

There are a few tricks when it comes to keeping everything straight with prefabricated race bodies—and staying on the right side of the rules

Prelab

've known more than a few people who will cuss a prefabricated racing body every chance they get. Granted, classes where everybody runs themparticularly Late Model Stock-tend to make all the cars look alike, and in a world where everyone's frame differs a little from the next, the onesize-fits-all mentality usually means one-size-fits-nobody-quite-right. But you have to admit the bodies are economical, they generally look a lot better than a homemade attempt, and the average Joe can save a whole ton of money by installing one on his car himself. When you get right down to it, the only specialized tools you need are a good straight edge, a felt-tipped pen, and maybe a ball of string.

The real key to hanging a prefab Late Model body well is patiencetruckloads of patience-and a little meticulousness when it comes to reading the tape measure. And although you can get a body on with a minimum of equipment, a few specialized tools you can make yourself out of scrap tubing can save you a lot of time and headaches. What type of tools you say? Well, that's what we're here for.

Mark Davis has been hanging bodies on race cars longer than he cares to tell (he hung bodies on Buicks back when they were in Winston Cup, if that tells you anything). For a time, he made his living fabricating and hanging his own bodies on Late Model Stock cars. These days, he operates the Carolina

Motorsports Tech Center in Conover, North Carolina. CMTC is a racing school that concentrates on giving its students hands-on experience building cars; it's also one of the most successful schools in the country when it comes to placing its graduates in Winston Cup shops. So when the topic for this story came up, we asked Davis to help us hang a new body on a NASCAR-legal Late Model Stock frame and show us a few of his tricks.

Of course, we couldn't let it be as simple as hanging a new body on a new car. Instead, we brought Davis a three-year-old car with Ford Taurus sheetmetal and asked him to put a new Monte Carlo skin from Aluminum Racing Products (ARP) on it. At the time, we had no idea



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Once the existing body is off the car, Davis marks the centerline between the rear framerails on the fuel-cell cage and then also marks a line on the floor using a floor-mounted laser, available at major hardware stores. The framing square provides a solid surface for the laser to shine onto.



This is a simple fixture used to locate the front bumper cover forward of the front wheels. NASCAR's rules require the front overhang for the Monte Carlo be no more than 45 inches. This fixture is a simple L-the horizontal tube is clamped to the front crossmember so the vertical tube is exactly 45 inches from the centerline of the wheels. If the rules change, the next time around you can just slide the fixture in or out before clamping it. We've also determined the ground clearance of the front bumper cover based on the minimum required height; the block under the fixture helps locate that distance.



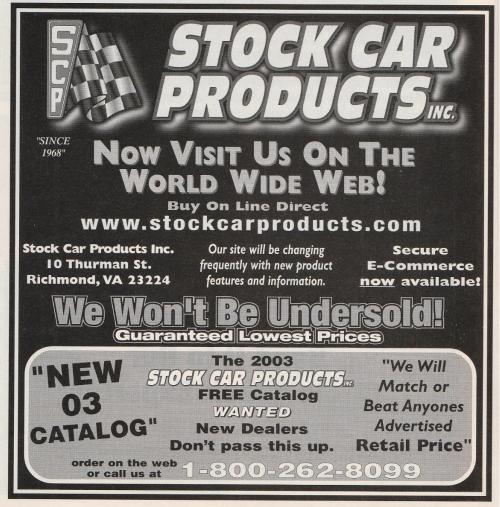
Before you can do anything with either of the bumper covers, excess material needs to be trimmed. One easy way to get a consistent edge for the lip on which the hood rests is to tape it off with %-inch masking tape. Cut away everything that is exposed and you now have a lip that's a consistent depth.

what a challenge this would turn out to be.

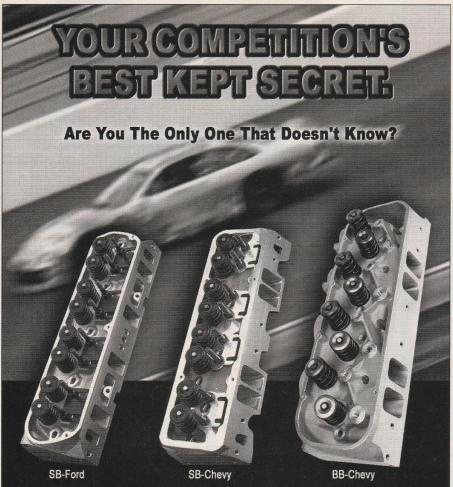
FIRST THINGS FIRST The economics of Saturday-night racing being what they are, a racer is more likely to put a new body on an existing frame rather than buying everything new, so that's what we are doing. Obviously, the first thing is to strip the old body. Rarely do old brackets and crush panels fit perfectly from one body to the next—especially when switching makes—but, just in case, we saved everything. Although they might not fit exactly right off the bat, it's still easier to modify an existing bracket than fabricate a new one.

While Davis' students were stripping the body, Davis photocopied the page out of NASCAR's Late Model rule book that deals with body placement and posted it on a wall in easy view of the workspace. Unlike the Busch and Winston Cup Series, NASCAR's Weekly Racing









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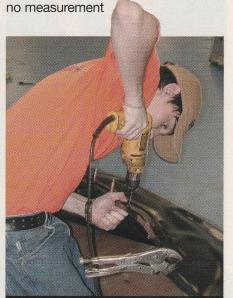
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Series uses a series of measurements instead of templates to check body placement. Many of these measurements work off of each other. For example, there is



The bumper covers are flexible to prevent breaking in the event you need to provide the ol' chrome horn to someone, but this means there needs to be a support framework. You can make your own, but ARP provides prebent tubing for the framework and bumper tubes that's a perfect fit at a good price. Here, Roy Vaughn fits up the 1-inch square support tubing that helps stiffen up the area where the hood and bumper cover meet.



A Beverly shear isn't a tool you will find in every race shop, but it sees constant use here. It is more precise than a nibbler and a lot easier on the arms than a pair of snips. Here, Davis and Evans trim up a rocker panel.

FF HUNEYCUTT



Rocker panels should follow the rake built into the frame from front to back but be parallel with the ground as they extend outward. This chassis has tabs welded to the frame for mounting rockers, but when they don't, Davis usually attaches the rockers to the bottom of the frame tubes to get them as low as possible.



New receiver tubes for the bumpers are cut and drilled, but before they are welded to the frame, nuts are welded to the bottom side of the hole so the bolt holding the bumper tubes in place can be removed quickly with only one wrench.

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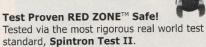
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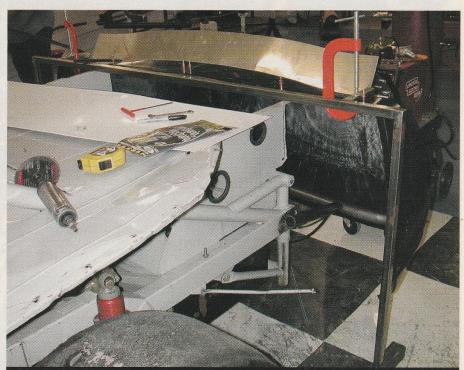


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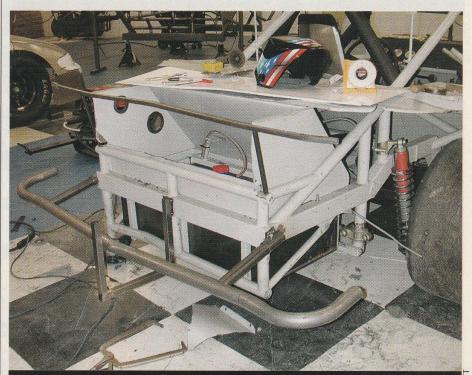
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Two measurements are critical and affect everything else that goes on the car: the height of the rear bumper cover and the maximum distance from the back of the cover to the center of the rear wheels. To help get that right, this fixture was made. It holds the bumper cover steady so that proper height is maintained where the bumper cover meets the decklid and rear corners. A second fixture, which isn't visible in this photo, makes sure we cannot exceed the maximum rear overhang. For racing, you want to pull the rear bumper cover as far back as possible to extend the decklid and get the rear spoiler in as much air as possible. Finally, the bumper cover is not offset. Its centerline matches the car's.



This is the fixture that sets the rear overhang. The bumper and cover both have to fit inside the "U." It has been welded to the car to make sure it cannot be kicked or bumped out of line, but once the bumper is in place the welds will be ground off and the fixture removed.

EFF HUNEYCU



The front bumper (which has already been riveted into the cover) and the bumper cover are fitted up in much the same fashion. A fixture, which is clamped to the crossmember, limits the front overhang, and multiple blocks clamped to the cover maintain a consistent ground clearance across the front of the car. Like the rear cover, the front bumper cover is also centered with the car.

for locating the position of the roof forward and backward directly to the car. Instead, there is a measurement for the maximum overhang of the rear bumper cover in relation to the center of the rear wheel, another measurement for the maximum decklid length, and another for the maximum rear window length. Once you tie those measurements together, that determines your working parameters for locating the roof. For this reason, the first piece that should be hung on a NASCAR Late Model Stock is the rear bumper, followed by the front bumper. Once you have those, it's relatively easy to locate the rest of the panels.

Once the old body was stripped from the car, Davis pulled out the first tool in his bag of tricks: two lasers for marking the centerline of the car. Using a tape measure, he measured the distance between the framerails at the front and rear of the car. Then, using a laser mounted on a beam directly over the car, he shot a line connecting the two points and marking the centerline of the car. The advantage here is that the line created by the laser is perfectly straight and always sits on top of the car. When installing the roof, if the center of the roof is marked, all you have to do is lay the roof on top of the car and position it so the centerline on the roof is in alignment with the line created by the laser (which is





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shining directly on the roof). You now know the centerline of the roof is true to the centerline of the car. The second laser Davis used was a portable carpenter's laser about the same size and shape as a tape measure. This one can be set on the centerline that the overhead laser shines on the floor and can be used to mark a line underneath the car where the

overhead laser cannot reach.

**SETUP** Davis already knows the car's desired ride height. Once the frame is positioned, he uses four 2- x 4-inch pieces of tubing cut at specific lengths to set ride height. In our case, the measurements are 4 inches to the frame at the left-front, 4.75 at the right-front, 5.5 at the



The stock roof (once it has been trimmed to size) window pillars, decklid window framing, and rear quarters are all built off the car. This can be done because the only measurement that ties this entire assembly to the rest of the car is the maximum length of the decklid, which is determined on one end by the bottom of the window and on the other by the rear bumper cover (already located on the car). For building car bodies, Davis uses only rivets with steel shanks to increase shear strength, and almost every rivet is a consistent 2 inches apart.



Before placing the roof/rear quarter-panel assembly on the car, Davis checks the fit with the front fenders. Because wheel travel on a Late Model is usually no more than 3 inches, a 2x4 block turned on its side is the perfect spacer to determine fender height.

EFF HUNEYCUTT



It's also a good idea to set your fender height before the doorskins are in place. The bottom is located by the rocker panel, but as you can see, our existing bracket will need to be modified before it can be used with our new fenders.

right-rear, and 4.75 at the left-rear. Likewise, blocks are also used to set the height of the front bumper cover at the NASCAR minimum of 22 inches at the seam where the hood meets the cover. "I use blocks and fixtures all over the car to help me find my measurements and make sure I don't get off," Davis explains. "Another good one is an L-shaped bracket you can make and clamp to the front crossmember to help you set your distance from the front bumper cover to the center of the front wheels. You can usually make this stuff out of scrap, and once you have them they can be used over and over. I recommend that everybody hanging a body make up every fixture they can possibly need, then paint 'em neon green or something so they won't lose them. Mark 'em with your measurements and then you can use them over and over again."

The roof, A, B, and C pillars, and rear quarters are all fitted and assembled off the car. This can be done because all the measurements required by NASCAR work off the different panels and not the car (see the diagram we used). You may not be building a race car to compete



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Once the roof and rear quarters are set into place, it is obvious we have a problem. The halo bar on the rollcage is mounted too high and runs too wide for the new body. It causes the roof to sit too high (measured at the center by this fixture) by about 1 inch and the fenders to flare out too wide. Because of the extra height and width, if the rear quarters are pushed down and into place, they are way too high. The only option is to start cutting on the 'cage.

To reroute the halo bar, all the support tubes are removed. This is what we were left with. Evans volunteers for the unenviable task of grinding everything smooth after all the offending bars are removed with a plasma cutter.

under the NASCAR sanction, but most governing bodies use a series of measurements like this. The key is to understand how each maximum or minimum measurement for a specific body panel affects the next panel down the line. Any panels located off a piece of the race car frame (usually the center of either the front or rear wheels) have to go

first, and then you can figure out how everything else fits from there.

**PROBLEM SOLVING** Our problems came when we tried to place the roof/rear-quarters assembly on the car and match it to the rear bumper cover, which was already mounted. The halo bar on the rollcage held the roof about an inch too high. It was

also too wide and kept the B and C pillars from curving down at the angle we wanted. This extra height and width, in turn, made the guarters sit way too high. What had worked for the old Taurus skin didn't work with our new ARP Monte Carlo, and some changes would have to be made. In the end, we had to cut off the halo bar and all the supports from the door bars up and replace it all with new tubing from Stock Car Steel and Aluminum in Mooresville, North Carolina. Cutting and patching a rollcage is obviously beyond the scope of this story, which is limited to skinning a car.

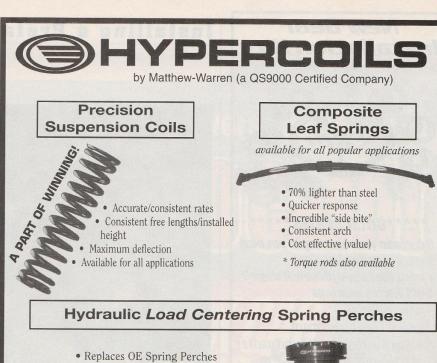


Rollcage repair may be necessary. It was in our case, so Davis had to put in the final welds.





The new halo bar is a much better fit for our body. This shows how the overhead laser helps center virtually every body panel on the car. All you have to do is make sure the center of the roof panel (already marked) lines up with the laser, which tracks the car's centerline.



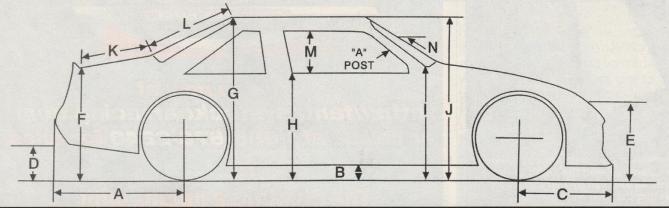
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Α	Rear Overhang (max.)	51%	52	51 <sup>7</sup> ⁄⁄⁄8	52
В	Side Panel Clearance (min.)	4	4	4	4
C	Front Overhang (max.)	45	45	45	45
D	Bumper Cover Ht. (max.)	15½	15½	15½	15½
E	Nose Height (at nose & hood seam-min.	) 22	23	22	23
F	Quarter-Panel Height (at rear-max.)	341/2	34½	34½	34½
G	Roof Height (at center rear edge-min.)	45¾	45¾	463/4	453/4
Н	Door Height (at rear)	331/4	331/4	33¾	331/4
1	Front Fender Height (at "A" post—max.)	321/2	32½	32½	321/2
J	Roof Height (10 inches back—min.)	48	48	48	48
K	Decklid Length (at center—max.)	18	18 <sup>1</sup> / <sub>4</sub>	17½	181/4
L	Rear Window Length	31½	31½	<b>32</b> %	31½
M	Side Window Opening (min.)	15	15	151/4	15
N	Windshield Angle	26	26	26	26



NASCAR has a set of very specific measurements that set the body parameters for every type of car that it races. These are the measurements that guided everything we did as we hung the new Monte Carlo body.

The rest of installation held no more surprises, and the body came together quite nicely. But now that the body is in place, the work has only just begun. In part two of this story, we will tackle brackets, radiator ductwork, and the most universally hated part of building a race car—crush panels. **CT** 

#### SOURCES

Aluminum Racing Products (ARP) • 888/245-1468 • www.arpbodies.com

Carolina Motorsports Tech Center • 828/695-8445 • www.carolinateamconcept.com

Stock Car Steel and Aluminum • 704/664-3044

