past for the lead. Kinwald held on to win the main and the class.

Expert Stock 2WD

Team Losi's Jimmy Babcock grabbed TQ with his factory-backed XXX, but all eyes were on Scottsdale local Ryan Maifield and his Reedy-powered Associated B3. It looked like Babcock was going to bring home the win, but Maifield began closing about two minutes into the race. His B3 was clicking off some very fast, low 18-second lap times when Babcock lost control of his XXX on the last lap. Maifield motored past him with 10 seconds remaining and held on for the victory. Chalk one up for the A-Team.

2WD Modified

F	Driver	Car	Tires (F/R)	Motor	ESC	Battery
1	Matt Francis (TQ)	Triple-X	Losi Losi	Trinity	LRP IPC V7	Trinity
2	Mark Francis	Triple-X	Losi Losi	Orion	Novak Cyclone	Orion
3	Brian Kinwald	Triple-X	Losi Losi	Trinity	Novak Cyclone	Trinity
4	Jimmy Jacobson	RC10B3	Losi Losi	Orion	Novak Cyclone	Orion
5	Billy Caley	Triple-X	Losi Losi	Trinity	Novak Cyclone	Trinity
6	Brian Dunbar	Triple-X	Losi Losi	GM	GM V12	GM
7	Brent Thielke	Triple-X	Losi Losi	Race Prep	LRP IPC V7	N/A
8	Jimmy Babcock	Triple-X	Losi Losi	Orion	LRP IPC V7	Orion
9	Jason Corl	Triple-X	Losi Losi	Trinity	LRP IPC V7	Trinity
10	Gabe Boudreau	Triple X	Losi Losi	Trinity	Novak Cyclone	Trinity

4WD Modified

F	Driver	Car	Tires (F/R)	Motor	ESC	Battery
1	Brian Kinwald	XX-4	Losi Losi	Trinity	Novak Cyclone	Trinity
2	Matt Francis (TQ)	XX-4	Losi Losi	Trinity	LRP IPC V7	Trinity
3	Jimmy Jacobson	XX-4	Losi Losi	Orion	Novak Cyclone	Orion
4	Mark Francis	XX4	Losi Losi	Orion	Novak Cyclone	Orion
5	Travis Amezcua	XX-4	Losi Losi	Orion	Novak Cyclone	Orion
6	Jason Corl	XX-4	Losi Losi	Trinity	LRP IPC V7	Trinity
7	Brent Thielke	XX-4	Losi Losi	Race Prep	LRP IPC V7	N/A
8	Brian Dunbar	XX-4	Losi Losi	GM	GM V12	GM
9	Sohrab Tavakoli	XX-4	Losi Losi	Orion	Novak Cyclone	Orion
10	Ryan Mayfield	XX4	N/A N/A	Reedy	N/A	N/A

Modified Truck

F	Driver	Car	Tires (F/R)	Motor	ESC	Battery
1	Brian Kinwald	Triple XT	Losi Losi	Trinty	Novak Cyclone	Trinity
2	Jimmy Jacobson (TQ)	RC10T3	Losi Losi	Orion	Novak Cyclone	Orion
3	Matt Francis	Triple XT	Losi Losi	Trinity	LRP IPC V7	Trinity
4	Travis Amezcua	Triple XT	Losi Losi	Orion	Novak Cyclone	Orion
5	Scott Hughes	RC10T3	Pro-Line	Proline	Reedy LRP IPC V7	Reedy
6	Gene Hickerson	Triple XT	Losi Losi	Peak	Tekin G10	Peak
7	Brian Dunbar	Triple XT	Losi Losi	GM	GM V12	GM
8	Jim Gard	RC10T3	Pro-Line/Losi	Reedy	Novak Cyclone	PM
9	Ryan Cavalieri	Triple XT	Losi Losi	Trinity	Novak Cyclone	Trinity
10	Mark Francis	Triple XT	Losi Losi	Orion	Novak Cyclone	Orion

Expert Stock Truck

Jerry Walter made it look easy, leading the entire race from start to finish. He was the only driver in the class to run 14 laps, just beating out his own TQ time. Joe Pillars and Kraig Krueger kept things interesting behind Walter. By the middle of the race, the field was spread out, and time became the only enemy of Walter and his XXX-T. He managed the lapped traffic well, and hung on for the win.

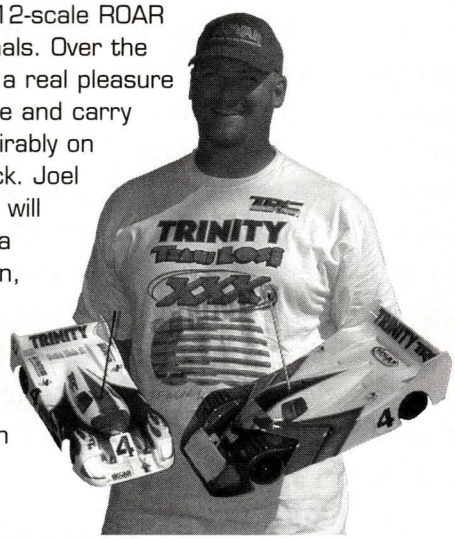
In The End

The Pro-Line Cactus Classic always brings huge game to the table, and this year was no exception. The racing was fast and clean, and everyone was smiling all weekend. Scott and the crew at SRS worked their asses off and ran a great program. There were no real on-track controversies, and the racers maintained even-tempers through 50+ heats of racing every day.

Brian Kinwald and Matt Francis drove like the champions they are, and Team Losi have enough trophies and accolades to keep their marketing department busy for the next six months. But there were countless other drivers that shined in their races; sportsman racers from all over the southwest make their way to SRS every March to see if they have what it takes to run with the heavy hitters of RC. That's what makes the Cactus special.

Magic Retires!!!

Joel "Magic" Johnson has decided to hang up his transmitter. After more than 25 years of racing and 2 IFMAR World Championships Joel has decided to retire from National and World competition. Joel still plans on doing some club racing from time to time near his home in San Jose, California but will avoid the big time races. Word from San Jose is that with Joel's demanding work schedule and family life he could not to commit to the large races as much as he'd like. Just last year Joel managed to win the 1/10- and 1/12-scale ROAR On-Road Nationals. Over the year's it's been a real pleasure seeing Joel race and carry himself so admirably on and off the track. Joel has always and will continue to be a great gentleman, sportsman, and champion. Thanks Joel! (Check out our Profile of Joel in Issue 5.3.)



NEWS FLASH

Just hours before sending this issue to print Team Losi let loose with some more information on their new Nitro truck. Although no photos are available yet, here's what we do know.

Drive Train: The XXX-NT will use a new transmission that has a super low 4.11:1 internal ratio. The low ratio allows the truck to use a small diameter spur gear mounted to a double disk slipper instead of the large spur gear used in the past. Inside the gear box is a large diameter diff.

Chassis: The XXX-NT will be built atop a 1/8" thick aluminum chassis. We're told there is some CNC work done on the chassis. That leads us to believe that the underside is completely countersunk.

Engine mounting: The engine blocks allow you to mount just about any type of .12 or .15 size engine. The aluminum manifold will work on pull-start and non pull-start engines. Linkage hardware will be included with the kit to allow the use of both barrel and slide carbs.

Suspension: In front the XXX-NT will use many of the same suspension components found on the Triple-X Truck. It's still a mystery what the rear suspension components look like.

As we stated in this month's Inside Line, as soon as more info or photos of the new truck become available we'll be sure to pass them along.

Congratulations Mark and Laurie Francis

Mark and his wife Laurie recently gave birth to their first child. Austin Francis was born 7lbs, 10ozs. and is already working on holding a transmitter. We were told about the new little boy by a very happy and excited Uncle Matt. Congratulations to the Mark and the entire Francis family.

Orion Gets Oily

Orion will soon be introducing their own line of silicone shock oil. The shock oils will be available in thirteen different weights to begin. The new oil will carry the "Sledge" name plate. What Sledge means we don't know, but it sounds cool. Look for these new oils on the market in the next couple of months.



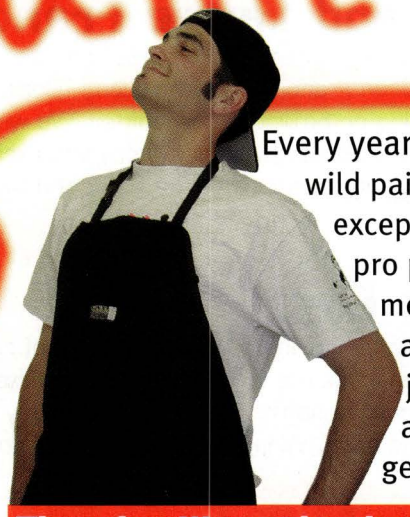
LRP Challenge

LRP recently hosted their third annual LRP Touring Car Masters in Heidelberg Germany. Along with 170 open class drivers there were 30 invite drivers from around the world. The race used a triple-A set up. In the first A Masami Hirosaka got into the lead early and held on. Barry Baker in third while Atsushi Hara finished in second. The second A was basically a scene from Groundhog Day. The order was the same but, this time Masami would take the overall win with two first place finishes. In the third A Teemu Leino challenged for the lead but Barry Baker managed to get bye in an aggressive move. Barry ended up with the Final A win followed by Hara, and Hubert Honigl of Austria. The podium was a Yokomo sweep with Masami in first, Barry in second and Atsushi in third.



Like Irving "Magic" Johnson, will Joel comeback from retirement or go race in Sweden?

Paint Like A Pro



Thunder Wessels shows you how to Paint Like A Pro...

Every year it seems like pro drivers come out with more and more wild paint jobs. Who paints those sweet looking bodies? With the exception of a few top drivers, most have their bodies painted pro painters who specialize in laying down some killer pigment. One top painter who's really made a name for himself as of late is Thunder Wessels. Thunder paints custom paint jobs for Team Orion, Team Orion drivers, and other drivers around the R/C world. For some insight into what it takes to get that pro look I sat down with Thunder to go over the basic ideas and techniques to achieve that pro look. Thunder is our first How-To Pro Interview subject. He'll shed some light on some simple and advanced painting techniques that will help you achieve that sought after pro look.

For somebody that wants to try to get that pro-racer look what are the golden rules for somebody that's already got airbrush, and knows how to use it?

Rule number one is to always use the best mask possible. Buy only high quality 3MM tape. Using the right tape is critical. Cheap tape will allow paint to bleed, leave residue, and won't cut very well when you go to cut out a graphic.

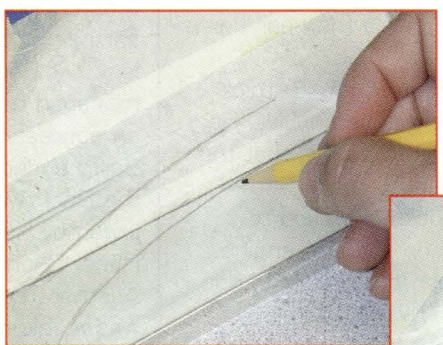
Rule number two is always use a brand new blade when you're cutting mask. After you get done with a paint job throw away the old blade, or put it in a separate box for other uses.

Rule number three is to put your designs on the sides of the body that are the easiest. Usually the hood, the roof, and the side panels. If you try to put an intricate design on an area of the body that has a lot of contours or molded in design you're just setting yourself up for failure.

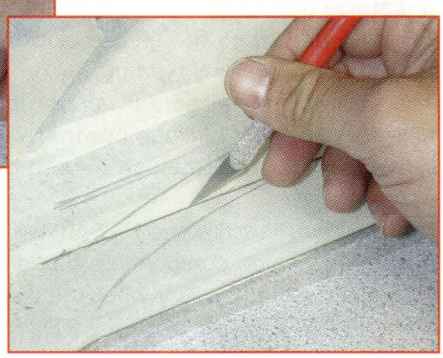
How do you mask your bodies?

The first thing I do is cover the area I'm going to be masking. I make sure that everything is tightly sealed with no wrinkles in the tape. Then I draw in the design with a pencil before a blade comes near the mask. Once I see that the design is exactly how I want it I'll go in with the X-acto knife and cut out the area that's going to be painted first. Once I peal

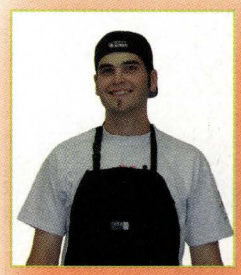




Above: Always have a fresh blade with every new painting job.
Left: Once you put the masking tape down draw your favorite graphic until it's just right.



Right: Once your graphic is set proceed to cutting out the mask leaving the area you want to paint first.



off the excess mask I then go ahead and do my fades if it's something like a flame or scallop.

How do you get a faded look around graphics like flames and scallops?

I use a dual stage airbrush. What that means is you push down for air to go through the brush and then you pull back on the trigger to allow more paint to flow through. I always use a medium tip and needle. To get that faded look I aim for the mask and just allow the over-spray to fade around the graphic. If you aim for the edge of the graphic the paint will look blotchy and won't look right. A slight overspray is all you need for a good looking effect.

What kind of paint do you use?

For the most part I use lacquer based acrylic paint. The lacquer base makes the paint adhere to Lexan really well.

Thick paint versus thin paint? When should you use a thinner or thicker paint?

There's a sweet spot that you'll find works good all the time. With Pactra paint it's 60% painter, 40% thinner. If paint is too thin it will be runny and won't look right. If the paint is too thick it will start to web when you spray.

Do you pick your colors first before you start painting or do you come up with color schemes as you're going along?

I get the best results when I plan ahead and figure out what colors I'll be using before I start painting. Sometimes I'll stumble across a situation where a different color might look better than what I originally chose. I think if you decide on color before you start painting you'll have a better idea in your head of what the end result will look like.

Do you pay attention to what colors you're laying down first?

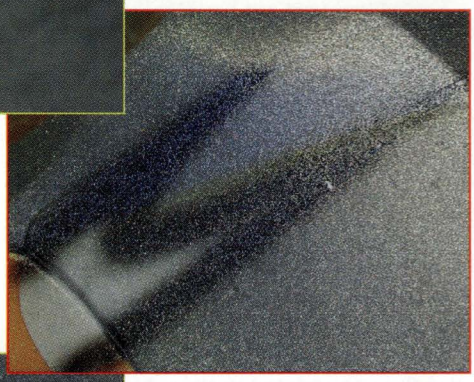
No, not really. Some painters do but I think that limits creativity. If I put down a florescent or candy color, something that might show other colors through, I'll back it up quite a bit before I put a darker color next to it. So if I'm painting florescent yellow I'll back it up with white, then silver and then maybe another coat of white to make sure that it's sealed really good.

Between each coat of paint how often do you allow the paint to dry?

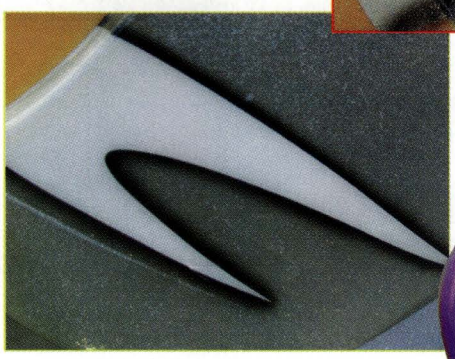
It depends on the paint and the conditions. If it's a hot day you'll need less time between coats than if it's cold or damp. Also it depends on the color. If I'm painting blue and I'm going to back it with silver I might not wait at all. The time it takes to change colors should be enough. Keep in mind though that I always apply thin coats. If I want real good cover-



Left: To do a simple fade first start with your masking exactly how you want it.



Right: Run your fade color over the mask. Aim for the mask not the body. The overspray from the paint line will give you the clean fade look you see below



Left: If you're going to paint a high contrast color like white next to the black fade lines shown you should run a damp terry cloth towel around the inside of the body to clean off any paint dust that's collected. Make sure the paint is completely dry before wiping down the inside of the body.

Right: Thunder keeps a bottle of lacquer thinner close by to clean his brushes between each color change.



Parma Faskolor paints offer a large variety of colors, many colors you can't easily find in lacquer base. Do keep in mind that these water-base acrylics take longer to dry between coats than do lacquer based acrylics.

If you race gas don't confuse your fuel bottle with your thinner bottle.

age I might apply two or three solid coats of paint before going on to another color. Typically fifteen minutes is a safe amount of time to wait between coats. If you have to peel mask off next to a color you just painted make sure that the paint is completely dry before you start peeling. If the paint is not completely dry it will tear the paint off of the body. If you have mask that runs off the body line, mask that you're going to cut off anyway, you can do a test peel to make sure the paint won't rip. If the paint is stretching when you start to peel then just leave it alone. If the mask is coming off nice and sharp you can go ahead and remove the mask using caution of course.

How do you know when paint is dry?

You can tell by just pushing on the paint with your finger nail. If you push in on the paint and your nail leaves a mark or if the paint still feels soft it's not dry yet.

How do you clean your brush between coats of paint?

I just use lacquer thinner in an airbrush bottle. I plug the thinner bottle to the airbrush and spray the thinner through the brush. There's a technique called back flushing that is very effective. To back flush you place your finger over the tip and press the airbrush trigger so that air starts to flow. Since the air can't escape through the tip it pushes paint into the thinner bottle. I do this a couple of times between colors and it seems to do a very good job of keeping the airbrush clean.

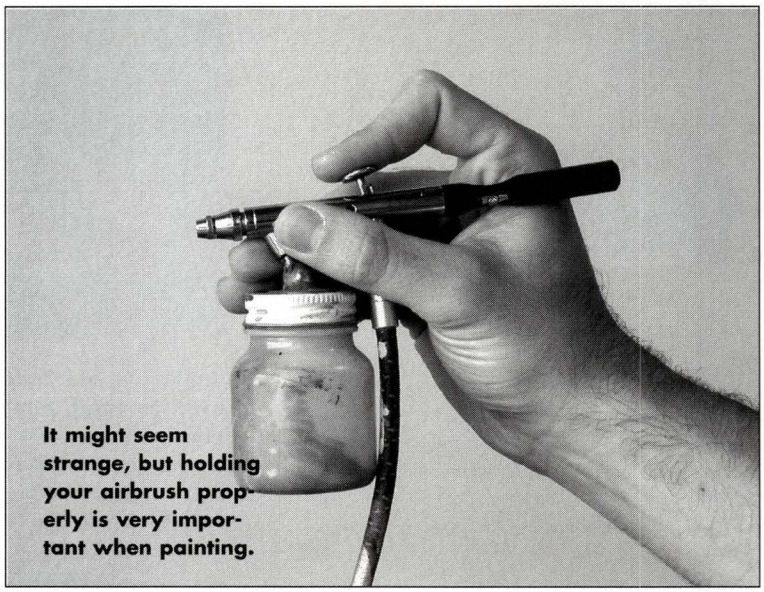
How do you fix your mistakes?

If it's a small mistake I use denatured alcohol to rub off the blem paint. Denatured alcohol removes most R/C paint real well and doesn't harm the Lexan. If I've made a big mistake I'll try to find a similar color to paint the section that's messed up so that it's not as noticeable.

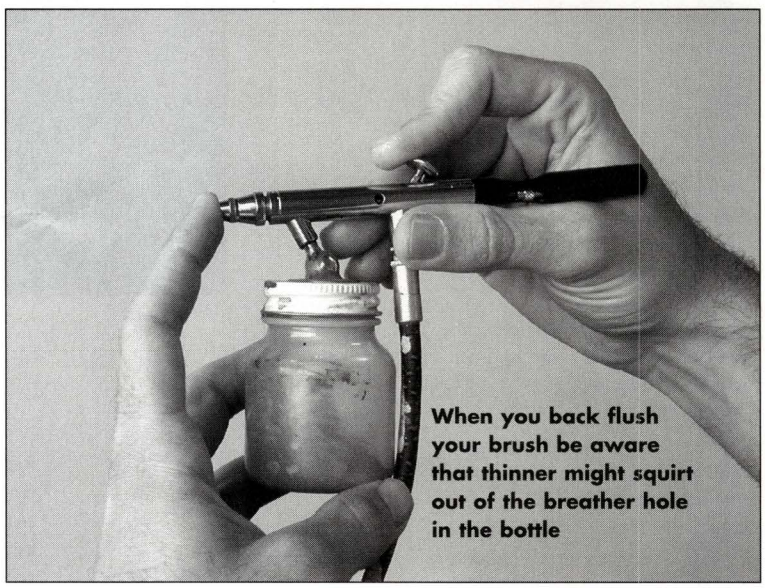
Are there any rules to limiting the number of different colors on a body?

Not really, just keep it simple. Too many colors will make the car look like a clown car.

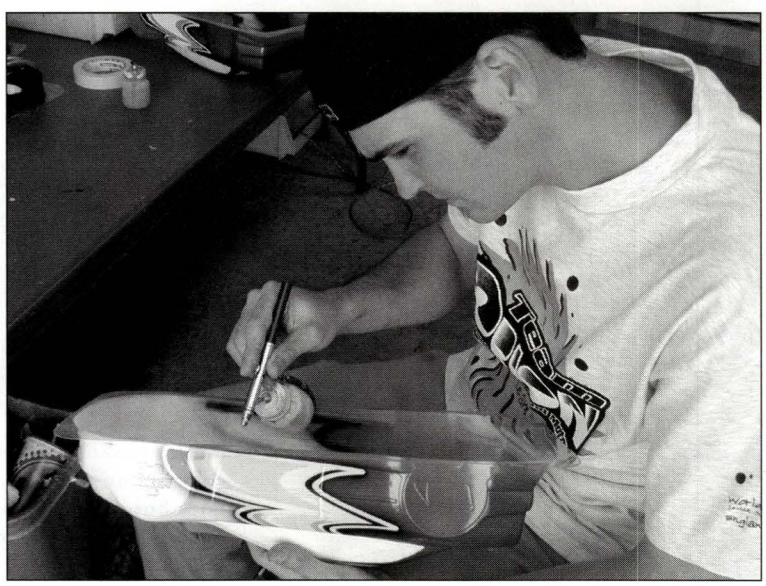
We're not promising that all of your bodies will suddenly look like works of art. But now you have some more ammo in the fight for a good looking paint job. Good luck.

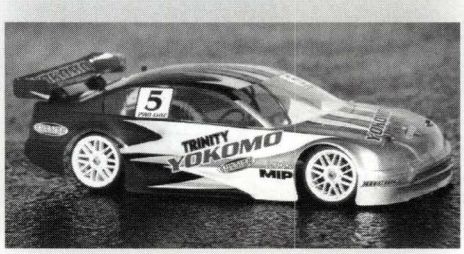


It might seem strange, but holding your airbrush properly is very important when painting.



When you back flush your brush be aware that thinner might squirt out of the breather hole in the bottle





INTEGY MSR Progressive Spring Set

Spring To It!

Racers are always looking for that little something extra. Something that will give them that slight edge over the competition. That little edge might be the difference between an A-Main win and a 11th place qualification spot. Integy Technologies has built a reputation on innovative products. Their newest offering to the racing market is the MSR Progressive Spring Set. Although the concept isn't new, this spring set is the first of its kind for the touring car market.



FEATURES

What it is

The MSR Progressive Spring set is a set of eighteen mini springs in nine different tensions. The mini spring stack on top of each other so that they form a two-piece spring that is the same length has most standard touring car springs. A small plastic collar sits between the two different springs so that the final spring works properly on a consistent basis.

Purpose

The purpose behind this product is to give cars the feel of two different spring types at once. Huh? Lets say you're on a bumpy track, but you want to minimize body roll like a stiff spring would. Well with the Progressive Spring set you could run a medium spring to help absorb the bumps and pair that medium spring with a stiff spring to help on chassis roll. Basically you're trying to split the difference when it comes to achieving two different desired effects.

Pricing and Availability

Considering that you get what equates to nine complete springs the price isn't bad. One set of springs will set you back $19.95. In order to set up your TC with every possible spring combination you would need two sets. Integy products are available in most hobby shops and can be ordered directly through Integy's web site.

SETUP AND TESTING

To test the spring set I took out the HPI RS4 Sport 2 that we had just gotten in for testing. With two sets of springs in hand I started by just feeling different combinations of MSR springs until I found a combination that felt like the stock silver springs that came with the car. On the package that comes with the spring set there's a chart that tells you the range from hard to soft and where each spring color falls. Unfortunately this chart gives you no hard numbers. Spring tension rates in lbs per inch would have been nice. That way I could do a comparison to springs that I was replacing. After plenty of spring squeezing I settled on the #2 soft springs combined with the #6 medium springs. This felt as close to the stock silver HPI springs as I could find. With the new combination on all four corners I set out. I ran the car with the progressives and then swapped them with the stock silver springs. Because I was simply going by feel, how close my combination was to the stock springs is pretty unscientific. With that in mind the MSR springs felt pretty good. The car seemed to handle turns as well with the MSR springs as it did with the stock springs. The car also seemed to soak up a couple of rough spots without losing traction.

After a couple of runs with the same combination I started to experiment. After all the different combinations I tried, about eight combinations in total, I kept coming back to the 2/6 combo all the way around.

THE SPECIFICS

Part #T3847 MSR Progressive Spring Set
MSRP $19.95
Manufactured in China.

ASSEMBLY REQUIRED:
Simply snap springs into collars and install completed spring onto car.

CONCLUSION

If you've got the time patience to test different combinations of spring rates with the MSR springs I think you'll be happy with the result. The springs do exhibit the dual-personality traits they claim. The collars that go between each spring fit nicely. If you're not into spending lots of time testing, I wouldn't run out and buy these springs (That is unless you have a buddy that will do the testing for you.). If you don't mind spending the time to see what works for you these springs would be nice to have in your artillery err, pit box.

VITAL INFO

Integy Technologies
1140 Centre Dr #E
City of Industry, CA 91789
www.integy.com

HITS

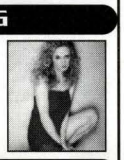
- Splits the difference when looking for that perfect spring.
- Reasonable price.
- Look trick.

MISSES

- No advice on different combinations included with the set.
- Not sold separately.

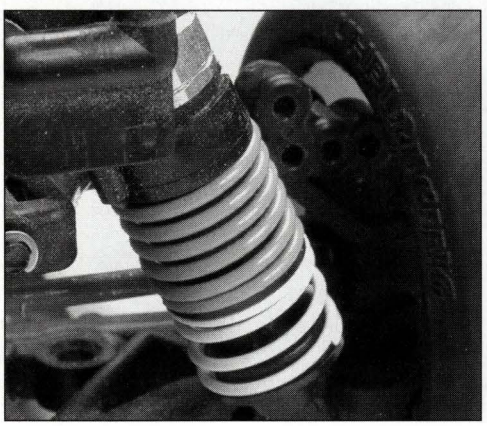
RATING

8 Celebrity Equivalent: Heather Graham



THE LAST WORD

If you've got the time to test, give these springs a try. You'll be happy with the wide number of combinations you can come up with.



The dual color springs will turn heads once their on your car.

R/C Oils: Lubrication, and Damping

by Mike Velez



You remember your first R/C car kit. You forked over the cash at the local hobby shop, got in the car, took the shrink-wrap off of the box, and peered inside only to find hundreds of little pieces packaged in a couple of dozen different bags. Once you got home, you grabbed your tools and started to slap that bad boy together. When you got to the car's first bushing or bearing you noticed in the instruction manual a little guy point to the bushing or bearing with the words "Oil Here" just above. You knew that putting oil on a particular piece would help things spin or move more freely, but did you know why? How about when you built your first set of oil-filled shocks? You used the oil that came with the kit, but why did the manufacturer instruct you to use oil instead of water from the tap? How about if you're a hardcore racer who has a dozen different oils in your toolbox, each with a specific purpose? Do you know why you have different oils for different purposes? In this article I'm going to share with you everything you've ever needed to know about the different oils and lubricants we use in the world of R/C.

In R/C, oil is used for two distinct purposes. The first is as a lubricant. The basic functions of a lubricant are friction reduction, heat reduction, and suspension of contaminants in moving parts. The second purpose of oil in R/C is as a resisting force to provide damping in R/C shock bodies.

Lubrication

The foremost function of oil as a lubricant is as a friction reducer. Friction is reduced by the thin film of lubricant placed between surfaces that are moving with respect to each other. The lubricant prevents the surfaces from coming into contact and, subsequently, causing surface damage. This type of lubrication is called hydrodynamic lubrication. The best example of this would be found with a simple ball bearing. When you lubricate a bearing with the right type of oil, the oil will surround each tiny ball inside the bearing and keep a thin film between each ball bearing and the races that support the bearings inside the balls. Failure to lubricate a bearing will cause the balls and races inside the bearing to ride directly on each other. After just a couple of runs in your car, a dry bearing can be ruined and will always have a gritty, resistant roll.

The lubricant also acts as a heat reducer. The best example of this theory in action would be a nitro engine. If you were to run two fuels through the same engine – one fuel with 5% lubricant and the other with 12% lubricant – with all other variables being the same, you will see a drastic difference in operating temperature.

The lubricant in a gas engine illustrates perfectly the third basic function of oil, as a suspender of contaminants. When fuel goes into an engine, the fuel is usually a clear liquid with some type of a color tint. After an engine is run, the oil that drips out of the exhaust pipe is brown and dirty looking. The residue from the alcohol, nitro, and oil that was exploded inside the engine is now suspended in the oil that drips out of the exhaust pipe. The oil actually keeps the engine clean; otherwise you'd have to physically tear down your engine to clean it out between each run.

Lubrication in Use

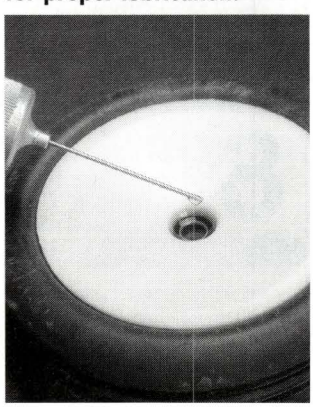
There are basically three areas on any R/C car that require lubrication: bearings, bushings, and gears.

Bearings

For optimum performance, use a thin oil designed for bearings. Thicker oil, oil with a higher viscosity,* has more fluid friction.* In order to understand fluid friction, think of the oil between two surfaces as being divided into layers. The oil that's closest to the two surfaces, sticks to those surfaces. The oil in between actually does all the work. The thicker that oil is in between, the more resistance it possesses. A thin oil will allow bearings to spin more freely. Thinner oil will also work its way into tiny spaces on the internal bearing surfaces. Microscopic gaps and cracks develop over time. Because thin oil offers least amount of fluid friction, it also wears off quicker. As speed and load on a bearing change, the amount of oil expelled from a bearing changes as well. During the course of a four-minute race, the amount of oil protecting a wheel bearing might be just 25% of the amount of oil with which you started the race. That's why it's so important to frequently clean and re-lube your bearings.

- For wheel bearings and other bearings that you can easily clean and re-lube, use a thin oil.
- For bearings inside of a transmission or on bearings that aren't as easily accessible, use a slightly thicker oil that won't need to be replaced or reapplied as often.
- If you're running a gas car in an hour-long race, it might be wise to oil the wheel bearings with a slightly thicker oil so that lubrication doesn't break down before the first ten minutes.
- On electric motor bearings, use a slightly thicker oil than you normally would for wheel bearings. Because of the tremendous high speed, heat, and load, oil is expelled from motor bearings much quicker than from wheel bearings.

Just one or two drops of oil per bearing are necessary for proper lubrication.



Petroleum Vs. Synthetic

Most of the oils used for lubrication in R/C are blends of different compounds. Oils can be lumped into two basic categories: Petroleum- or Synthetic-based. Petroleum-based oils are derived from crude oil that's pumped from miles underground. Petroleum-based oils are much less expensive than synthetic oils. For this reason, car kits will come with a bottle of brown-colored oil for building shocks, oiling bushings, and lubricating certain gear assemblies. Be cautious when using petroleum based oils on some plastics. The plastic might react adversely to the petroleum base. You can typically spot a petroleum based oil by its strong odor as opposed to synthetics that are usually odorless.

Synthetic oils, on the other hand, are a combination of different compounds, chemicals and chemical reactions. In general, synthetic oils can be used over a wider temperature range than petroleum-based oils in the same thickness range. Synthetic oils perform well in high-heat environment since they don't keep their viscosity better in high heat situations. Silicone oil, which is just one type of a synthetic, is widely used as shock oil to damp suspension movement. Silicone oil has a very high VI*, meaning there is little change in viscosity through a broad temperature range. On the other hand, silicone oil isn't the best lubricant for metal-to-metal surfaces. Silicone oil is made from silica which is basically sand. You can definitely feel the difference between one ball differential assembled with silicone diff lube versus a diff assembled with a non-silicone lube. The silicone lube diff will feel and sound a little gritty after a while.

Bushings

Compared to a bearing, lubricating a bushing is quite a bit different. A bearing has the luxury of acting as a reservoir that keeps oil inside the bearing itself and constantly keeps lubricating the moving surfaces inside the bearing. While in use, a bushing will expel oil quicker than a bearing will since there's not shield or race keeping the oil between the bushing and its opposing surface.

• For bushings use a thick, fluid lubricant as it will adhere better to the bushings than a thin lube. A lubricant that is too thin will quickly wear off leaving you with no lubrication at all.

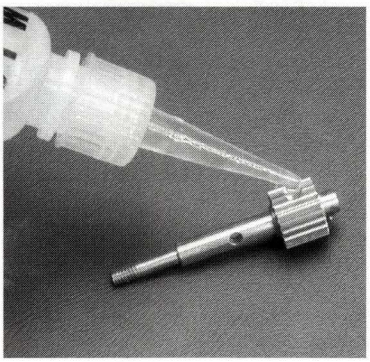


After lubricating a bushing, wipe off the excess oil that might build up.

Gears

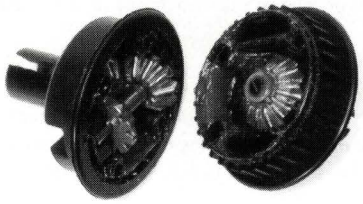
Oil can be used on gears for two completely different purposes. The first would be as a lubricant. The only time you'd want to lubricate a gear system would be in an enclosed case, like an off-road transmission. You shouldn't lubricate gears that are exposed because dirt and dust will be attracted to the lube. And even inside of a gear box, the addition of lubricant sometimes adds rolling resistance. If you want to cut down on gear noise inside your gear box, try just one drop of Losi clear Hydra Fluid on the gears inside your transmission. The lubricant will work its way around to all of the gears and help quiet things down.

The other purpose of oiling gears is actually to slow down the differential action in a geared diff. In this capacity, the lube works as a damping agent that slows down the gears so that the car's differential will exhibit different drive characteristics. Owners of 1/8-scale off-road buggies often use different oil weights to change the turning characteristics of their cars.



One drop of Hydra Fluid or other very thick silicone oil is enough to coat a traditional three-gear transmission.

Changing the oil weight in a geared diff can have a tremendous effect on the vehicle's handling characteristics.



Oily Definitions

from oilanalysis.com

Abrasion - A general wearing away of a surface by constant scratching, usually due to the presence of foreign matter such as dirt, grit, or metallic particles in the lubricant. It may also cause a break down of the material (such as the tooth surfaces of gears). Lack of proper lubrication may result in abrasion.

Density - The mass of a unit volume of a substance. Its numerical value varies with the units used.

Dyne - A centimeter-gram-second unit of force equal to the force required to accelerate a 1 gram mass one centimeter per second.

Fluid Friction - Friction due to the viscosity of fluids.

Friction - The resisting force encountered a the common boundary between two bodies when, under the action of an external force, one body, moves or tends to move relative to the surface of the other.

Kinematic viscosity - The time required for a fixed amount of an oil to flow through a capillary tube under the force of gravity. The unit of kinematic viscosity is the stoke or centistoke (1/100 of a stoke). Kinematic viscosity may be defined as a quotient of the absolute viscosity in centipoise divided by the specific gravity of a fluid, both at the same temperature.

Lubricant - Any substance interposed between two surfaces in relative motion for the purpose of reducing the friction and/or the wear between them.

Oil - a greasy, unctuous liquid of vegetable, animal, mineral or synthetic origin.

Viscosity - Measurement of a fluid's resistance to flow. The common metric unit of absolute viscosity is the poise, which is defined as the force in dynes required to move a surface one square centimeter in area past a parallel surface at a speed of one centimeter per second, with the surfaces separated by a fluid film one centimeter thick.

Viscosity index (VI) - A commonly used measure of a fluid's change of viscosity with temperature. The higher the viscosity index, the smaller the relative change in viscosity with temperature.

Damping

If you were to take your off-road buggy and drain all of the oil out of the shocks, first you'd have a mess on your hands, second your car would bounce horribly all over the track. Why, you ask? That's because when the springs on your car compress, they quickly release stored energy from the compression and rebound causing your car to constantly bounce every time the car hits a bump, changes direction, or changes speed. To combat this effect, R/C cars, and full size cars for that matter, use a damper. R/C car dampers are the oil-filled shocks that surround your car. Inside of a shock is a piston and damping fluid. By changing the size of the piston and/or the viscosity of the damping fluid in the shock, we can drastically change how the damper handles the stored and expressed energy inside of a shock.

Viscosity

When a fluid, like shock oil, is subjected to external forces, like a shock piston, the oil resists flow due to internal friction. Viscosity is a measure of this internal friction. A more viscous fluid is thicker than a less viscous fluid. Therefore, a more viscous shock oil is more resistant to the movement of a shock piston than a less viscous shock oil.

What does this mean in R/C car terms? Oil that is labeled 80 weight (wt) is thicker and more viscous than 15wt oil, which is much thinner and less viscous. You might be wondering where the weight comes from. The actual scientific unit of measure for shock oil or any other damping fluid for that matter is the absolute viscosity. In order to find the absolute viscosity of a shock oil, the maker must first know the Kinematic Viscosity. That's measured in centistokes* by how quickly a liquid flows over a certain distance with the simple pull of gravity. Once a number is established for the Kinematic Viscosity, the Kinematic Viscosity in centistokes is then multiplied by the fluid's density. The density is a simple measurement of volume and weight. Once the density and KV is multiplied, the absolute viscosity is apparent. This number is described in units called poise or centipoise.

Manufacturers like Team Losi use a machine called a Viscometer. A Viscometer calculates the viscosity in terms of poise by spinning an instrument with a given amount of weight and surface area. The viscometer then calculates the viscosity through a number of different calculations. For complete accuracy, oil is heated and cooled during testing. Once a number for the absolute viscosity is established, it's then converted to weight using standards set by the Society of Automotive Engineers (SAE). SAE weight is the accepted standard in R/C circles. Although, SAE weights are typically used for determining petroleum-based lubricating oil weight, we're stuck with it. As far as we know, Team Losi is the only company that doesn't use SAE weights. Instead they've developed their own weight system. So 45wt Losi oil may not be the same as 45wt oil from Associated or Trinity. If you've ever picked up a bottle of shock oil from Japan or Europe you'll notice that the manufacturers use a centistokes measurement, rather than the SAE weight system.

So what effect does viscosity have on your car?

Basically damping and changing the damping by changing shock oil will effect how your car handles bumps, corners, and jumps. Even the slightest change in oil weight can be noticed by a keen driver. For starters always consult your car's instruction manual or one of our Hook-Ups. When you change shock oil you're effecting a vehicles static damping. This affects how a suspension system reacts when it is slow moving, like cornering. In general the following statements are true.

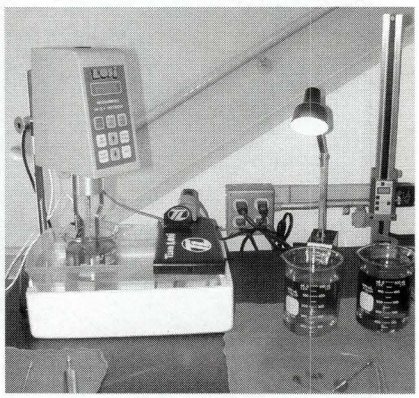
For off-road: You should try a lighter oil if you car or truck feels as if the suspension isn't reacting to changes in the road surface. If your vehicle doesn't soak up ruts and rough sections try a slightly lighter, or less viscous oil. If your vehicle feels too quick to react or bouncy, try a thicker, more viscous oil.

For On-Road: Using a lighter oil will allow the shock to absorb and rebound faster. On a rough or bumpy track a lighter oil will give you increased control, but at the expense of chassis roll that might slow you down. If the track is smooth go with a heavier oil. Heavier oil will reduce body roll and increase traction on a smooth surface.

These are just general statements. Consult our Hook-Ups or your car's manual to see what oil weight you should use in your shocks.

Viva La Lubrication!

Hopefully now you have a better understanding as to why you're using a particular weight or type oil for one use and not another. When buying, oil beware of oil with no label stating its intended purpose. Using the wrong oil in the wrong application can cause some expensive damage. You now know when to use thick oil, thin oil, synthetic, or petroleum.

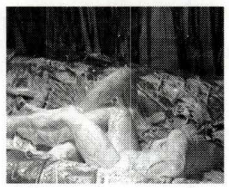




A viscometer gives an extremely accurate measurement for oil viscosity. Even a one degree change in temperature can be picked up by the viscometer.

Two of our favorite oily things:

Hot Oil Wrestling: Before we go to far here let me re-phrase that. That should read "Hot Female Oil Wrestling." Hot oil, mud, Jello™ no matter what gooey mess you throw into the mix, when you hear the words "Female," "_____," and "Wrestling" you've got high-quality family/bachelor entertainment. Don't let anyone tell you different.



Fried Foods: If you've got any meat on your bones, I'll venture to guess you love oily, fried foods. Who doesn't? Anything tastes good deep fried. Don't like vegetables? Deep fry them, dip them in ranch dressing, and you've got a balanced meal. The best fried food of all; fried cheese, basically fat fried in fat. My arteries tighten just thinking about it.



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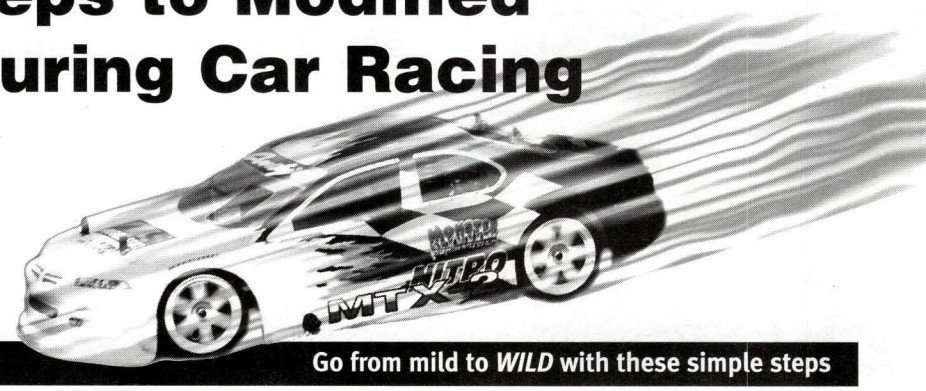
7 Steps to Modified Touring Car Racing



Go from mild to *WILD* with these simple steps

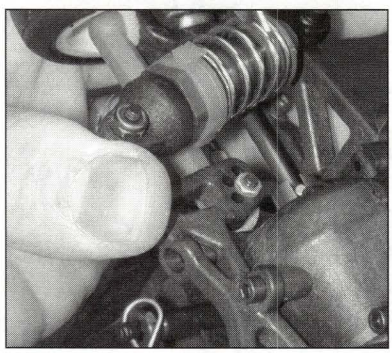
You've been in the sedan racing world for a while now. You've moved up from novice and you've had your share of 1st place finishes. Now you are looking to the next challenge. What should you do? Try Modified Touring Car racing! Modified TC class is where the elite come to play. In this class the super horsepower that these cars possess is matched only by the precision driving that it takes to drive them.

So you think you're ready? You want to learn how to be one of the fastest of the fast? If so, follow Xtreme R/C Cars magazine's seven steps to get you and your car ready for the modified class:

1 Rebuild and Be Ready

You should already know by now that rebuilding your car should be mandatory at least once a month if you race. By doing so you can check over every part and readjust or replace worn or broken parts before they cause disaster. When running mod motors, the whole car is subjected to stronger forces, especially the drive train area. Trust me, you do NOT want a drive train failure when running a mod motor. Imagine this for a minute: drive belt breaks, rear end spins out, car goes into wall, parts fly. Get the picture? Good. Make sure your car is in great condition before switching to mod.

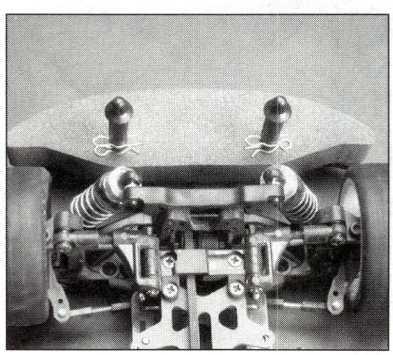
If there is anything you suspect might fail, replace or upgrade it (See "Up to Upgrade," below). For example, if you have a bent tie rod, it would be a good idea to replace it. If a bearing feels gritty, replace it with a silky smooth new one. Full sized motor sports teams don't even think of putting their car on the starting line if it has a worn or failing part. It could be the difference between a race win and an early departure from the race track.



2 No Bumper(less) Cars!

It doesn't matter how good a driver you are; front bumpers are a must, especially in the mod class. A good front bumper can absorb a good amount of punishment, but make sure you get the more flexible (with cutouts or holes, not a solid piece) kind if it is available for your car. The solid bumpers are indeed stronger, but in a heavy impact that solid bum-per will transfer more energy to your chassis.

If a solid bumper is the only choice, drill a few strategically placed holes into the bumper so that it will collapse and dissipate the impact energy. Don't be too frisky about weight concerns either. A front bumper doesn't weigh much, and the more powerful modified motor will easily compensate for that extra gram or so that a bumper weighs.



R/C boats use a type of carb that's either all on or all off.

3 A Specialized Set of Shoes

After your car is fresh and ready, it's time to upgrade to a better set of shoes. If you run with standard width tires in stock class, you're close. If you run Super Narrows in stock, save them for your stock motors. Modified motors have massive amounts of torque. Even the mild 17+ turn motors can overpower a Super Narrow width tires grip on the earth. When stepping up to the modified class, a set of standard width tires is a good choice. Standard width tires offer more surface area and more grip for the more powerful mod motors.



Before you run out and buy just any set, go to your regular race track and check out what compounds the fast mod drivers are using. Since you are just starting in mod, stay away from the ultra soft compounds for now and start with a medium-firm compound. These tires last longer and are perfect to run while you are learning the modified driving style (more on this below). Standard width radials are always a safe bet, since they last long and work on just about any surface imaginable.

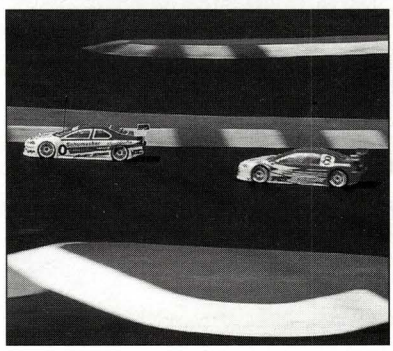
4 Power Up

Now the fun part - selecting a motor! Finding the right motor for your sedan will take some trial and error. For starters try a low wind motor, something between and a 10 and 14 turn motor will put you in the right range. Avoid single and double wind motors. These motors will have too much pop and may make putting the power to the ground difficult. Try a triple to quint wind. These higher wind motors will have a smoother power band. See if you can hook up with a couple of buddies and give their motors a try. See what you like. The lower the turns the faster the motor will be. If you have the batteries, you might try a very low wind like an 8 or 9-turn. But, a super hot motor may not be your best choice. It might be too much power for you to handle. Be patient, you'll find a wind you like.



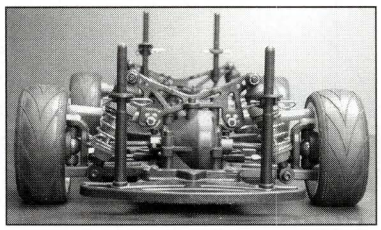
5 Pushing Forward is Good

If your driving style caters to 4 wheel drifts or freewheeling in neutral to slow down, get ready for a change. I've seen a lot of mod drivers come to the end of the straightaway and whip the rear end 180 degrees to make the turn, then peel out with all four wheels to exit the turn. Although this looks cool and wows the crowd, the end result is actually more strain on your car and slower lap times. Don't believe me? Watch the pro drivers the next time you're at a race track. I guarantee that you'll never hear tire squeal, never see 180 turns, and their lap times will be super fast. What's the key? Brakes! The pros know the common but misunderstood phrase, "go faster by slowing down." The pros (as well as any seasoned mod driver) drive their car more like real motor sports drivers do. They accelerate out of turns, and always brake when slowing down. Braking keeps the tires planted on the ground, ready to pull out of a turn. Remember, every time your tires loose their grip on the surface, you add to your lap time. The next time you're practicing with a mod motor, spend half of that time using the brakes. Find braking points around the track and practice them. Your braking point should be as close to the turn as possible without skidding or stopping too early. Correct braking is a skill you develop over time, so be patient. Keep in mind that it is better to brake too early than too late!



PC/RC used to make an on-board fuel mixer that would make carb adjustments on the fly.

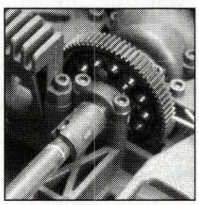
6 Tweaking it Flat

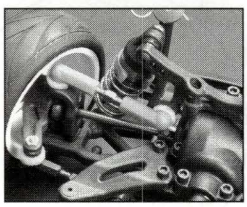


Tweaking your chassis is another trick that shows more results when running a mod motor. Tweaking is where you setup your chassis so that it puts even pressure on all four wheels. This makes your car perfectly balanced and it will perform better on the track (For more info on tweaking, see Xtreme R/C Cars Magazine Issue 3.5).

What happens when your car is out of tweak? A lot of things can happen, especially with a mod motor. Sometimes your car will grip around a right hander but spin out on a left. Sometimes your car will swerve to one side when you gun the trigger to full. Sometimes your car will steer left slightly at low speed, then steer right at high speed. You never know what will happen if your car is out of tweak. The bottom line is that your car will be unpredictable and might do something you don't want it to do at any given time.

7 Useful Options





Upgrades in mod class are always welcome. They not only beef up your ride for mod action, but you can also rest assured that when you bolt in that stock motor, you'll worry less about breaking that part. Before you go out and order so many hop-ups that your car will look like a moving showroom of aftermarket parts, start smart. Think function before fashion. For example, if you have stock plastic shocks, a good option might be to upgrade to smoother and tuneable aluminum ones. If you need quicker steering response to match the power of your mod car, look into purchasing a high speed servo. If you are running fine toothed 64 pitch gears, a set of beefier and more sturdy 48 pitch gears should be considered.

Only upgrade if it is to further add to the performance of your vehicle. As far as the flashy aluminum or graphite stuff, determine if it is really necessary. For example, if you keep bending tie rods, consider upgrading to a set of titanium pieces. Or, try graphite shock towers if the stock plastic ones bend too easily. Smart upgrades not only improve performance but also helps in keeping more $$$ in your wallet!

There you go. You're ready to give mod a shot. Good luck, don't break too many parts and have a good time.

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Class 1 _____ ***Class 2*** _____ ***Class 3*** _____

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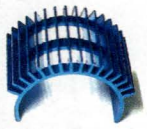

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+1 TOE-IN REAR HUB CARRIER FOR YOKOMO

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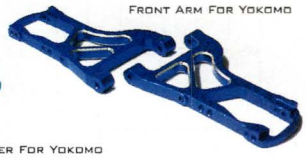

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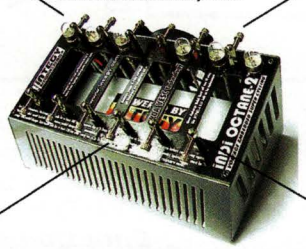

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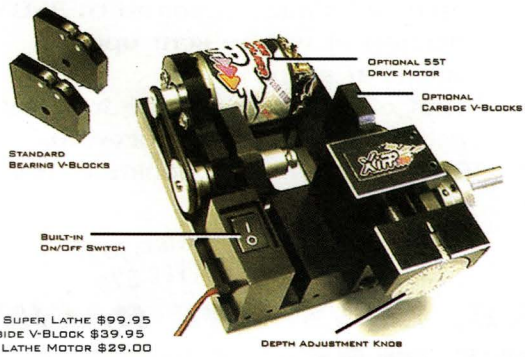

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All pre-entries receive a T-Shirt.
Deadline for Entry: June 5, 2000
Entry Fee: $45 per class, $35 for each additional class
Late fee: $20
Information package will be sent upon receipt of entry form.
For more information call (816) 358-0238 from 12 noon-9pm M-F.

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☐1/8 STADIUM TRUCK:	FREQUENCY 1.___	2.___	3.___	4.___	5.___
☐1/10 BUGGY:	FREQUENCY 1.___	2.___	3.___	4.___	5.___
☐1/10 STADIUM TRUCK:	FREQUENCY 1.___	2.___	3.___	4.___	5.___

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Available at track
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Spokane Washington • July 21st - 23rd 2000

Entry Fee: $65 1st class, $45ea additional
Each class includes 1 handout motor.
Additional motors available at $15ea (limit 2 per class)
First entry includes 1 T-shirt & Dinner on the 20th

For More Info call: Spokane Radio Controlled Car Club
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Info packet will be sent upon receipt of entry.
Proof of age required for Jr. Class
Location: Hank Perry Raceway,
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REGISTRATION DEADLINE: JUNE 21, 2000
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CLASS(ES)	FREQ 1	FREQ 2	FREQ 3
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❑ Truck St	____	____	____
❑ Masters Trk St	____	____	____
❑ Jr 2WD St	____	____	____
❑ 4WD st	____	____	____

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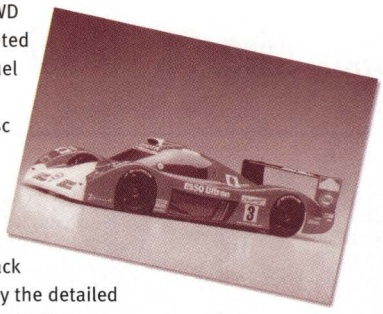
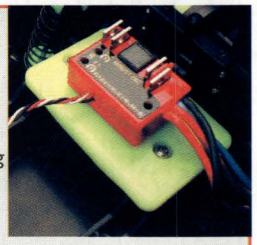
Kyosho F-10 Toyota TS-0200 GT1

The world-famous ESSO Ultron Toyota GT1 racer is now available from Kyosho! The TS-0200 GT1 is based on Kyosho's F-10 series chassis, which features a 3-belt 4WD drive train, midship-mounted GS-11R engine, lowered fuel tank, long travel double wishbone suspension, disc brakes, and inner-spring oil-filled dampers at all four corners. The chassis also has adjustable camber, caster, and toe for track setup. All of this topped by the detailed replica of Toyota's GT1 monster!



Part#: KYOC0332; price: $479.99.

RPM Molded Goodies



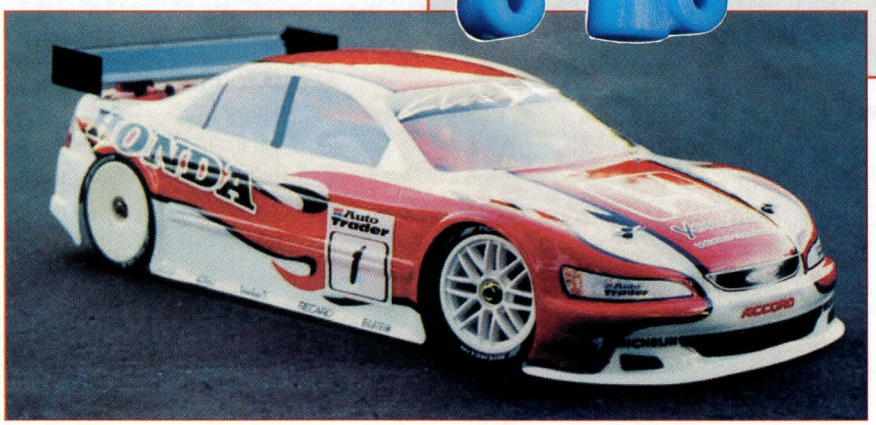
For Traxxas Stampede owners, there is the new Stampede ESC mount. This mount bolts up in place of the kit mechanical speed controller and provides ample space for mounting an ESC. It is available in either black, neon blue, or neon yellow. Also new are rear toe blocks for B3/T3. This is RPM's answer to all of the requests they've had to come up with a stronger, more bulletproof piece for the popular B3/T3 series of vehicles. The rear toe blocks are beefier than the stock pieces, have the same specs (3 degrees of toe-in and 3 degrees of anti-squat) as the factory pieces, and include four stainless steel ultra-thin jam nuts to hold the mounts securely in place. Both the Stampede ESC mount and B3/T3 rear toe blocks are molded in RPM's famous indestructable blend of nylons that is strong, heavy duty, and impervious to all cleaners and motor sprays.



Part#'s: various;
Prices: **$3.95** (Stampede ESC Mount); **$5.95** (B3-T3 rear toe blocks).

Andy's 190mm BTCC Accord

The BTCC and STW championship winning Honda Accord racing sedan has been reproduced in all its racing form by Andy's Bodies. Following up on the success of his legendary Stratus body, the new Accord is slated to take over where the Stratus left off! This sleek new body is the legal 190mm width, and includes two different rear wings, window masking, and detailed decals for finishing. The new Accord is available from Yokomo USA, and is available in singles or pairs. (You save some cash when buying two.)



Part #: ZR-AAB (Single), $21.95; ZR-AAB-2 (Twin-Pack), $35.95.

Tamiya F103LM-TRF Special

The Tamiya Racing Factory boys lent their tuning hand on Tamiya's F103LM chassis. In place of standard components, TRF added a Formula link-type front suspension, formula super low friction damper, F-1 low friction pad, height adjustable rear gear case, aluminum anodized servo mounts, and a carbon main chassis and upper deck components. All of this rides on Tamiya's F-1 reinforced slicks (type A). Tamiya also throws in their 540 Sport-tuned motor. Body and other electronics are not included.





Part#: 58258;
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O.S FS-26S-CX Pull-Start

Now the high performance and low noise levels of O.S. Engine's breakthrough 4-stroke engine is combined with a recoil starter in the FS-26S-CX! The FS-26S CX features reinforced valve springs, 1AB carburetor, special camshaft, and black alumite coating on the crankcase and rocker cover. Now the realistic sounds of the FS-26S can be used on almost any 1/10-scale application with the added convenience of a recoil starter!

Part#: **OSMG2094;**
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TAMIYA
Championship Series

Action Hobbies Race #69 - Tulsa, OK

Results from race #69 held at Action Hobbies, Tulsa, OK - March 12, 2000...

F-1

1st Place	Russell Johnson
2nd Place	Neal Sartor
3rd Place	Bob Enochs
Best of Show	Marvin Blake
Top Qualifier	Russell Johnson

Touring GT2

1st Place	Russell Johnson
2nd Place	Bob Enochs
3rd Place	Edward Ratliff
Best of Show	Michael Masters
Top Qualifier	Russell Johnson





Super Touring GT1

1st Place	Kevin Camp
2nd Place	Mike Wood
3rd Place	Michael Masters
Best of Show	Michael Masters
Top Qualifier	Mike Wood

Mini

1st Place	Marvin Blake
2nd Place	Michael Feliciano
3rd Place	Sean Carling
Best of Show	Blake Sternberger
Top Qualifier	Marvin Blake

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Mail in attached form to: Tamiya America, Inc., Attn: Customer Service, 2 Orion, Aliso Viejo CA 92656 or Phone: (800) TAMIYA-A or Fax: (949) 362-6852 Hurry! Registration for Race #71 closes 5/18 and Race #72 closes 6/22.

Next Qualifiers

Please Check One:

☐ **TCS Race #71**
May 21, 2000
West Valley Hobbies
Salt Lake City, UT

OR

☐ **TCS Race #72**
June 25, 2000
Hobbytown USA
Overland Park, KS

Name_____ Age _____

Address_____

City_____ State _____ Zip _____

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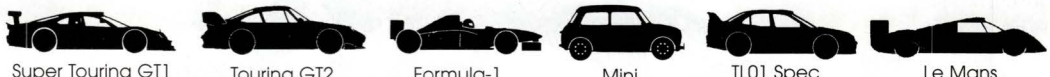

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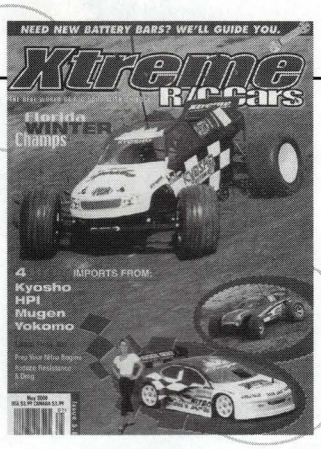

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Reviewed: Associated RC10GT, Yokomo YR-4 M2. How-to: Add Body Detail, Tighten Suspension. 10 Keys To Big Race Success. ROAR On-Road Nationals. T3 Pics.

3.3 October '97
Reviewed: Novak Pit Wizard, M.troniks Prodigi, Schumacher CAT SE, Tamiya TL01 Skyline. How-to: Use Swaybars to Tune Your Ride. Features: Motor Mysteries Revealed, They Call So Cal Home, A Close-Up Look At David Jun's Winning TA03. Also, B3 Pics, Worlds Results.

3.4 Nov-Dec '97
Reviewed: Associated T3, Trinity Switch Blade 12. How-to: Tune with Down and Up Travel, Mount Rubber Tires, Hop-up and Tune the HPI Nitro RS4. Features: All About Discharge Trays, '97 Off-Road Worlds Coverage.

3.5 January '98
50 New products for '98, Reviewed: Losi Street Weapon, Associated RC10L2. Inside Look at Kinwald's XX, Learn About Airbrushes. How-to: Rebuild Shocks, Tweak Touring Cars. NORRCA Off-Road Nats Results

3.6 Feb-Mar '98
Ultimate Touring Car Tire Guide, Reviewed: Associated B3, HPI Nitro Mini, Tamiya Nissan R390, Kyosho Lotus GT1. How-to: Reduce Your Cars Weight, Pack Light. Race Calendar

3.7 April '98
Reviewed: Losi XX 'CR' Kinwald Edition, Tech Voggerd T-10, Mugen Prime 12, Kyosho Super Sport 10 Learn How-to: Break-in gas engines, Turnmarshall, Convert your B2 to B3. Carpet Oval Nats coverage. Midnight 2 tested.

3.9 June-July '98
Reviewed: HPI Mini RS4, Losi XXT 'CR' Graphite Plus, Tamiya M-02L Porsches', Tekin G-10 Learn How-to: Use Caster, 24 Radio Glitch Fixes Features: '98 Winter Champs Coverage, Allen Driver Buyers' Guide. Evaluations: Xipp Power Jig, GM Discharge Box, Traxxas Free Wheel.

4.2 Sept-Oct '98
Reviewed: Associated L3 Oval, FSR Bullet Pro, TT VSpec. How-to: Cut 4WD tires, Stock Comm Cutting, Better Batteries. Features: MaxTec's Aftershock, ROAR On-Road Nats.

4.3 November '98
Tested: Schumacher Nitro 21 Xtreme, Tech Racing Voggered GT, JR Racing R-1 Radio, Tenth Tech. Streetwise Rally. How-to: Prep Stock Motors, Clean Tires. Features: ROAR Modified & Stock National Coverage.

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Tested: HPI Nitro RS4 Racer, Kyosho Quad Rider ATV, Tamiya M-03 Rover Mini. Learn How-To: Start your own club, 10 Moto-tool R/C Uses. IFMAR On-Road Worlds Reports. Hook-Up: T3 & Street Weapon Guide to Pinion Gears. X-ratings: Team Cobra Probe 4000, Hitec CG-330 Charger, PSE Hood Tool

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Tested: Losi NXT GP, Kawada SV-10, HPI RS4 Mini Pro, Tamiya SVT Lightning, GM GMVIS Commander. Learn How-To: Read Dyno Sheets, Build Your First Car. Tamiya TCS Nationals Coverage. What's New for '99

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Tested: FSR Nitro Bullet V12, HPI RS4 Rally, Fox Team Losi R/C Racer. Learn How-To: 11 Tips to Better Decals, Use Camber to its Fullest Hook-UP: Associated B3 and Tamiya TA-03F Pro. First Takes: HPI Super Nitro RS4, Traxxas Nitro 4Tec, Tamiya Nitro TG-10, Losi IWC Street Weapon.

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Tested: Yokomo YR4 M2 Pro, Traxxas Nitro 4-TEC, HPI Super Nitro RS4, Schumacher SST '99 Pro, Novak Millenium. Learn How-To: Choose and Use Nitro Fuel, Repair Broken Servos. Hook Up: Losi Double-XT. X-Ratings: Trinity Paradox, Take-Off Sedan Tires, INDI 16X2 Nitro, Parma Faskolor Paint. First Takes: Kyosho TF3-R Spider '99, Duratrax Maximum ST, HPI RS4 Pro 2.

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5.3 December '99
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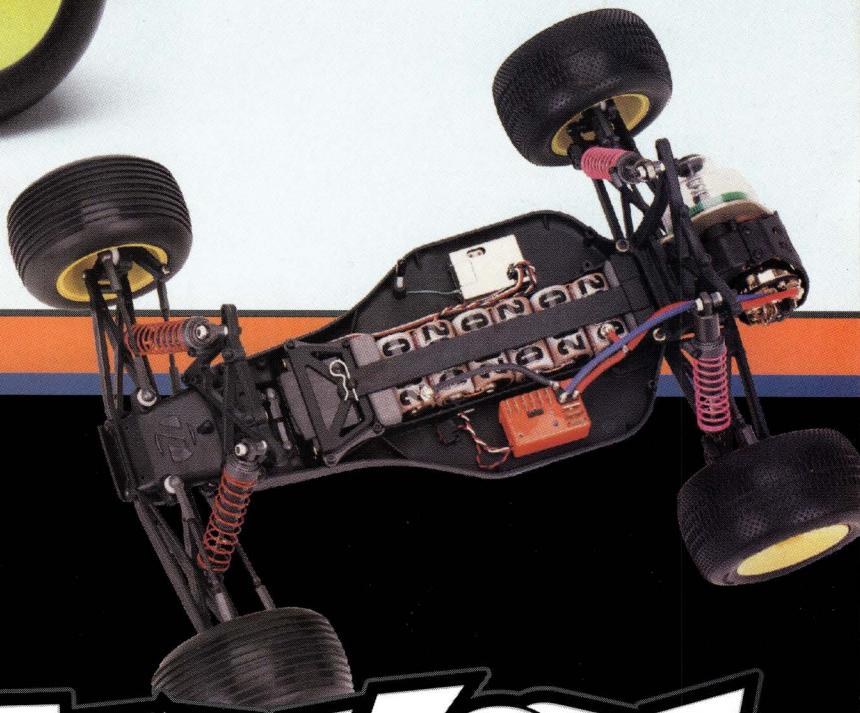

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