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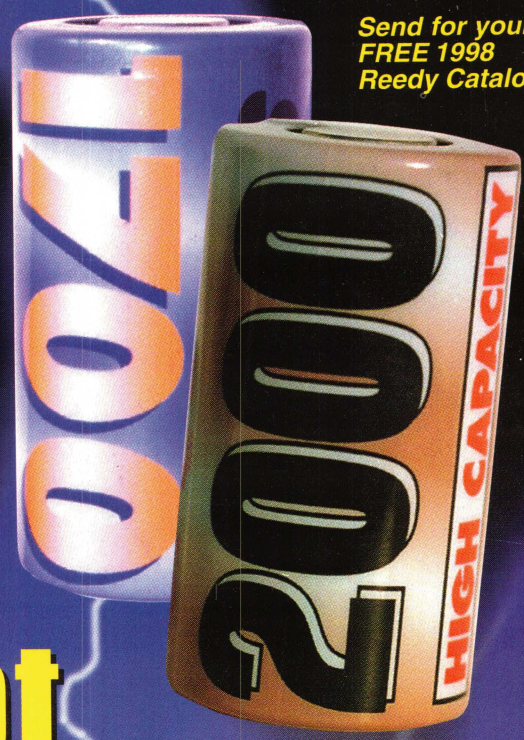

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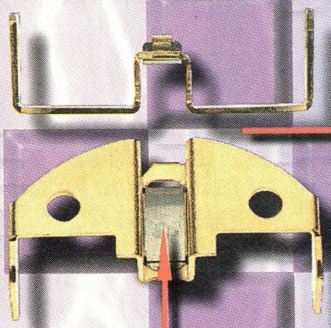

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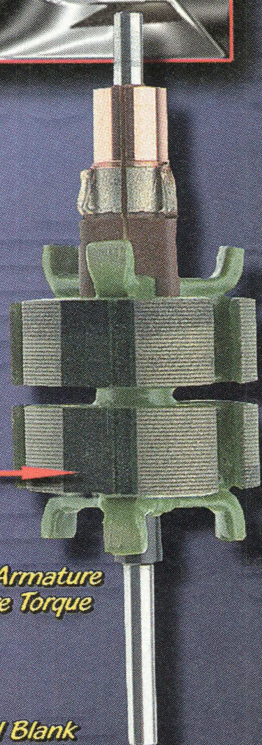

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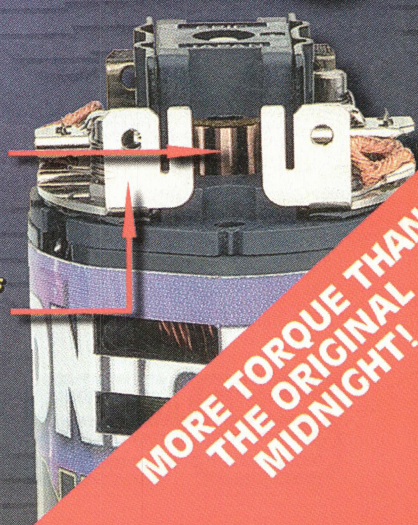

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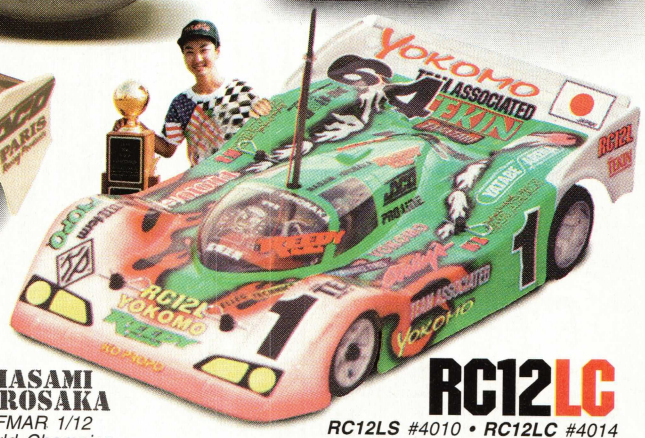

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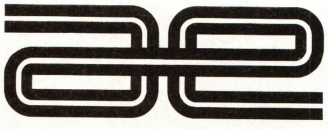





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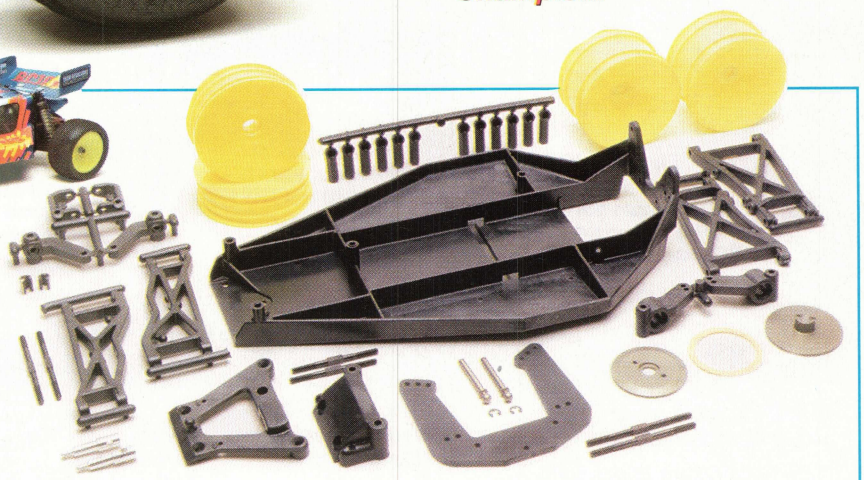

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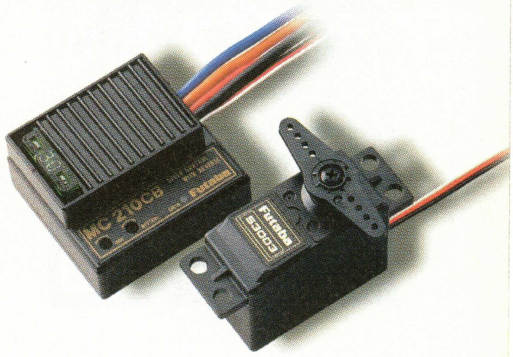
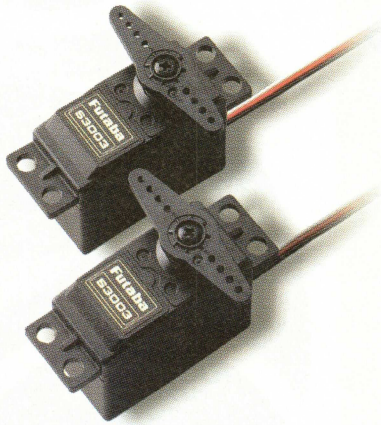
Now our newest Magnum Sport 2PC and Magnum Junior 2PCKA systems are the fourth generation of radio control's most popular series.

The Magnum 2PC Sport has everything you need to get started at a very affordable price. Our new pistolgrip case design has balance and comfort you won't find in its class. Servo reverse and trims are provided for easy set-up and LED's help alert you to low battery levels.

A new narrow band 2 channel BEC receiver, the R122JE is included. Just 0.6 of an ounce, the very compact R122JE is SMT-robotically assembled for extra vibration resistence. Choose either a pair of S3003 servos or one S3003 and an MC210CB electronic speed control and your Sport system is complete (we also include a battery case, switch harness and frequency flag, too).



The MC210CB electronic speed control has fuse protection, reverse and comes wired ready to plug into Tamiya and other popular R/C models.



With 42 oz./in. of torque, S3003 servos are a perfect fit for entry level, resistor speed control-equipped R/C models.

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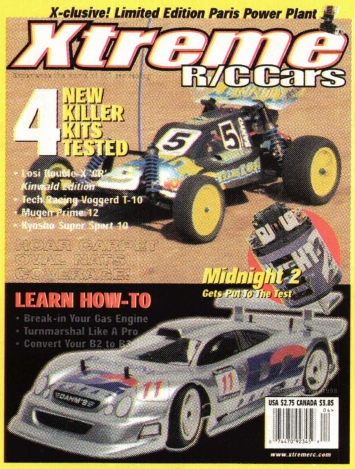

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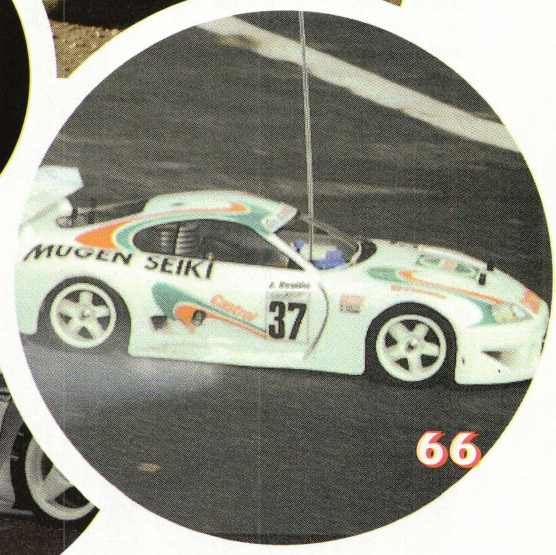

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- ***Reverse Disable*** - Transforms both Roosters into forward only ESCs.
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- ***One-Touch Set-Up*** - Makes adjustments to your transmitter easy.

Check out the Rooster and Super Rooster for unmatched reversible performance!

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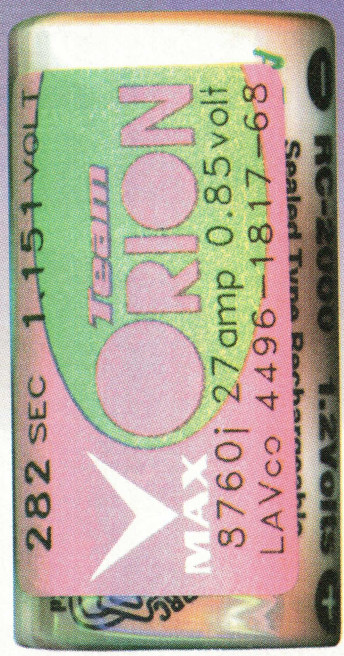
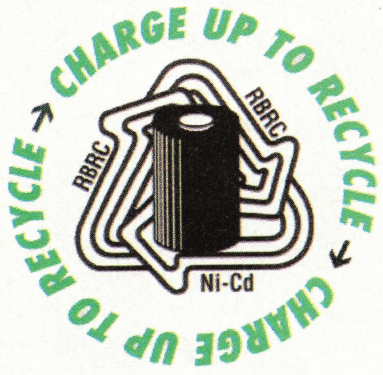
NEW!! Team Orion would like RC racers to get involved in a new recycling program for rechargeable batteries. Every Team Orion cell sold in America now displays the Rechargeable Battery Recycling Corporation (RBRC) logo. See the information below on how to join the program.



Join Team Orion and help support the RC industry's recycling program.



Join Team Orion!



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Cell Type	RBRC
1400 SCR	Yes
1700 SCRC	Yes

Team Orion supports racers and racing organizations. We will continue to sell 1700 SCRC cells for a period of one year so that racers can choose if they want to switch to the new 2000 cells. All Team Orion cells meet ROAR, NORRCA and RBRC rules.

The Rechargeable Battery Recycling Corporation (RBRC) is a public service organization that was started in 1994 by Nickel-Cadmium (Ni-Cd) battery manufacturers to implement a nationwide public education and battery management program. The RBRC collection program is funded by Team Orion and more than 185 other companies who are committed to providing the most environmentally sound collection methods for used rechargeable Ni-Cd batteries. To help the RC industry and Team Orion protect the environment, phone 1-800-8-BATTERY for the RBRC recycling program near you.

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editorial

You finally decide to plunk down the cash for a new racer. You tell the guy behind the counter you want the best, the fastest one he's got. He pulls a shiny box down from the shelf. You look at the price tag, then look in your wallet.

"It's 'top-of-the-line'?" you ask the salesperson.

He replies, "Yup."

Just as he rings you up he asks, "Did you want titanium turnbuckles with that? How about a graphite chassis? You do want ball bearings for the steering, right?" A new kit being reviewed in this issue of *Xtreme R/C Cars* may rid us of this scenario forever. Is Team Losi's new Double-X 'CR' *Kinwald Edition* a sign of things to come? This kit comes with all the extra bells and whistles that are normally sold separately. What effect will this have on the industry, if any? Will competitors soon follow suit? Will this concept soon take hold in other markets, like the sedan market? The answer is yes. Tamiya's new TA03-F Pro "David Jun Edition" sedan (which will be reviewed in our next issue) comes loaded. I think these two cars are a glimpse into the future of R/C racing.

Along with the Losi review, we've got some more killer reviews for you. Inside this issue we take a look at Mugen's Prime 12 nitro sedan and Kyosho's new Super Sport 10 Subaru Imprezza. You want How-To's? We've got How-To's. In order to properly break in your gas engine, our resident gas guru Dean Brown is back and he, along with some added insight from Ken Marcum, has written the most complete and comprehensive gas engine break-in article ever put to paper. There is also an informative little article on turn marshalling. For all you B2 owners, you don't have to feel left out because of the new B3. We'll show you how to update your B2 to the new B3.

Oval racers, indulge yourselves in our complete coverage of the ROAR Carpet Oval Nationals. This race was definitely one to write home about. Lots of action and some controversy.

Sit back, relax, and enjoy this latest issue of your favorite R/C mag, *Xtreme R/C Cars*. Also, be sure to fill out our new survey and send it in. Tell us what you think of the new look.

See you at the track.

Mike Velez
Publisher/Editor/Racer

The Legal Stuff

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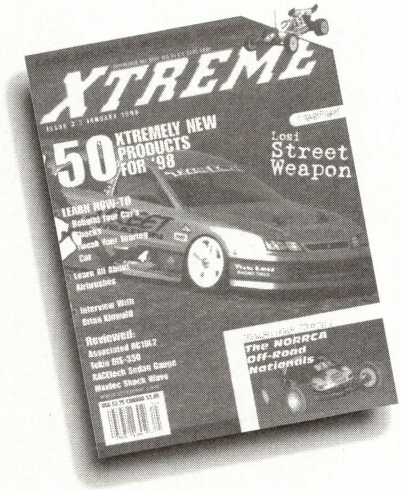

Touring What?

What's the story with these touring car things? I haven't raced in about seven years, and when I did we used the on-road cars that were just flat, boring chassis. Now these street-racer type things with 4WD look really cool. Is this what everyone is racing now? Could I just buy one and race it everywhere or do they only race these at certain places? What kind of batteries do I need now? Things have changed so much. I read something about sportsman classes. Do they have these at most places? Any info is appreciated.

Thanks
Rob Experience

Rob,
About 3-1/2 years ago Tamiya created the first touring car by changing one of their off road buggies (do you remember the 4WD Manta Ray?) to an on road sedan. Now touring cars are just about everywhere! This new class caught the eye of many new and veteran R/Cers because of their realistic-looking bodies that are scaled and styled like the full-size cars you see on the road every day. There are many different brands of touring cars nowadays; for a few examples look at what companies like Tamiya, Yokomo, Kyosho and even Team Losi have to offer.

In regards to your racing question, the answer is yes! Theoretically you could just buy one and race it. Ask your local hobby shops to see if they or someone they know holds parking-lot races. The parking-lot races have evolved over the past couple of years from a "run-what-you-brung" place to their current status as a touring car's "playground".

As far as batteries and touring cars are concerned, there are a lot of changes from seven years ago. Touring cars usually accommodate either stick packs (6 cells, shotgun style), side-by-side packs (6 cells, ends exposed) or saddle packs (two 3 cell packs wired in series). 1400 SCR's are slowly fading away giving way to the new 1700 mAh and the latest 2000 mAh high voltage cells. These cells are a far leap performance wise from the batteries of seven years ago.

Sportsman classes are a sort of an "in-between novice and expert" class. Most R/C racers would fit into this category. If you're skilled enough to maneuver through a race track smoothly, but not pulling lap times fast enough to compete with the expert drivers, or are not sponsored, you fit into the Sportsman class. At most race tracks a majority of the competition is in the Sportsman classes.

Thanks for writing, Rob. Be sure to send us a picture of your new touring car when it's ready to race! –James

I'll Trade You A Subscription For An Answer

Hello, cool magazine, I have picked up a couple off the newsstand before. I will subscribe to your magazine for two years if you can help me with this problem, please.

I own an XX 'CR', XX-T 'CR', and GTX. I am going for the XX-4 this summer. But, can you direct me to where I might find some help with my GTX. It seems that I have lost all control of steering. The wheels turn but it appears that the motor is overdriving the controls. Someone suggested that I weight down the front end; is that a possible solution? I hate to bother you with this problem, but the nearest hobby shop is over 60 miles away. Help! I am desperate! Thank you.

Barry Jarrell
via the Internet

Try these tips to increase the truck's steering: Make the front camber links shorter to increase the amount of negative camber up front, try -3°. Set the rear camber at -1°. Use a softer spring up front than what you're currently using. Lower the front ride height slightly. Try a pair of new soft compound front tires like Losi Silver Directionals. Try each of these suggestions one a time, one or all of them should do the trick. We'll be waiting by the mailbox for your subscription order. –Mike

Tell It Like It Is

Hi. I've been reading your mag for a short time now and I really like what I see. The article on the Street Weapon was great. You were very up front and honest. I think that mentioning the nonstandard wheel design was a justifiable thing to complain about. There must be 50 different sedans out there and all use a standard axle size and hex adapter. Anyway I'm adding you guys to my magazine list to buy monthly. Keep up the good work. Sedan racing does the heart good!

Joel Lagace
via the Internet

007'S Evil Twin

In "Look Inside A Worlds Winner" in Issue 3.4 you guys mentioned that Brian used 7-0-0 shocks. I can't for the life of me figure out what you're talking about. Please fill me in. I love the magazine, keep up the great work.

Gary Wolf
Harrisburg, Pennsylvania

Oops! I guess that was rather cryptic. The 7-0-0 means 57-60-60. Looking for more info? The pistons were Losi #60 3-hole pistons with one hole drilled out with a #57 drill bit. Racers Edge sells some drill bits with finger handles that allow you to easily drill your pistons; they're available in a variety of sizes. –Mike

You Suck!

I'm quite disappointed with your magazine, I have just purchased one of them and I'm unsatisfied with it because it does not show the prices of each model. I hope that you consider this point and show the prices in the future.

Jim McDodle
Via the Internet

Wow, you're a hard guy to please. We've always posted suggested retail prices on kits and products and are now incorporating Estimated Street Prices on many items like cars and electronics. The EST is an average of actual sale prices at hobby shops around the country. Do keep in mind the EST is an average and actual prices may vary with location. –Andy

The Worlds Best English-Speaking R/C Mag?

I must start out by saying that *Xtreme* is the best R/C magazine next to RC World (but then most people can't read Japanese), so *Xtreme R/C Cars* magazine is the best in the U.S.

I wish sometimes you would still bag on that "other mag" like you used to, but then a lot of readers wouldn't get it anyway. Thank you for putting out a



magazine that really cares about the racer, beginner, and hobby shop. The new semi-gloss paper is cool. Hopefully it doesn't cost much more to print on it.

Here's the only thing I have to say. Would it be possible to contribute a few more pages to the interview section? The new issue contains an article with BK that is more in-line with what I'm thinking. The racer Profile could be so much more. I know that you're aim has to be open to all the age groups of the hobby. I'm just asking for an in-depth interview. What really made these professionals so hungry to win? Why do they change the setups for the car from one race to the next so dramatically? What do those changes mean? Have them describe in detail their triumphs and their disappointments. Who was or is their biggest influence and why? Help understand their backgrounds and the history of the sport. Maybe talk to the industry leaders themselves.

I think you get the picture.I'm looking for a little more substance. Sometimes I can find these things on the web, but so many "know it all's" contribute to information that is just not true. Anyway just a suggestion. Keep up the great work.

Ben Parker
via the Internet

Hi Ben,
R/C World is cool, lots of pictures. But, like most, I don't

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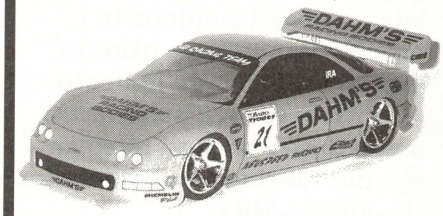

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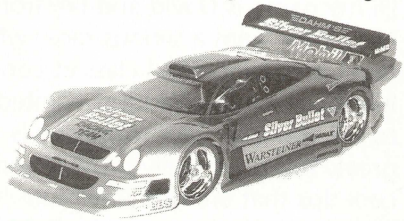

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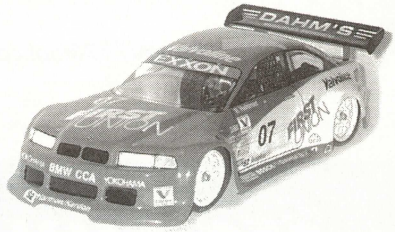

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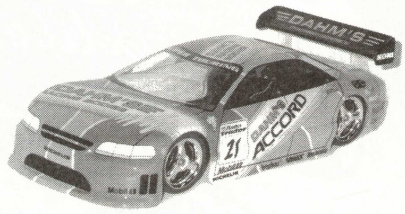

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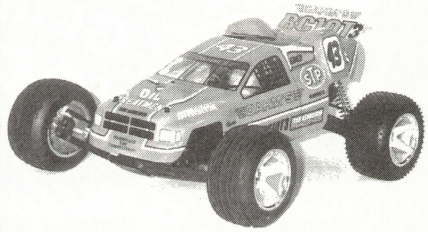

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read Japanese either. As for the cheap shots, we just try to put out the best magazine we can issue after issue. The Kinwald interview came out pretty well and was fun to do. Our Profile column has seen some changes lately and will continue to change. We do have plans of printing some more in-depth interviews with popular racers and industry leaders. Keep an eye out for them and thanks for the input. –Mike

The Serious Racer's Favorite

Hi my name is David and I'm from New York. I am a serious racer who races in the modified class at Long Island Raceway, and I just wanted to tell you that your magazine is great. You guys really provide some cool tips that are really helpful. Well, keep up the good work, and keep pumping out those awesome issues. See ya!

Racer9797@aol.com


RACEtech Touring Car Camber/ Toe-in Gauge

PART 1: ADJUSTING CAMBER

PART 2: ADJUSTING TOE

FUNCTION

REAL WORLD TESTING

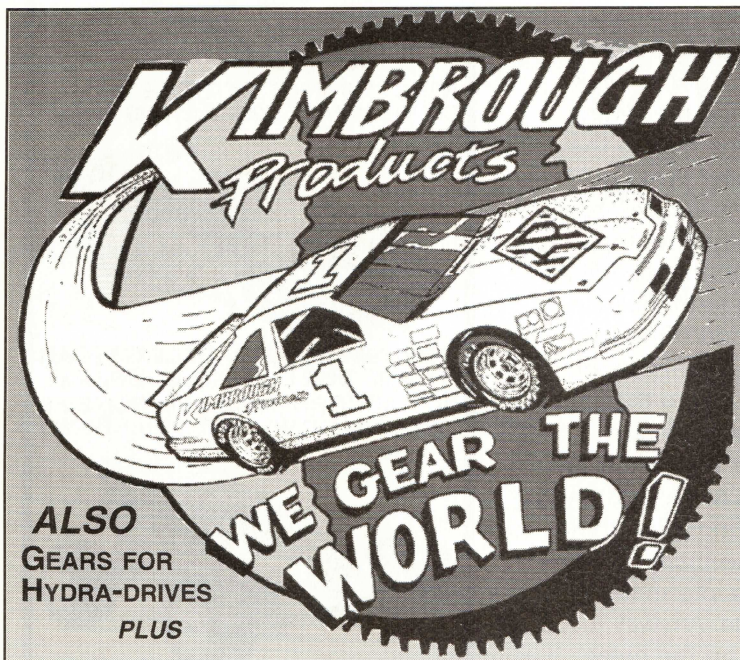
Oh, Oh! I Know, I Know!

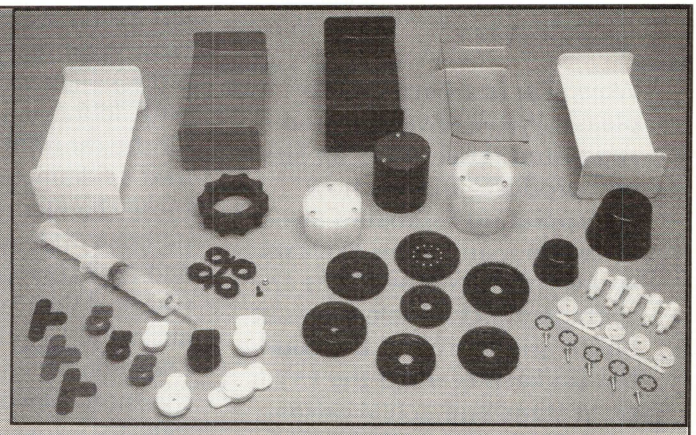
I purchased the RACEtech on-road camber toe-in gauge and your January issue at the same time. Your reviewer may have been led astray by RACEtech's lack of forethought. My gauge "accurately" measures toe-in with a little extra effort. Two methods are possible. First simply rotate the gauge plates 90 degrees (rods on top). Place a straight edge across the degree plates' bottoms and your have a reading. This method is a little awkward as the degree plates want to fall off the pins. The method I prefer is to use the gauge in its normal position and measure the distances between the front of the gauge and the back of the gauge take the difference and apply some math to get the degrees of toe-in. I have marked two points on each of my own gauge plates which makes it easier to read toe angle. For example, 3/16 difference gives 1 degree and 5/16 gives 2 degrees.

Bob Bass
Charlotte NC.

X

Xtreme R/C Cars magazine always welcomes reader comments, suggestions and letters to the editor. Send your correspondence to Editor, *Xtreme R/C Cars* magazine, 627 E. Edna Pl., Covina, CA 91723. We can also be reached via e-mail at xtremerc@xtremerc.com or FAX us at 626-331-9753. Due to the amount of letters we receive, we cannot guarantee individual response. All letters chosen for publication may be edited for clarity and space.





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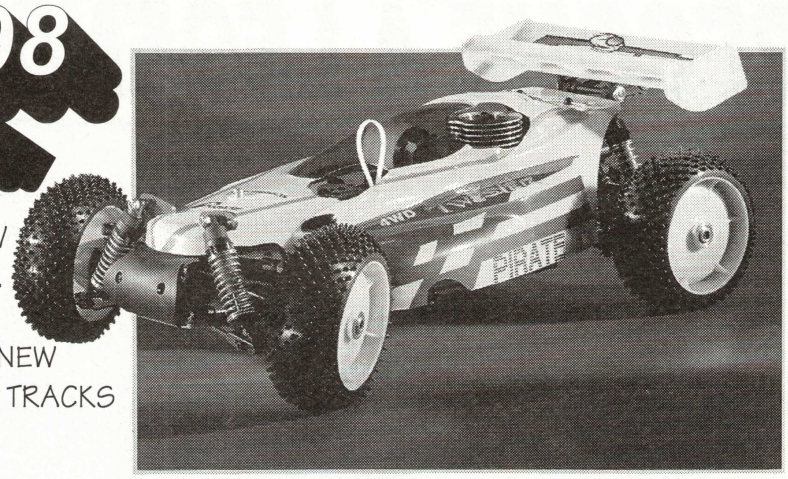
1/8 Competition buggy



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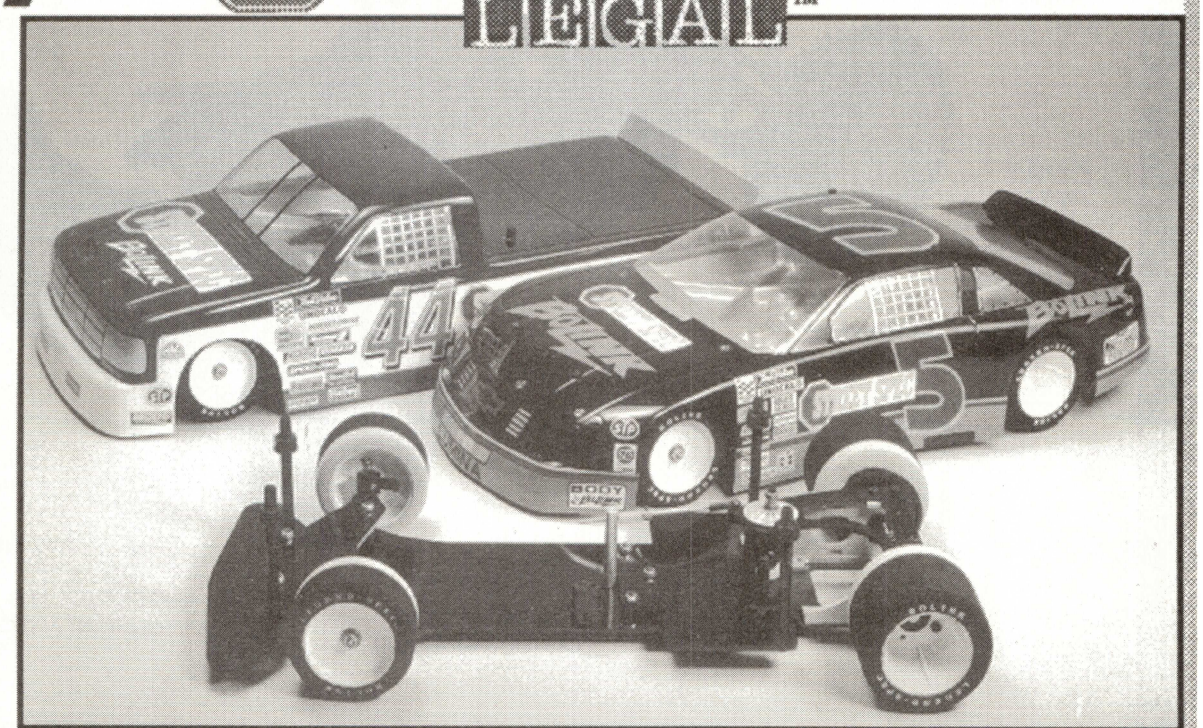

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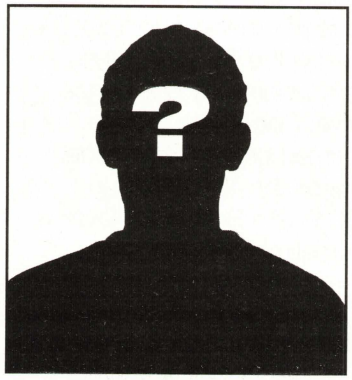


Who Will Be King?

Xtreme R/C Cars is going to clear the smoke and crown the king of the '98 racing season. *Xtreme R/C Cars* magazine has stolen the points system from the Indy Racing League to crown a king in the 2WD Buggy, Truck, and 4WD off-road modified classes. We'll accumulate points from six major races across the country to be held this year: The Reedy Race of Champions, Florida Winter Champs, Motor Man Challenge, ROAR Modified Nats, NORRCA Nats, and the Cactus Classic. The points will be awarded in the factory or invitational classes, which ever apply to the particular race. We will award 50 points to the race winner, 40 for the second-place finisher, 35 for third, and 32 for fourth. Two points each will separate fourth through 10th. In the B and C Mains tenth through 29th will be separated by one point each. Finishers lower than 29th will each receive a single point. Also, the top three qualifiers will receive bonus points – three points for TQ, 2 for 2nd and 1 point for third qualifier. Each driver will have a single "worst or no show" race thrown out when the final order is tabulated. Check out the points standings in next month's coverage of The Reedy Race of Champions. Depending on your response to this points system we may extend the ranking system to an east coast, west coast, and mid-west series of races in other classes like expert, sportsman, and sedans. Tell us what you think.

New Servos On The Horizon!

Rumors are flying about a new line of servos from JR Propo. Specs are not yet available on the new servos although they promise to be impressive. One reported feature on these new servos is they will have shorter wire leads going to the receiver. This is a feature racers have long been waiting for. No word yet on exactly when the new servos will hit store shelves.

ON THE FLY UPDATES

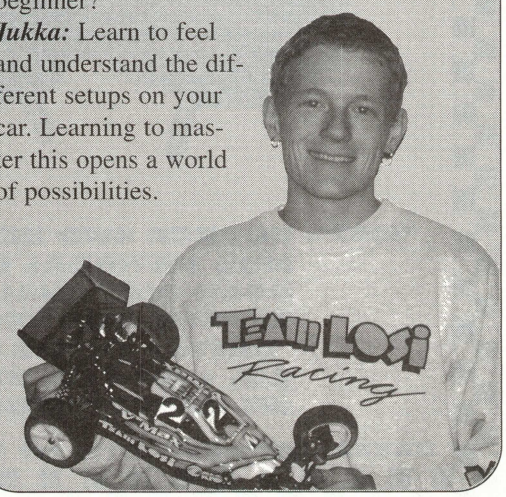
MIP's famous On-Board Temp Gauge has recently been updated. The original Temp Gauge would update temperature readouts once every five seconds. The updated gauge updates every second. This gives you an "on-the-fly" readout when you need it. Other changes made to the gauge are in the marketing area. The gauge is now being sold with "The Loop" as standard equipment. The Loop lassos around the engine head and allows you to move the gauge from car to car easily without needing any disassembly. To top off all these improvements is an improved price; the updated gauge (part #3615) with "The Loop" is only $39 compared to the original price of $52.50.

Jukka Makes A Switch

Jukka Steenari is the latest world-class racer to join Team Losi. In early January, Jukka made the trek to Chino, California, and he agreed to run Team Losi vehicles. The length of the contract is unknown to *Xtreme R/C Cars.* Jukka will continue to run Orion batteries and will also be running Orion's new line of motors that will be sold overseas. Jukka will be using Novak ESCs in all of his cars. Jukka's claim to fame came with a second place finish in the 4WD class at the '97 IFMAR Worlds and 1st place at last year's Florida Winter Champs.

Jukka Speaks

Xtreme: Why did you switch to Team Losi?
Jukka: As an engineering student, I'm very interested in Team Losi's advanced engineering and I'm hoping to learn a lot from them. Also, I think Team Losi makes the best cars in the worlds.
Xtreme: Was switching from Schumacher to Team Losi a hard decision to make?
Jukka: Not at all. Adapting to this new situation has been very easy.
Xtreme: What are your aspirations for the future?
Jukka: I want to win a world championship and graduate from college.
Xtreme: Does racing still excite you?
Jukka: More than ever before!
Xtreme: What's your best advice to a beginner?
Jukka: Learn to feel and understand the different setups on your car. Learning to master this opens a world of possibilities.



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NOVAK GOES ATOMIC

More info is coming through on Novak's new Atom speed controller. The Atom is 25% smaller than their world championship winning Cyclone while still packing many of the powerful features found in the Cyclone. When weighed without wires and heat sinks, the Atom weight only one ounce. Some of the Atom's features include: Polar Drive, One-Touch Set-Up, HYPERFET III Transistors, three factory-programmed profiles, and solder posts. Along with all previously mentioned features the Atom can be programmed using either the Pit Wizard or ESC Profile Software. Novak is planning to have the Atom on store shelves sometime in March.

"Very, Very Interesting"

Our spies in Germany (former KGB agents back when there was a West Germany) have brought back some very interesting highly classified documents from GM Racing. It turns out that the scientists there are working on a new multi-function charger with a long list of features. The new charger will have two basic charge modes, linear and VIS charge. Our spies are still looking for more info on the VIS Charge, but we are lead to believe that it is the same charge method that GM uses when they match batteries. The new charger is also loaded with the same battery matching software that GM uses allowing you to match your own batteries. There is also a PC interface that allows you to monitor things with your PC. You can also program some GM speed controllers with this new charger.

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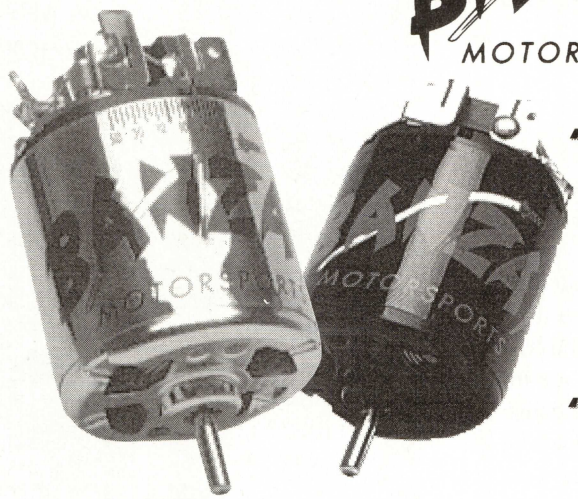

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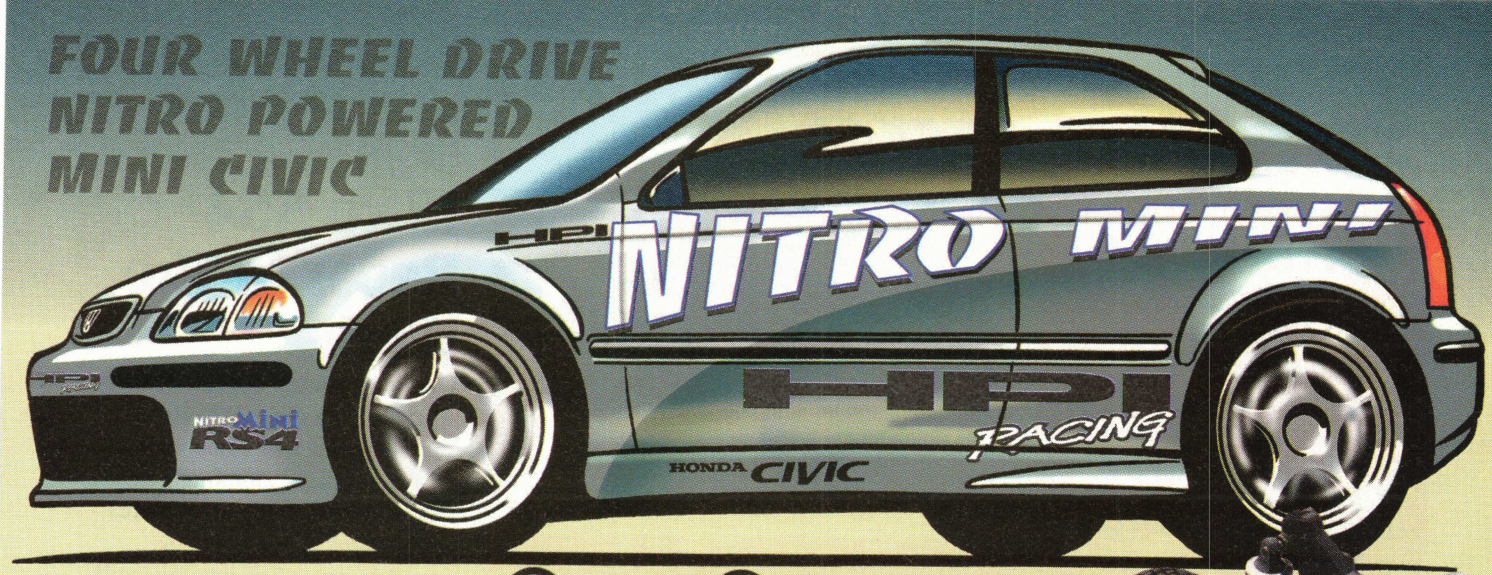

NITRO MINI RS4



NITRO MINI RS4
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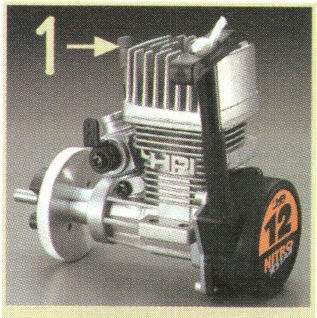
Nitro Mini RS4 with Honda Civic body #451
Suggested Retail Price $299.00

Small size. Big fun.

The new Nitro Mini RS4 is here! We've revolutionized the Mini class with this new four wheel drive nitro powered car. The kit comes with our hot new Civic hatchback body, a powerful Nitro Star .12E engine, oil filled shocks, a disk brake, and an tuned muffler.

How does it run? The Nitro Mini is an absolute blast to drive! The suspension is tuned for great handling on any paved surface. And, our legendary Nitro Star engine delivers power "all day long". Just fill up the fuel tank and have fun.



Just one easy carb adjustment!

It's tough.

The Nitro Mini RS4 isn't a toy, it's built with many of the same parts as our full sized Touring Cars. Glass filled Nylon suspension arms, a thick aluminum chassis, and an aluminum front suspension brace are just a few of the standard features.



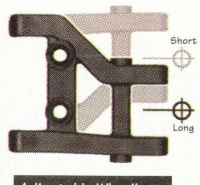
Easy to start. Easy to tune.

The Nitro Star .12E engine included inside the kit has just one carburetor adjustment. That means tuning the engine is easier than ever before. Just lean it out a few clicks after a break-in tank and start racing. Plus, the recoil pull starter makes starting the engine easy. A couple of short pulls and the engine fires right up... and idles smoothly.



HPI Hop-up wheels and tires





Adjustable Wheelbase

It's adjustable.

The Nitro Mini RS4 has adjustments for long or short wheelbase, so most of the popular Mini sized bodies will fit. A huge selection of wheels, tires and bodies are already available. And, many of our Nitro RS4 option parts fit, like the 2 speed transmission... *Get a Nitro Mini!*

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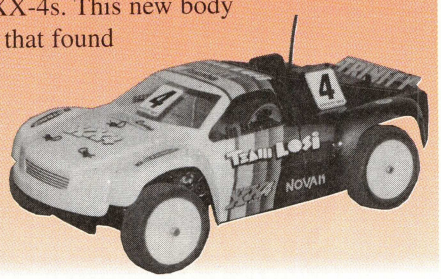
inside line

We Knew It!



Last month Team Losi strongly denied our questioning, but being the brutes we are, we beat it out of 'em. A Double-XT 'CR' *Graphite Plus* is in the works. Basically, the new truck will be a *Kinwald Edition* truck, minus the blue anodized parts. The *Graphite Plus* will come with graphite parts everywhere, MIP CVDs, Lunsford titanium turnbuckles, ball bearing steering, dual pad slipper, and tons of other dialed hop-ups. No word on exactly when the new truck will hit shelves, but we expect to see it sometime this spring.

Speaking of Losi trucks, the boys from Chino have come up with a truck body modeled after a Ford SODA racer for their XX-4s. This new body coupled with a body mounting kit similar to that found on the Street Weapon creates a kind of half-sedan, half-truck, desert prerunner. The truck bodies make for some interesting off-road, 4WD, wheel-to-wheel racing. The body and the mounting kit will each be sold separately.



Nitro RS4 Racer In The Works

Due to consumer demand, HPI is working on a Nitro RS4 Racer. The Racer kit will come with a purple-anodized aluminum chassis that is 2.5mm thick and features countersunk screw holes. A complete set of ball bearings will be standard as well as a new fiber disk brake for longer brake life. The Racer will not come with an engine; HPI will leave the engine decision to the racer. Other features will include 5-spoke wheels, adjustable tie-rods, a 15-tooth clutch bell, aluminum shock bodies, and other improvements. No word when the new kit will hit the streets. Expect the racer to sell at about the same price as the original Nitro RS4.

Hex Appeal



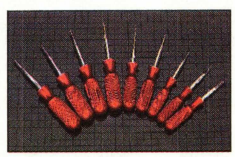
Sure, their shapely contours and sizzling red anodized finishes are seductive.

"Hold me," they plead.

But the new Dynamite Hex Wrenches are more than just a set of pretty handles.

They're incredibly functional.

With hardened, replaceable, ground tool steel tips, they'll never "round off." And those alluring CNC-machined aluminum handles are shaped for a heavy-duty grip. Plus they're perfectly proportioned to their tips for size-relative torque.



Too cool—handles proportioned to the tips for perfect torque! Available in all popular metric and standard sizes.

To top it off, their sizes are clearly inscribed and there's a flat machined in each one so they'll stay put in your pit area.

And they're waiting patiently at your dealers' now.

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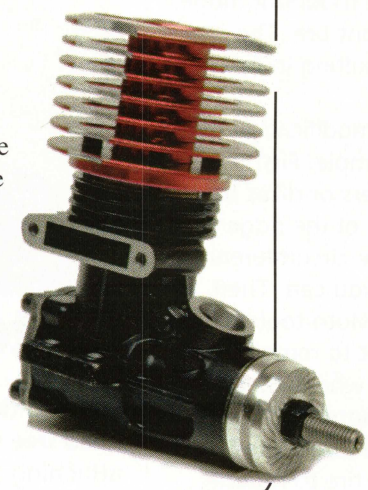
Ron's Masterpiece

Ron Paris, the wizard of gas engines, has produced a very limited number of Modified .12PD Dynamite Engines. When we say limited, we mean limited. Only 100 of these Ron Paris signature engraved engines were produced. The features of this modified engine include: the new Dynamite 7075 Super connecting rod to handle the increased power output, and modified intake ports to increase fuel and air flow for increased power and efficiency. The crankshaft counter weight is knife-edged and a flow port was added for increased efficiency. The crankshaft and back plate have been hard anodized. The top of the cylinder has been faced and the chamber itself modified for increased compression. The heat sink combustion chamber was also modified and fitted to the sleeve. If you want to find out what the worlds top gas racers have known for years, seek out one of Ron's master pieces.



OOPS!

In last month's Inside Line we accidentally referred to Oscar Jansen as the '94 1/12-Scale IFMAR World Champion. The column should have read that Oscar Jansen had tuned the motor for David Spashett who is the one and only winning 1/12-Scale IFMAR World Championship driver. We apologize to our readers, Oscar, David, and their sponsors for the mistake.

@ Deadline

• Brian Kinwald has just won the Reedy Race of Champions in Corona, CA. The weekend was very exciting. A champion was not crowned until the last of the twelve qualifying races. Complete race coverage along with photos and winning setups will be in Issue 3.8. This win puts Brian in the lead for the *Xtreme Cup* in both 2WD and 4WD classes, with Mark Pavidis in a close second.

• ROAR has adopted five minute race lengths for all stock classes, except for 1/12-scale carpet and paved on-road which stay at eight minutes.

X

Introducing the slowest bearing you can buy.



At first spin, you might be alarmed to discover that Dynamite RedSeal bearings *won't* spin.

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It's a fit so perfect we guarantee your RedSeals will stay clean for six months or we'll replace them for free.

And when it comes to bearings, clean means fast. Lap, after lap, after winning lap.

So head for your dealer's, pick up a set and get a slow start on the fastest times you've ever run.

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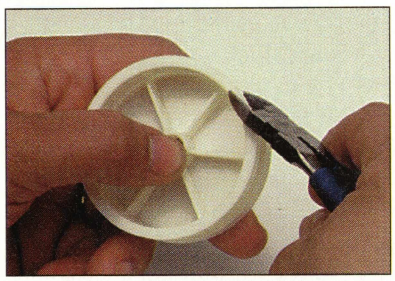
quick tips

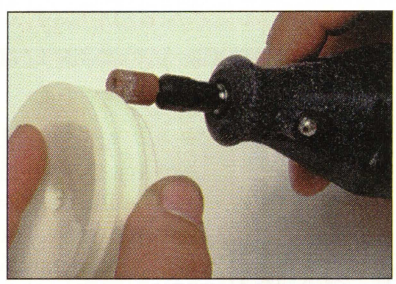
Have you got a Quick Tip for us? If so, send it in. If we use your tip, we'll give you a FREE one year subscription to *Xtreme* or an extension of your existing subscription. So don't wait! Send in your Quick Tips today. Send them to: Quick Tips, *Xtreme R/C Cars*, 627 E. Edna Pl., Covina, CA 91723. Free subscription offer only to U.S. residents.

Wider Is Better!

Not long ago, when we got the chance to take a close look at Brian Kinwald's Worlds winning Double-X 'CR,' we noticed that he had modified his front wheels slightly. He removed the outer mounting ridge from the inside of the wheel. By removing the mounting ridge, Brian was able to widen the contact patch of the front tire. The wider contact patch gave his car more front bite resulting in more steering.



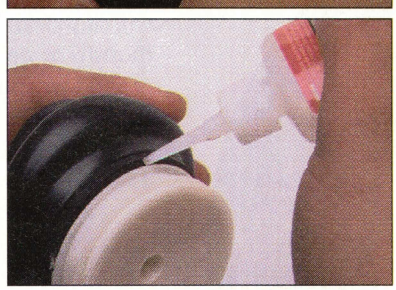
Making this modification to your wheels is simple. First use a pair of wire cutters or dikes to remove as much of the ridge around the entire circumference of the wheel as you can. Then, use a Dremel™ Moto-tool and a drum sanding bit to remove any burrs left on the wheel. Be careful not to remove more than is necessary. The plastic area where the ridge originally was needs to be even with the flat area of the wheel in order for the tire to mount securely.



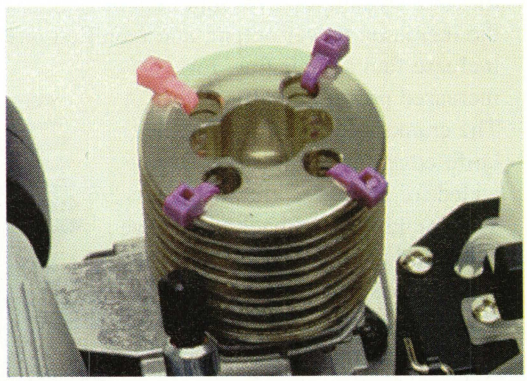
Once you're done with the Moto-tool, use a small piece of 150-grit sandpaper and rough up the entire tire mounting area of the wheel. Mount the tire without the foam insert. Pull the tire so that the edge of the tire's mounting bead is flush with the edge of the rim that the ridge was removed from. Run a bead of thin CA glue around the rim's entire mounting area on this side only. Make sure that the edge of the tire is flush with the side of the rim. Once the glue has dried, go over things one more time filling any gaps with CA.



When the glue on the inside edge of the tire has completely dried, flip the tire inside out. Run a thin bead of CA between the tire mounting bead and the wheel. Set the tire and wheel aside and allow them time to dry.



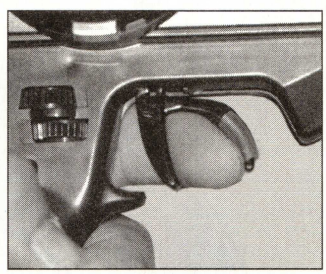
Once everything is dry, place the foam insert over the wheel and flip the tire over the foam and onto the wheel. Now, glue the other side of the tire onto the wheel. Once the glue is dry, you're done. (For more information on tire mounting check out the article in Issue 3.4.)



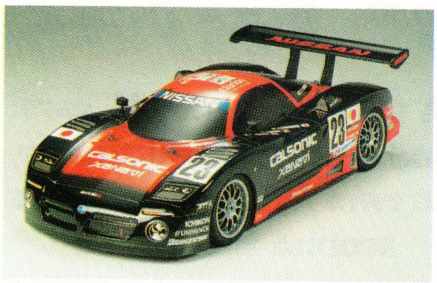
Protect Your Head

Gas guys, protect that noggin of yours with zip ties. Keep your engine's heat sink head free from scratches and dents by attaching zip ties around the screw hole on the top fin of the heat sink. Place the zip tie so that when it's tightened the large fastening end is facing upward. Pull the strap tight and then with a pair of wire cutters snip off the extra portion of the zip tie that's not being used. Many hobby shops offer zip ties in a variety of colors, you can customize your nitro ride by picking up your favorite colors.

A New Brake Pedal For Your Finger



Everyone knows in order to go fast around the track you must use your brakes. To achieve a smoother transition from on-throttle to on brake you must reduce the gap between your trigger finger and the brake portion of your controller's trigger. You can quickly and easily do this by stretching a thick piece of fuel tubing over the brake trigger. You can also stretch the tubing over the on-power portion of the trigger as well. Your finger will have less area to cover resulting in a quicker response. The rubber fuel tubing will also prevent your finger from slipping off the trigger.



1:10 Nissan R-390 GT1 *58203*

Our new TA03R chassis gives R/C road racers important new handling and weight distribution options.

First introduced as the TA03R-S (S for short wheelbase) this new mid-motor design dominated the Tamiya World Championships, with Tamiya Team USA driver Robert Itoh and his 911 GT1 taking home top honors.

Unlike the TA03R-S, the TA03R shares its 10.2" wheelbase with the TA03F and includes a second set of body posts that allow it to use most of our large selection of touring car bodies.

Both the new avex Dome Mugen NSX and Nissan R-390 GT1 share the TA03R platform. The TA03R. Sports car or a touring car? It's both. With the versatile TA03 chassis, Tamiya can now duplicate two renowned racing series. Either way, the TA03R is yet another tool for speed on the race track.

1:10 Porsche 911GT1 *58193*



The TA03R-S was the chassis of choice in the Tamiya World Championships

Our TA03 is Sporting a new Attitude.

1:10 avex Dome Mugen NSX *58207*
Features include TA03R belt drive 4WD chassis with low profile front shocks, molded wing and mirrors and JGTC stickers



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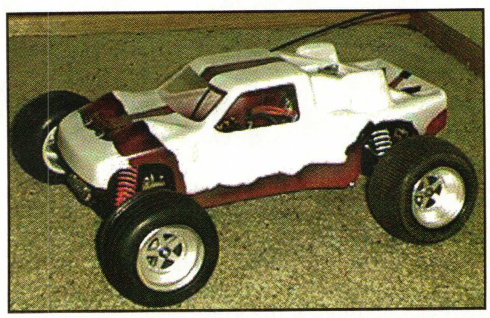
racers' rides

A showcase of R/C cars and trucks submitted by *Xtreme R/C Cars* readers around the world!

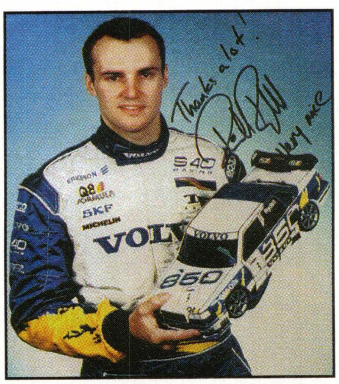




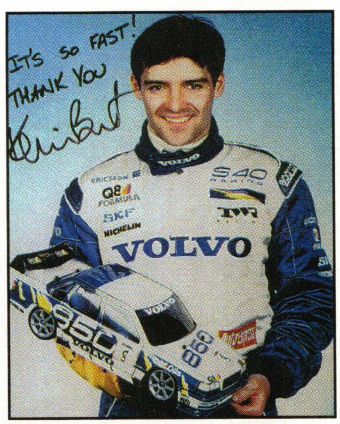
Take a look at Justin Fischer's custom Traxxas Stampede doing what monster trucks do best. Hailing from South Lake Tahoe in California, Justin painted the Dahm's Virtual Fantasy body himself. Nice flame job Justin!



Here's Russ White's Losi XX-T. The truck features a Tekin ESC, Lunsford links, Hitec servo, Racers Edge motor plate, RPM custom wheels, and more! Controlled by a Futaba 3PDF, Russ has a race-ready machine!



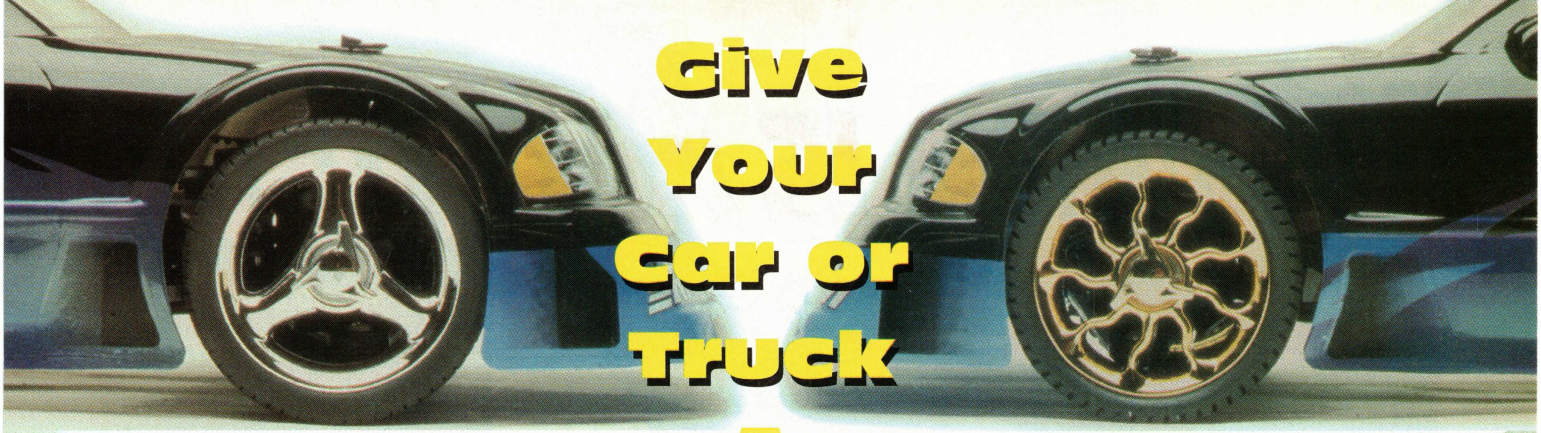
Racers, meet Rickard Rydell and Kelvin Burt of the Volvo/TWR Racing Team. These guys compete in the BTCC touring car championships, and are seen here holding painted and detailed Factory Works' Volvo 850 bodies. The question here is, which one of the two gets the free subscription?



ATTENTION READERS!!!

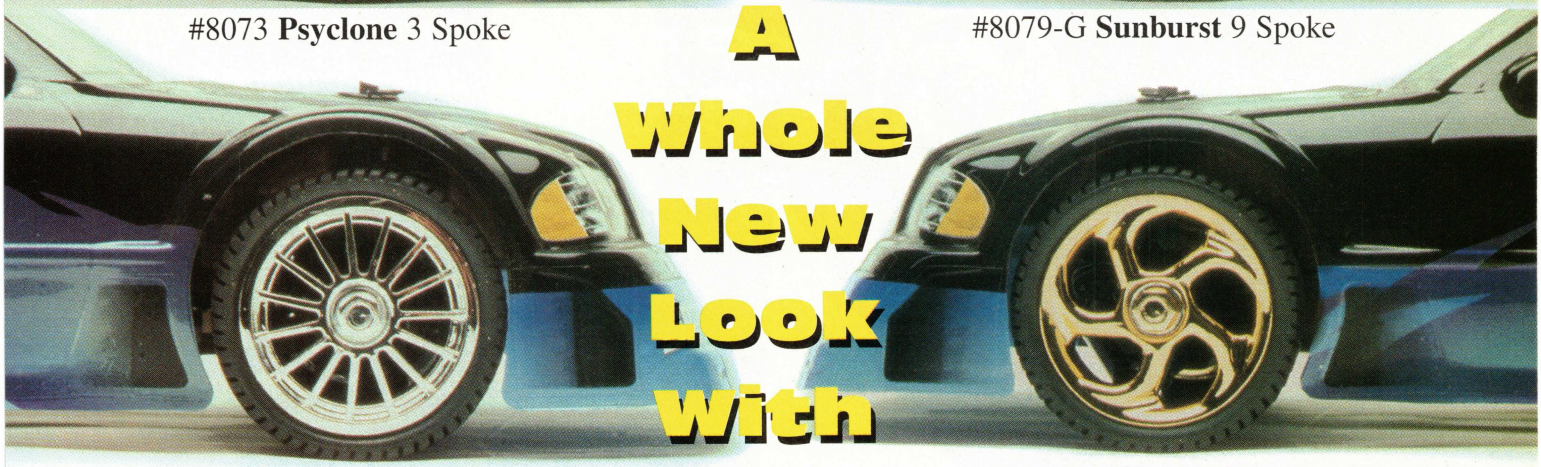
So you've spent countless hours getting your ride to look its best. Now it's time to show it off to the world! Send us sharp, clear color prints or slides of your car (no Polaroids) along with your name, address, and a description of your ride to: *Racers' Rides c/o Xtreme R/C Cars Magazine, 627 E. Edna Pl. Covina, CA 91723.* If we choose to feature your ride, you'll receive a FREE 5 ISSUE SUBSCRIPTION (or subscription extension) to *Xtreme R/C Cars Magazine*. So don't hesitate. Send in those prints or slides now! Good luck!

Give Your Car or Truck A Whole New Look With



#8073 **Psyclone** 3 Spoke

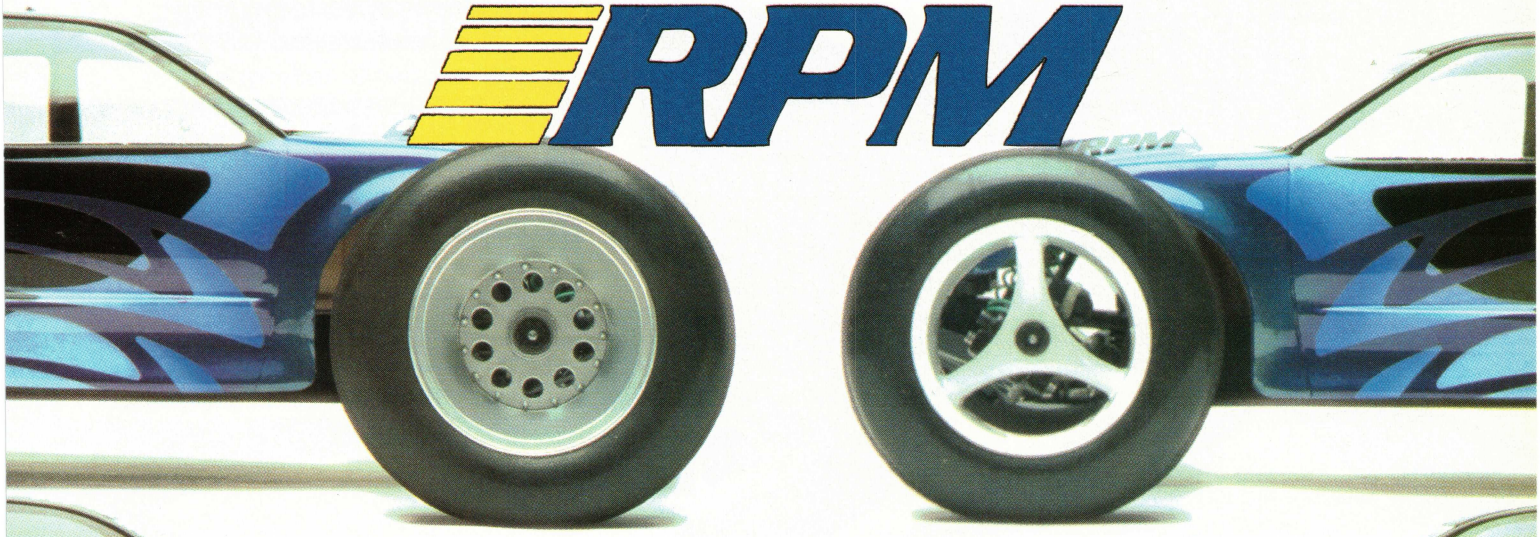
#8079-G **Sunburst** 9 Spoke



#8084 **Invader** 15 Spoke

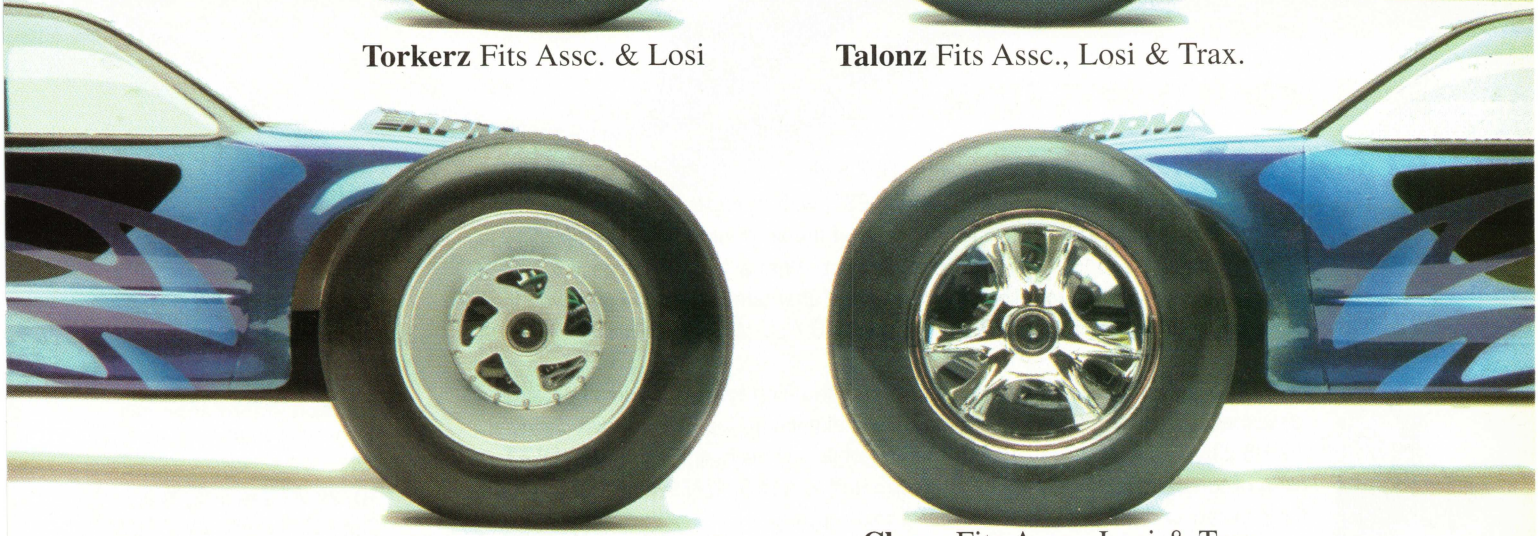
#8095-G **Vortex** 5 Spoke

RPM



Torkerz Fits Assc. & Losi

Talonz Fits Assc., Losi & Trax.



Typhoonz Fits Assc. &Losi

Clawz Fits Assc., Losi & Trax.

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HFX Speed Control



The all-new Hitec HFX high frequency electronic speed control (ESC) with its super high performance mosfets (FETs) and state of the art double decker circuitry, keep this unit small and compact. With a "one push" easy set up button and a "current limiting adjustment" that tames the power of even the hottest modified motors. Size: 1.6 x 1.2 x 0.7 in. Weight: 1.9 oz.

HS-235AG Servo



Blistering speed and high torque in a small package describes the new HS235AG from Hitec. With aluminum output and brass gears, the HS-235AG travels at a sizzling .09 sec/60 while still maintaining a respectful 43 oz/in of torque, and weighs only 1.1 oz. Created for use in 1/12th and 1/10th scale flat pan cars and the popular 1/10th scale touring cars.

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xtreme review

Team Losi Double-X 'CR' *Kinwald Edition*

by Mike Velez



BUILT FOR SPEED!

Just a few weeks after Brian Kinwald won the IFMAR Worlds we got a hold of his car for a photo shoot. *Xtreme* was the first magazine in the world with these close-up shots. When we were getting the car ready for the photo shoot, we were in awe of all the killer hop-ups Brian had on his 'CR.' Titanium here, anodized aluminum there, and graphite as far as the eye could see. It was the car most racers dream about. But if you were to total up the amount of money you'd have to spend to equally equip your Double-X 'CR' to match Brian's, the total figure would be a startling wake-up call for most of us.

At the hobby show in Chicago, Team Losi announced they would produce, in limited quantities, a Double-X 'CR' *Kinwald Edition*, featuring most of hop-ups Brian used to win the Worlds. That sounded good, but how much would this dream machine cost? Amazingly, the *Kinwald Edition* 'CR' retails for only $50 more than the original Double-X 'CR'. Wow! That's cheap (relatively speaking of course).

Recently we got our hands on one of these dream machines. In Issue 2.4 we reviewed the Double-X 'CR'. In this issue of *Xtreme*, we'll focus on the hop-ups that distinguish the *Kinwald Edition* from the original 'CR' and take it to the track and put it through the paces.

Features

• Graphite Everywhere

The *Kinwald Edition* replaces many of the molded Stiffezell pieces with molded graphite pieces. The list of replacements includes the channeled tub chassis, front and rear suspension arms, battery brace, front suspension stiffeners, and the rear shock tower. The graphite pieces are all indicated by the word "Graphite" stamped in silver. The graphite pieces are slightly lighter and many times stronger than their Stiffezell counterparts.

• New Front Shock Tower

To save weight on his Worlds winning car, Brian removed portions of the front shock tower. The outside holes on both the camber link placement and the shock mounting location were removed. In the *Kinwald* kit, Team Losi removed these mounting locations as well since very rarely are either of these locations used. The new shock tower is slightly lighter and looks better.

• Ball Bearing Steering

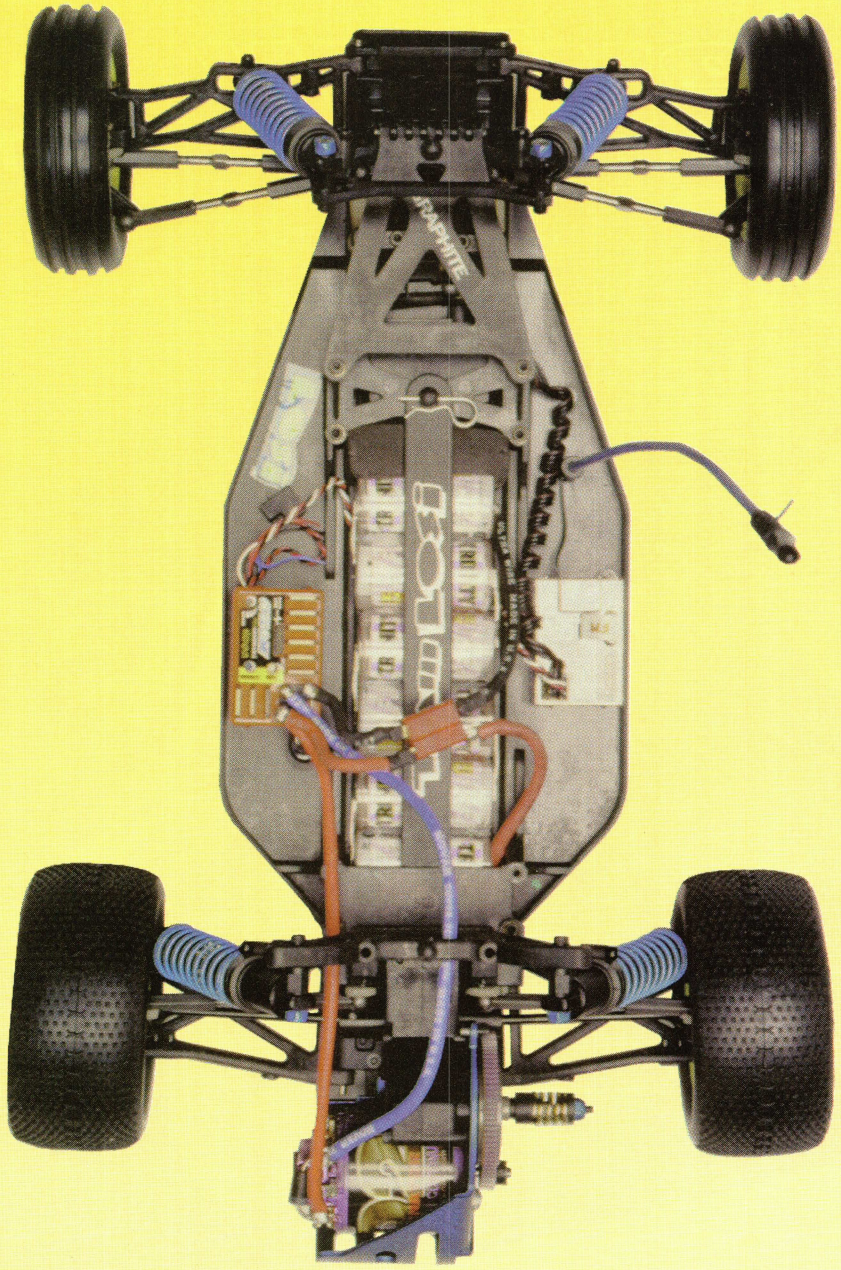
For years racers have been discarding the bushings that come with their kit's steering and replacing them with precision ball bearings. The *Kinwald Edition* has this replacement made for you. The bearings result in quicker, smoother steering and less drag on the steering servo.

•4WD Dual Pad Slipper Assembly

The slipper that comes with Team Losi's XX-4 4WD is standard on the 'CR.' The 4WD slipper features slipper pads on both sides of the spur gear. The result in performance is a slipper feel similar to the Hydra-Drive fluid clutch, but with the low rotating weight of the standard slipper. The 4WD slipper can handle those super low wind motors better than the original slipper and is more consistent through an entire race.

• Lunsford Titanium Turnbuckles

Never bend a tie rod again. These bad boys are 0.13" thick and feature a large square hex for making adjustments. Both the steering and front and rear camber links are included in the kit.



• MIP CVDs

Want the smoothest universal drive known to the R/C world? MIP CVDs have been equipped on four World Championship winning rides and Brian's was one of them. That means they're standard equipment on the *Kinwald Edition*.

• Titanium Nitride Coated Shock Shafts

To reduce wear and time between rebuilds, as well as provide smoother dampening, the kit includes Titanium Nitride coated shock shafts for all four shocks.

• Aluminum Top Shaft

Someone at Team Losi must of read last month's article on weight reduction. Included in the *Kinwald Edition* kit is an aluminum, hard-anodized top shaft/gear for the transmission. The lightened shaft reduces rotating mass and improves quickness.

• Kingpin/Ball Stud Option

The *Kinwald Edition* comes with the hardware necessary including the kingpin to convert the front carriers to the "Kingpin/Ball Stud" carriers. The kingpin/ball stud moves the camber rod mounting location out farther, slightly changing the suspension geometry. The option is recommend for low traction tracks. It gives the car a more aggressive and precise steering feel.

• Blue Anodized Parts
Many of the blue anodized pieces found on Brian's Worlds winning car are standard on the *Kinwald Edition*. Those pieces include the motor plate, wheel nuts, machined wing buttons, and many of the 4-40 nuts used on the car. These blue anodized pieces are unique to the *Kinwald Edition*. Although similar anodized pieces are available from other manufactures, Team Losi is only making these items available in the kit and are not being sold separately by Team Losi.

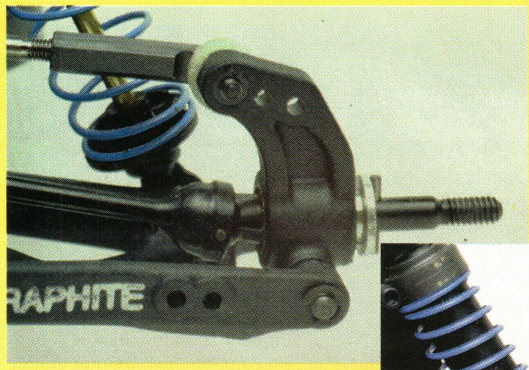
• Cool Blue Springs
The rear springs Brian used at the Worlds were pink. To keep the look consistent and to stay true to the Worlds winning setup, Team Losi is coating their usually pink rear springs with blue coating. These "blue on the outside, pink on the inside" springs are only available with the *Kinwald Edition* kit.

• Tires
The *Kinwald Edition* comes with Team Losi's super-soft Silver compound tires. In the front there are "Wide Bodies" and in the rear are the new X-2000 treads.

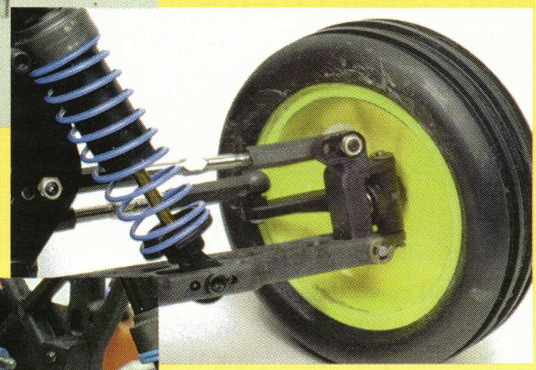
• Body
The kit has Losi's tight-fitting, low-profile, aerodynamic X-Celerator body. The body hugs the side of the chassis to keep dirt away, and allows a small vent hole to be opened to rush air to the ESC if necessary.

• Price
Probably the most amazing feature of them all is the *Kinwald Edition*'s price. Anybody could throw all these hop-ups in a kit and sell it for a thousand bucks, but Team Losi has done it for only $50 over the suggested price of the original Double-X 'CR.' Purchasing these hop-ups separately would easily be over the cost of a new 'CR' kit. Team Losi's never told us an exact number, but they say that only a limited quantity of these kits will be available and once they're gone – they're gone.

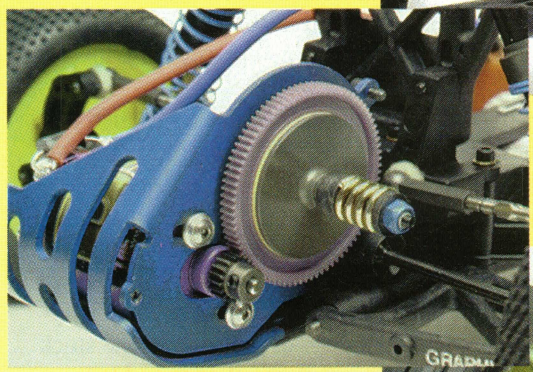
Test Gear
To keep in form with Brian's Worlds winning setup, we tested the *Kinwald Edition* with many of the components Brian uses:
- Novak Cyclone ESC;
- Novak Mercury Receiver;
- Trinity D2 13-turn triple motor;
- Trinity VIS EX-TRA RC2000;
- Peak Nightmare 2 stock motor;
- Futaba 3PJ FM Transmitter;
- Airtronics 94151 high-speed servo.



Above: The *Kinwald Edition* uses hub carriers with one additional camber link mounting hole. The MIP CVDs are silky smooth.



Below: The *Kinwald Edition* comes with an optional kingpin/ball stud, but is only recommended for use on very high-bite tracks. For the most part, the standard two hole hub carriers are used.



Left: The new slipper on the *Kinwald Edition* can handle those super-hot modified motors and still provide consistent slippage.



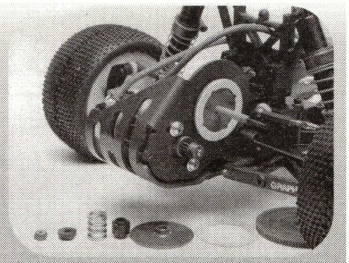
Right: Graphite arms and Lunsford Titanium turnbuckles are standard. The turnbuckles are lighter and much stronger than stock, steel turnbuckles. When coupled with Losi's long H.D. Ball Cups, you have the strongest suspension around.

Building
Even though the *Kinwald Edition* is a limited edition kit, Team Losi went to the trouble to furnish a new instruction manual specifically for the *Kinwald Edition*. This is much nicer than having a ton of addendum sheets. The instruction manual is easy to follow and features easy-to-read text and accurate line drawings. It's very important that you follow the text instructions and do not simply follow the pictures.

Testing
Dave (our trusty Art Director) and I tested the *Kinwald Edition* for three full practice days and two days of racing. Our testing ground was MnM Raceway in Corona, CA. MnM is a high traction, well-maintained track that features a long straightaway, some killer huge jumps, wash boards, some heavily rutted sections, and every other type of jump you can imagine.

For our first time out with car, the Peak Nightmare 2 stock motor along with a 26-tooth pinion were installed. The first time around the track the car felt as if I'd been racing it for weeks. With each lap I drove faster and faster. Coming off the jumps and entering the back straightaway, the car's rear end felt a bit too soft. I replaced the rear shock oil with some 35WT Losi Silatech oil. The oil was the only change I made for the second run. The

Easy Upgrade



If you own a Losi vehicle with the standard XX transmission and slipper you can easily and economically upgrade to the 4WD slipper setup that's included on the Kinwald Edition car. You'll need to purchase two slipper pads (#A-3123), one slipper back plate (#A-3132), and a 4WD spur gear (#A-3930). To ensure optimum performance, use two new slipper pads rather than one new and one old. Place one slipper pad on each side of the spur gear. Place the spur gear against the original slipper back plate. Now take the new back plate and insert it against the spur gear so that the flat surface is against the gear. Now insert the slipper spring spacer, gold spring, retaining washer, and nut from before. There you have it; your new cutting-edge slipper is ready to go and all for under $16.

Hits:

- World-class performance.
- Fully loaded with all the options.
- Easy to build.
- Graphite everywhere.
- New slipper works great.

Misses:

- You need to hack up the front carriers to use the kingpin/Ball Stud.

heavier oil cured the slight problem I was having going onto the straightaway. Although the traction was adequate with the stock X-2000 silver compound tires, I opted for the faster bald tires that everyone was running. (See Quick Tips in Issue 3.6 for the how-to on balding your off-road tires.) The bald slick up front and in the rear made a great difference – more traction all over the track. After a few more runs with the stock motor installed I was very comfortable with the car's handling. I was able to drive it hard into the turns and power out with great control.

For our next run, we installed the Trinity D2 13-turn triple motor. I geared this beast with a 19-tooth pinion and the stock 84-tooth spur. The power of the D2 would test the *Kinwald Edition*'s limits. Wow! Too much punch. I had to loosen the slipper about 3/4 of a turn from the stock adjustment. With all of the added horsepower, the new double pad slipper worked great. Around the track the car was explosive. But all this explosive power had a price. Going into and exiting the turns the car had begun to push. I brought the car in and quickly lowered the front ride height slightly and put the car back on the track. Lowering the front helped a little, but still didn't yield the end result I was looking for. After killing that battery pack I moved the shock mounting location on the front shock tower

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Combines smooth, super-quick response with convenient one-button setup.

Want an easy way to gain a competitive edge on the race track? Catch the new Streak electronic speed control from DuraTrax. This forward-only unit is loaded with performance features, like ultra-high frequency and ABS braking, and is a breeze to set up. Best of all, this high technology comes with a surprisingly low price!

- Ultra-high frequency saves battery power and allows the ESC to run cooler.
- 2-color LEDs make setting up the Streak one-button easy, and settings are maintained even when the unit is turned off.
- ABS braking function works just like that in full-size cars to increase stopping control, especially when cornering.
- The Streak delivers extraordinary traction control, customizing tire gripping for less slippage or spin-out when accelerating.
- Reverse voltage protection guards against damage due to incorrect hookup.
- Works well with hot stock or modified motors of at least 12 turns.
- Other features include: heat sinks, built-in on/off switch and pre-installed "bullet" style motor connectors for Futaba J or Airtronics/Sanwa.

Specifications —
Voltage Input: 4-10 cells
BEC Voltage: 5 volts
On-resistance*: 0.004 ohms
Rated Continuous Current*: 300 amps
Operating Frequency: 3500 Hz

Dimensions (w/o heat sink): 1.6" x 1.5" x 0.6"
Weight (w/heat sinks): 2.1 oz
Motor Sizes: 12 turns or more
*Transistors's rating at 25°C junction temperature.

For the location of the dealer nearest you, please call 1-800-682-8948, and mention code number 2319P.

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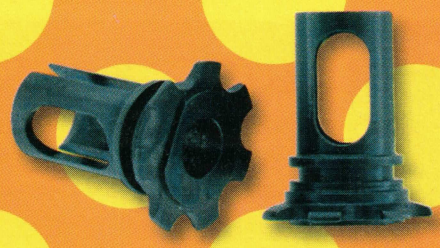
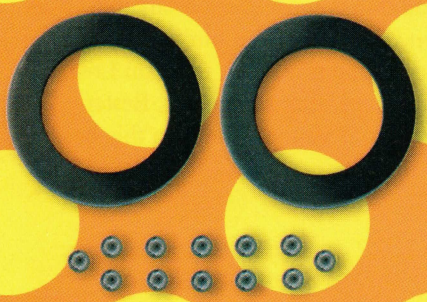
MIP Golden Shock Shafts are precision machined of stainless steel, polished to a micro finish, and coated with the best selection of titanium nitride for smoothness and durability. MIP Blue Seals reduce friction with less swelling and less wear than standard "O" rings.



MIP Lite Drives have been proven to substantially increase your car or truck's acceleration and overall top speed. They are manufactured of high grade steel and lightened in every possible place. Designed for both stock and modified racing conditions, and sold in pairs.



MIP Super Diff Rebuild kits feature the hardest and roundest carbide balls made, polished smooth diff rings, and longer lasting no grit diff lube. Get twice as many runs between rebuilds.

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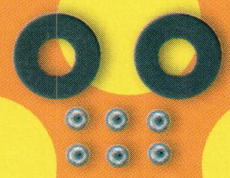
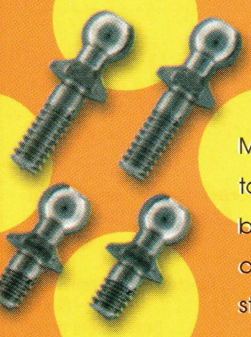


MIP's Thrust Rebuild kits feature two precisionly ground washers that are polished to a mirror finish, high grade thrust balls, and an all new specially formulated lube. Keep your diffs running smoother and lasting longer



MIP B.J. Ball Ends are oversized to make for a tighter fit in plastic ball cups, eliminating slop and chatter commonly found in stock linkages. B.J. Ball Ends are precisionly manufactured of high grade stainless steel and polished to a diamond finish.



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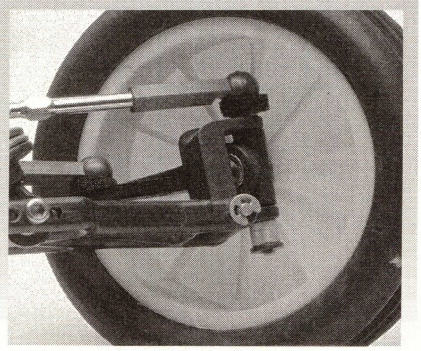
Upgrade To Version B.K

Double-X 'CR' owners, if you're looking to upgrade your racer, here's a list of the items necessary to upgrade your kit to a *Kinwald Edition*.

Part#	Description
Team Losi	
A-1106	Kinwald Edition Front Shock Tower
A-9701	Graphite/Composite Front Arms
A-9813	Graphite/Composite Rear Shock Tower
A-9900	Graphite/Composite Chassis Brace Set
A-9902	Graphite/Composite Chassis w/braces
A-9930	Aluminum Gear/Slipper Shaft 2.19:1 Ratio
A-9941	Bearing Spacer/Wheel Washer Set
A-8340	XX 'CR' Kinwald Edition Sticker Sheet
A-7202S	Front Wide Body Rib (silver) w/Foam Liners
A-7369S	2.2 Rear "X-2000" (silver) w/Foam Liners
A-8042	X-Celerator Body w/Masks
A-8120	Machined Aluminum Wing Buttons
A-8107	Wide "V" Wing
A-6951	3/32" Carbide Diff Balls
A-6912	3/32" x 3/16" Steering Bearings
A-5062	Rear Shock Shafts
A-5060	Front Shock Shafts
A-9707	Kingpin/Ball Stud Kinwald Edition
A-4113	Battery Hold-Down Strap
MIP	
1200	Shiny CVDs
Lunsford	
PF08	1.875" Titanium turnbuckles
PF07	1.75" Titanium turnbuckles
PF06 1	.625" Titanium turnbuckles

Kingpin/Ball Stud

The optional kingpin/ball stud can be used by taking a Dremel tool to the front hub carriers. Remove the standard camber mounting portion of the carrier with a cutting wheel. Then take a coned grinding wheel and remove the indented portion of the carrier as shown. Now replace the stock kingpin with the kingpin/ball stud. Place two gold washers under the ball stud portion to raise it slightly off the carrier. Place two more gold washers under the carrier, and fasten the kingpin with an E-clip. You'll need to lengthen the front camber rods slightly. I recommend purchasing an additional set of front carriers (#A-1121) to modify for use with the kingpin/ball stud so that you can easily switch between the two setups at the track.



inside one hole, put in a freshly charged pack, and took the car for a spin. Moving the shock did just the trick. The car had the same amount of steering going into the turns as it did exiting — problem solved.

Conclusion

The Double-X 'CR' *Kinwald Edition* handles as well as any off-road kit I've driven. It's forgiving enough for a racer with average skills to excel and nimble enough for the highly-skilled driver to cut through the competition like a knife. Its performance, in addition to all the included hop-ups and after market accessories, make the Double-X 'CR' *Kinwald Edition* the best value in its class today. But, like they say, "All good things must come to an end." The *Kinwald Edition* is a limited production kit and according to Team Losi, the kits are almost sold out. Better hurry up if you want to own this beast.

X

TEAM LOSI XX 'CR' KINWALD EDITION

THE VITALS

MANUFACTURER:
Team Losi Inc.
13848 Magnolia Ave.
Chino, CA 91710
(909) 465-9400

SPECIFICATIONS

Country of Origin	USA
Scale	1/10
Manufacturers List Price	$399.95
Estimated Street Price	$240-$250
Part #	A-0102
Intended Application	Competitive racing
Approx. build time	4 hours

DIMENSIONS

Length (rolling chassis)	15.00 in.
Wheelbase	10.625 in.
Width (F)	9.625 in.
Width (R)	9.875 in.
Weight (ready to run)	3lbs., 6 oz.

CHASSIS

Type	Channeled tub
Material	Molded graphite

TIRES

Front	One-piece plastic
Rear	One-piece plastic
Tires	(R) X-2000 silver, (F) Wide Body silver

TRANSMISSION

Type	3 gear w/slipper
Differential	Ball type
Bearings/Bushings	Bearings
Internal Ratio	2.19:1

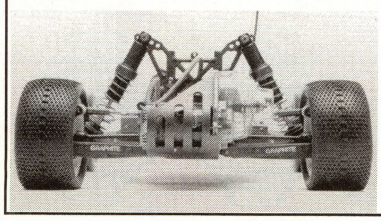
SUSPENSION (F/R)

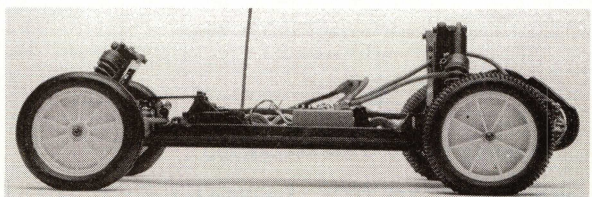
Type	4W independent w/lower A-arms
Dampening	Coil-over, oil-filled shocks

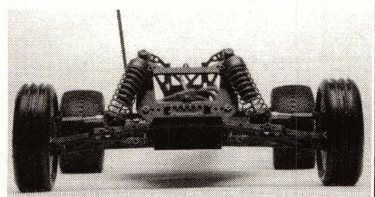
POWERTRAIN

Configuration	Electric motor powered
Type included	None
Layout	Rear wheel drive

MAIN COMPETITION
Associated B3, Schumacher Fireblade 2000 '98

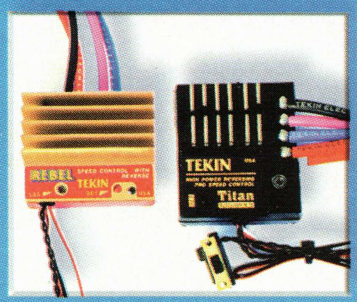






R/C PERFORMANCE GEAR





REVERSE ACTION

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

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



DRIVING FUN

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

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

COMPETITIVE ADVANTAGE

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

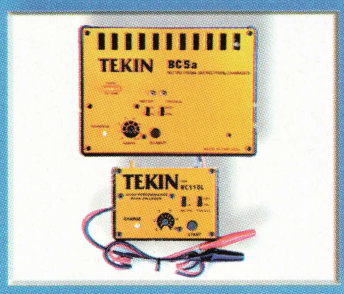
G-12c III adds new CoolSwitch circuit, TurboStart mode, more speeds for smoother operation, and PowerDrive motor interface. NEW anti-glitch software. The G-12c III is *Highest Amp-Flow* (torque) speed control made, for extra acceleration. 1997-8 World Champion.

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

SPEED EXTREME

The advanced generation G-10 speed control brings new levels of tuning functions, built-in.

Programmable read and set for all critical parameters, including throttle curve, drag brakes, neutral/brake, plus dual current limiters with timer. Easy operation, sets in seconds. Over 10,000 possible setups. Lights advance as throttle is applied. Back mounted CoolSwitch power MOSFETS improve handling with low center of gravity. Replaceable power wires. Exclusive advanced internal circuitry handles the most rigorous racing and performance demands. Pat Pend.



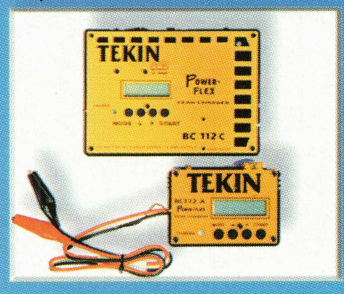
PEAK CHARGING

For basic charging with high-tech peak circuitry, it's the BC5A or BC110L. Reliable performance and rugged durability with 33Khz switching operation. Unique adaptive peak sensing design delivers better charges and longer battery life. Easy to use. Cool, safe operation and complete overload protection. The BC110L DC charger is a full 0-10 amps. The BC5A has a solid 0-6.5 amp AC/DC power supply built-in. COMING SOON, BC120L with built-in discharger.



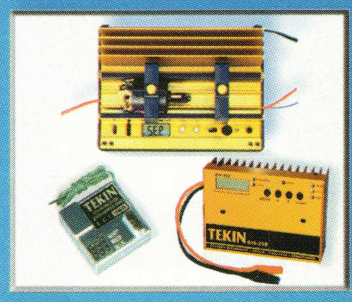
DIGITAL CHARGING

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



POWER-FLEX PRO CHARGING

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



RADIO ACCESSORIES

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

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Brian Dunbar Worlds Special
This is a limited series of 12 turn and 13 turn motors that feature the same wire dimensions and brushes Brian Dunbar used for his title at the 1997 IFMAR Worlds. Dunbar had the fastest lap (2wd) throughout the entire event!





Powercharger
- peak cut off
- input: 12V/110V AC/DC
- charges 4-8 cells
- cycle functions
- fast charge/slow charge
- 300mA or 0.5 to 6.5A
- discharges at max. 4A
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- ultimate GMVIS power!

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Super Glue
This is the fastest sticking stuff you've ever seen! Use for tires, plastics, metal or anything else.
Part# GM8000 thin
GM8001 medium
GM8002 thick



Looking for High Tech Accessories?

Then you have found your slice of heaven!



Female plugs
Part# GM1232

Male Gold Plugs
Part# GM1230



Battery Bars
GM-Racing battery bars, lowest resistance, strong connection
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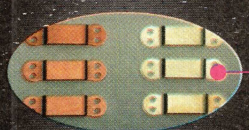
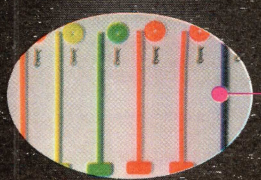
GM1280, copper
GM1281, silver

Tire Sticks
Holds a set of four tires, no more getting mixed up!
Part# GM1279





Motor Box
Holds 8 motors and small accessories container.
Part# WA003





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xtreme review

TECH RACING'S Voggerd T-10



by James Revilla

A few months ago a friend showed me an imported Japanese magazine, and an ad caught my eye. The ad was for Tech Racing's new touring sedan — the Voggerd T-10. Since Tech Racing is based in the Japanese market, I wondered if it would ever reach American shores. In the ad, the car looked very high tech, featuring a host of aluminum parts and lots of adjustments. The triple belt-drive system caught my eye as well.

GTP of California must have thought the same thing; they now import many Japanese aftermarket brands, including Cross, Ride, and Tech Racing. Before I knew it, *Xtreme R/C Cars* Editor Mike handed me a UPS package, and inside was the Voggerd T-10 itself. Is it all that it looks to be, or are the aluminum parts and unique suspension just for show? Let's find out below.

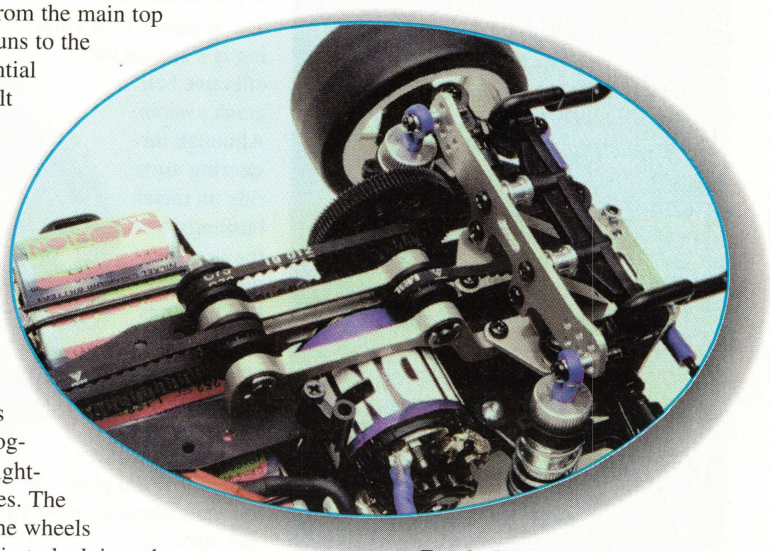
CHASSIS

The main chassis is a double-deck black fiberglass design. The slim, Y-shaped upper deck connects to the the Voggerd T-10's simple steering system and bridges the gap between the front bulkhead and the rear pulley arms. The upper deck is very narrow, making it easy to mount electronics on top of the main chassis. The Voggerd T-10's lower deck is configured for stick pack batteries, and the positioning of the battery holders leaves a very large area to mount your steering servo, receiver, and electronic speed control. Race-ready, the Voggerd T-10's center of gravity sits low and near to the ground, which is exactly where you want it.

TRANSMISSION AND DRIVETRAIN

The Voggerd T-10 utilizes a three belt, 4WD system. From the main top shaft, one belt runs to the rear ball differential and the other belt runs above the motor to the middle top shaft. From there, another belt runs forward to the front ball differential. From the differentials, the power moves through metal dog-bones and into lightweight alloy axles. The hex drives that the wheels mount to use a pin to lock it to the axle, but unlike other touring cars the drive pins go through a hole inside the hex drives, locking the hex drive to the axle.

The Voggerd T-10 also features trick looking front and rear differential housings made of lightweight aluminum. The two lightweight ball differentials ride on two aluminum "stands" which are topped off with an aluminum top plate for rigidity. These top plates also serve as mounting points for the upper arms of the Voggerd T-10's unique suspension system. The rear



Tech's AWD sytem uses three different length belts to transfer the power to both ends of the car.

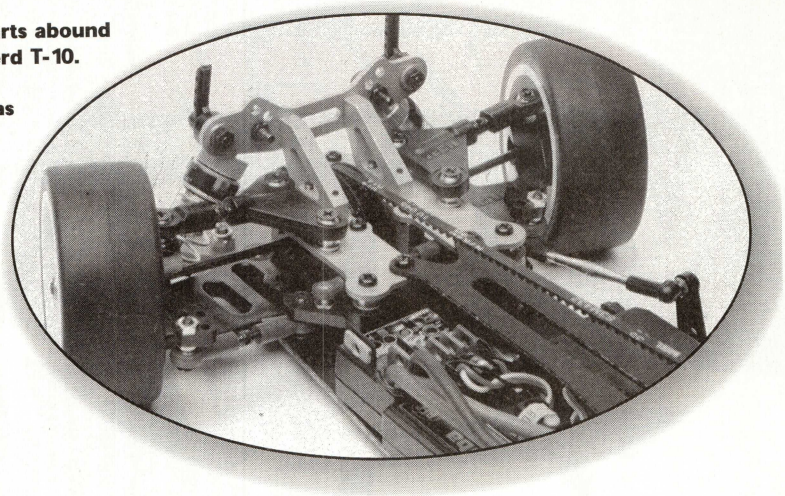
differential stands have long arms which reach forward over the motor. These arms hold both the main top shaft and the center top shaft directly above the motor.

SUSPENSION

The Voggerd T-10's unique suspension is based on the typical adjustable upper and lower arm setup. Upper A-arms with threaded tie rods are combined with solid molded lower A-arms on all four corners. Both the front and rear suspension use the same parts (except the shock towers). There are two shock mounting positions on the lower A-arms and multiple upper shock mounting positions on the aluminum shock towers for adjustability. The Voggerd T-10's suspension is unique in that all four lower suspension arms mount to the main chassis on pivot balls. By using pivot balls instead of hinge pins, the suspension stays very smooth throughout its travel. There are no E-clips to mess with, no more bent hinge pins, and no more binding. The upper arms on both the front and the rear of the car can be mounted in one of three positions to alter the wheels' caster angle. These upper arms also mount to the differential top plates with pivot balls for a super smooth suspension assembly.

The Voggerd T-10 uses identical molded hub carriers on all four corners. While the front hub carriers are positioned with the steering linkage, the rear hub carriers are connected to a threaded rod which bolts to the differential top plate. These threaded rods can be lengthened or shortened to adjust the rear wheels' toe angle. Talk about high tuning capabilities!

The Voggerd T-10s shocks are of the conventional coil-over, oil filled type. These aluminum shocks use brass inserts which provide a smooth surface for the aluminum pistons to slide in. The bottom of the shock is sealed with a double O-ring aluminum cartridge assembly similar to those found on Team Losi shocks. The top of the shock bodies are sealed by a metal puck with an O-ring around it. This metal puck is held down inside the shock body by a small cone spring, which is compressed in between the brass shock sleeve and the shock cap. A total of five O-rings per shock ensure that there will be no leaks come racing time. Aluminum shafts hold aluminum pistons in place with a couple of E-clips. One thing I didn't like is the lack of extra pistons in the kit. Only one set of pistons are included.



Aluminum parts abound on the Voggerd T-10. The front suspension has provisions to adjust camber, caster, and toe. Note the multiple shock mounting positions on the front shock tower.

BODY, WHEELS, AND TIRES

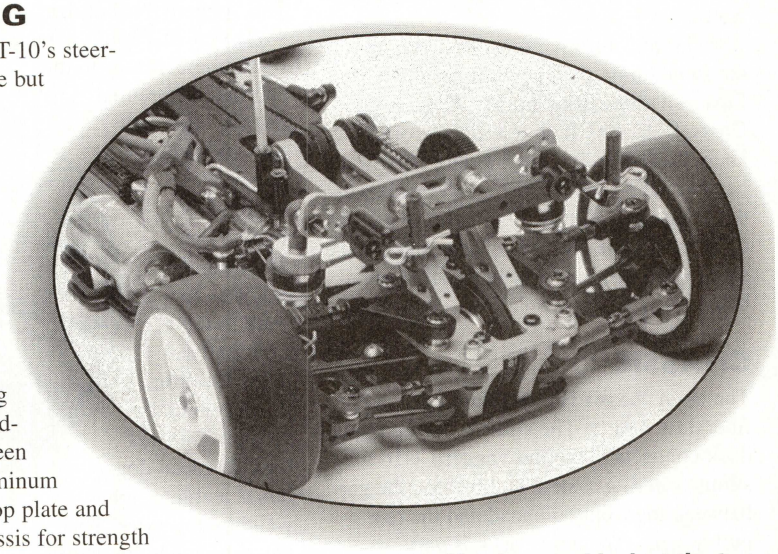
The Voggerd T-10 was received as a chassis only kit. I outfitted my test kit with Dahm's new CLK/GTR. The body features sleek, flowing lines with good detail. Tech Racing's standard width slicks mount onto their own 3-spoke wheels. The kit tires are a soft, high-traction compound that should perform well.

OTHER FEATURES

Another unique feature found on the Voggerd T-10 is a two-piece molded battery holder which uses large O-rings to hold the battery down. I don't feel too secure knowing that my expensive 2000s will be held down to the chassis with O-rings, but I'll have to wait until testing to see if they will keep the battery pack down. The holders themselves are designed for stick packs only. Side-by-side battery packs (especially the larger 2000 cells) won't fit unless you do a little grinding with a Dremel.

STEERING

The Voggerd T-10's steering is a simple but effective bell crank system. Although the steering arms ride on metal bushings, they can be upgraded to ball bearings easily. The entire steering system is sandwiched between the front aluminum differential top plate and the main chassis for strength and stability.



Here's a good look at the two aluminum braces that hold the entire drive system in place. Note the aluminum differential case.

Optional Parts

Although the Tech Racing car is full of features, there still is a long list of available options to tune the T-10 to your liking. A week after receiving the T-10 chassis for testing, Glen at GTP sent me a set of adjustable turnbuckles which I installed for easier trackside tuning. Here's a list of some of their recommended upgrades:

Part#	Name
VS-1	Adjustable Upper Arm 1 pair
VS-2	Adjustable Front Tie-Rod 1
VS-3	Adjustable Rear Tie-Rod 1
VS-4	Ball Bearing Set 16 pieces
VS-6	Universal Joint-Front pair
VS-6R	Univeral Joint-Rear pair
VS-10	Graphite Main Chassis
VS-11	Graphite Center upper deck
VS-17	Graphite Front upper deck
VS-18	Graphite Rear upper deck
VS-26	Set-Up Spring, Soft
VS-27	Set-Up Spring, Medium
VS-28	Set-Up Spring, Stiff

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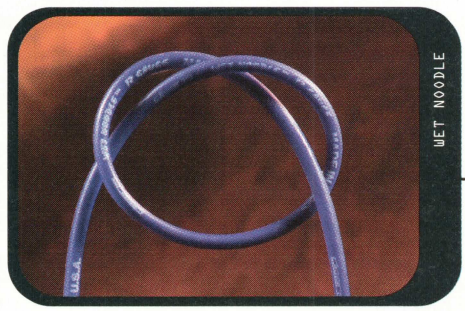

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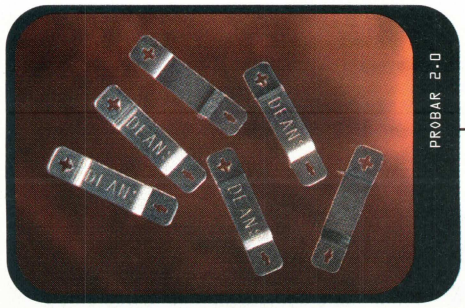

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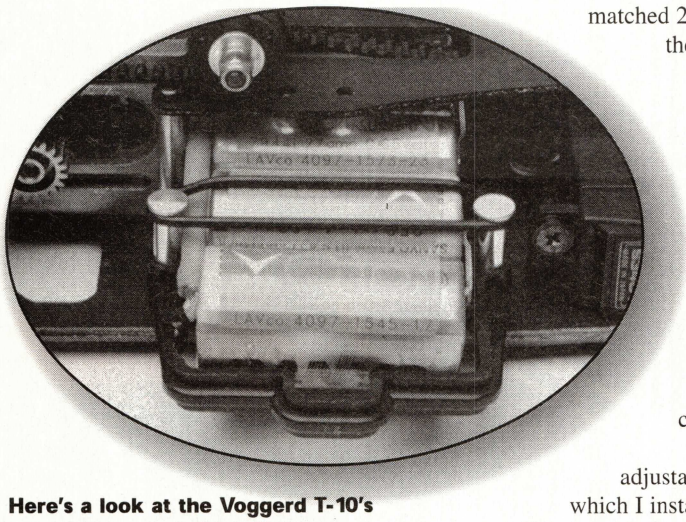

Here's a look at the Voggerd T-10's unusual battery holder. No snaps, no clamps, just a pair of rubber O-rings stretched across two aluminum posts. This allows for quick battery swaps, and believe me, they keep your batteries down!

One disappointment — the Voggerd T-10 is billed on its box as a "Performance 4WD Racing car", but the included metal bushings contradict this statement. While building the car, I substituted the bushings with ball bearings since I was going to be in competition at my local race track. (Tech Racing has a bearing set for the T-10, part #VS-4.)

TEST GEAR

My KO Precious transmitter and receiver provided the controls for my testing. An LRP IPC V6 speed control and Integy matched 2000 cells provided the juice, and I used a Peak performance Raven 24-degree stock motor as the motor of choice.

Before the first drive, I made a few modifications to the car. First of all, I changed the metal bearings to ball bearings. A week after receiving the chassis, Glen at GTP sent me a set of adjustable turnbuckles which I installed for easier track-side tuning. Also, I set aside the kit tires for a pair of standard width offset belted slicks in the rear and low profile belted slicks up front, both manufactured by Cross Racing Equipment (also distributed in the U.S. by GTP California).

HITTING THE ROAD

After arriving at the track, I quickly unpacked, grabbed a frequency clip, and brought the Voggerd T-10 for its maiden run. The car launched forward a little soft from a standing start although I had the torque limiter turned to max. My diagnosis was that I was geared to close to top end, but then I was being passed by everyone halfway down the straights. I wanted to have at least the same top speeds as my competition, so I brought the car in and changed gearing 4 teeth up from the included pinion gear.

With a fresh battery pack, I tried again. This time the car felt even softer from a standing start, but overall speed felt good. The handling was a little twitchy. Through some corners, the Voggerd T-10 would stick to the pavement. Then, a lap later, the rear end of the Voggerd T-10 would break loose. I brought the car in to inspect the suspension.

One of my racing buddies noticed that the rear toe was uneven. Upon inspection the left side had angle, but the right side was parallel to the chassis. A check with my toe gauge proved him right. I adjusted the rear wheels to have negative 1.5 degrees of toe in, and I re-checked the camber settings at all four corners just in case.

After the first practice session I felt that I needed more shock movement for the somewhat bumpy race track. The kit came with only one set of pistons, so instead of altering the stock pistons I played with shock oil. After a few oil weight changes, I found that the stock pistons aren't a burden at all when setting up the T-10. My final setup was 50-weight oil up front/40-weight oil in the rear. Try this and you'll see a big difference when compared to the stock oil.

With the suspension symmetrical on both sides, I brought the car out for the first heat. At the sound of the tone, I was off and running. The Voggerd T-10 felt very good. The car had a very slight hint of oversteer going through the large sweeper. In the infield was a series of tight left- and right-hand turns. The Voggerd T-10's handling characteristics were very neutral and highly responsive, especially through that particular section of the course. Top

TECH RACING T-10 VOGGERD

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SPECIFICATIONS
Country of Origin ..... Japan
Scale 1/10
Manufacturers List Price $289.99
Estimated Street Price $190.00
Part # ..... TV-A
Intended Application ..... Competitive racing
Approx. build time ..... 3 hours 40 minutes

THE VITALS

DIMENSIONS
Length (rolling chassis) ..... 12.00 in.
Wheelbase ..... 8.8125 in.
Width (F) ..... 6.18 in.
Width (R) ..... 6.18 in.
Weight (ready to run) ..... 3lbs., 4 oz.

CHASSIS
Type ..... Double-deck
Material ..... Fiberglass

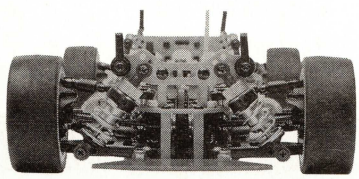
TIRES
Front ..... One-piece plastic
Rear ..... One-piece plastic
Tires ..... Tech Racing Slicks

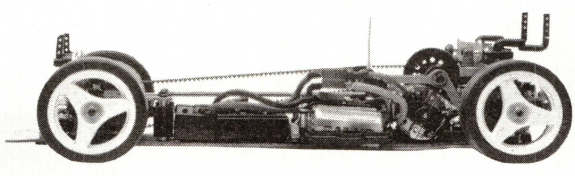
TRANSMISSION
Type ..... Belt-to-pulley front and rear
Differential ..... Ball type
Bearings/Bushings ..... Bushings

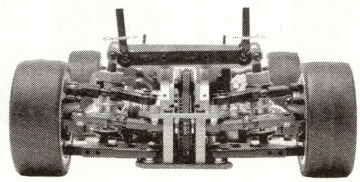
SUSPENSION (F/R)
Type ..... 4W independent w/lower A-arms
Dampening ..... Coil-over, oil-filled shocks

POWERTRAIN
Configuration ..... Electric motor powered
Type included ..... none
Layout ..... Belt-driven 4WD

MAIN COMPETITION
Tamiya TA03-F Pro, Yok.YR4-MII, HPI RS4 Pro, Losi Street Weapon, Elite Xpress, Schm. SST200.







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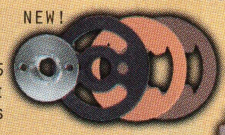
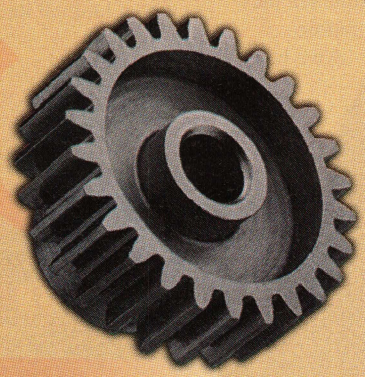
NEW!



RRP-7805 FOR LOSI TRANS

RRP-1506 NEW! FIXED SLIPPER PADS SET OF 2 PADS (1 OF EACH TYPE)

48P/64P "Absolute" Machined Pinion Gears



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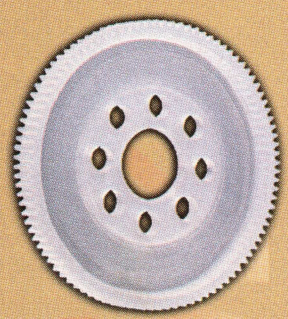

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EACH "PRO SERIES" SPUR INCLUDES GEAR RATIO CHART.

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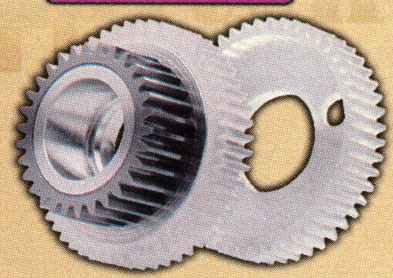

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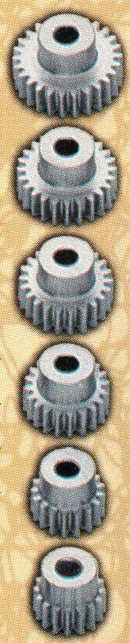

RRP-1050 - 16, 18, 20, 22, 24 & 26 TOOTH PINIONS
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speeds were very good, but then it happened at about 45 seconds before the 5 minute mark — my batteries dumped.

For the second heat, I dropped down a tooth, but I still dumped with a lap to go. (I was running 2000 cells). I went down one more tooth for the Main event. During the Main, the Voggerd was handling very well. It was still responsive, but with this gearing I was slow down the straights. I made the run time, but the lack of top end due to the gearing didn't help me.

Back at home I cleaned the Voggerd T-10 up and checked if everything was okay. While checking the drive system, I noticed that the middle belt was tight on its pulleys. Even after I installed the ball bearings, it had a lot of drag. This might explain the shorter run times. I stretched the belt out a little with a C-clamp, reinstalled it, then drove the Voggerd T-10 again. The car took to the ungroomed street very well, with slightly higher top end after stretching the belt. With my excellent driving skills, I went wide on a left hander and tapped the curb. The left rear wheel flew off the car and started rolling faster than the T-10, which at this point was grinding to a halt. After I chased after the runaway wheel I inspected the car. Yes! I snapped the axle. After searching for a solution, I found that a set of universal axles designed for another sedan used the same bearings and had the same measurements to fit the T-10. With that fixed, I went back to the street (albeit a little more careful) and finished off the battery pack.

ALL IN ALL

Tech Racing has a highly-advanced touring car here. Almost everything is adjustable, so there's no excuse for not being able to set up the car for every track you visit. This is a plus and a minus. It is a plus for seasoned racers who know what subtle changes in suspension geometry can make in the tuning of a car; it is a minus for novices who might be overwhelmed by the high number of adjustments on the car. I also didn't like the stick pack-only configuration of the battery holder. An optional saddle pack chassis would be nice. Also, the standard ball ends that are included in the kit are very soft. I'd recommend swapping them for a set of sturdier aftermarket ball ends. As for the suspension, the Tech Racing shocks worked good. They can be tuned by altering shock oil only, as the stock pistons work well in various track surfaces. The unique pivot ball suspension design is perfect. There's no more E-clips to mess with, no more binding, no more bent hinge pins. This design is simple, and yet it works so much better than the hinge pin setup found on other cars. The kit ball differentials are very smooth, and after I stretched the middle drive belt, the entire drive train loosened up. I enjoyed driving the Voggerd T-10. It was a unique car with a look all its own.

X

Hits:



- **Super adjustable suspension.**
- **Smooth and easily-adjustable shocks.**
- **Quiet triple belt drive system.**
- **Pivot ball suspension works great.**

Misses:



- **Battery holder too small for 2000's.**
- **May have too many adjustments for the sports man racer.**
- **A competitive car like this should have ball bearings included.**

Rumors???

Word has it that Tech is going to come out with a GT edition sometime around Spring of '98. This version may include items such as a graphite chassis, universal drive shafts, ball bearings, adjustable turbuckles, one-way torque splitter, etc. Look for the T-10 GT in your hobby shops



XTREME R/C'S T-10 VOGGERD BUILDING TIPS

The Voggerd T-10 is a highly adjustable car. Thus, the assembly might be slightly more advanced than your normal touring car. However, although the Voggerd T-10 has many parts, the whole car went together rather easily. Here's a few of my building tips:

STEP 1: Before you begin, I highly suggest that you find an empty egg create or some multi-compartment container and put the hardware (screws, washers, etc.) of each parts bag in the container with the bag labels. The Voggerd T-10 has a large number of screws, nuts, washers and what have you, so by separating them in their own compartments you can keep the parts organized for easy access.

PAGE 3, BOTTOM: After assembling the two ball differentials, make sure you read the diagram at the bottom of the page. The differentials will loosen up after a couple of laps if you install them into the car in the wrong direction.

PAGE 5, TOP: The top shafts (referred to in the manual as "idler shafts") are two different lengths. Make sure you place the shorter shaft towards the front of the car.

PAGE 7, ALL: Take some CA glue and glue part #'s PP12 and PP13 together. When installing your steering servo, CA part #'s PP18 and PP16. Do not glue PP17 to PP18 or you will eliminate the servo saver and raise the chances of damaging your servo.

PAGE 8, BOTTOM: The instruction manual shows the use of two screws (#AP15) to hold the spur gear onto the top shaft. If you change spur gears, use four screws. This way the spur gear will be centered onto the top shaft even if the inner hole on the spur gear is larger in diameter than the top shaft.

PAGE 9, BOTTOM: Put a dab of thread-lock onto the drive pins (#MP37) before installing them inside the hex drives. This will keep them from falling out when you change wheels and tires.

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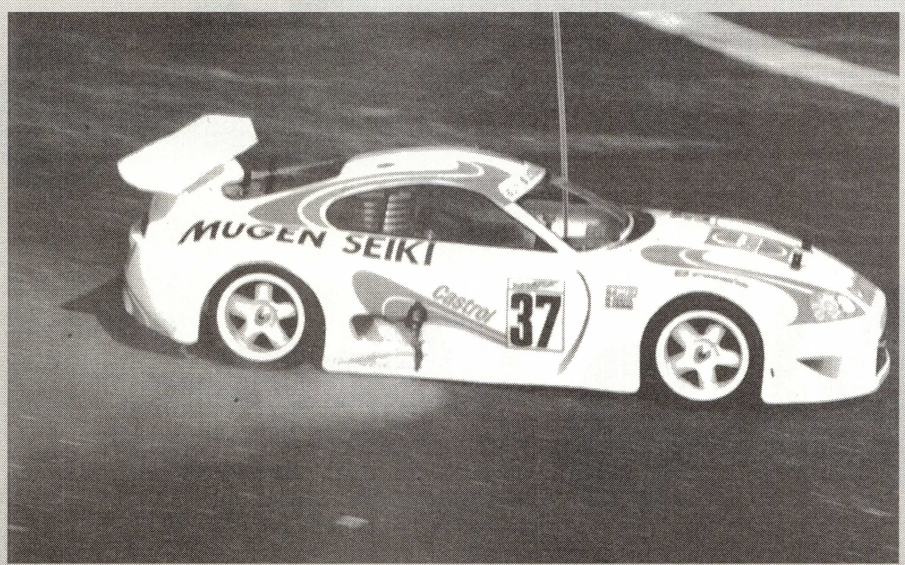
learn how-to

The ABCs of Engine Break-In

by Dean Brown



If you want to thoroughly confuse a new owner of a nitro-powered R/C car, have several experienced racers tell him how to properly condition the engine before any prolonged high-speed operation. On one hand, the advice will be "Fire it and forget it!" On the other hand, another voice will describe a complicated procedure best performed under a full moon wearing a mask and bare footed.

For the average racer, the reality is somewhere in between. But no one should ever ignore the subject. To do so is to ask for frustration and disappointment. Very soon the stupid thing will not start easily — or at all. It will not idle dependably, or run really fast.

Commonly called "break-in", engine conditioning is the process of achieving a proper fit between the piston and cylinder sleeve at normal operating temperatures. Depending on the particular engine, it can take only a few minutes; or many minutes and several tanks of fuel. But whatever it takes, the amount time and fuel is well spent. You will save money on the cost of replacement parts and have more fun because the payoff is longer engine life and better performance.

You might ask, "Why don't the engine manufacturers do it right in the first place?" After a millisecond of thought, you'll have the answer. Money! Although providing an amazing result, the mass production of R/C engines doesn't allow for the required fit of the piston to the sleeve wall. This requires some initial operation where you provide extra lubrication and pay careful attention to engine operating temperatures.

How long the break-in process takes depends, in large part, on the type of engine. It can be an ABC or ABN engine. In either case, the "A" stands for aluminum piston and "B" stands for brass being used to form the sleeve. The letter "C" means the sleeve wall is chrome plated. The letter "N" means the sleeve wall is nickel plated. Most of the sizes, 0.12 to .15 cubic-inch engines, are the ABN type. They are less trouble to break in, but have a relatively shorter engine life. As will be seen, an ABC engine can require some special attention during break-in. But it pays off with longer engine life at high performance.

BASICS REVIEW

To help understand the hows and whys of proper engine break-in, let's cover some basics. Engine life simply means how long the engine can be operated before wear between the piston and sleeve wall results in an excessive loss of compression. Compression occurs because the upward traveling piston is reducing the cylinder volume, and an excessive loss of compression is the basic cause of overall poor performance. After break-in, when most of the resistance is caused by high friction between the piston and sleeve wall, you might be able to feel the compression of an installed engine by turning the flywheel by hand to experience the alternating resistance and free turning. Later, the resistance you feel is the result of compression each time the piston approaches the top of the sleeve. It disappears when the piston passes through the top position and starts down in the sleeve. Compression will be reduced from engine operation and, finally, with enough engine running time, becomes almost nothing. Then it's time to replace the matched set of piston and sleeve.

Just about everything describing engine operation, such as starting, idle, and top-speed operation, depends on how much compression is developed in the cylinder before the piston arrives at the top position. Good compression in a new engine, or one just fitted with a new piston/sleeve assembly, is made better by proper break-in and that compression amount will last longer. So, don't just "fire it and forget it!" You'll be sorry if you do.

KEEP IT RICH

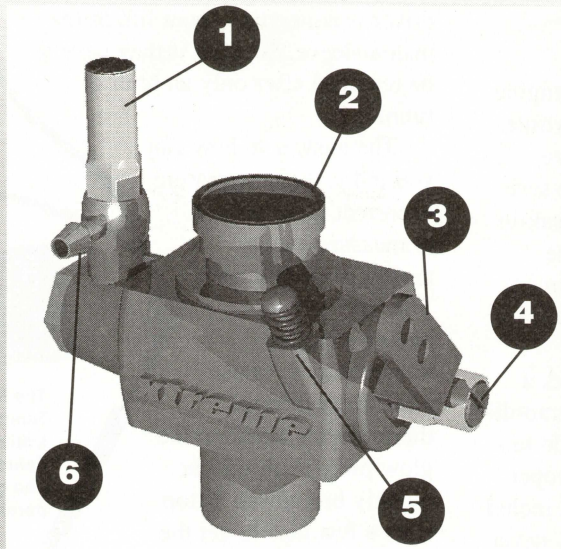
If there's one piece of consistent advice about how to break in an engine, it's

that a richer-than-normal mixture is required during the break-in process. The fuel-to-air ratio always should be on the rich side but make it even richer during break-in.

The term "rich" — and its counterpart, "lean" — refer to how much fuel mixture is admitted into the air stream flowing through the carburetor. (Air flow, of course, is controlled by the position of the throttle valve in the carburetor.) If there is less fuel flow than would be ideal, the mixture is said to be lean. If there is more fuel flow than would be ideal, the mixture is said to be rich. This fuel flow is controlled by one or two adjustment screws on the carburetor. If there is only one screw, it controls the volume of fuel flow during mid-range and high-speed operation. A factory setting inside the carburetor controls fuel flow at idle and low speed operation. If there are two screws, one controls mid-range to high speed fuel flow. The other screw controls idle to mid-range fuel flow.

The real importance of understanding whether the fuel mixture is lean or rich is that our fuel is a blend of chemicals, nitromethane and methanol, intended to burn and provide power and chemicals intended to lubricate and help cool the engine. Typically, about 18% by volume of the fuel is lubricant, a mixture of synthetic and castor oils. So, when the mixture setting at the carburetor is lean, this means there is less than an ideal amount of lubricant present in the cylinder. Engine top speed can be greater than if the mixture is rich. But the downside is more heat and risk of not having enough lubrication. A visual clue to this condition is little or no smoke in the exhaust.

A rich mixture, on the other hand, means there is more than the ideal amount of lubricant present in the cylinder. When excessively rich, as it must be during break-in, the engine doesn't sound right and the exhaust will be very smoky. The engine probably doesn't accelerate well and never really "cleans out" and screams. An excessively rich mixture is not good for anything except when you're breaking in the engine. During this time, extra rich is good; any amount lean is bad.



Anatomy of a Carburetor

1. High-speed needle adjustment
2. Air intake
3. Throttle control arm
4. Low-speed needle adjustment
5. Idle adjustment
6. Fuel inlet

GENERAL BREAK-IN TECHNIQUES

First and foremost, read or re-read the instructions that came with the engine or car kit. For example, the instructions that accompany the popular HPI RS4 1/10-scale car kit include a separate sheet devoted to engine break-in and care. They include this statement, which should be cast in stone: "The first few minutes of the life of the engine is the most critical time." Instructions provided with the OS 12CV engine and the Dynamite 12PD engine are other outstanding examples of advice about how to break in and operate these engines.

You will not find it in manufacturer instructions, but some racers like to give new engines, or new piston/sleeve assemblies, some "pre-starting" attention. They will remove the air cleaner and fully open the throttle valve and add a couple drops of an after run oil, or mineral oil, into the carburetor. Before adding fuel to the fuel tank, they will remove the glow plug and add a drop or two of oil into the cylinder. Then, they either pull the starter cord a few times or bump the flywheel on the starter box to spread the oil through the interior of the engine. Finally, replace and tighten the plug.

NEEDLE SETTINGS

As was stated earlier, the one piece of consistent advice about engine break-in is that the high-speed mixture must be set richer than normal. This requires opening the needle valve or high-speed adjustment some amount beyond what would be a normal setting. Unfortunately, there isn't good agreement on how much extra to open the screw. Different manufacturers, or engine experts, also use different terms. Some refer to fractions of a turn (i.e., 1/12). Others refer to clicks or a certain number of degrees. Some refer to a certain number of turns out, or counterclockwise, from fully closed. Some also suggest setting the idle mixture a little richer than normal.

To help avoid confusion:

1. Top end is a reference to mid-range to high speed engine operation. It involves the use of the Needle Valve.
2. Bottom end is a reference to idle to mid-range engine operation. It involves the use of the Idle Mixture screw.
3. To richen either mixture setting, the adjustment screw is turned out, counterclockwise, or left. All these terms mean the same thing.
4. To lean either mixture setting, the adjustment screw is turned in, clockwise, or to the right. All these terms mean the same thing.
5. Lacking other information, it is good practice to make adjustments in increments of 30-degrees. Later, when really fine tuning, think in terms of clicks, or a few degrees, or, the ever popular "just a tad".
6. BE CAREFUL WHEN TIGHTENING EITHER SCREW TOWARD FULLY CLOSED. DELICATE O-RINGS CAN BE DAMAGED.

WATCH THAT TEMPERATURE

It is absolutely critical that an engine not be seriously overheated anytime. Period. However, it is even more important that an engine not be seriously overheated during the break-in period. Don't, however, keep the engine too cool. A certain minimum amount of engine heat is required for proper conditioning of the piston/sleeve wall surfaces. And, a really rich mixture, with its extraordinary amount of lubricant, can do too good a job of lubrication for proper engine break-in. Moving parts, including the connecting rod big end, never make proper contact to allow a burnishing action to occur.

Having said all that, the following questions arise: What is a good running engine temperature? And how can you measure that?

The answer to the first question depends, in part, on the engine size. Most experts agree that for reasonable engine life the .12-.15 engines are OK in the range 200-220 degrees F, 93-104 degrees C. The .21 engines are OK in the range 230-250 degrees F, 110-121 degrees C. Did you notice the words "most" and "reasonable"? If you ask a driver about to race for a major title in 1/10-scale running a .12 or .15 engine about maximum acceptable temperature, he might say 250 degrees. A driver going for a major title in 1/8-scale might say 290 degrees. Neither driver is concerned about life of the piston/sleeve. So what if they have to be replaced after only an hour of running?

The answer to how can you tell if the temperature is correct is, of course, to measure engine temperature. But how? The best way to measure engine temperature is to use an indirect infrared thermometer aimed at the glow plug. With the car quickly brought to a stop after a few laps to get the engine up to temperature, point the instrument down directly over the glow plug and read the result. Sounds great, but there is a problem. Did I say these devices will cost several hundred dollars? Very precise but very expensive and beyond the budget of most racers.

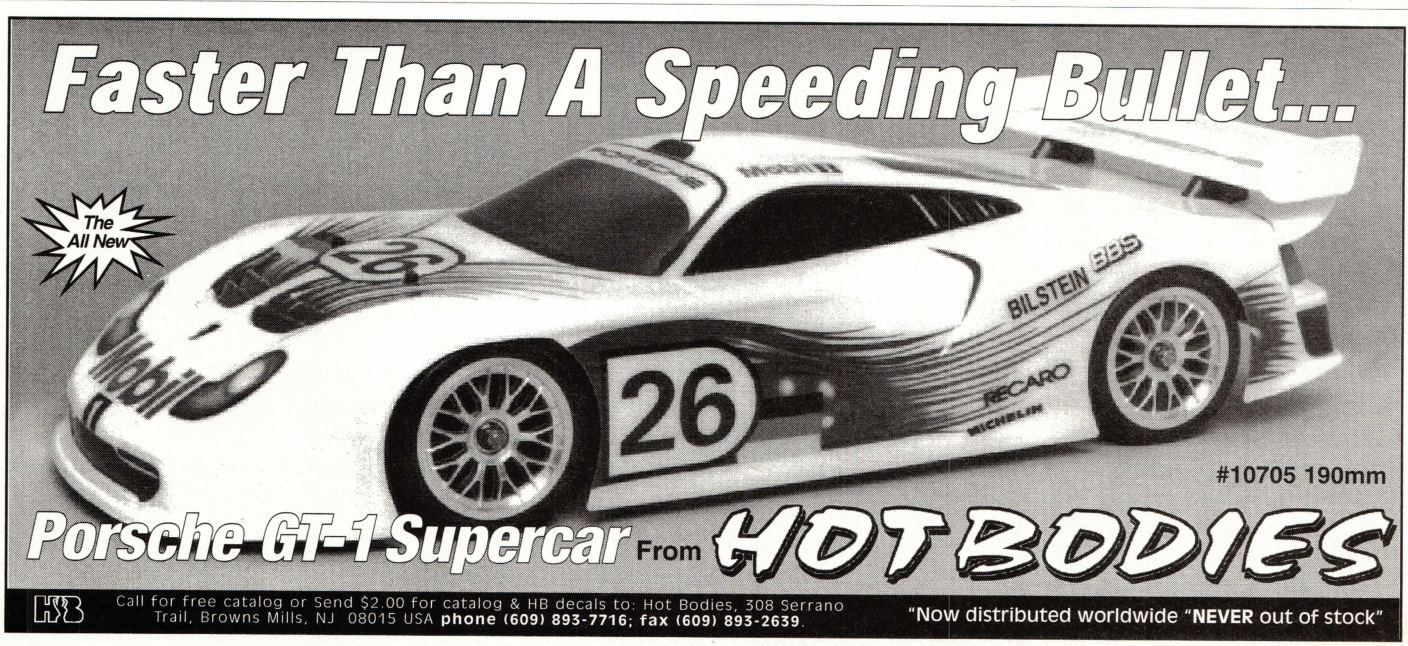


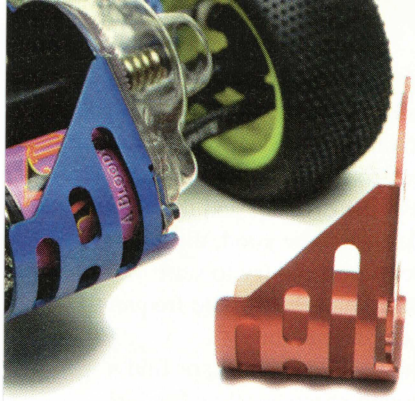
The MIP On-Board Temp-Gauge™ is available in both Fahrenheit and Celsius. The gauge updates temperature every second.

However, there is hope,. There are temperature measuring devices from MIP (about $40.) and PC/RC (about $55.). Both attach a sensor to the cylinder head and provide a digital readout at a separate, on-board module. In one version, the MIP sensor wraps around the sleeve head. In another version, the sensor is attached under a cylinder head screw. The PC/RC sensor attaches under a cylinder head screw. Compared to an indirect infrared thermometer, both suffer from the fact they are actually measuring less-than-true maximum engine temperature because they are remote from the glow plug. But they are very reasonably priced and will serve as reliable reference. Just stay on the low side of either engine size recommended temperature range.

A no-cost method of checking engine temperature is referred to as the Spit Test. Water from an eyedropper can be used if you're sensitive about such things, but here's how. Run enough laps, or time elsewhere, for the engine to reach operating temperature. Quickly bring the car to you, apply some spit to your index finger tip, and quickly drop it on the cylinder head surface. The saliva should just slowly boil off in two or three seconds. It should not dance around as if it were on a hot griddle. Nor should it just lay there and steam. As one expert puts it, "If your spittle will sizzle, the engine is too hot."

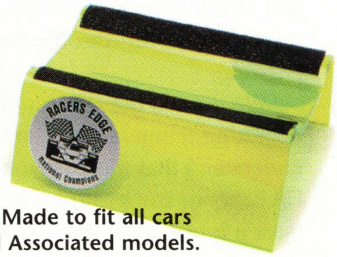
If the engine temperature is too high, open the needle valve 30 degrees and check the temperature again after putting more full-throttle time on the engine. If engine temperature is too low, and you're sure you gave it enough time to arrive at a maximum,











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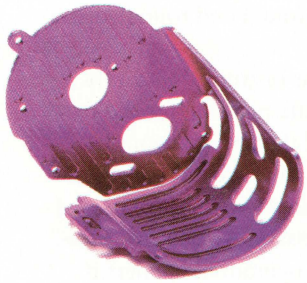

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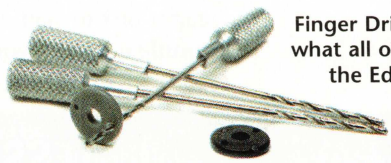

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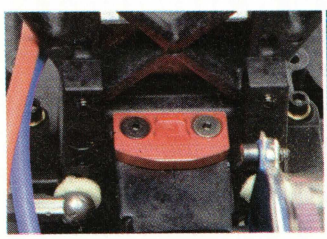

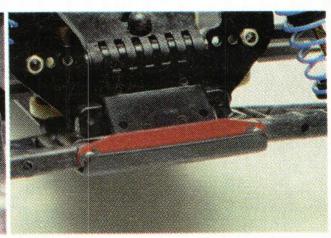

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then close the needle valve 30 degrees and check temperature again after putting more full-throttle time on the engine.

Finally, on the subject of engine operating temperature, it important to understand that most of you operating R/C cars or trucks probably will not have a problem. If, that is, you avoid running too lean a mixture and make sure there is good airflow past the cylinder head. These two factors are critical. Also, observe guidelines contained in this article and found in car kit or engine manufacturer instructions. It is all for your benefit from reduced replacement costs and enjoyment in R/C car operation.

So, spit test if you want; attach onboard measurement systems if you like; or dig deep and enjoy the precision of an indirect infrared measuring device. At all times, common sense should tell you that, if the engine operating temperature is too high, the high-speed mixture is too lean.

TYPICAL ENGINE BREAK-IN PROCEDURE

In addition to the ABC engine information noted later, the following procedure is a guide to properly breaking-in any non-ringed R/C engine. Expect that the engine is going to be cranky during this time. Because the fuel mixture is abnormally rich, the engine will require a little more than usual throttle to idle. It will not accelerate well, and it will have poor high-speed performance. Be patient. It is only a dumb machine. It doesn't answer to prayers or threats.

1. GENTLY close each adjustment screw.

2. Open the needle valve two turns.

3. If present, open the idle mixture screw one turn.

4. Until break-in is complete, increase the idle speed a tad and be ready to increase it more after first starting the engine.

5. With a full fuel tank and glow plug igniter connected, use pull-start rope or starter box to start engine. Open the throttle a little beyond normal idle. If the engine does not start after six to eight pulls on the starter rope or a few bumps on the starter box wheel, stop and check for cause. If there is a fuel mixture in the cylinder and the glow plug is known to be good, the engine will at least pop and try to start.

6. Expect to blip the throttle frequently to keep engine running.

7. Put the vehicle on track, or find a large enough space to allow for "up and back" or "round and round" operation.

8. Drive the car or truck constantly changing throttle position for the first tank of fuel. If the engine stumbles along and will not take any throttle, close the needle valve 30 degrees and restart, if necessary. After a few minutes of engine operation, be alert if engine speed suddenly wants to increase. Bring the car in immediately and refill the fuel tank. (The tank is almost empty and the mixture is going lean.)

9. After the first tank, it is good practice to stop the engine and allow it to completely cool. Then, restart the

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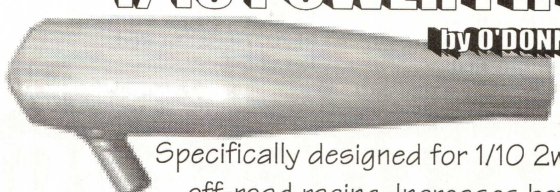

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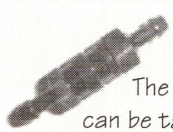

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Seal It Up

by Ken Marcum

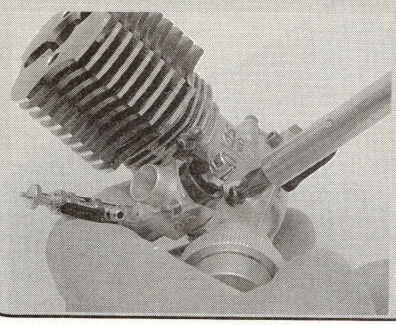
The first thing you will need to do to make sure your new baby will run properly and, with the least amount of muss and fuss, to make sure the engine is sealed properly. You need to ensure that there are no air leaks through any of the openings in the different access areas of the engine. Air leaks will adversely affect the way the engine idles and whether it will run properly or even at all.

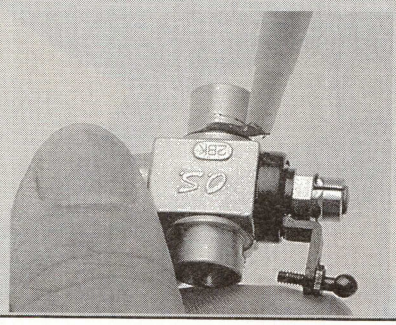
There are three main areas you need to make sure get sealed properly: The carburetor, the carburetor mounting screws, and the backplate. The backplate on a pull-start engine needs to be sealed just the same as it does on the non-pull-start versions. To properly complete this operation you will need a couple of things. Some quality alcohol. Not the rubbing stuff that only costs $.69 a gallon, but Denatured alcohol found in hardware stores or Methanol sold by O'Donnell and other fuel makers. These types of alcohol contain no water and will not contaminate any of the engine surfaces. You will also need some red RTV sealant which is available in most hardware and auto parts stores. A few tools to disassemble parts of the engine and some clean rags. Now that you have all of that assembled in a clean place where you can work, we can get started.

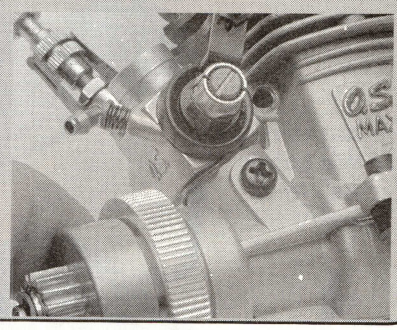


Remove the backplate by taking out the four screws that hold it in place. If you have a pull-start engine the screws are found under the pull-start mechanism. You will have to carefully remove the pull-start first in order to get to them. Take extreme caution not to let the spring unwind as you remove the mechanism as the spring is very difficult to replace it. (I know I have done a number of them for the customers in my shop.) Now that you have the backplate removed (leave the gasket on the backplate), clean both surfaces with the alcohol to remove all of the machining fluid and oil that the factory uses to ensure a good bond with the RTV. Put a small bead of RTV around the base of the backplate. Don't use too much, a little goes a long way. You just want to fill in the corner of the part that meets the engine case. To error on the side of caution is OK. Not enough is better than too much. You don't want any RTV to get into the engine case where it can do a lot of damage. Carefully replace the backplate and wipe any excess RTV off of the outside of the case.

Next, remove the carburetor and repeat the same procedure for it. Again, be very careful not to overdo it. Just a small bead is all you need. If you have an engine like the O.S. CV you will not have to worry about the bolt that holds the carb in. If you have a CZ type engine (CZ, CZ-Z, TNT, etc.) you can put some RTV on the threads of the screws that hold the carb in place and replace them with the carburetor. Let the engine sit overnight so that the RTV has a chance to set up real well. Reinstall it into your vehicle and you are ready to start the break-in process.







engine and proceed.

10. Continue operation for three or four tanks of fuel. By now, the engine should take throttle from idle and start to run better at full throttle. Meanwhile, the engine should still be passing your temperature checks.

11. Close the needle valve 30 degrees. Begin a series of tests where you will run a few laps at or near full throttle on the straight and listen for higher and higher engine speed at full throttle. Repeatedly close the needle valve in 30-degree (or less) increments. Keep checking engine temperature.

12. When highest engine speed is achieved for full throttle, immediately bring car or truck to you and open the needle valve 30 degrees. This should be the slightly rich proper mixture for sustained high-speed operation.

13. It good practice to drive another couple of tanks at this setting and observe the smoke from exhaust, you'll see less and less as the engine leans. You will observe engine operation keeps getting better and better.

14. To test for a good glow plug any time, let the engine idle at normal speed. Put the glow plug igniter on the glow plug for a few seconds, then remove the igniter. If the plug itself is good, there will be no increase in engine speed. If engine "loads up", which means RPM decreases, replace the plug.

CHECKING IDLE MIXTURE

If, from an idle lasting about ten seconds, the engine puffs out a lot of smoke when throttle is suddenly opened, and does not accelerate rapidly, close the idle mixture screw 30 degrees, and retry. The mixture was too rich. If, on the other hand, engine tends to speed up momentarily and cut out, open the idle mixture screw 30 degrees. The mixture was too lean.

Another way to check the idle mixture is to allow engine to idle and then pinch the fuel line closed. If the engine dies immediately, the idle mixture is too lean. If the engine speed increases for a few seconds and, then, the engine dies, the mixture is OK.

ABC ENGINE STARTING AND BREAK-IN TIPS

In addition to performing the steps given previously as Typical Engine Break-In Procedure, consider the following for ABC engines. An ABC engine probably will be difficult to start for break-in. It doesn't want to turn over when you're trying to start it. The fit of the piston in these engines is much tighter than in ABN engines. In fact, the cylinder diameter narrows toward the top to squeeze the piston and force it into a better fit and seal from the break-in process. It's interesting to note that the efficiency of the piston-to-sleeve seal is so important that custom engine builder Ron Paris works to a tolerance of 25 millionths of an inch when selecting and fitting these parts .

Also, remember that rather than having a nickel-plated sleeve, these engines have a chrome-plated sleeve. Chrome is a much harder material so it lasts longer. But its hardness also contributes to a longer break-in period.

STARTING AND BREAK-IN TIPS

Some of the following information is taken from the Dynamite 12PD engine instructions. However, the information represents some of the characteristics of any ABC engine.

If you're running this engine, probably you are not using a pull-starter. But, if you are, try and borrow a starter box for the first few starts. If one is not available, be very careful not to over extend the starter rope when starting the engine.

1. Before attempting to start the engine for the first time, it's good practice to pre-oil the cylinder wall. Remove glow plug, place a few drops of an after run or a mineral oil into the cylinder, and bump a few times on the starter box to lubricate the cylinder wall.

2. Replace the glow plug but leave it a turn or two loose. During the first few start-ups, this will serve to release some of the cylinder compression

3. When engine starts, use the glow plug igniter as handle and finger-tighten the plug. Then use plug wrench to fully tighten.

4. Expect that you will use a plug or two during break-in. Microscopic pieces of metal attach to the glow element of the coil of wire, and adversely affect its thermal conductive properties.

YOU CAN CONSIDER THE ENGINE BROKEN-IN WHEN:

1. Engine will reliably idle at low RPM for 30 seconds and, then accelerate to full throttle without dying.

2. Engine will consistently maintain a needle setting for one tank of fuel.

3. Engine will start quickly with one quick burst from the starter box or pull-starter rope.

So, that's it. Now you know a little more about why it's so important to properly break-in a new engine, or a new piston/sleeve assembly. And you have some basic guides to how it's done. Good racing!

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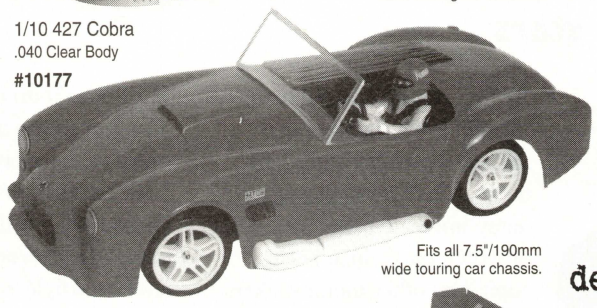

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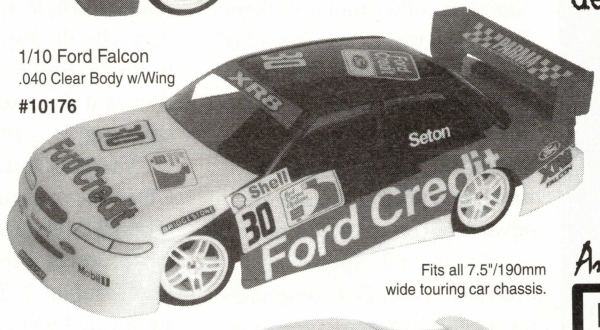

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.040 Clear Body w/Wing
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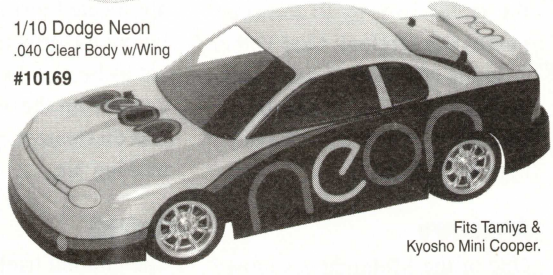

Fits Tamiya & Kyosho Mini Cooper.

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www.parmapse.com

evaluations

Midnight Strikes at 2

Trinity's Midnight 2 Stock Motor



Xtreme R/C Rating:

4 1/2 stars

Retail Price: $39.99

Part #: RC2295, RC2296 (Pro)
Pro comes with "E" silver brushes and is dyno tuned and tweaked.

Weight: 5.5 ounces

Applications: All forms of Stock racing

Manufacturer:
Trinity
36 Meredian Road
Edison, NJ 08820
Phone: (732) 635-1600
Fax: (732)635-1640
Website:
www.teamtrinity.com

Back in September of 1995, Trinity introduced the Midnight motor. The Midnight employed many innovative features, some of which have since been copied by other motor makers. To keep a step or two ahead of the competition, Trinity has introduced the Midnight 2. Will this sequel live up to the original? When a great movie is made often times the sequel never lives up to the original; Caddy Shack 2, Speed 2, Predator 2, etc. But sometimes the sequel lives up to and surpasses the original; God Father 2. Is the Midnight 2 just another sequel or does it raise the standard? That's what we're here to find out.

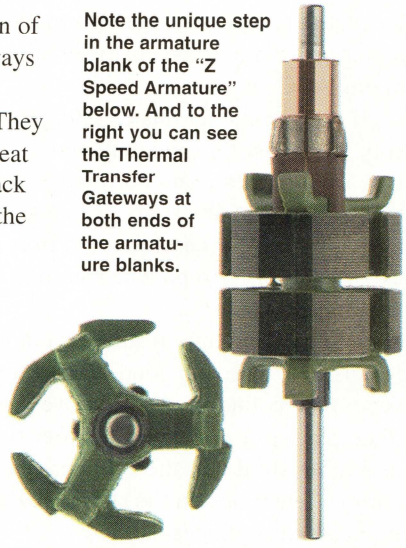
Armature

One of the Midnight 2's most notable innovations is the "Z Speed Armature." The armature is designed to trick the motor into thinking its timing is more advanced than it actually is. How does it do this you ask? The face of the armature that opposes the motor magnets has been stepped. What does that do you ask. Well to give you a complete answer would take another article all by itself. But basically the theory is similar to timed brushes. The motor acts as if the timing was advanced 8 to 10 degrees.

Thermal Transfer Gateways, a features carried over from the original Midnight, are still incorporated into the design of the Midnight 2. The Gateways are located just above and below the armature stack. They act as heat sinks and pull heat away from the armature stack and dissipate the heat into the moving air.

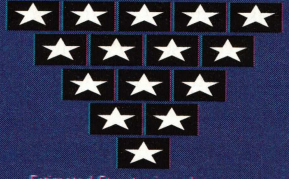
Endbell

The endbell itself has a new look. A large vent hole was cut out between the wire posts. This is to provide better cooling and allow you to easily inspect the commutator for wear or damage. The size of the solder tabs has been increased to provide a larger and easier surface area for you to solder your speed control leads to. In case you've used solderless connectors in the past, you still can even with the larger soldering tabs. This is due to a slot cut into the tabs. Another notable feature on the endbell is the Brush Stabilizing System



Note the unique step in the armature blank of the "Z Speed Armature" below. And to the right you can see the Thermal Transfer Gateways at both ends of the armature blanks.

RATING SCALE



5 STARS- Excellent! a Must in our book; worth every penny.
4 STARS- Very Good. Definitely worth taking a look at.
3 STARS- Good. Although it could be improved, it gets the job done.
2 STARS- Fair. It's Okay for some racers.
1 STAR- Poor. Don't say we didn't warn you.

Estimated Street prices shown are an average of 10 hobby shops and race tacks chosen at random. Actual selling price may vary depending on location and availability. All tests are representative of the actual unit we received. Your results may vary.

(BSS). The BSS keeps the brush from moving up and down. This helps keep brush arc to a minimum. Although the brush stabilizer idea is not a new feature to stock motors, it's the first time the feature is present on a Trinity motor. Unlike other brush dampeners, the Midnight 2's are located above the motor brush. This placement puts more surface pressure and more contact area on the brush than competing designs. Other features on the Midnight 2 endbell include black anodized heat sinks and removable spring posts.

The Can

The most noticeable aesthetic feature of the Midnight 2 is the LCG Flat Can™ The theory behind the Flat Can design is to bring the magnetic field created by the motor magnets closer to the armature to produce more torque and power. Another feature of the Midnight 2 can is the improved venting via the four slots cut into the flat area of the can. To a certain extent, the larger vent holes nullify some of the benefits of the of the Flat Can design since 42% of the flat surface is cut away. The vents on the mounting surface of the can have been opened wider to increase airflow. With all this increased airflow more attention will be needed to quickly clean any dirt or debris that gets into the motor.

The magnets on the Midnight 2 are the latest 6.0 version wet magnets. They are still 5.2mm thick, but have more cohesive strength which makes them less susceptible to magnetic-strength loss due to increased heat.

Other Features

The Midnight 2 includes Narrow Cross-section bushings. First introduced on the original Midnight, Narrow Cross-section bushings have a reduced surface area for less drag. The Flux Collector, which improves the end-to-end balance of the magnetic field of the motor, is also featured.

Testing Time

The first test we conducted was a comparison of the Midnight 2 with the original Midnight using a dyno. We used a Competition Electronics Turbo 45 dyno to test our motors. As you can see on the two printouts, there was noticeable and measurable improvement in the area of rpm's and punch (wattage) without sacrificing torque.

Next, we subjected the Midnight 2 to actual performance testing by running in in an off- and an on-road vehicle. For the dirt test, I installed the Midnight 2 in the same Losi Double-X 'CR' *Kinwald Edition* that's reviewed in this issue. I started with the pinion/spur gear combination recommend in the owner's manual for a 24° motor. With a 26-tooth pinion and an 84-tooth spur gear installed, I hit the track. For a minute or two I thought I had accidentally installed a modified. The Midnight 2 was fast, very fast. Off the line the buggy jumped up and took off. Top speed was equally impressive. After five minutes of driving hard around the track I brought it in. The Midnight 2 was not excessively hot. It kept well within a reasonable temperature range.

For my second time off-road, I was able to kick it up a tooth and run a 27-tooth pinion gear. Again, off the line the Midnight 2 was still very quick and was even faster on the top end. Overall, on the dirt I give the Midnight 2 an "A."

On the asphalt we ran the Midnight 2 in a Schumacher SST2000 sedan. Installed in the car was an 89-tooth spur gear. My first run was with a 24-tooth pinion. Once again the Midnight 2 took off like a rocket and quickly got up to speed. Around the track the car was silky smooth. The Midnight 2's long, smooth power band felt more like a multi-wind modified than a stock motor. After the first run I replaced the 24-tooth gear with a 27-tooth. No problem. Performance was still excellent off the line with more top speed down the straightaway. On the pavement, the Midnight 2 gets another "A".

MIDNIGHT 2 @ 7.00 VOLTS				
RPM	TORQUE	WATTS	EFFI.	AMPS
22127	3.7	60	65	13.0
20690	4.9	76	68	15.9
19578	6.3	91	69	18.8
18446	7.7	105	68	22.0
17641	8.9	117	67	24.0
16875	10.0	125	64	27.9

MIDNIGHT @ 7.00 VOLTS				
RPM	TORQUE	WATTS	EFFI.	AMPS
20060	3.6	54	59	13.0
19124	5.2	74	66	15.9
18303	6.8	92	69	18.8
17352	8.2	106	68	21.9
16587	9.5	116	66	24.9
16196	10.1	121	62	27.9



The LCG Flat Can™ uses four mounting tabs, two more than before. The additional tabs are for tamper resistance and to prevent the endbell from coming loose during a hard hit.

Conclusion

With increasing competition in the marketplace, Trinity has risen to the occasion. Off-road and on-road, the Midnight 2's performance was second-to-none. My one and only concern is with the increased number and size of the vent holes on the can; special care must be taken to prevent debris from entering and damaging the motor. The Midnight 2 employs performance-improving innovations without compromising reliability or cost. If you're a stock racer, you need to try one of these motors. You won't be disappointed.

Who It's For:
On and off-road stock class racers looking for the latest high performance motor.

Good News:
- Runs cooler but with more rpms.
- Innovative features.
- Improves on a great product to begin with.

Bad News:
- Large side vents allow debris to enter the motor.

High Octane?

INDI Reactor 20 discharger

Xtreme R/C Rating:

3 1/2 stars



Retail Price: $49.95
Estimated Street Price: $45-$50

Part #: INTE2005

Weight: 13 ozs.

Applications:
Discharging 6 or 7 cell battery packs

Importer:
Integy Technologies
Phone: (800) 627-2713
Fax: (909) 444-2767
Website:
None Yet

Who It's For:
Anyone looking for a easy, safe and relable battery discharger.

Good News:
- Inexpensive.
- Durable.
- Lightweight.
- Regulated current.
- Built-in adjustable automatic cut-off.

Bad News:
- Adjusting cut-off voltage requires taking unit apart and voids the warranty.
- No instructions provided.

Batteries are arguably the most important single component of a radio controlled car. Even the world's fastest motor combined with the most efficient speed control is nothing without a good power source. Keeping that power source in top notch condition involves proper discharging of your batteries. The ideal discharge technique is simply running the battery in a car. However, when this is not possible, there are many dischargers available, such as the Integy Reactor 20, that can accomplish the task.

Features

The Reactor is a departure from the typical light bulb discharger. Instead of bulbs, to drain the battery the Reactor uses five large resistors that are enclosed in a sturdy, metal case. This discharger features an integrated cooling fan, automatic cut-off and reverse voltage protection. Reactor 20, as it name implies, discharges at 20 amps. The unit itself measures 4.33x3.15x2.56", and weighs 10 ounces. In other words, it is compact and lightweight. The Reactor's layout is quite simple. There is a start button, alligator clips to attach to the battery pack, and a row of nine LED's that indicate how much energy is left in the battery. Operating this product is very simple — just hook it up, and push the start button. It automatically shuts itself off after the pack has been discharged. A digital voltmeter was used to check the point when the automatic cut-off occurred.

Discharge Test

Before testing any of the specific features of the Reactor, I decided to put it through a bit of a torture test to see how well it would handle discharging battery after battery without any time in between packs to cool off. The test began with four fully-charged battery packs. The Reactor performed well. It discharged all four batteries consecutively without a problem, and shut itself off after each battery had reached 4.3 volts. The integrated fan does quite an effective job of keeping the unit cool. After the first battery had been discharged, the Reactor was warm, but I could still comfortably hold it in the palm of my hand. After the fourth pack was done, it was too hot to hold in my hand, but I could still touch it for a few seconds at time without burning my hands. Compared to a light bulb discharger, which becomes hot enough to burn skin the moment it is hooked up, the Reactor is considerably safer.

Reverse Voltage Test

I was a bit afraid to test the Reactor's reverse voltage protection. However, I took a deep breath and hooked the negative to the positive and the positive to the negative. Next, I cautiously pushed the start button. Nothing happened. The Reactor has the best type of reverse voltage protection; the unit just won't activate. That is much more convenient than blowing a fuse (that the user will have to change) , or shutting down for a few minutes (forcing the user to wait).

Integy doesn't provide any documentation of any kind with the Reactor. However, this is not problem considering how easy it is to operate. After my initial testing had been done, I decided to consult my Integy catalog to see if there were any features I had overlooked. The catalog description read, "Simply press the start button, your pack will be discharged at 20 amps until it reaches the selected cut-off point." I assumed that the phrase "the selected cut-off point" implied that the cut-off point was adjustable by the user, yet there was no control anywhere on the unit to adjust the cut-off point. So, I decided to give Integy a call. The helpful staff at Integy informed me that they recommend staying with the factory set cut-off voltage. But, within the Reactor, there is a potentiometer which controls the voltage at which the discharger will shut itself off. I found that from the factory, my unit was set to the minimum cut-off point of 4.3 volts. I adjusted the potentiometer to its maximum setting, resulting in a cut-off at 6.8 volts. After a bit of trial and error, I eventually set my Reactor to shut itself off at 5.4 volts. Integy does acknowledge that you may adjust the shut-off voltage, but doing so voids your warranty.

The Verdict

Most dischargers can be split into one of two groups, either the relatively inexpensive light bulb type, or the expensive programmable computerized units. The Reactor is a definite departure from this convention that takes the best features of each and combines them all in one product. Like expensive computerized dischargers, the Reactor has regulated discharge current and adjustable cut-off voltage, and at a fraction of the cost. With a retail price of $49.95 it is a bit more expensive than the typical bulb discharger, which retails for about $30. But when you factor in the auto-cut off, you're a couple bucks ahead of the game. In conclusion, I was rather impressed by the Reactor 20. Integy has packed a lot of features into a relatively inexpensive product.

NEW High Voltage

V•MAX 1700



More Punch
Higher Top Speed
Accepts High Charge Rates
Best Choice For Stock Class

Team Orion is proud to announce a new Sanyo cell designed specifically for stock motor racing. The new V•Max 1700 cells deliver our highest voltage ever due to a totally new cell construction and the exclusive World Champion V•Max voltage boosting process.

They're designed for high voltage and will make your stock motor deliver more punch and top speed. And, they're equipped with extra protection for the high charge rates found in stock racing. If you race in the ultra-competitive stock classes, get the extra voltage of the new Team Orion V•Max 1700's. It can be the difference between winning and... not winning.

High Capacity

V•MAX 2000

Team Orion V•Max 2000 cells have been dominating modified races around the world. The RC-2000 cells are designed for high capacity and deliver 10% more run time with the same durability as 1700-SCRC cells. Each cell is treated with the V•Max process that noticeably boosts voltage for the life of the cell without sacrificing run-time. For modified racing, Team Orion V•Max 2000 cells are clearly the choice of champions.

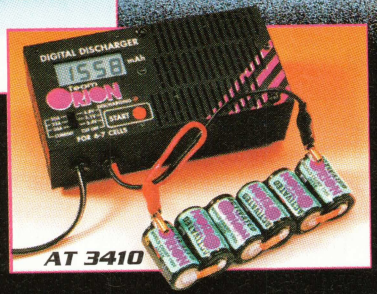


Long Run Time
Very Good Voltage
Perfect For Modified Class

Also Available:



Active Discharge Device



Digital Discharger

Please recycle your cells.

Help the RC industry and Team Orion protect the environment, phone 1-800-8-BATTERY for the RBRC recycling program near you. All Team Orion cells meet IFMAR, ROAR, NORRCA and RBRC rules.

Team® ORION

Team Orion cells are distributed in North America by:

Peak Performance, 23352-J Madero Road
Mission Viejo, CA 92691 714-707-4683

On the Web??
WWW.TEAM-ORION.COM

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Trade inquiries to: Neidhart Distributing, 363 Rue de Bernex CH-1233, Bernex, Switzerland FAX 4122-757-4186

Power To The People

Orion V-Max RC1700 Batteries

Xtreme R/C Rating:

★★★★

4 stars



Retail Price: $58-98
Estimated Street Price: $40-$70

Part #: Various

Weight: 11.5 ozs. (assembled with wire)

Applications:
Supplying power for R/C vehicles

Importer:
Peak Performance
Phone: (714) 707-4683
Fax: (714) 707-4684
Website:
www.team-orion.com

Who It's For:
Racing; stock racers will see the greatest performance/cost benifits with the lower priced packs.

Good News:
- Cheaper than RC2000s.
- Durable.
- High voltage numbers.
- Perfect for stock racing.

Bad News:
- The high-dollar packs are not as good a value as the lower-priced packs.
- RC2000s work better for modified racing.

Although they were announced last summer, Sanyo's new RC1700 cells didn't hit our shores until early this winter. That's when we got our hands on a few packs of Orion's V-Max RC1700s. Since then we've been running and testing the cells under a variety of conditions. Off-road modified and stock racing and Sedan stock and modified racing. We've also put them on the discharger and recorded the data. Take a look at what we've found.

Features

The RC1700 cells were set to fill the gap between Sanyo's 1300 mAh sport cells and their ultra high tech RC2000 cells. The new RC1700s are made with the same technology used to manufacturer their 2000 mAh counterparts. Through out the months we've been testing them we've had nothing but good luck in the form very little if any cell venting. (Venting: when built up gasses inside the cell are released through the vents in the positive terminal. Although the cells are designed to do this from time to time, it is not something that is desired.) Venting was a frequent problem found with the earlier 1700 mAh SCRC cells.

Orion offers the RC1700 cells in a variety of ways. They can be purchased in standard matched packs or V-Max matched which have gone through a voltage increasing process. Whether you decided on matched or V-Max matched, Orion offers the cells in one of three levels which are determined by the time rating (in seconds) when the cells are matched on Orion's Lavco system. The order goes Sportmatched, Pro-Team, and Activated for the matched and Sportmatched, Stock and Activated for V-Max cells. The greater the time level the greater the price. For the highest levels the RC1700 are only slightly lower in price than the longer running RC2000 cells. At the lower end, Sportmatched for instance, the RC1700s are much less expensive then their RC2000 counterparts.

Assembly

The RC1700s are the same size, physically, as the RC2000s. This means that when using battery jigs or other tools, it will be just like assembling a pack of RC2000s.

Testing

Like I mentioned earlier, we tested the Orion RC1700s under a variety of conditions. We found that their performance really shined in stock racing. They delivered voltage and punch characteristics very similar to our more expensive RC2000 cells. In modified racing we dumped a few times when we pushed the gearing envelope with very low ratios. When the same gearing was used with a RC2000 pack, we didn't not dump and actually had some run time left over. When we put the RC1700 through some bench testing on our Tekin DIS-350 we found that they delivered on average 30 seconds less run time than the RC2000 cells we tested under the same circumstances. The RC1700s voltage however was on par with the voltage readings we got from our RC2000s.

Conclusion

If you're planing on shelling out the big bucks for the highest level V-Max RC1700s you can find, think again. Go the extra mile and opt for the V-Max RC2000s or even a comparably priced pack of Orion RC2000s. Where the RC1700 excel is in the lower price ranges. The Sportmatched V-Max cells provided good average voltage numbers when compared to more expensive V-Max RC2000 packs. For stock racing these are perfect. The RC17000s are much better than any of the 1300 mAh packs around and give you the punch you need for stock racing along with excellent reliability. X

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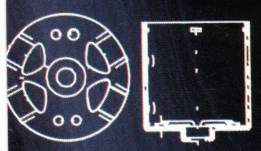
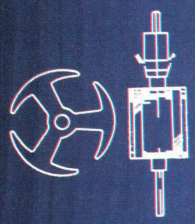
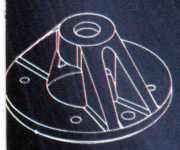
ShockWave



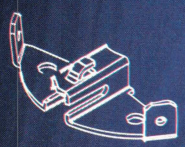
° High Strength Endbell made from advanced polymer will not melt or deform under high temperature.
° CAD designed to allow maximum air flow.



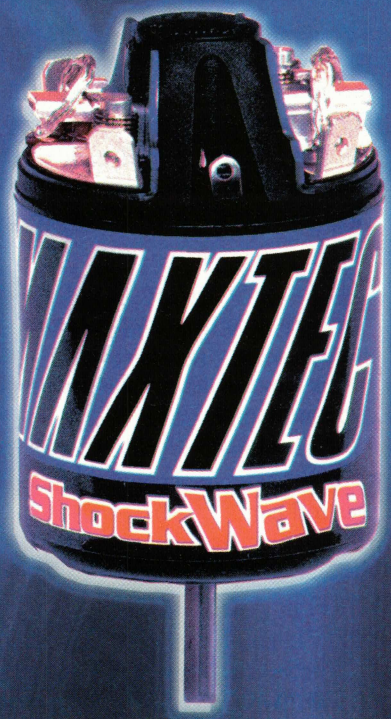
° Patented "Reverse Taper" Armature produces the highest level of EMF.
° Custom manufactured lamination steel reduces heat and amp draw under load by over 10%.



° 1.4mm thick can combined with v5.5 magnets creates the strongest magnetic field for more torque.
° Can design provides maximum airflow and increases field strength.



° Silver Plated Brush Hood provides 400% less resistance.
° "EZ Solder"Tabs move solder away from brush spring.



The fastest motors in the world now come from the USA. MAXTEC is proud to offer the Shockwave, the first motor to be based on AMP technology. The ShockWave is packed with more features than any other motor available, such as the patented "Reverse Taper" armature , 1.4mm thick can , silver plated brush hoods and v5.5 magnets.

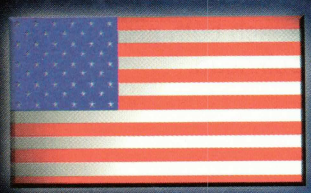
Advanced custom application steel along with the finest components create the strongest magnetic field available for a ceramic magnet motor.

The patented "Reverse Taper" armature generates the highest level of EMF (electro magnetic field) while reducing amp draw under load by over 10%.

AMP technology combined with MAXTEC's custom winding process, high power brushes, and dyno tuning provide the ultimate in performance.

100% QUALITY GUARANTEE

The only motors available with a quality guarantee! Maxtec guarantees all AMP based motors to be free from defects, shorts, and all forms of premature failure.



THE SHOCKWAVE IS MADE ENTIRELY IN THE USA!

3609 West Mac Arthur Blvd. Suite 807 Santa Ana, CA 92704 For More Information Call: 714-427-5180

learn how-to

Convert Your B2 Into a B3

by Dave Palacios



When the B3 was introduced last year we were impressed with many of the new features. B2 owners may have felt a little left behind, but never fear B2 owners, Associated has come to your rescue by offering a B3 conversion kit. The kit allows you to quickly, easily and relatively inexpensively, convert your B2 to have complete B3 performance. Team Associated offers the performance conversion kit two ways, in composite graphite or standard molded composite. The difference in price for the two kits is a mere $30. For that reason I highly recommended any one thinking about the conversion opt for the graphite. (B3 Conversion kit – #9022 standard, $99; #9023 graphite, $130.)

The conversion kit includes:

- New steering geometry.
- New suspension arms front and rear.
- New front shock tower (woven graphite on the graphite kit).
- New front bulkhead, suspension brace and aluminum axles.
- New larger diameter slipper assembly.
- New chassis to accommodate optional rear roll bar.
- 2.2" front one-piece wheels.
- New rear hub carriers.
- Steel tie rods.
- New longer heavy duty ball cups.

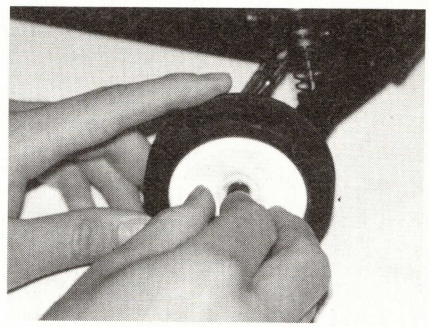
The instruction manual that's included with the conversion kit is the same manual used to build the B3 from scratch. Using this conversion How-To along with the instruction manual should make things very, very easy. Let's begin.

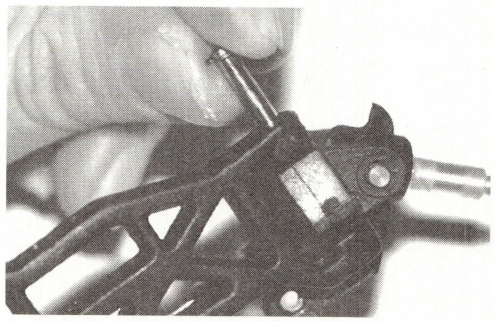
STEP 1

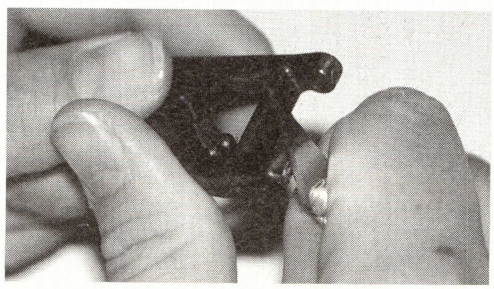
Begin by disassembling the front end. Remove the front tires and remove the outside hinge pins holding the front block carriers to the arms. Now go to Pg. 3, Step 1 in the instruction manual and begin assembling the new front block carriers. You will need the two (2) 4-40 setscrews and the two (2) ball ends attached to the old steering blocks. (The Tamiya box wrench works great for removing and installing the rod ends.) The new block carriers have left and right markings attached, don't remove those markings until you have the correct steering blocks and block carriers paired up. Once you've completed Step 1 in the manual you can go to our Step 2.

Tools You'll Need:

- Phillips #1 and #2 screwdrivers
- Needlenose pliers
- Hobby knife
- Liquid thread-lock
- .050", 1/16", 5/64", and 3/32" Allen wrenches
- Associated's molded wrench set
- Ball cup wrench made for Losi ball cups
- Tamiya box wrench
- A ruler or caliper





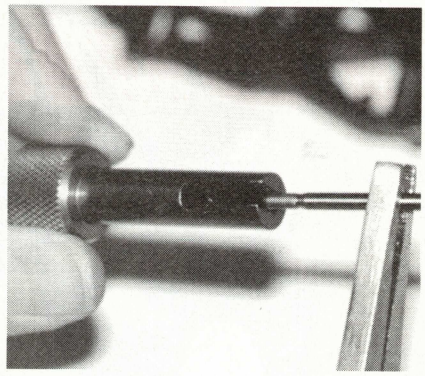


STEP 2

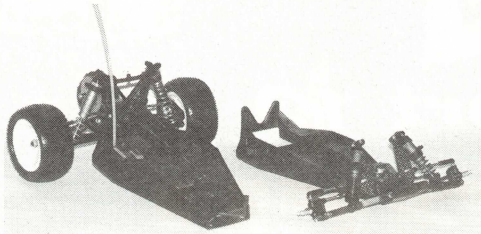
Remove the inner hinge pins from the old front assembly. Remove the mold runners from the front suspension arms and using your hobby knife remove any composite material that might remain. You can now attach the block carrier assemblies to their respective arms using Pg. 4, Step 2 in the manual. At this time you can also attach both arms to the new bulkhead.

STEP 3

Now remove the old shock tower from the old bulkhead and remove all the hardware attached to the old tower. Using the instructions in Pg.4, Step 2 attach the hardware to the new shock tower and attach shock tower to the new bulkhead. If you had titanium tie rods on your B2, you can remove the old ball cups and install the new longer ones. Otherwise, attach the new ball cups to the supplied tie rods. The ball cup wrench made for Losi ball cups works perfectly for installing and adjusting the new ball cups. Use the measurements in the instruction manual to correctly adust the tie rods. Once you've got the size right, attach the tie rods to the block carriers and shock tower to complete the front end.



STEP 4



Remove the kickup plate, bulkhead and front top plate from the old chassis. Place the steering assembly to the side for a minute and skip to Pg. 6, Step 4 in the manual. Proceed to their Steps 5 and 6 to complete the front end using the new front top plate and new chassis. At this time remove the old steering tie rods and complete the new ball cups and tie rods using the diagram on Pg. 7, Step 7. You're now halfway to finishing your full-fledged B3.

STEP 5

Remove the old slipper assembly from the transmission to the point where you are left with the top shaft and a single roll-pin going through the pin. You do not need to remove the transmission from the chassis plate or the motor mounting plate. Once you have completely removed the old slipper go to Pg. 11, Step 10 in the manual and complete Step 10 with the new parts.

STEP 6

Remove the four 4-40 x 3/8" screws holding the rear aluminum chassis plate to the chassis. Remove the four screws holding the rear shock tower to the old chassis. Remove the rear shocks from the suspension arms and the tie rods from the hub carriers or chassis. When everything is removed, you'll be able to pull the entire rear end away from the chassis.

STEP 7

Remove the inner and outer hinge pins from the rear end and disassemble the old rear hub carriers. At this time you can also remove the ball ends attached to the old chassis at the camber link mounting points. Reattach those ball ends to the inside mounting holes on the new chassis. Be sure to use a 4-40 nut on the back side of those ball ends.

STEP 8

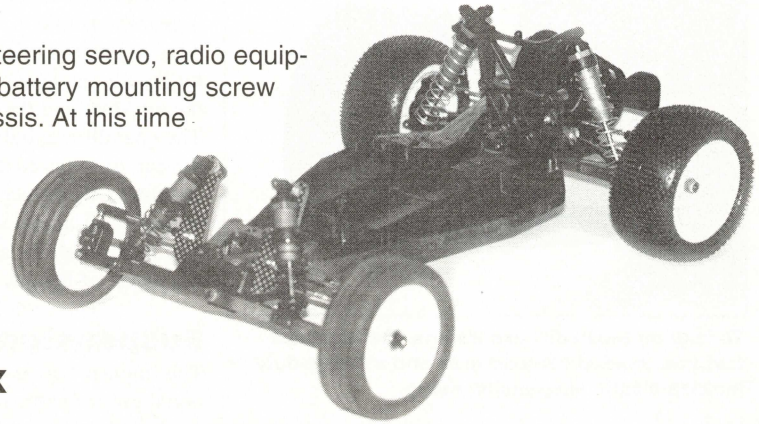
Attach the new rear arms to the suspension mounts and go to Pg. 13, Step 1 to complete the hub carrier assemblies. Once you have finished the step, attach the rear end to the new chassis using the four 4-40 countersunk screws you removed from the bottom of the chassis earlier. Once you've reattached the rear end at that point you can attach the old shock tower to the new chassis.

STEP 9

Use the diagram on Pg. 14, Step 3 to complete the rear tie rods. Once you've got the right measurements you can attach the tie rods to the chassis and rear hub carriers. Now attach the rear shocks to the outer mounting holes on the new rear suspension arms.

STEP 10

Using the instructions in the manual install your steering servo, radio equipment and motor to the new chassis. Remove the battery mounting screw from the old chassis and install it on the new chassis. At this time you can also carefully remove the foam battery pads from the old chassis and restick them to the new chassis. In case the pads tear or get damaged, you can pick up a new set (#9235) from your local hobby shop. Reinstall your old wheels or pick up two new pairs of 2.2" tires and mount them to your new wheels and you're all done. Your new B3 is ready to rock and roll. X

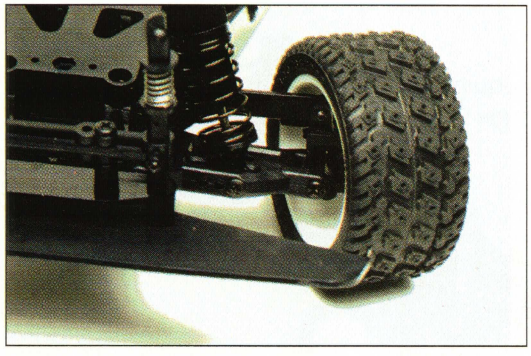


xtreme review

Kyosho Super Sport 10 Subaru Impreza

by Steve Wang

Do you remember your first R/C car and how anxious and eager you were to run it when you first got it? Remember that smile you had as you watched your truck or buggy rumble through the grass, or your road car shoot down the driveway? Sometimes, we get so caught up in all the technological and racing aspects of R/C that we forget why we got involved in this hobby in the first place — to have fun...remember? Sure, racing is fun, but often after a day of racing, I find myself wanting to pull out my old cars and just go bashing around in the backyard. It's almost like a "vacation" and your only goal is to have some fun. For my most recent "vacation", I was equipped with the new Kyosho Subaru Impreza WRC. The SuperTen scale Impreza is an entry-level 2WD gas kit fashioned after the full-size Subaru Impreza from the World Rally Car Championship. The best part about this kit is that it's 90% pre-built, and this means less wrenching time. So, let's take a tour of the Impreza's features.



To take on those dirt excursions, the Impreza features treaded off-road tires and a heavy-duty molded plastic suspension setup.

Features

Chassis

The Impreza's chassis is made out of resin material. The chassis is very strong and stiff due to its bathtub configuration and the many molded channels which run the length of the chassis. All the electronics and engine components fit very well on the chassis. The receiver batteries are placed right in the middle of the car, and the gas tank and the throttle servo are off to each side. The batteries are boxed in with a removable top lid, which also provides a perfect spot for the receiver.

Transmission

The Impreza uses a conventional 3-gear transmission. I was delighted to see that in this beginner/sport kit Kyosho included bearings for the top shaft and the idler shaft. The gear differential and the rest of the car are supported by metal bushings. All the gears are made of strong material and with their pitch size they should be able to handle the power of the gas engine easily.

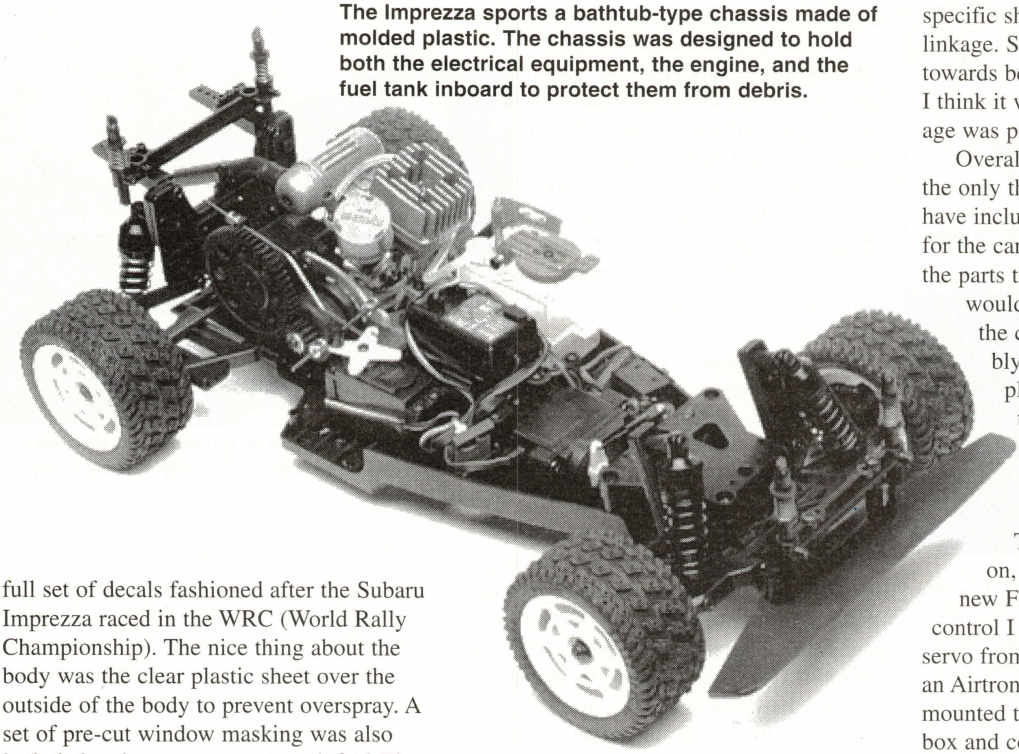
Suspension

The Imprezza utilizes a conventional lower A-arm and upper control link suspension setup. Providing a good foundation for the suspension, the front and rear A-arms are made of thick nylon composite, while the camber links and the shock towers are made out of durable molded plastic. The only part of the suspension that I worry about is the front shock tower; it has a lot of flex in it and during a bad head-on collision there might the possibility of it either snapping or bending out of shape. I think a brace made out of either fiberglass or molded strengthen the front suspension overall. Rounding out each corner of the car are oil-filled, coil spring shocks. Even though these are plastic shocks, I still think it is great that oil-filled shocks were included in the kit. Also included are two sets of springs with different tensions. A huge front bumper that covers the entire width of the car provides good protection for the front end.

Tires, Wheels, and Body

The Imprezza comes with a full set of rally-style treaded tires along with a nice set of white 6-spoke wheels. Because the car is SuperTen scale, the tire and wheel sizes are close to the size of an off-road buggy's rear tire. This gave the Imprezza about a good inch or so of ground clearance.

The kit came with a highly-detailed Subaru Imprezza body with separately molded rear wing, side mirrors, and windshield wiper. The body also came with a



The Imprezza sports a bathtub-type chassis made of molded plastic. The chassis was designed to hold both the electrical equipment, the engine, and the fuel tank inboard to protect them from debris.

full set of decals fashioned after the Subaru Imprezza raced in the WRC (World Rally Championship). The nice thing about the body was the clear plastic sheet over the outside of the body to prevent overspray. A set of pre-cut window masking was also included...what more can you ask for? The body mounts are very innovative. They are not only adjustable heightwise, but the rear mounts also adjust lengthwise. Accommodating different bodies would be a simple task and in most cases you wouldn't have to purchase different body mounts. Also, using body clips is not necessary with these mounts. Just slide the body on and flip a small piece of plastic on top of the body mount and the body is securely mounted between a coiled spring and the small piece of plastic.

Other Features

The kit also came with Kyosho's own GT12S-CR pull-start engine. The engine comes equipped with a high-end adjustment valve and a pre-set low-end adjustment. Also included is a very comprehensive booklet on engine adjustments and troubleshooting. The engine is mounted on an aluminum plate that is bolted on to the chassis. The aluminum plate is angled to allow the clutch bell to reach the spur gear. However, this eliminates the possibility of upgrading to a non-pull-start engine because it would be impossible for the starter box to reach the flywheel.

Building and Setup tips

- Remove as much flashing as possible off the threads on the shock bodies so that the shock cap can be tightened down.
- Make sure the black shock springs go up front and the silver ones go to the back.
- Read the engine manual prior to break in and set the high-end needle valve accordingly.
- Instead of the kit's shock oil, Trinity's 60WT silicone shock oil was used with positive results.

Construction

Since the car was 90% pre-built, all I had to do was mount the tires and wheels, set up the steering and throttle linkage, and assemble the shocks. Mounting the tires and wheels was a breeze, but I noticed that there were no foam inserts for the tires. It would be interesting to see how these tires will work. Next, I went and started the shock assembly. I had a few minor problems during the assembly; The shock bodies in my particular kit had a lot of flashing on the threaded part of the shock body, which made threading down the shock cap a little more difficult if the flashing wasn't removed completely. Second problem was that the shock oil included in the kit was way too thin (almost like water) and it smelled terrible. I filled the shocks with some Trinity 60WT silicone shock oil instead. Last was the throttle and steering linkage. The steering and the throttle links were easy to do, but the brake linkage was a little more difficult because of the specific shape that you had to bend the linkage. Since this kit is aimed more towards beginners and first time hobbyists, I think it would have been better if the linkage was pre-bent.

Overall, the assembly was not difficult, the only thing that I wish Kyosho would have included is a full instruction booklet for the car instead of a partial one with just the parts that needs to be assembled. This would make maintenance and repairing the car later much easier. The assembly took less than an hour to complete, and it took me twice as long to finish the body due to the large decal sheet.

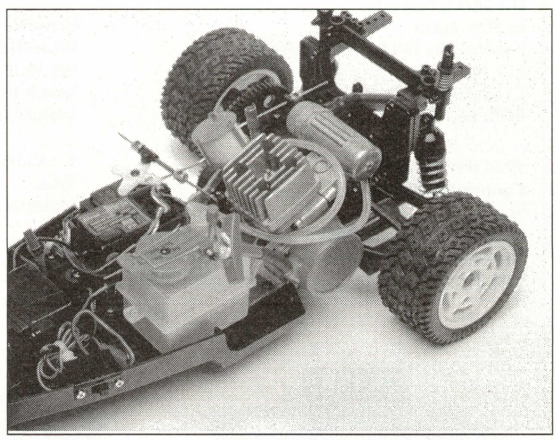
Test Equipment

To control this rally car champion, I used my new toy — Hitec's new FM radio, the Lynx. For throttle control I used the included ball-bearing servo from Hitec. For steering, I went with an Airtronics 94102 standard servo. I mounted the receiver on top of the battery box and covered it with a Kyosho receiver cover. I always recommend this item to all the gas racers; it's an inexpensive investment that really protects the life of your radio gear from fuel, dirt, debris, and such. Dynamite Blue Thunder 20% was the choice for fuel and the GS12S-CR engine was broken in with 5 tanks of fuel over a period of 4 days.

Test Drive

Since the Imprezza will probably see most its action in the backyard, that's the place I headed when the car was complete. The testing ground included a combination of rough parking lot surface with lots of small rocks and pebbles, low cut grass, some dirt and smooth dusty concrete. Sounds like the perfect combination for a rally car!

The engine came to life with a few



Here you can see the Imprezza's GT12S-CR powerplant with recoil starter, air filter, and muffler. The whole unit is conveniently pre-installed at the factory.

Hits:

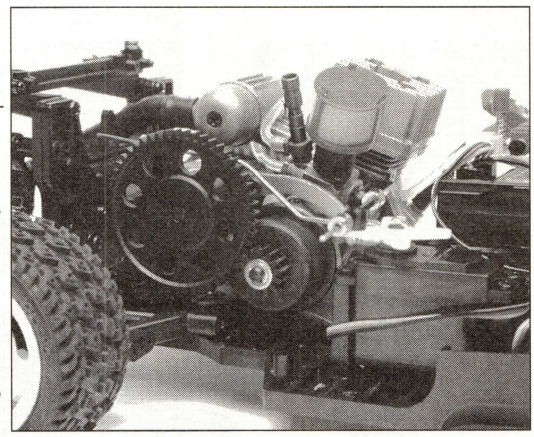
- Easy and fun to drive.
- Very durable.
- Highly-detailed, realistic body.
- Innovative, adjustable body mounts.
- Long-lasting tires that work great on almost all surfaces.

Misses:

- Shock oil is too thin.
- No complete instruction manual for the car. A complete instruction manual would come in handy for future repairs.

quick tugs on the pull-start. After breaking in the engine as prescribed in the instruction manual, I let it rip in the backyard. The car had very good speed, comparable to a mild modified electric car. On the grass, all you saw was a combination of exhaust fumes and chewed up grass flying behind the car. The car handled very well on the grass, and I can turn at full speed without upsetting the car.

On the rough pavement the car handled like it did on the grass — very predictable — and the rear end stayed planted on the ground. The spring and oil combination seemed to be right in the ballpark for these two surfaces, but when I went on to the smooth dusty concrete, the car had trouble gripping the surface. Granted, any car on that type of surface would have trouble getting grip, but I could have got the car to handle a little better if I stiffened up the rear end a bit. None the less, I was having way too much fun with this car to stop and make any adjustments! The sound of the engine, the exhaust fumes, and the realism of the Imprezza body combines for a high score on the fun scale.



The Imprezza's GT12S-CR's horses go through the clutch bell into a conventional off-road 3-gear transmission.

Being curious as to just how tough the Imprezza really was, I decided to abuse the car a little bit. First, I removed the body and then headed for the garage wall at full speed. (I don't recommend you doing this to your own car...this was just a test of the car's durability.) The car hit the wall head on and rolled back for about four feet. I quickly ran to the car and saw the front bumper sideways. First thing I thought was "Oh No! I broke it." Luckily the bumper was just loose. As it turned out, most of the screws on the chassis, including the ones that held the bumper, were not screwed in all the way. After making sure all the screws were tight and everything was fine, I finished the rest of the fuel in the tank and called it a day.

Conclusion

Upon returning from my "vacation" with the Imprezza, all I thought about was how much fun I had with the car. This car goes almost anywhere, on almost any surface, and it handles the terrain like a true rally car. From its SuperTen size to the sound of the engine and the exhaust fumes, the realism of the car was incredible. Throw in the highly-detailed body and the next thing you know you're imagining yourself in a rally car championship. The car is very durable and well designed. However, the few minor problems during assembly and the lack of a complete instruction for the car prevent me from giving it both thumbs up. All in all, I had a great time with the Imprezza. If you're looking to take some time off and go on a little "vacation" of your own, try Kyosho's Imprezza and get ready for some fun!

X

KYOSHO

Imprezza WRC

THE VITALS

DISTRIBUTED BY:
Kyosho Japan
Imported by Hobbico/Great Planes
P.O. Box 9021
Champaign, IL 61826-9021
(800) 682-8948

SPECIFICATIONS
Country of Origin ..... Japan
Scale 1/10
Manufacturers List Price $299.99
Estimated Street Price ..... $230-$240
Part # KYOC0499

Intended Application ..... Backyard Bashing
Approx. build time ..... 1 hour

DIMENSIONS
Length (rolling chassis) ..... 16.125 in.
Wheelbase ..... 11.125 in.
Width (F) ..... 8.75 in.
Width (R) ..... 8.75 in.
Weight (ready to run) ..... 3 lbs. 9 oz.

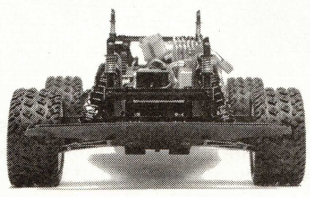
CHASSIS
Type ..... Channeled tub
Material ..... ABS Plastic

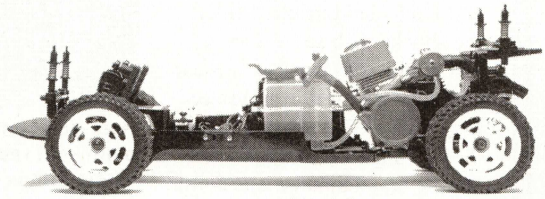
TIRES
Front ..... One-piece plastic
Rear ..... One-piece plastic
Tires ..... Treaded Rally

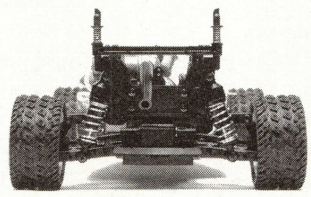
TRANSMISSION
Type 3-gear
Differential ..... Non-adjustable beveled gear
Bearings/Bushings ..... Bushings

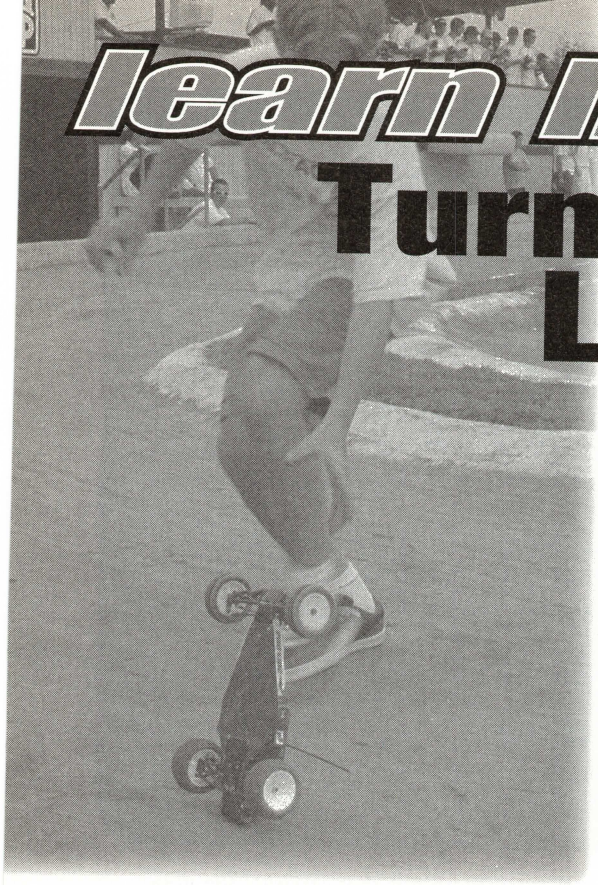
SUSPENSION (F/R)
Type ..... 4W independent w/lower A-arms and non-adjustable camber links
Dampening ..... Coil-over, oil-filled shocks

POWERTRAIN
Configuration ..... 0.12 fuel engine
Layout ..... Mid-engine rear wheel drive









learn how-to Turn Marshalling Like a Pro

by James Revilla

Xtreme R/C tells you the in's and out's of good turn-marshalling, from race track positioning to emergency trackside repairs.

Picture this: You're out front in the lead in the A-Main. You're about half a track ahead and all of a sudden a corner marker jumps out in front of you and your car flips over on its lid. In any other form of racing, this would mean serious injury and a DNF (Did Not Finish) for you. Luckily this is R/C and within seconds of your mishap, someone runs to the rescue and puts your car back onto its wheels so that you can keep your lead and finish the race.

This person is more commonly known in the R/C racing field as a turn marshal. A turn marshal's job is easily described as "one who watches a turn", but there's more to being a good turn marshal than just that. Turn marshalling takes quick reflexes, good crash spotting, and knowledge of your surroundings. In the short story above, the quickness of the turn marshal helped the racer keep his lead and eventually win the race. I'm not saying that it's the turn marshals duty to give you the win — that's up to your driving. But a quick marshalling job can keep you in the race.

Basic Turn Marshalling Skills

At most race tracks, all the drivers from the previous race are expected to turn marshal the race immediately after theirs. Sure, there might be something you have to fix on your car for the next race or you might want to discharge your batteries, but as a racer it is your duty to turn marshal first. Even if the race director doesn't call your name out for turn marshalling duties, it's a good idea to go out and do your part. If you actually think about it, five minutes isn't so long, is it?

As a turn marshal, your first and foremost responsibility is to stay alert. Regardless of whether you were assigned to a particular corner or if you chose your own, pay attention to that section of the course only! I've seen a lot of instances where the turn marshal had a car flip over right in front of him or her, but they didn't notice it because they were too busy watching the race.

Watch your surroundings, especially the turn leading up to your section and maybe even the straightaway leading to that turn. Since you just came off of the race track, you should have a pretty good idea where the trouble spots are and where most of the cars might have a problem on the track. If you are positioned near one of these turns, be extra alert since you might have to turn marshal more than the others.

Also, don't sit down while turn marshalling. The saying "quick on your feet" has true meaning when it comes to turn marshalling. If you were racing and you needed the aid of a turn marshal, who do you think would come to the rescue faster, the guy standing up watching the corner or the other guy sitting down eating a hot dog?

Turn Marshalling Level 2

So what's the difference between being a turn marshal and being a good turn marshal? Good turn marshals not only flip cars over when they crash, but they also take charge in certain situations to make racing as exciting and competitive as possible.

During multiple-car fiascoes, a good turn marshal always gets the cars flipped back onto their wheels in the order that they rolled over. This keeps things fair and eliminates any favoritism. If your friend's car turns over after someone else's in the same place, it wouldn't be fair to run after his or her car first just so that they can catch up to the leader. When you're turn marshalling you should treat every racer equally; when you're racing and you need turn marshalling assistance, the favor will be returned.

A Little Bit Of Courtesy Counts

The one thing I hate the most is hearing a driver complain or blame their poor finish on a turn marshal that was "too slow" or "not watching his or her car." The fact of the matter is, when you crash or flip over, they don't have to do anything. The reason turn marshals are there is to help you finish a race if you accidentally flip over or get pointed the wrong way. Those drivers who complain do nothing but show poor sportsmanship, and they don't realize that the turn marshal wasn't driving the car when it flipped over – the driver complaining was! The turn marshals deserve a little bit of respect when they are out there in the middle of traffic. These turn marshals have only two eyes to keep a watch out for around 10 cars. It's not easy. If you've turn marshalled a full heat of race cars, you should know. Be courteous and let the turn marshals do their job. They're only there to help you! So when you're up on the drivers' stand, here are a few things to keep in mind when you're driving or if you need a turn marshals help.

- NO YELLING! Whatever you do, don't yell at a turn marshal if he doesn't make a mad dash to your car at the EXACT moment that it flips over. As soon as they see your car, they will help you. Like I said, they didn't flip your car over for you, and they're not there to babysit your car everytime you roll on a dot!
- OFF THE TRIGGER! When your car flips over, don't pull the trigger until the turn marshal's hands are clear of the car. It wouldn't help you anyway to pull full throttle while the car isn't on its wheels. All you end up doing is wasting battery power (or fuel) and risk the chance of cutting the turn marshal's fingers open with an exposed drive shaft or spur gear. (It has happened to more than a few turn marshals, including myself.)
- WATCH THE TURN MARSHAL! If your car does one of those sudden stops, watch the turn marshal who picks your car up. If he checks your car, he might look towards the drivers' stand to give signals to you. For example, if he twists his hand back and forth like he's holding a doorknob, he's signalling you to move the steering wheel so he can maybe diagnose the problem. Likewise for throttle. If the turn marshal makes a trigger action with his finger, that means to blip the throttle. By working with the turn marshal, he might be able to get you back onto the track so you can finish your race.

Another thing that separates the good turn marshals from the exceptional is in situations where cars suddenly stop on the track. Exceptional turn marshals not only remove the car from harm's way, but also look at the car itself to see if the problem is fixable, and fix it if possible. They look for things like ESC switches accidentally switching to "OFF" after a heavy impact, steering servos locking up, loose battery or motor plugs, shocks popping off of a ball end, etc. If it's a loose pinion gear or wheel, the nearest pit table should more than likely have a screwdriver or box wrench you can quickly borrow to tighten the part and get the car back on the track.

If the damage is beyond a quick fix, such as a broken suspension arm or a fried spur gear, the marshal should put the car outside of the track, turn off the power switch (or unplug the battery) in electric cars or bump your shoe onto the flywheel on nitro cars, then quickly get back to turn marshalling the other racers. If the marshal just sets the car off to the side without turning off the car and the owner accidentally turns his transmitter off, you might have a runaway car. This could lead to more damage if the car goes full speed into a curb or a wall, or even worse if it flies into a spectator's leg and causes personal injury.

Here's a good example of a good turn marshal. My friend Ken stands out at my local R/C track for the little things that he does for us racers while turn marshalling. For example, if a nitro car flames out at the starting line and he's there, he'll grab the car and run to the nearest starting box in attempts to get the car fired up and on its way. Usually a racer not in the current heat stands in for him at the turn he's in charge of turn marshalling. This might be beyond the grasp of some turn marshals, but the guy I'm talking about doesn't even race; he's there for his son. If the race director is short on turn marshals, he's one of the first to volunteer. It's these little things that separate the good turn marshals from the exceptional ones.

5 Things to Keep in Mind When Turn Marshalling

When it's your turn out to turn marshal, here's a list of five things you should keep in mind before you step out onto the track.

1. WEAR SHOES. I've seen and heard stories of injuries caused by cars hitting ankles or toes while turn marshalling. Do yourself a favor and never wear slippers, sandals, or open-toe shoes to a racing event. Although these cars are small, they reach high velocity very quickly. You might not be able to move in time to avoid them, especially during high-traffic racing situations. When it is your time to turn marshal, you might end up worrying more about your ankles than the race.

2. NO SUNGLASSES. Okay, so you might look cool in them, but what would happen if you bent down to flip someone's car over and your super-cool sunglasses fell of your head? What if the car coming toward you at full speed hits your sunglasses? Can you get mad at the driver of the car for ruining your sunglasses? No you can't. Unless you don't care much for your sunglasses, do yourself a favor and leave them on your pit table while you turn marshal, especially if they're those trendy "loose fitting" styles. There are some exceptions to this rule (such as prescription glasses) but if you absolutely have to wear them while turn marshalling, don't say that I didn't warn you.

3. ROLL UP THOSE SLEEVES. Seeing exactly where your hands are during the race is important when turn marshalling. What if your sleeve gets caught in the gear mesh? How about if you flip the car over and the muffler tip catches the button on your cuff? Don't laugh. I've seen it happen.

Also, a little bit of fuel and oil is easier to clean off of your skin right after the race than off of your sleeve the following laundry day. I'm telling you, fuel, bearing oil, and certain other R/C chemicals are harsh on cloth. Remember this. You'll thank me when you do your laundry on Sunday.

4. TIE YOUR HAIR BACK. This applies only to those racers with long hair (yes, both men and women). Save yourself some personal injury (and a bad hair cut) and tie your hair up when you are turn marshalling. If you don't like the idea of your clothes getting caught in the transmissions of R/C cars, imagine what would happen if your long and beautiful hair got caught instead!

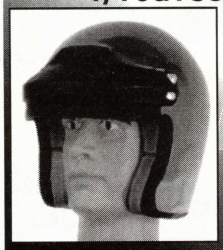
5. BRING A PAIR OF GLOVES. I strongly suggest buying a pair of gloves to save your hands from some abuse. I'm not talking some soft, fuzzy ones either. Try a set of inexpensive construction gloves. They only cost around ten dollars, but they do offer an advantage while turn marshalling. Simply, they keep your hands clean and protected from hot exhaust, burnt up motors, and those killer spur gear/pinion gear combos. I don't use gloves when I turn marshall, and I have all the scars to prove it!

Turn Marshalling Skills

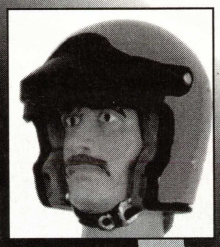
Turn marshalling is a very important aspect of R/C racing. Due to the nature of these cars and trucks (both off and on road) there will be roll overs and accidents. Unlike their full-scale counterparts, a crash doesn't necessarily mean it's the end of the day. If you have good turn marshals out on the track, you can get back on all four wheels with a minimum amount of time loss.

There's a little more to turn marshalling than most people think, but now that you know how to prepare for it and the techniques, you should have no problem turn marshalling like a pro. **X**

1/10th Scale Driver's Heads



PT#701 is our Simpson open-faced NASCAR Style $4.95 retail



PT#702 is our Bell Mag 4 open-faced NASCAR Style $4.95 retail

NEW



PT#703 is our Simpson Fresh-air induction full-face helmet for $6.95



Part# 7352 $16.95

" SUPER MINI VAN " for Tamiya Mini Cooper Chassis



Part# 7350 $20.95

" SUPER MOD " Oval truck body for T2, using our T2 OVAL TRUCK SHOCK TOWERS.

VOLVO 850 BTCC RACING BODIES

For Narrow 1/10th Scale Sedan Chassis



PREPAINTED Wagon bodies in 1994 BTCC Racing Colors & Sticker Sheet PT# 7371

PT#7367 Sedan body comes with precut window masking & Headlight, Taillight & Grill detailing stickers. $22.95
PT#7368 Wagon body comes with precut window masking & Headlight, Taillight & Grill detailing stickers. $22.95
PT#7371 1994 BTCC Wagon Sponsor sticker sheet $13.95

COOL THINGS

PT#921 Stainless Steel Button Head Motor Screws



NEW

2-3x8mm, 2-3x10mm & 2-882 Cool Things $5.50

ALSO AVAILABLE WITH OUR COOL THINGS ANODIZED IN BLUE BLACK OR RED.

PT#920 Stainless Steel Socket Head Motor Screws



NEW

2-3x8mm, 2-3x10mm & 2-881 Cool Things $5.50

COOL THINGS

LOAD-SPREADING DRESS-UPS are machined Billet Aluminum pieces, designed to replace the flat washers used all over our race cars and trucks. They have a minimum .030" washer thickness, including side walls, to prevent them from bending as washers typically can do. Their smooth shape and Anodized colors of BLUE, RED, BLACK, and Bright Silver make your already cool R/C racer look just that much more COOL!!!

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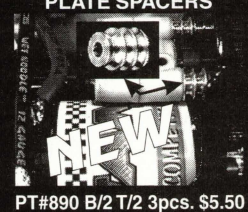

NEW

PT#890 B/2 T/2 3pcs. $5.50
PT#891 RC/10 4pcs. $6.50

Part number Series 880's are specially machined to fit the heads of 4-40 Socket Heads, while part number Series 881's are specially machined to fit the heads of 3mm Socket Heads. Our newest part number Series 882 are for 4-40 & 3mm Button Screws.

The Original True Spin Washer - Spacer Kits... AND WHY YOU NEED 'EM!

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xtreme review

Fire Breathing Pavement Pounder!



Mugen Seiki

PRIME 12

Nitro Touring Car

by James Revilla



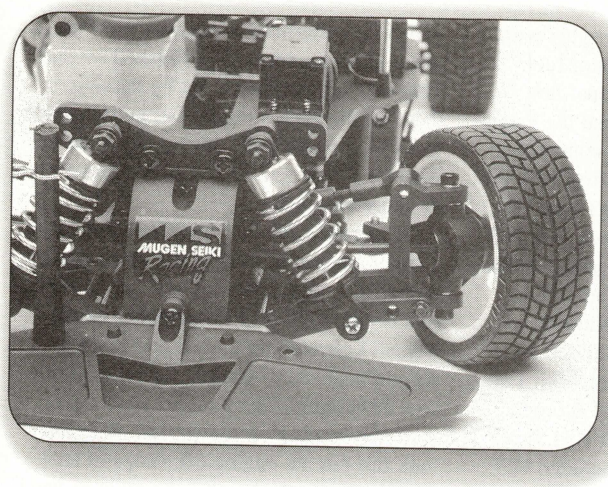
Mugen Seiki debuted its new Prime 12 nitro-powered touring car at the 1997 Chicago Hobby Show. I remember it well because I was there at the *Xtreme R/C* booth next to Mugen's display. Looking over the wall, I noticed an electric sedan-sized chassis, but with an engine in it. After talking to Craig and Eric at Mugen, they introduced the Prime 12 to me. The car caught my eye and as soon as they sent us one, I had to test it! The question was, "with all of the new nitro touring cars popping up into the market from all directions, can the Prime 12 set itself apart from the rest of the pack?"

Actually, the answer is yes! The first thing that sets the Prime 12 apart from others in this market is that out of the box the chassis is 90% pre-built. Even the camber and steering linkages were centered at the factory. (I even checked them with my RPM camber gauge.) All I had to do was install my radio equipment, fill the shocks with oil, and glue the tires to the wheels. With the 75cc fuel tank filled I had the Prime 12 ready to go in about 30 minutes! With a quick and easy start-up like this, the performance of the Prime 12 will tell whether or not it's a contender. Let's go over the Prime 12's layout and features.

FEATURES

POWER TRIP

The Prime 12's driveline is based around a two piece center drive shaft. From the engine, the power goes through the clutch



The Prime 12's front end features a conventional lower A-arm/upper adjustable link suspension. Coil-over oil-filled shocks dampen all four corners, and the Prime 12's main diff housings are interchangeable front to rear. Less parts mean less confusion! Also check that large front bumper. So far it survived my testing!

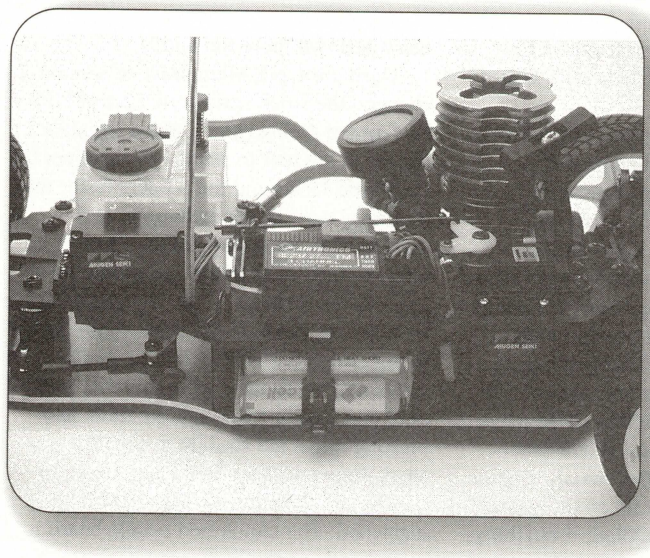
bell to the main spur gear. From here the power splits to two thick dogbones, one to the front bulkhead and one to the rear. Heavy duty, metal, conical gear differentials which look similar to those used in Mugen's 1/8-Scale Super Athlete buggy, are featured underneath each bulkhead. From there the engine's horses reach all four wheels through standard but hefty dogbones and outdrives.

MAIN CHASSIS

The main chassis is aluminum and features kicked-up sides and cutouts for the flywheel and steering servo adjustment. The bottom side of the chassis is not countersunk, however, leaving the bottom screw heads exposed to the surface. Due to the layout of the main driveshaft the engine mounts to the main chassis inline with the driveshaft on the right side of the chassis. This places the muffler to the side of the car as opposed to the other competitors "rear exhaust" layout. The upper plate is molded plastic and serves as a mounting point for the receiver, radio battery pack, both servos, and the fuel tank. The fuel tank sits forward of the engine on the right side of the chassis with all of the electrics on the left. This puts more of the weight toward the right side. During testing we'll see if this affects the way the Prime 12 takes the turns.

SUSPENSION, SHOCKS, AND STEERING

The Prime 12 features conventional coil over oil-filled shocks. The shock bodies are plastic, but are easily upgradable to aluminum types. The Prime 12 uses stiffer than usual shock springs, and as a plus the shocks are pre-built ready to fill with the included medium weight oil. The suspension on the Prime 12 is the common adjustable upper arm/lower A-arm setup. Upper A-arms with threaded tie rods link the hub carriers to the shock towers while molded lower A-arms are used on all four corners. The lower arms feature two mounting points for the hub carriers; one for a wide setup (200mm) and one for a narrow width (190mm) setup. All four lower suspension arms mount to the main chassis with hinge pins that are held in place with a metal brace; this eliminates those dreaded E-clips that are a pain to find when you lose one. One feature I like is that the lower arms have a setscrew positioned directly above the outside



The Prime 12's upper deck holds the entire electrical system. To access the main chassis for cleaning or maintenance, you simply disconnect the servo linkages and remove the upper deck.

MUGEN PRIME 12 BUILDING TIPS

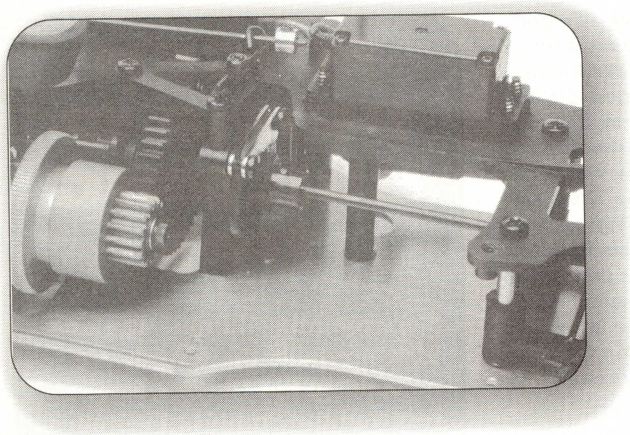
Since the Mugen Prime 12 came 90% pre-built, there really are no building tips to offer. Since I received the Prime 12 I've rebuilt it a few times (once to install ball bearings, plus routine cleaning after races) and I can say that there's no cause for alarm. The included "exploded-view" diagram of the car is a plus. Before you run the Prime 12, there are a few things I'd suggest that you do first. You they're simple, you only have to do them once, and once you are done you won't have to worry about them again.

• Before you run the engine, take apart the clutch and liberally lube the needle bearing with metal grease. This will keep it from burning up like I did with my first needle bearing.

• Although the chassis is 90% pre-built, go over it once with a screwdriver and a bottle of thread-lock. You only need to put thread-lock on the screws that thread into metal, such as the engine mounts and the muffler.

• Loosen the muffler assembly and rotate the exhaust outlet so that it points diagonally down and to the right of the chassis. On my particular kit it was pointed straight down. By angling the outlet, the exhaust will exit the side of the body and away from the right rear tire's contact patch.

• Adjust the disk brake so that there is a slight amount of drag brake when the trigger is at neutral. When properly tuned this engine is fast. The drag brake will help at the end of the straights. Trust me!



With the 75cc fuel tank and fuel lines removed, you can see the center drive shaft, central disk brake assembly, and inverted steering servo.

edge of the chassis plate. With these screws, the Prime 12's ride height can be adjusted, and the chassis itself can be tweaked for an even balance and consistent handling. The Prime 12's bellcrank steering system is simple but effective. The entire steering system bolts to both the plastic top plate and the main chassis to give it stability. The built-in spring-loaded servo saver is a nice touch.

THE EXTERNALS

The Prime 12 I received came with Mugen's own Toyota Supra GT body, complete with a full decal sheet simulating the Castrol-sponsored machine that competes in Japan's GT class. (There is also a kit with a Mercedes CLK-GTR or a Dodge Ram Truck.) The body was detailed well and had correct proportions, giving it a more realistic look than some of the other bodies out there. Sometimes "wide chassis" bodies look too bulky. Mugen's Supra looked great! A set of HPI Super Radials and 5-spoke wheels hook up the Prime 12 on the pavement and complete the kit.

TESTING

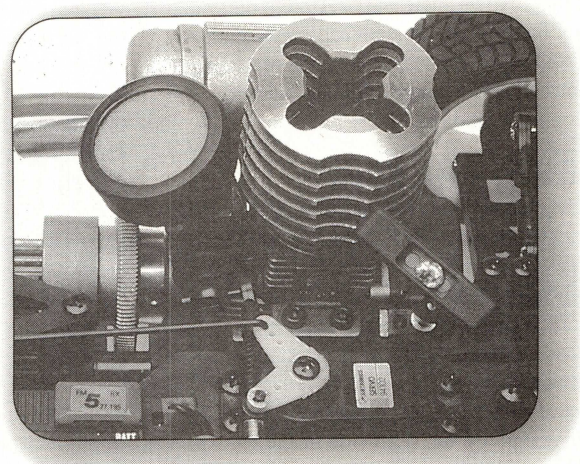
POWER AND CONTROL

I used an Airtronics Caliber 3PS radio and a pair of matching servos for this test. A gallon of Dynamite 20% provided the fuel and initial spark was generated from a Duratrax glow plug igniter. Mugen's own Vertex .12 engine is included with the Prime 12. The engine features a built-in recoil starter and a slide carburetor, the latter a feature more common to aftermarket high end engines. The air filter is pre-oiled, and the included sport muffler is also factory installed.

After I installed the radio equipment, all it took was one pull of the Vertex .12 engine to get it running. After checking the idle adjustment and adjusting the main mixture needle a little to the rich side I broke in the engine with four full tanks of fuel. Before the actual first drive, I prepped the Prime 12 for racing conditions. As the usual first step, the metal bushings went out for a set of smoother and faster ball bearings. I then swapped the stock fuel line for Dynamite's red fuel line and added a Du-Bro inline fuel filter. Last but not least, I brought along a set of HPI Super Slicks to supplement the kit included HPI Radials depending on traction conditions.

DRIVE TEST

The next weekend after break-in, I found myself at the local race track entering myself into the sedan gas class. Like break-in, all it took was one pull of the starter and the Prime 12 was ready for its shakedown run. As I was taking my first few laps to get used to the track, the muffler screws shook themselves loose. A screwdriver and a couple drops of thread-lock solved that minor problem. During practice, I ran the car at full throttle. Starting line jump was soft, and top end wasn't that great either. Ooops! The lack of power was due to the main needle being adjusted too rich during break in! With the help of my friend and GM Team driver Bill Martinez, we fiddled with the Vertex .12 engine until practice ended. We had no choice but to wait for the first heat to see if our changes helped. If only I had more top end!



Mugen's Vertex .12 recoil-started engine packs a lot more power inside than first expected. Also unique is the included slide carb. A slide carb is available only as an aftermarket option – if at all – on other nitro sedans.

It was during actual racing conditions that the Prime 12 showed its prowess. Handling was first rate; even with the factory setup, the Prime 12 was very predictable through both high- and low-speed turns. In fact, as I was driving I overheard a couple of the long-time nitro sedan racers saying nothing but positive comments regarding the car's stable handling. Soon I found myself attacking the turns at will. The Prime 12's excellent suspension soaked up any bumps that I drove over. Obviously the layout of the chassis (engine and fuel to the right) had no effect whatsoever as to how the car handled; if anything, the layout was perfect. Also, here's a statement about the Prime 12's excellent handling: Out of the seven cars in my heat, which had aftermarket engines with much, much more horsepower, I finished second. This was accomplished not by passing them on the back straight, but in the infield turns by threading the course like a needle with the Prime 12. Now if only I had a little more top end!

In between the two qualifiers, I noticed a small amount of fuel on the main chassis. At first I thought that this was due to the rich needle valve at the beginning of the day, so I cleaned up the car and ran my second heat. Sure enough, the fuel puddle was there again. The puddles were traced to the main bearing on the engine. With the tank full but the engine off, drops of fuel would form at the base of the main bearing behind the flywheel. Theoretically this might result in a slight loss of performance, but I didn't notice any weird idle or stuttering from the engine that day. Now if I had just a little bit more top end!

During the pre-Main practice session, I changed the stock springs to a set of HPI Racing red springs and I added negative 1 degree to the rear to see if I could squeeze the Prime 12 around the corners faster than it already was. In the meantime, Bill messed with the engine a little more in an effort to tune in as much top end out of it as possible. With all of the changes made, I took the car out onto the track again. Wow! A big difference! The Prime 12 really impressed everyone during this run, bobbing and weaving through the turns and blasting down the straight faster than any stock engine we've seen. Then, three minutes before the end of practice something happened. The clutch bell needle bearing seized and eventually burned itself up. No harm was done to the stock engine except for small chunks of melted plastic around

the flywheel area. With the Mains starting, I had no choice but to call it a day. It was okay. When I get a new clutch bell needle bearing installed, I'll be back the next race day. This time with more top end!

STANDING TALL

The Mugen Seiki Prime 12 is definitely a car to look out for. Its simple, shaft-driven layout hides its true nature. This car handled better out of the box than some cars that I've driven that were equipped to the maximum with hop-ups! The engine is easy to work with, and once you tune it to the conditions, it runs a lot faster than typical kit included nitro engines. Best of all, getting this racing machine up and running takes less than an hour, thanks to the pre-built chassis. As for durability, the car is strong. I was involved in more than a few hairy incidents, with the worst result being a scratched wheel.

Later on during the week I made a phone call to Mugen Seiki and they told me that 2-speeds, ball diffs, and molded graphite suspensions are in the works. With my experience so far with the Prime 12, it might not need that many hop-ups, as it is already a high performer out of the box. Also, I talked to them about the clutch bell needle bearing. They suggested two options for that. The first one was simple. Install another standard-sized needle bearing, but lube it liberally with grease to cut down the heat generated by the high rpm clutch bell and keep things running smoothly. The second option was to use three 5x8mm ball bearings and a few small washers to equal the size of the standard needle bearing. I had a few 5x8mm bearing sitting around on my work bench so I went that route, but I suggest greasing the standard needle bearing before you use the Prime 12 for the first time. By greasing the bearing before you start the engine, you won't have to worry about it failing.

With a great handling car like the Prime 12 leading the way for Mugen Seiki to enter the hot nitro sedan market, it's inevitable that this car will chalk up more than its share of wins. Mugen's done a good job with the design of this car, and without a doubt, the Prime 12 is a winner!

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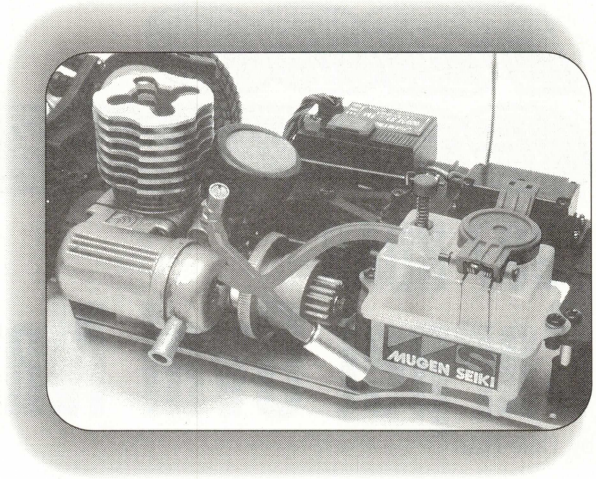


The Prime 12's shaft-driven layout positions the engine inline with the drive shaft and to the right side. Note the side exiting muffler.

Hits:

- **90% pre-built.**
- **Quick starting engine.**
- **Superb handling.**
- **Mugen Vertex engine faster than other brand's kit-included engines.**

Misses:

- **Main engine bearing leaked fuel.**
- **Clutch bell needle bearing burnt up during testing.**
- **Chassis bottom is not countersunk.**

MUGEN SEIKI Prime 12

THE VITALS

DISTRIBUTED BY:
Mugen USA
15311 Barranca Parkway, Irvine CA 92618
(714) 453-8995; (714) 453-8997 fax

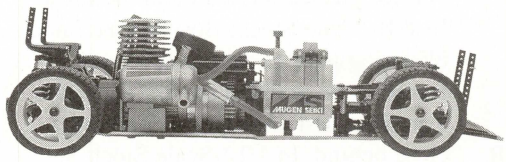
SPECIFICATIONS
Country of Origin . . . . . Japan
Scale 1/10
Manufacturers List Price $355.99
Estimated Street Price $245.00
Part # K0001
Intended Application . . . . . Competitive racing
Approx. build time . 30 minutes (90% pre-built)

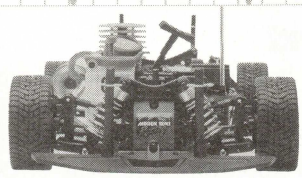
DIMENSIONS
Length (rolling chassis) . . . . . 15.16 in.
Wheelbase . . . . . 10.32 in.
Width (F) . . . . . (198mm) 7.92 in.
Width (R) . . . . . (197mm) 7.90 in.
Weight (RTR) . . . . . 3 lbs. 4oz.

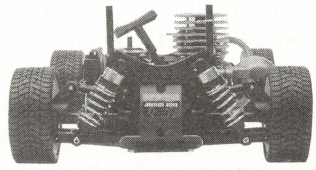
CHASSIS
Type . . . . . Double-deck
Material . . . . . Plastic upper/Aluminum Lower

TIRES
Front . . . . . HPI Racing Super Radials
Rear . . . . . HPI Racing Super Radials
Wheels . . . . . HPI Racing One-piece plastic

TRANSMISSION
Type . . . . . Shaft to conical gear, front and rear







Differential . . . . . Metal conical gear-type
Bearings/Bushings . . . . . Bushings

SUSPENSION (F/R)
Type . . . . . 4W independent w/lower A-arms
Dampening . . . . . Coil-over, oil-filled shocks

POWERTRAIN
Configuration . . . . . Nitro engine powered
Type included . . . . . Mugen Vertex .12 recoil
Layout . . . . . Shaft-driven 4WD

MAIN COMPETITION
Kyosho GP-10, HPI Nitro RS4, OFNA Nitro Z10



race coverage

1997 ROAR Carpet Oval Nationals

Left Turn Only!

by Dale Hill

Among the oval racing crowd, ROAR's Carpet Oval Nationals is one of the most highly-anticipated events of the year. In November, some of the fastest oval racers in the country came to K&N R/C Speedway in Stafford Springs, CT to see who would be the '97 ROAR National Champion. One-hundred fifty entries showed up to have fun on one of the country's fastest oval tracks. The event was sponsored by Jaco, Pro-Line, Protoform, Competition Products, and Novak. After hours of chassis tuning, tire truing, comm truing, dyno testing, and racing, several new champions would be named in the first-ever ROAR Carpet Oval National to run a triple A-Main Format!

The Track

K&N is among the finest R/C racing facilities in the country. The track is located on the site of the Stafford Motor Speedway, a full-size NASCAR racing facility. It is located on the second floor of the building along with a hobby shop. The first floor of the building was set up as a pit area to accommodate a large number of racers. There was plenty of pit space for everyone.

The track itself is a 210 foot centerline, banked, carpet oval. The track featured banked corners and straights and the racing surface consisted of gray ozite carpet. The track was very fast and several track records were broken during the event.

The Classes

The classes consisted of 1/10-Scale Stock and Modified, 1/12-Scale Stock and Modified, and NASTRUCK. The 1/10-Scale Stock class was by far the largest with over 75 entrants competing for the title. 1/10-Scale Modified was the second largest class while NASTRUCK and the 1/12-Scale classes were the smaller classes. The Stock classes used a Trinity Green Machine 2 as their handout motor.

Qualifying

The qualifying schedule included two rounds of qualifying on Friday and two rounds of qualifying on Saturday. Saturday's qualifiers were re-sorted, allowing drivers to attempt to qualify with those who ran at a similar pace. The re-sort made for some exciting action!

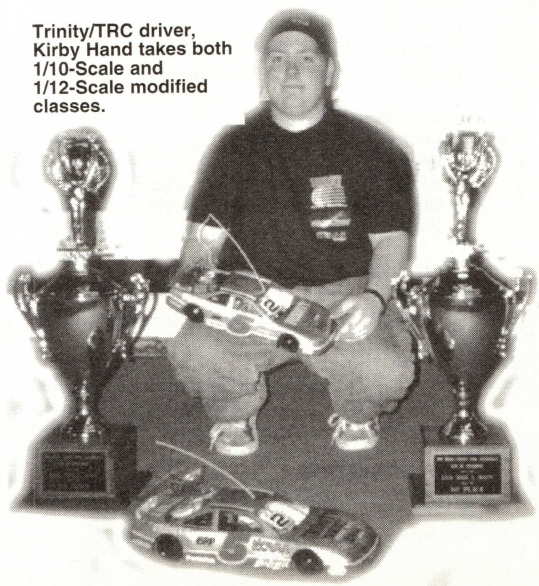
In the stock classes, the Green Machine 2s were screaming as high voltage pushed them around the track! In 1/10-Scale Stock, Bob Pedone ran a blistering pace to set the new track record as he grabbed the TQ spot with Tom Barnhart and George Verbonitz close behind. In 1/12-Scale Stock, it was John Hauenstein who took TQ honors with Eric Beltz and Phil Marabella taking the second and third positions. Joe Allevo capture the NASTRUCK TQ in front of Ted Connolly and Stan Misiuk.

The Modified classes were just as exciting as the stock classes. Former 1/12-scale world champion Chris Doseck made his presence known as he returned to oval racing to capture the 1/10-Scale TQ position in front of multi-time national champion Kirby Hand and Jason Lambert. The top ten included several of last year's A-Main finalists including Frank Polimeda, Kevin Champion, and John Asber. In 1/12-Scale Modified, last year's national champion Frank Polimeda showed the rest of the field the fast way around the track. He TQ'd, followed by Kirby Hand and Shane Kocher in the second and third qualifying positions.

Mains

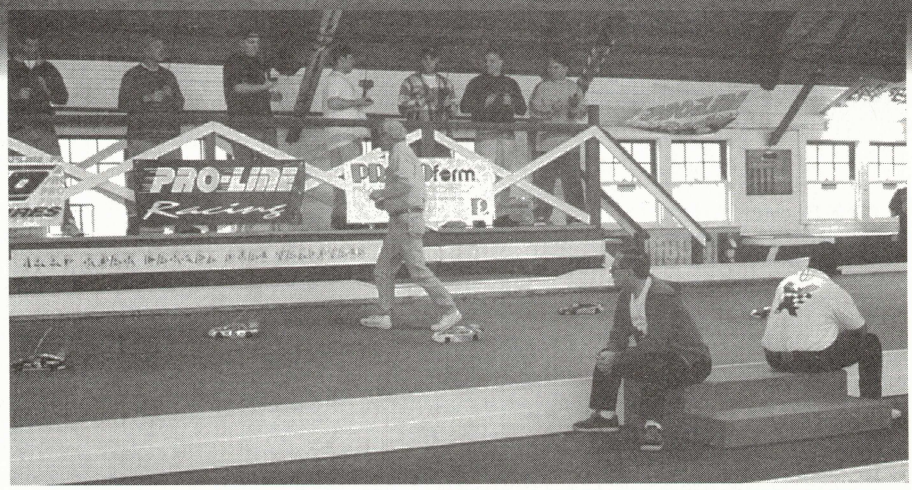
This year's first-ever triple A-main promised to be exciting and boy did it deliver! The two best A-mains were used for scoring the final finishing order. Points were assigned for first through tenth in an A-main. The winner was the one with the highest total points.

If you were there and you left early you would have thought that Chris Doseck won the 1/10-Scale Modified class in his return to oval racing by finishing first, second, and first in the triple A-mains. Guess again! Chris's transponder was not in his car when he started the third A-main and he was disqualified. Kirby Hand, who finished fourth, first, and second respectively was bumped up to finish first in the third A-main because of Chris's D.Q.



Trinity/TRC driver, Kirby Hand takes both 1/10-Scale and 1/12-Scale modified classes.





and Kirby was crowned the '97 ROAR Carpet Oval National Champion. The runner-ups were Chris Doseck with a first and a second, and Mike Blackstock who pulled off two second place finishes ended up in third. Frank Polimeda and Kevin Champion finished in fourth and fifth respectively.

The 1/10-Scale Stock A-mains went off with a bang! The first two A-mains were riddled with accidents and the winning times were slower than that of the winner of the C-main. By the time the third A-main rolled around the drivers wanted to turn some fast laps. Bob Pedone responded by beating his record-setting TQ run and put another one in K&N's record books. Charlie Stewart, who finished second, first and fourth was declared the winner and National Champion with Tom Barnhart (1st, 8th, 2nd), George Verbonitz (3rd, 2nd, 3rd), Bob Pedone (5th, 6th, 1st) and Bob Vincenti (4th, 5th, 9th) in second through fifth.

In the 1/12-Scale Modified A-Mains, all eyes were on TQ Frank Polimeda as everyone wanted to see if he could outrun the field as he did in qualifying. Frank won the first A-main with Kirby Hand and Chris Doseck in tow. The second A-main was tragic however, as Frank's speed control stuck wide open and his car bounced around the infield like a ping-pong ball, destroying itself in the process. Kirby finished in first with Bob Smith in second and Mike Murphy in third. After a fast furious rebuilding process, Frank's car was back out on the track for the third A-Main. Running a

THE TRANSPONDER REMOVAL CONSPIRACY

Track rules and the D.Q., Chris Doseck's disqualification, were the cause of much frustration for both Doseck and his sponsors. Chris' pit crew said the transponder was in the body of his car when they took the chassis over to the track to scrub its tires .Afterwards they mounted the body, but never checked to see if the transponder was still there! Where did it go? I don't think we'll ever know.

The track rules, which were in effect and enforced during the weekend were clear. Any car without a transponder would not be manually counted and would be disqualified in that run. (The racing action was too fast-paced for Race Director Nick Kahl to score a car and call the race properly.) ROAR's Nationals Guidelines state that a car should be teched and checked for proper transponder operation prior to the main. These are guidelines, not rules. The disqualification was protested, but upon review the protest was denied.

When asked about the D.Q., ROAR President Phil "the Colonel" Hurd commented, "The Nationals Guidelines are just that, guides. They don't carry the weight of rules, but they will next year." Nick Kahl had his system and it worked until the very last race. The protest was denied because the rules that were in effect required disqualification for not having a transponder, and what the guidelines recommended had no bearing. Phil added, "Another guideline that will be a rule next year is that all cars must be teched before each race. It is not fair to have a car run a race and perhaps take someone out only to have it found to be illegal after the race." Sounds fair to me. Well done, ROAR.

The Winners


1/10-Scale Stock


1/10-Scale Modified

Results

1/10-Scale Stock

Fin.	Qual.	Driver	Car	Body	ESC	Battery	Tires	Motor
1	10	Charlie Stewart	Hyperdrive	Protoform	Novak	SMC	JACO	HANDOUT MOTOR
2	2	Tom Barnhart	Trinity	Protoform	Novak	Trinity	JACO	
3	3	George Verbonitz	Trinity	Protoform	Novak	Trinity	JACO	
4	1	Bob Pedone	TRC	Protoform	Tekin	XIPP	TRC	
5	8	Bob Vincente	Associated	Protoform	Tekin	New Wave	JACO	
6	4	Jason Schressler	TRC	Protoform	Novak	Gonzo	TRC	
7	7	Chris Rhinehart	Woods	Protoform	Tekin	Orion	JACO	
8	9	Bob Briere	Associated	Protoform	Novak	SMC	JACO	
9	6	Jim Payne	Trinity	Protoform	Novak	G.M.	JACO	
10	5	Jeff West	TRC	Protoform	Novak	SMC	JACO	

1/12-Scale Stock

Fin.	Qual.	Driver	Car	Body	ESC	Battery	Tires	Motor
1	1	John Hauenstein	JHX12	Protoform	Novak	XIPP	JACO	HANDOUT MOTOR
2	4	Ed Thuresson	Trinity	Protoform	Tekin	Trinity	TRC	
3	3	Phil Marabella	Trinity	Protoform	Tekin	Trinity	JACO	
4	2	Eric Beltz	Wood	Protoform	Tekin	Gonzo	TRC	
5	9	Paul Heitz	Wood	Protoform	Tekin	XIPP	TRC	
6	8	Joel White	Comp. Craft	Bolink	Tekin	DP Matched	JACO	
7	10	Todd Ferguson	Associated	Protoform	Novak	XIPP	TRC	
8	6	Lou Abraham	Associated	Protoform	Tekin	SMC	TRC	
9	5	Antonio Denino	Trinity	Protoform	Novak	SMC	BSR	
10	7	Carl Edwards	Hyperdrive	Protoform	Tekin	New Wave	JACO	

NASTRUCK

Fin.	Qual.	Driver	Car	Body	ESC	Battery	Tires	Motor
1	1	Joe Allevo	10L/Hyperdr.	Dahm	Novak	New Wave	JACO	HANDOUT MOTOR
2	4	Gerg Hartman	Trinity	PSE	Novak	World Class	JACO	
3	6	Luis Martinez	TRC Holmes	Hot Bodies	Tekin	XIPP	JACO	
4	3	Stan Misiuk	TRC Comp.	Dahm	Novak	SMC	JACO	
5	2	Ted Connolly	STIFF ONE	Dahm	Novak	SMC	JACO	
6	5	Joe Gallant	Associated	Dahm	Tekin	B&T	JACO	
7	8	Jeff Rupert,	ACE	Protoform	Tekin	SMC	JACO	
8	10	Robby Clifford	TRC	Protoform	Novak	ESP	JACO	
9	7	Larry Boyd	Wood	PSE	Novak	N/A	JACO	
10	9	Don LeBlanc	Associated	Dahm	Novak	SMC	JACO	

1/10-Scale Modified

Fin.	Qual.	Driver	Car	Body	ESC	Battery	Tires	Motor
1	2	Kirby Hand	Trinity	Bolink	Novak	Trinity	TRC	Trinity
2	1	Chris Doseck	CDO10	Protoform	Novak	G.M.	JACO	Mighty Motors
3	5	Mike Blackstock	Trinity	Protoform	Tekin	Trinity	TRC	Trinity
4	6	Frank Polimeda	Trinity	Protoform	Novak	Trinity	TRC	Trinity
5	8	Kevin Champion	Hyperdrive	Bolink	Novak	B&T	JACO	Mighty Motors
6	4	Brian Burkhart	Hyperdrive	Protoform	G.M.	G.M.	JACO	Mighty Motors
7	3	Jason Lambert	Hyperdrive	Protoform	Novak	New Wave	JACO	Mighty Motors
8	9	Nick Themelis	Hyperdrive	Protoform	Novak	Mighty	JACO	Mighty Motors
9	10	Bill Bombard	Trinity	Protoform	Novak	SMC	JACO	Trinity
10	7	John Asber	Trinity	Protoform	N/A	Trinity	N/A	Trinity

1/12-Scale Modified

Fin.	Qual.	Driver	Car	Body	ESC	Battery	Tires	Motor
1	2	Kirby Hand	Trinity	Protoform	Novak	Trinity	TRC	Trinity
2	5	Mike Murphy	DRM	Protoform	LRP	XIPP	JACO	Pro-Pulsion
3	7	Chris Doseck	CD12O	Protoform	Novak	GM.	JACO	Mighty Motors
4	4	Bob Smith	Barnhole 12	Protoform	Novak	G.M.	JACO	Eastcoast
5	10	Josh Cyrul	Associated	Protoform	LRP	Stage 3	JACO	Reedy
6	8	Jason Lambert	Hyperdrive	Protoform	Novak	Ballistic	JACO	Mighty Motor
7	1	Frank Polimeda	Trinity	Protoform	Novak	Trinity	TRC	Trinity
8	9	Bruce Daniels	Associated	Protoform	Tekin	New Wave	JACO	Mighty Motor
9	3	Shane Kocher	Trinity	Protoform	Novak	N/A	TRC	Mighty Motors
10	6	Steve Fiume	N/A	N/A	N/A	N/A	N/A	N/A

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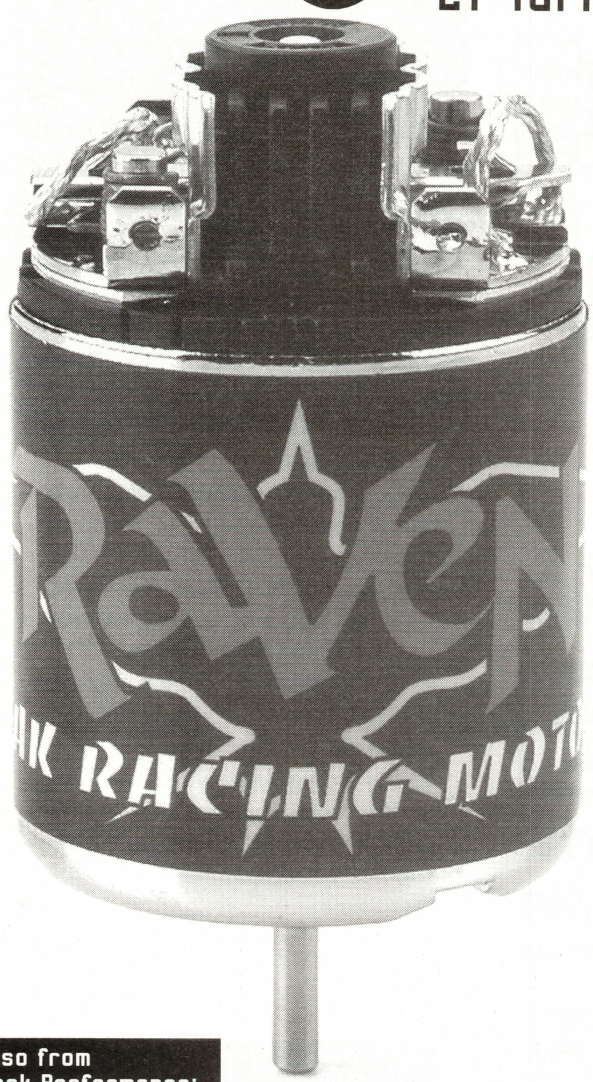



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national title winning pace, Frank finished ahead of Kirby and Mike Murphy only to have his car disqualified for not meeting the minimum height requirements after the rebuild! This meant that Frank would not repeat as 1/12-Scale Modified National Champion and the title would go to Kirby Hand who scored a second, first and first. The runner-up was Mike Murphy (4th, 3rd and 2nd) and in third place was Chris Doseck (3rd, 4th, 4th).

The 1/12-Scale Stock winner, and new National Champion was TQ John Hauenstein. The first A-main saw Ed Thuresson, Eric Beltz and Phil Marabella finish 1,2,3. A-2 had John Hauenstein setting the pace early on and not looking back with Ed and Phil right behind him. John also won the third A-main with Phil and Eric in second and third. The runner-up was Ed Thuresson and Phil Marabella finished third overall.


1/12-Scale Stock


1/12-Scale Modified


NASTRUCK

NASTRUCK's TQ, Joe Allevo, brought home the national title with two firsts and a ninth place DNF. The runner-up was Greg Hartman with a first and two third place finishes. In third was Luis Martinez with a second and two fourth place finishes.

Congratulations to the whole crew at K&N, especially Nick and Karen, and to the event sponsors. The '97 ROAR Carpet Oval Nationals was a terrific event! If you're an oval racer, this event should be on your '98 calendar. See you there!

X

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2. Novice Drivers Can NOT Race in any Other Class. E.G. Stock, Pro Stock Etc.
3. Novice Drivers must Run R.O.A.R. 24 deg. Approved motors.
4. Stock and Pro Stock Drivers must Run R.O.A.R. 24 deg. Approved motors.
5. Comm Cutting is Permitted on Stock Motors as long as the cans are NOT OPENED.
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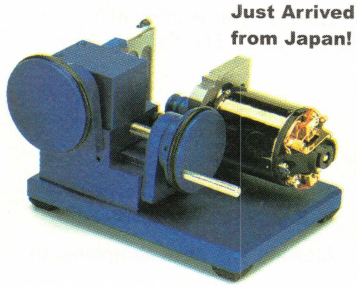

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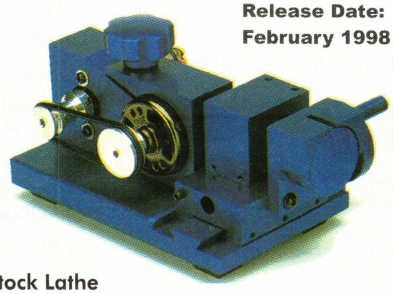

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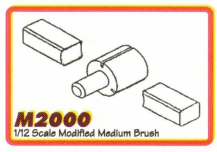

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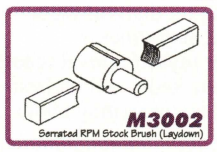
1/12 On-Road Racing



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Require Minimum Servicing
High Efficiency Output
Super High RPM
Ideal for 27 Turns Stock Motors
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Oval Racing
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Offroad Racing
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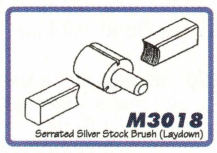
Touring Car Racing



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Maximum Efficiency Output
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Ideal for 27 Turns Stock Motors
Short Track Oval Racing
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Require Minimal break-in
Require Frequent Servicing
Maximum Efficiency Output
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Best for 12 Turns to 17 Turns
Oval Racing
1/12 Scale Racing



4% Silver Compound
Require Minimal break-in
Maximum Efficiency Output
Maximum RPM & Run-Time
Ideal for 27 Turns Stock Motors
1/12 Scale Racing
Large Oval Racing



1% Silver Compound
Require Minimal break-in
Require Normal Servicing
High Efficiency Output
High RPM and Torque
Best for 11 Turns to 14 Turns
Oval Racing
1/12 Scale Racing
Touring Car Racing



4% Silver Compound
Require more break-in
Better Cooling than M3018
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Ideal for 27 Turns Stock Motors
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1/10 On-road Racing
Touring Car Racing

OFFICIAL RECOMMENDED SET-UP

TRACK TYPE	TRACTION	REAR TIRES	FRONT TIRES	INSERTS
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Small	Medium	Belted 25 SN	Non-Belted 30 SN	Stock or HPI
Small	High	Belted 25 SN	Belted 25 SN	HPI
Medium	Low	Non-Belted 23 Std	Non-Belted 30 SN	Stock
Medium	Medium	Non-Belted 23 Std	Non-Belted 23 Std	Stock
Medium	High	Belted 25 Std	Belted 25 Std	TAM blue
Large	Low	Non-Belted 23 Std	Non-Belted 30 Std	Stock
Large	Medium	Non-Belted 23 Std	Non-Belted 23 Std	TAM blue
Large	High	Non-Belted 23 Std	Belted 25 Std	TAM blue/black
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1. Where did you get this issue (3.7) of ***Xtreme R/C Cars***?
❑ Subscription ❑ Newsstand ❑ Friend
❑ Hobby Shop/Race Track ❑ Other _____

2. For each of the following articles, features, and departments in this issue, please indicate how much you have read or looked at them.

	Read/Looked at Often	Read/Looked at Sometimes	Did Not Read/Look at
Editorial	❑	❑	❑
New Stuff	❑	❑	❑
Inside Line	❑	❑	❑
X-Mail	❑	❑	❑
Quick Tips	❑	❑	❑
Product Reviews	❑	❑	❑
Race Coverage	❑	❑	❑
Subscribe to Win	❑	❑	❑
Back Issue Index	❑	❑	❑
Racer Profile	❑	❑	❑
Evaluations	❑	❑	❑
Kinwald XX-CR Review	❑	❑	❑
Mugen Prime 12 Review	❑	❑	❑
Tech Voggerd T-10 Review	❑	❑	❑
Kyosho Imprezza Review	❑	❑	❑
B3 Conversion How-To	❑	❑	❑
Turn Marshalling How-To	❑	❑	❑
Gas Break-in How To	❑	❑	❑

3. Do you mostly agree or disagree with the following statements about ***Xtreme R/C Cars*** magazine:

	Mostly Agree	Mostly Disagree
• It covers subjects I'm interested in	❑	❑
• I get a lot of useful information	❑	❑
• It keeps me up to date on the latest products	❑	❑
• I like the way it's written	❑	❑
• It's the R/C car magazine for real racers	❑	❑
• It's one of my favorite magazines	❑	❑
• It's worth the price	❑	❑
• I like it better than the other R/C car magazines	❑	❑
• I consider myself a loyal reader	❑	❑
• The writers know and understand what they are writing about	❑	❑

4. How would you rate our new cover and logo designs?
❑ Excellent! ❑ Good ❑ Fair ❑ Poor

5. How would you rate this issue of ***Xtreme R/C Cars*** as compared to an issue a year ago?
❑ Much better ❑ Better ❑ Same
❑ Worse ❑ Didn't read one year ago

6. How would you rate this redesigned issue of ***Xtreme R/C Cars*** as compared to last months issue?
❑ Much better ❑ Better ❑ Same
❑ Worse ❑ Didn't read last month's issue

6. Do you plan to buy the next issue of ***Xtreme R/C Cars***?
❑ Yes ❑ No ❑ Not sure

7. How long have you been reading ***Xtreme R/C Cars***?
❑ 0-6 months ❑ 6-18 months ❑ 18-24 months
❑ Since the first issue

8. Have you ever accessed ***Xtreme Online***?
❑ Yes ❑ No

9. How many people, other than yourself, have read your current copy of ***Xtreme R/C Cars***?
❑ 0-2 people ❑ 3-5 people ❑ more than 5 people

10. How well does ***Xtreme R/C Cars*** satisfy your needs in the following areas?

	Want More	About Right	Want Less
Reviews	❑	❑	❑
Evaluations	❑	❑	❑
How To's	❑	❑	❑
Race Coverage	❑	❑	❑
Buyers' Guides	❑	❑	❑
Technical Articles	❑	❑	❑
Car Setups	❑	❑	❑
Touring Cars	❑	❑	❑
Direct Drive	❑	❑	❑
Off-Road Truck	❑	❑	❑
Off-Road Buggy	❑	❑	❑
Nitro Cars	❑	❑	❑
Oval Cars	❑	❑	❑
Drag Racing Cars	❑	❑	❑
Racer Profiles	❑	❑	❑
Race Calendars	❑	❑	❑

11. Which of the following magazines do you read regularly?
❑ *R/C Car Action* ❑ *Competition Plus* ❑ *The Starting Grid*

12. Your Age?
❑ Under 18 ❑ 18-24 ❑ 25-34
❑ 35-44 ❑ 45-54 ❑ Over 54

13. What is your marital status?
❑ Married ❑ Single (never married)
❑ Widowed ❑ Separated or divorced

14. What is the highest level of education you have completed to this date?
❑ Some High School or less ❑ High School Graduate
❑ Graduated from a 2-yr. college ❑ Post-Graduate
❑ Graduated from a 4-yr. college ❑ Other _____

15. What is your household's total combined income?
❑ Under $25,000 ❑ $25,000-$49,999
❑ $50,000-$99,999 ❑ $100,000 and above

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Lab Report

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By Aston Lee

'98 Heavy-Hitting New Products

Not too long ago, a few young guys with some high tech brains got together. They worked around the clock for months inside their small laboratory located in Walnut, California. Finally, they showed me their latest creation on a Saturday morning. These new products are truly revolutionary. The new TENBASE-T modified motors by Trek produce more rpm and power, yet still runs cooler and more efficient than any comparable standard hand wound motor. According to the technical advisor at Trek, their new winds develop an ultra wide power band, that means, racers can take advantage of the killer rpm on the straight and still have enough torque to pickup speed coming off tight corners. Super trick looking V shape cut laydown brush and medium springs are installed on all Trek stock motors. I took one of their stock motor home and test it on my 45A dyno, the V-cut brushes produce at least 2000 more rpm and 3% more power than my high silver full laydown brush set-up. Normally, I don't like to use comm drops on any of my motors. Most drops only last for maybe 30 to 45 seconds and the motor would be slow again. Brian at Trek give me a bottle of Liquid Metal motor additive and told me to give it a try. I put a drop on the stock motor and run the dyno again. Amazing! the rpm keep running faster and faster without decrease in torque or power. After running the motor at 20A for about 4 minutes, the motor still runs consistence without any sign of power fading. Brian said that their Liquid Metal works even better when the liquid is dried. The ultra thin chemical film protects brush and commutator surfaces, therefore, the motor runs cooler and more efficient. These are great products and look for them at your local hobby shop very soon. Remember, support your local hobby shop, go fast and have a blast!



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TK0903	9 Turn TENBASE-T Triple	TK1203	12 Turn TENBASE-T Triple
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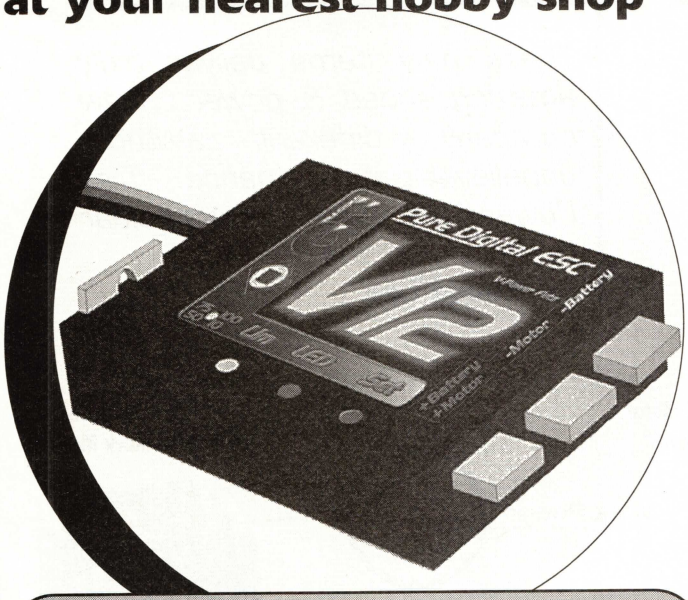


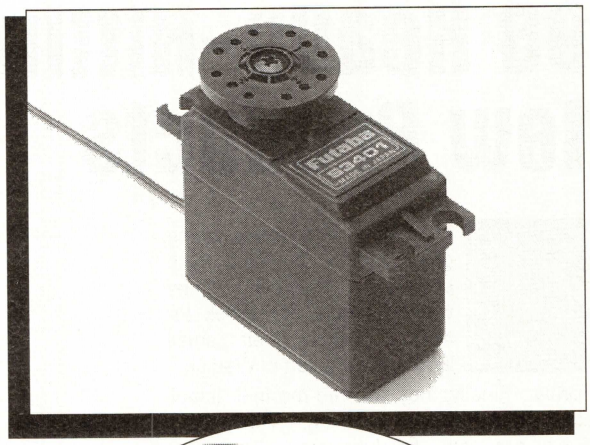
GM RACING V12 Micro Speed Controller

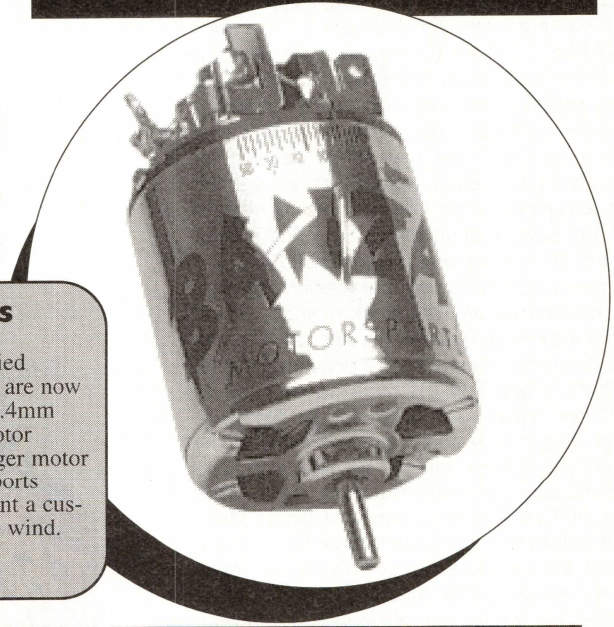
The V12 ESC from GM Racing is billed as the "next generation concerning high tech speed controls." At 0.0005 ohms, GM's 12 V-FETs claim to have the lowest internal resistance of any ESC in the world. The V12 also features direct solder posts for easy installation, torque control, turbo function, highly adjustable brakes, one-touch radio setup, BEC, and regenerating braking circuitry. Its small case size (1.26x1.02x0.55"; 0.72 oz.) makes it an easy install in any vehicle. **Part #s and prices: HE2216 (V12 forward only), $195.00; HE2217 (V12 w/reverse), TBA.**

FUTABA

High Speed Servos

Futaba has added two new high-speed servos to their line-up. Both servos feature lightweight coreless motors, metal internal gears, and ball bearings for smooth and consistent response. The FP-S9602 is a mini servo with vertical and horizontal mounting tabs for easy installation in both cars and airplanes. The standard-sized FP-S3401 features gasket seals to keep out moisture or fuel. **Part #s and prices: FP-S9602 (high-speed mini servo), $124.95; FP-S3401 (high-speed standard servo), $89.95.**





Banzai Motorsports

Hand Wound Motors

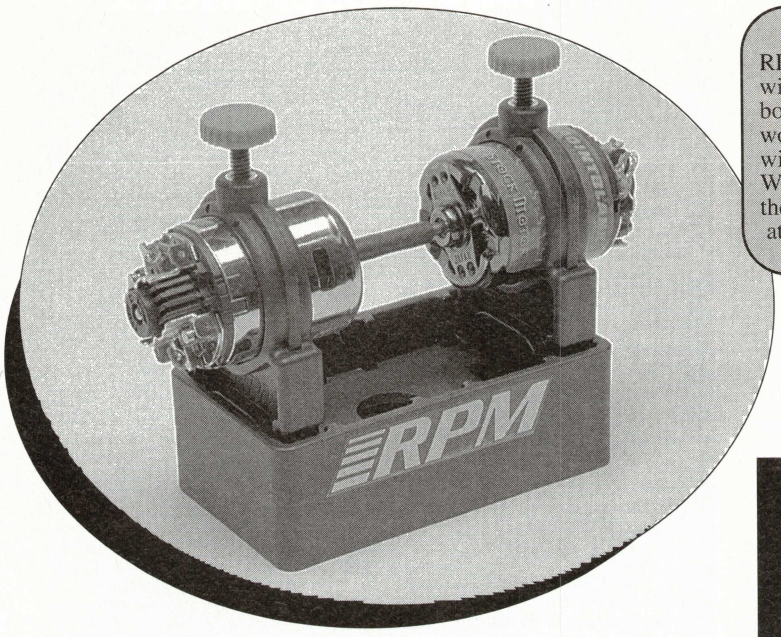
Banzai's new hand wound modified motors based on the new D3 can are now available. The motors feature a 1.4mm motor can, 6.0v wet magnets, motor brush stabilizing system, and larger motor wire solder tabs. Banzai Motorsports offers any wind, whether you want a custom wind or even a special 4WD wind. **Part #: various; price: $95.**

SEI Racing

1/5-scale FG McLaren F1 GTR

SEI's latest edition to their model line up is an officially licensed 1/5-scale version of the East-sponsored McLaren F1 GTR. Measuring in at about three feet in length, the SEI chassis features a 2.2 horsepower 22.5cc gasoline powered Zenoah ZG22 engine, a new monoshock front suspension system, fully adjustable suspension members, and a rollover cage to protect the engine. With run-times around 45 minutes (at speeds over 40 mph!) the SEI Racing chassis are in a class of their own. The GTR is available in four different configurations from the basic chassis with body kit to the fully hopped up "stage 3" kit. All kits are available with two engine choices; different body and wheel styles are also available. **Part#: 2000G (McLaren GTR); price (stage 3): $3,279.00.**





RPM Motor Work Station

RPM's new Motor Work Station features two motor stands with a common base. The motor stands can hold motors both horizontally as well as vertically for all kinds of motor work. Using two motors inline, you can break in new motors with the included motor coupling tube. The RPM Motor Work Station is impervious to all types of motor sprays, and the unit elevates both motors to prevent the magnets from attracting any harmful debris. **Part #: 8129; price: $12.95.**



Racers Edge

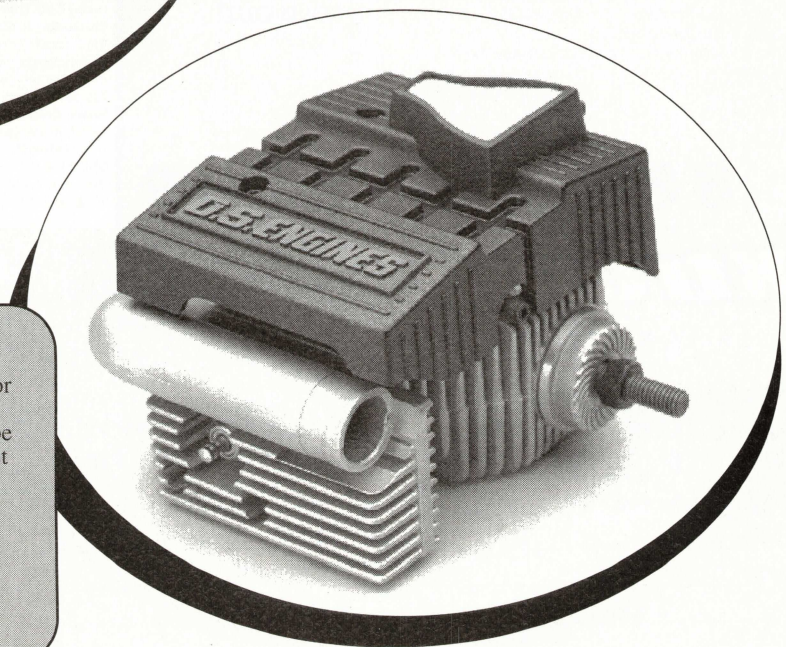
Wind Tunnel Car Stand

The new Wind Tunnel car stand features a special channel down the length of the stand which allows cars like the B3 or the XX-CR to sit flat and stable on the stand. Made of durable, impact-resistant plastic, the stand is available in six colors and includes adhesive-backed rubber pads to keep the car from sliding off. **Part #: various; price: $10.50.**

Hitec RCD HFX Electronic Speed Controller

The HFX features Hitec's own PowerFETs, One-button radio setup, a 20 120 amp current limiter, internal Schottky diode, and a 6v BEC output. The small case size is small enough to fit in almost any electric R/C vehicle. **Part #: 41810; price: $159.95.**





O.S. ENGINES

.12 LD Low Profile Car Engine

O.S. Engines has designed a unique new engine for car or truck applications. The new design features a horizontal "laydown" piston for a lower center of gravity, O.S.'s type 10F slide valve carburetor, a built-in air filter and exhaust header, and O.S.'s unique built-in engine mounting lugs which eliminate the need for engine mounts. The .12LD engine is available in two versions – one with a built-in recoil starter and one without. **Part #s and prices: OSMG2020 (.12LD), $269.99; OSMG2021 (.12LD-X recoil start), $299.99.**

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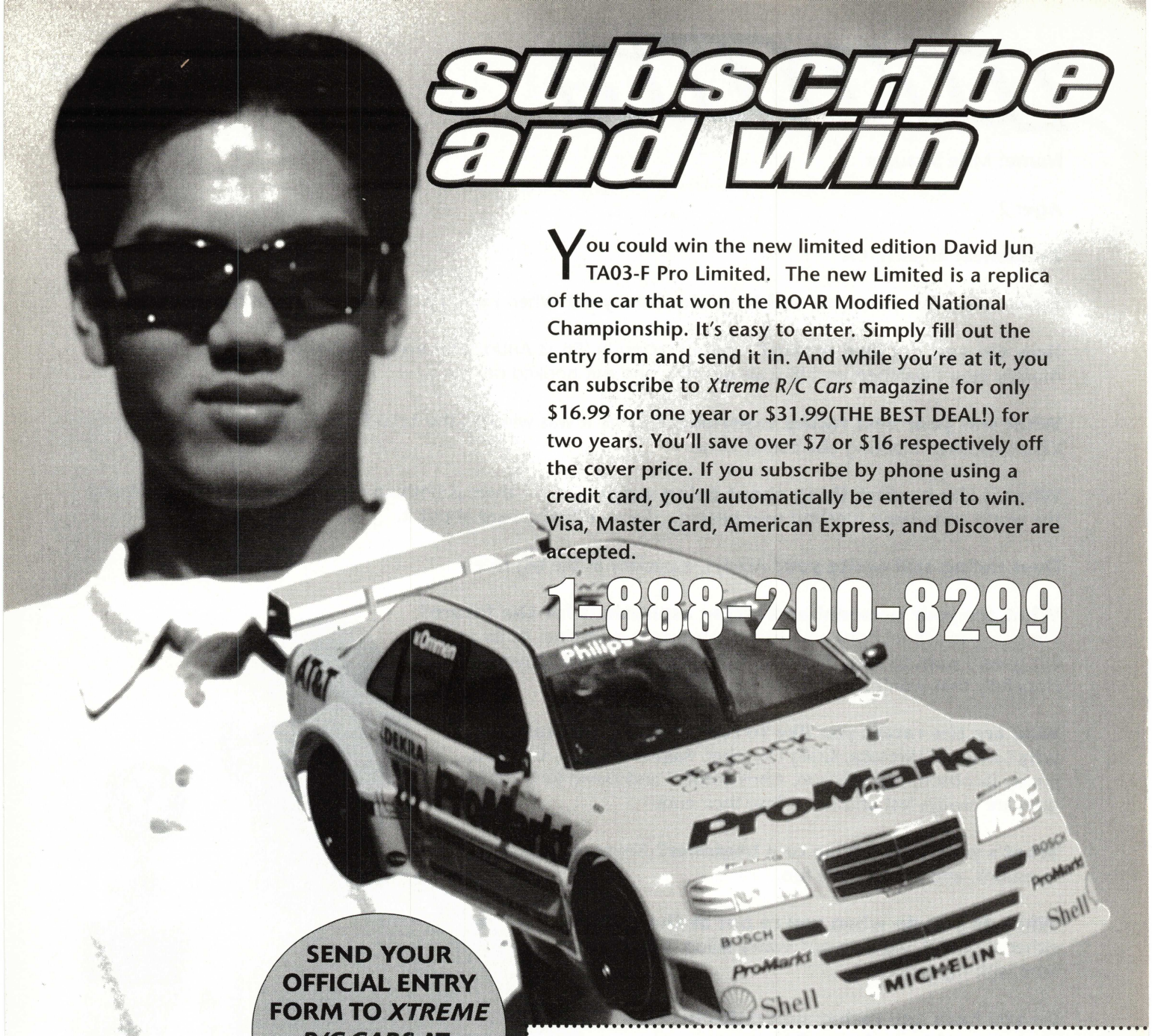

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profile

Name: Mike Swauger

Age: 21

Residence: Antioch, CA

What was your first car, and how old were you? When I was 10, I bought a Tamiya Grasshopper.

How did you get into racing? I started racing in '86 at Antioch Raceway. I raced off-road first. Then six months later I watched an 1/8-scale gas race and got hooked on gas.

What was your best racing experience? By far it was winning the 1/10-Scale On-Road World Championship. Nothing else comes close.

What is the hardest thing about being a pro? For me there is nothing hard about being a pro. Seeing the world and always meeting new people...there's nothing hard about it.

Does racing still excite you? Always, especially at the big races.

What are your personal and racing aspirations for the future? I'm going to school right now to get into sports medicine. As far as racing goes, I want to keep racing until I'm not competitive anymore. Hopefully that won't be for 10 to 15 years.

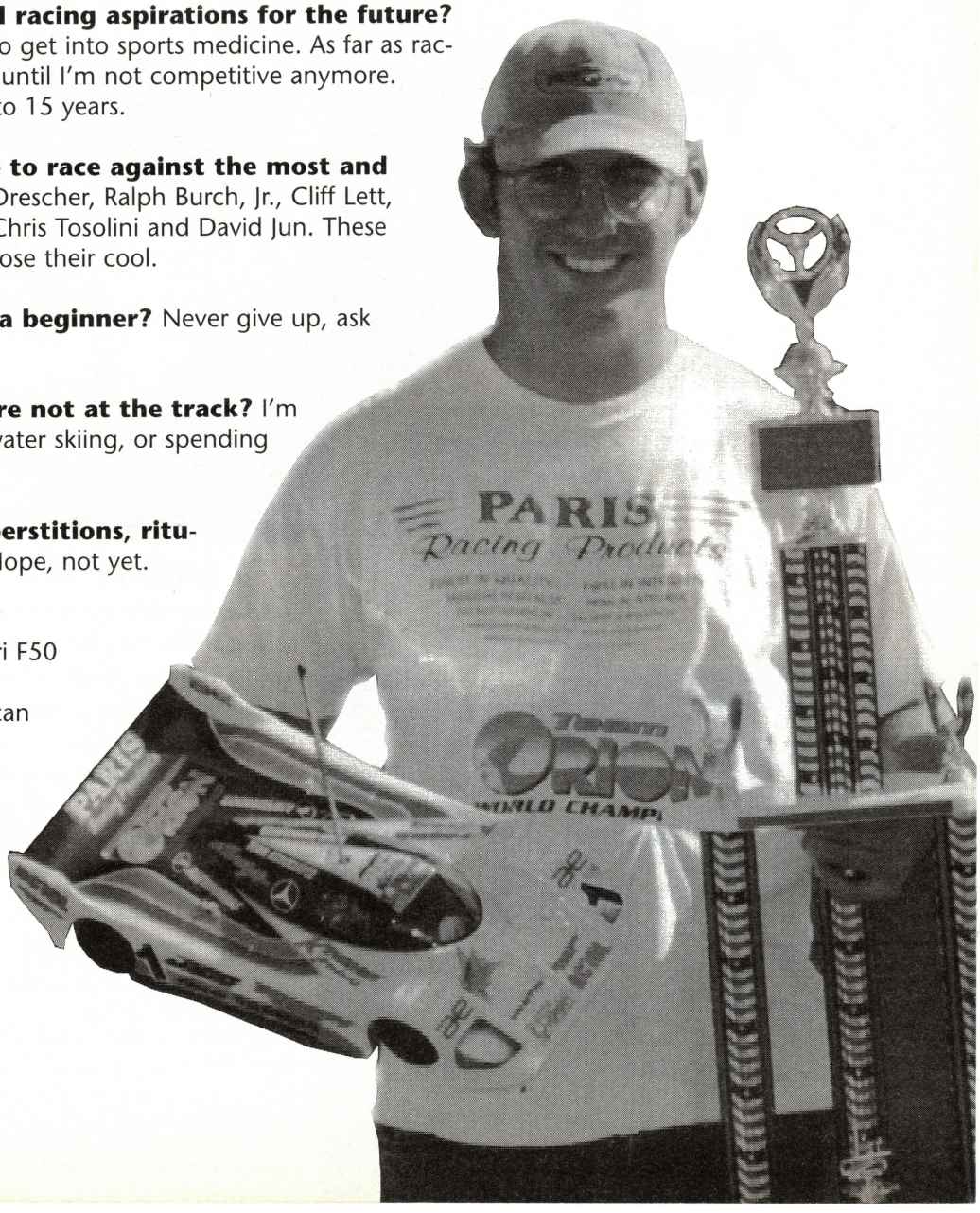
Who are the racers you like to race against the most and why? Masami Hirosaka, Craig Drescher, Ralph Burch, Jr., Cliff Lett, Jimmy Jacobson, Joel Johnson, Chris Tosolini and David Jun. These guys are always fast and never lose their cool.

What's your best advice to a beginner? Never give up, ask questions, and always have fun.

What do you do when you're not at the track? I'm either at school, working out, water skiing, or spending time with my girlfriend.

Do you have any racing superstitions, rituals, or good luck charms? Nope, not yet.

Favorite celebrity: Paul Tracy
Favorite full sized car: Ferrari F50
Favorite band: Sublime
Favorite type of food: Mexican
Favorite sports team: Miami Dolphins
Favorite movie: Pulp Fiction
Coke or Pepsi: Coke
Mary Ann or Ginger: Mary Ann



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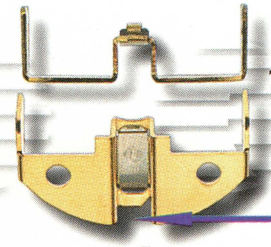
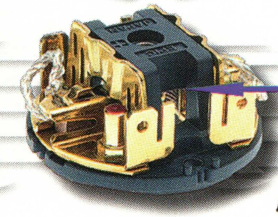


Brush Stabilizing System Presses Brush On Heatsink For Better Cooling And Eliminates Brush Bounce



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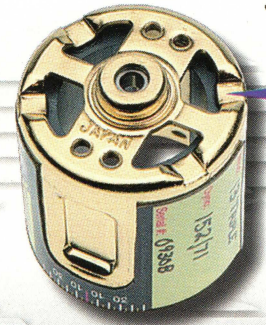

1.4mm Motor Can With 6.0v Wet Magnets For A More Efficient Higher Power Motor



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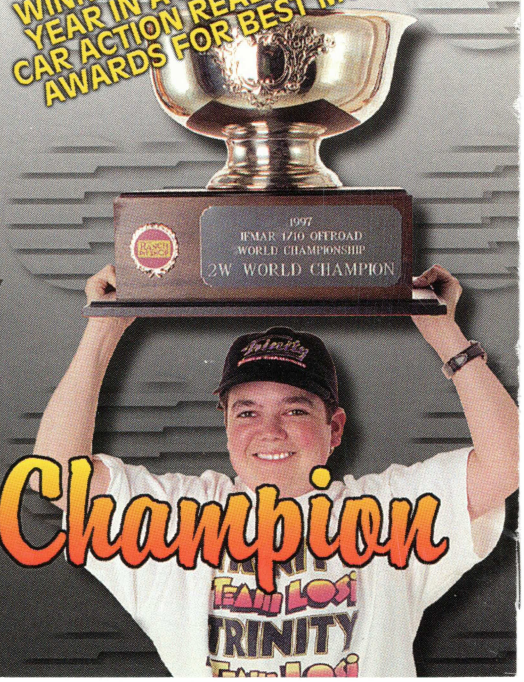

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