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& RACING TECHNOLOGY

POWER TECH: NEW ENGINE DESIGNS

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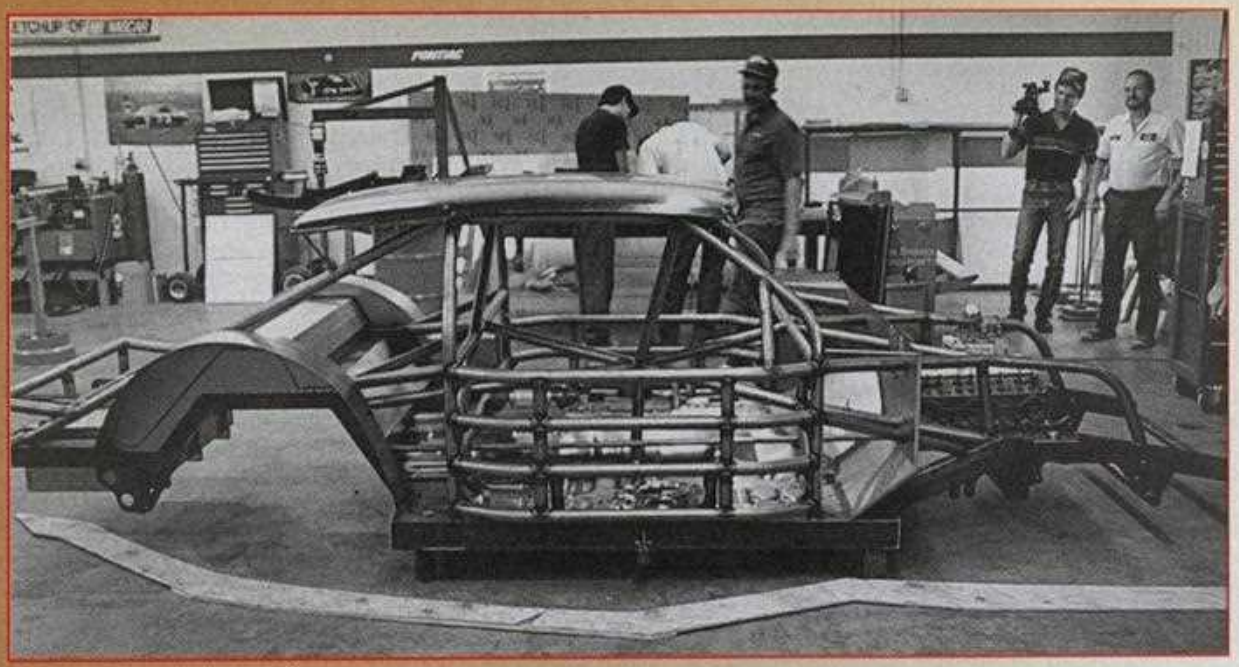
EVERY RACER



The roof panel for this Monte Carlo-bodied racer was fitted to a new Winston Cup chassis from Laughlin Racing Products. A mock-up engine block was used to line up all the mounting points correctly for the drivetrain.

S DREAM

Part I

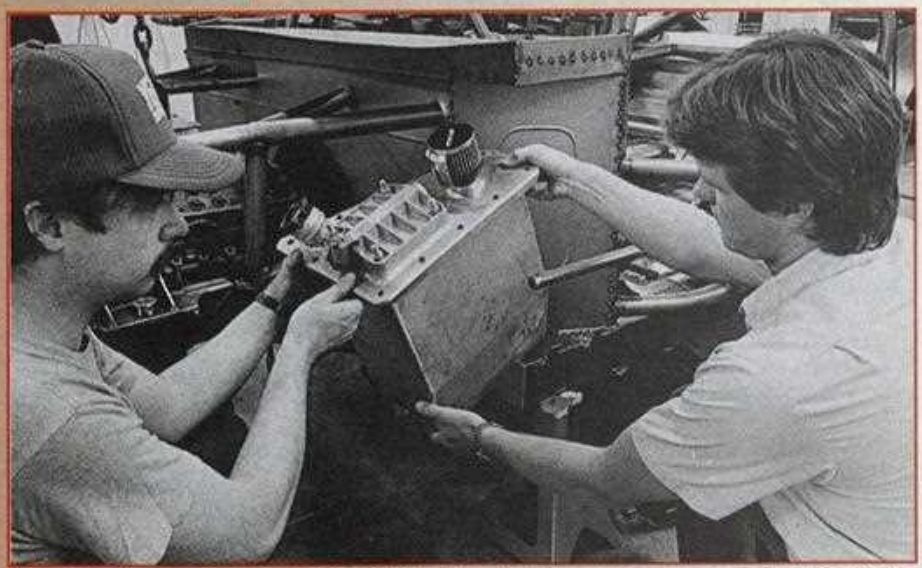
You can build this NASCAR Sportsman car and race with the big boys on Winston Cup tracks. Here's how.

By WILL HANDZEL

Every racer yearns to make the big time. Deep down, they all want to run the big cars, with the big dogs, on the big tracks, at the high speeds, in front of the big crowds. But the question constantly asked is, "How do I get the experience on those big tracks to learn how to race with the big dogs without spending a big fortune?" A decent Winston Cup car with a shot at winning a race costs roughly $70,000 to $90,000, and a similar Busch Grand National car is only just a little cheaper. Most people couldn't afford to even pay the tire bill on these machines. There is another race-car series, however, that resembles the WC and BGN cars and runs on selected big tracks. Called the Sportsman division, it only requires about $35,000 to get a brand-new race-winning car to the track. While this isn't cheap, many top-level local guys across the country routinely spend that much on such cars as dirt Late Models, Midgets, Sprints, and even quite a few local NASCAR division cars. To show you what it takes to build a top-level Sportsman race car, CIRCLE TRACK is following along as an advanced class of students at the Motor Sports Training Center in Mooresville, North Carolina, builds a Monte Carlo-bodied, Cobra Electronics-sponsored Sportsman car destined to run at such big tracks as Charlotte, Pocono, and others. You can, too.

TOP LEFT: The chance to drive on big name tracks is a powerful draw. Robbie Faggart drove the brand-new Cobra Sportsman car at Charlotte Motor Speedway as a sort of final exam for the build-up series that starts with this issue. *(Don Grassmann photo)*

BOTTOM LEFT: Sportsman class racers don't often get the chance to drive a race car at speeds over 150 MPH on a 1.5-mile tri-oval. The opportunity does exist. *(Don Grassmann photo)*



The chassis came from Laughlin with the firewall, floor, and rear paneled in sheetmetal. A small portion of the firewall was cut and relocated so a ButlerBuilt dry-sump oil reservoir could be mounted behind the left front wheel housing. This keeps the hot oil reservoir out of the driver's compartment, while keeping the heavy oil on the left side of the car. Notice how the oil sump has an Oberg filter housing welded right onto it.

COLOR PHOTOGRAPHY: MIKE SLADE

CAR SPECIFICATIONS

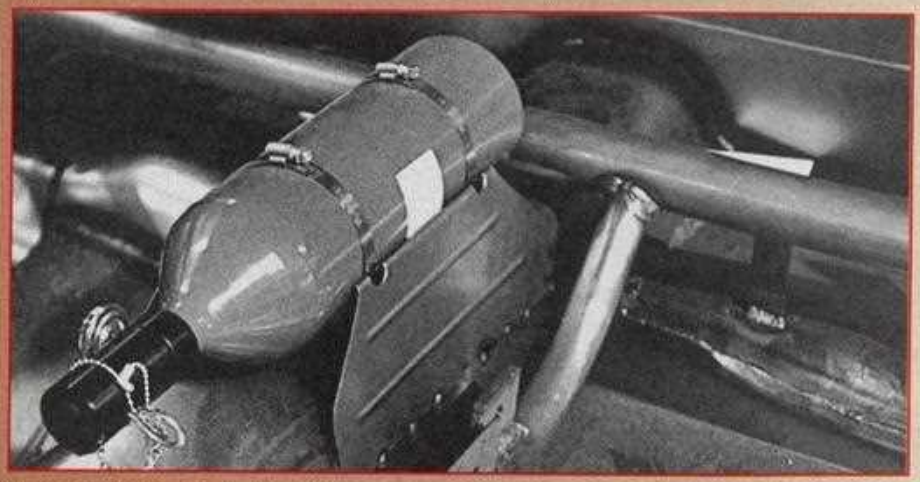
To understand the car specifications, it's important to know how the Sportsman division came to be. A few years ago, O. Bruton Smith and Humpy Wheeler envisioned an entry-level class using outdated Winston Cup and BGN cars as its basis. These two men knew there were many such cars around the nation, most of which could be bought for comparatively little money. By combining these existing chassis with inexpensive, low-power engines, a low-buck, speedway-safe series was born.

Because of the Winston Cup/Busch Grand National derivation, the cars are required to have a 110- or 105-inch wheelbase, a minimum 60-inch track width, weigh 3500 pounds, and have 22-gallon fuel cells. The cars can have bodies no newer than 1987 vintage with all the templates and specs of the WC/BGN cars from earlier days being followed. The engines are limited to 358 CID and are purposely limited on horsepower by the rules to keep speeds down. Underneath their skins, these cars are exact duplicates of current WC/BGN machines but with less engine power.

From the start, this series was intended as a steppingstone for drivers new to the speedways. By limiting horsepower, it forces the driver and team to concentrate on intelligent driving technique and getting the chassis set up correctly—laying the foundation for new talent in Winston Cup.

A STARTING POINT IN RACING

There are many ways to put together a running race car for this series. Some people start with a used rolling chassis purchased from one of the WC/BGN teams, fix it up a little, drop a mild engine in, and go racing. Usually, this type of car is not capable of winning because it is a conglomeration of used or used-up parts, put together by many different people for different reasons. Like it or not, every race car is a direct product of its initial builder/owner. You don't know if that used race car chassis you just bought was an experiment in cost savings, time savings, or what. If you just want experience on the track for the least cost, buying a used chassis, then rebuilding the car with safety and durability in mind is a good choice. If you have the funds, the best way to ensure that the race car you build is capable of winning is to start with new, top-quality components. The car being built here by an advanced class at the Motor Sports Training Center in the next four issues incorporates the best components and construction methods being used today in professional racing. This car could be purchased in ready-to-race form (turnkey) for $40,000. Even if you have or are going to get a used chassis to go Sportsman racing, many of the components and construction methods used in this story will help you build your car. You can pick and choose from techniques shown here—it's your choice.

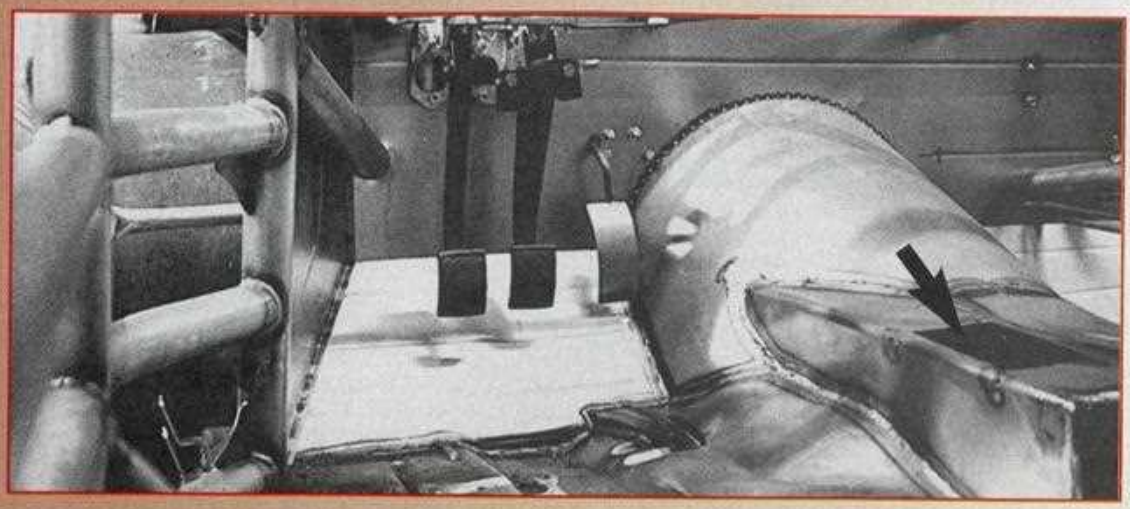


The bottle for the Firebottle Halon® system was mounted on the driveshaft tunnel. While this is not the mounting position Firebottle recommends, the instructors at Motor Sports say the NASCAR inspectors want to see the bottle mounted here. The seat mounts came installed from Laughlin but the seatbelt anchors were installed by Motor Sports.

THE ADVANCED CLASS

Motor Sports Training Center is a relatively new addition to the education centers available to a person who wants to be on a professional racing team but needs to learn the basic skills of fabrication. Starting a few years ago, the training center began offering a three-day course that teaches the skills required to "skin" or put a body on a race car. The construction of the Sportsman car depicted in this series initiates a second course that actually has students build a top-quality race car, starting with a raw chassis and components, ending up with a complete or "turnkey" race car.

The Advanced Course will be held



A Wilwood hanging brake and clutch pedal assembly was installed on the firewall next to a Stock Car Products gas pedal. The brake and clutch pedals really only fit in one area due to the stiffener tubes that run through the firewall. Motorsports students constructed the opening for the gearbox shifter *(see arrow).*

twice in 1992, takes 20 days to complete, costs $2800, and employs three full-time instructors who guide students through all phases of race car construction. The next Advanced Course will start on March 1, 1992, and Motor Sports is still taking students if you would like to be involved.

The course teaches how to trial-fit, fabricate, and mount every component in the interior and drivetrain, and also mount the body on the car before applying paint to the interior and exterior. After the paint, the car goes through final assembly and is ready to go racing. Students learn every facet of construction and fabrication.

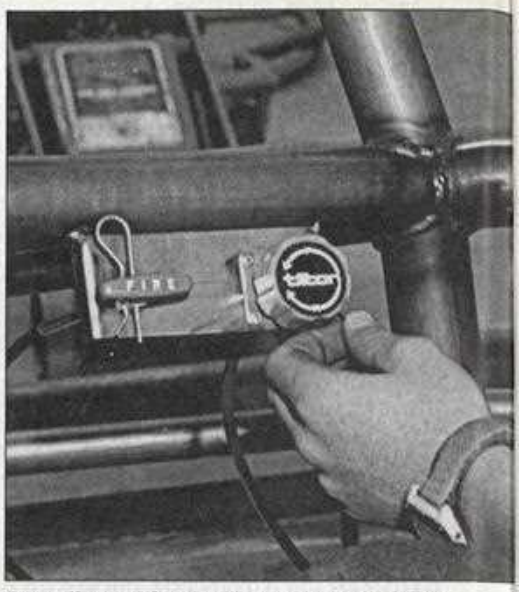
■ BUILDING THE CAR

The instructors at Motor Sports wanted to start the Advanced Course with a car that was capable of winning on the racetrack, yet had the show quality many expect of a Winston Cup car. Eight students would build this car to prove that with the right training and fabrication practices, anyone can build a top-flight car.

For this reason, a brand-new Laughlin Winston Cup chassis was ordered from Laughlin Racing Products in Simpsonville, South Carolina. The 110-inch chassis arrived, as all Laughlin chassis do, with all the interior sheetmetal installed, the lower A-arms to the front suspension already mounted up, all the mounting points for the

A ButlerBuilt superspeedway seat with Butler's energy impact system, 0.090-inch aluminum construction, and shoulder and leg supports was used in the Cobra Electronics-sponsored Sportsman car. The leg supports require that a special Hurst Competition Plus shifter handle be used. This shifter offsets the handle to the right about 1 inch so that the car can be shifted easily.

EVERY RACER'S DREAM



A small panel for the Firebottle Halon® fire extinguisher activator and the Tilton brake bias adjuster was constructed on one of the stiffener bars to the right of the driver, placing these important controls within easy reach of the driver in all situations.

truck arms and panhard bar on the rear suspension in place, and various other mounts affixed.

With the chassis in the shop, the students began building the car. The bare chassis needed to have end caps attached to the main frame rails to hold the lead ballast securely. The battery box, located directly behind the driver but accessed through the rear wheelwell, needed a door affixed to it. The oil reservoir for the dry-sump system was placed behind the front left wheel, so the firewall was modified there to accept it. The ButlerBuilt reservoir has an Oberg oil filter welded to its top, so the filter doesn't have to be plumbed into the system; it is a neat feature. From Laughlin the chassis has an area in the rear of the car for a 22-gallon fuel cell but a "can" or sheetmetal box with an open end needed to be constructed to hold the 22-gallon ATL fuel bladder in place. On top of the can, a piece of sheetmetal was fastened to seal the box tight. A brace was constructed on top to increase the strength in this area. The students mounted another Oberg filter on this brace that will be plumbed into the fuel system with Aeroquip lines in the future.

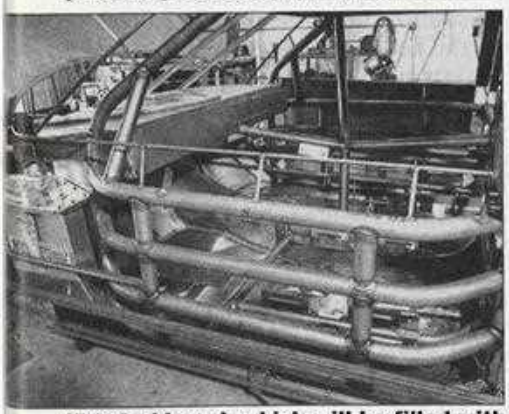
■ INTERIOR CONSTRUCTION

Installing the fire system, seatbelt anchors, seat, pedals, steering, dashboard, electrical system, ignition, and other assorted pieces were the next tasks facing the students.

A 10-pound Firebottle Halon® fire extinguisher system from Safety Systems in Modoc, Indiana, was installed in the car with Halon being routed to the engine, driver, and fuel cell compartment. The container that holds the Halon was mounted on the driveshaft tunnel in the fore-aft position. While Firebottle doesn't recommend this, the instructors at Motor Sports say NASCAR inspectors urge racers to place it there. All of the routing lines for the system were fastened to the car with metal brackets so that in a fire, they would not melt and allow the lines to move—plastic is a poor choice here.

While the seat mounts are installed by Laughlin, the seatbelt anchor points were added by the students. Mounting points for a Simpson 5-point harness were installed with a Butlerbuilt speedway seat mocked in place.

A hydraulic clutch pedal and a dual reservoir brake pedal in the hanging pedal configuration from Wilwood Racing Products in Camarillo, California, were next on the list. On the Laughlin chassis there is really only one place to put these pedals without making some major changes to the chassis, so installing them is relatively simple. They were mounted to the firewall between the two left-side firewall stiffening tubes. A piece of 1-inch square tubing was welded between the tubes to make the front mounting point for the pedals. Holes were drilled in the firewall so that the reservoirs to these pedals could be attached. The gas pedal is a Stock Car Products piece that was mounted easily to the car.



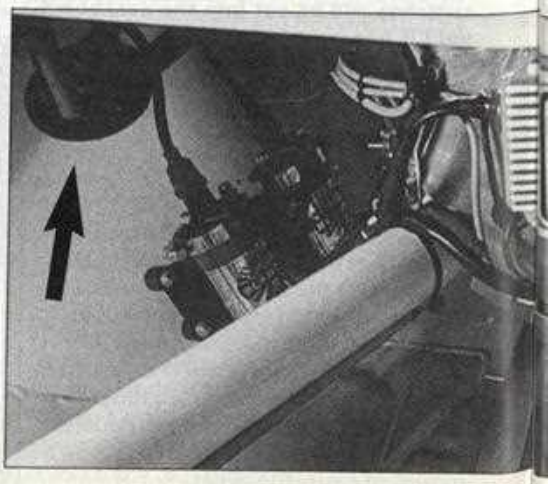
The dashboard, which will be filled with Auto Meter gauges and QuickCar electricals, is constructed of 22-gauge sheetmetal. None of the holes for the gauges or switches will be cut into the dashboard until it has been painted. The mounting points for a BSR latch mechanism, which will hold the Butler window net, were added to the door and roof bars on the driver's side.

EVERY RACER'S DREAM

The steering system on the Laughlin car is a front steer system, so the steering box hangs in front of the centerline of the front wheels. If not installed correctly, the steering shaft could hurt the driver in a front end collision. To avoid this, Borgeson U-joints were attached to the splined shaft on the C.J.R.-built steering box (of Mooresville, North Carolina). U-joints were also installed between the steering wheel shaft and the firewall. A firewall flange was used to run the ¾-inch-O.D., ½-inch-I.D. DOM mild steel shaft from the interior to the steering box. The steering shaft actually runs under the pedal reservoirs to the box. The steering box mounts to threaded holes installed by Laughlin.

The dashboard was bent up on a brake, trimmed to fit, and welded into place by the students. Holes weren't drilled or cut for the Auto Meter gauges or QuickCar electricals, as that will be done after the car is all painted. A mount for a QuickCar battery shut-off was placed next to the window on the driver's side but none of the wiring was placed in the car.

The ignition system, which is an entire MSD setup, was mounted on the right side of the interior to protect it from the heat and debris that is found in the engine compartment. To isolate the electronic components further from the elements, the control boxes and coils were mounted off the floor on rubber-isolated metal brackets. The Motor Sports students chose to use a new MSD switching unit that allows a driver to switch between the primary and backup ignition systems with just a small toggle switch. The MSD 6AL control boxes, coil, coil selector, and wiring were mocked into place, the brackets constructed, and everything removed except for what needed to be painted with the interior.



SOURCES

AERO TECH LABORATORIES, INC. (ATL)
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Dept. CT-02
Ramsey, NJ 07446
(800) 528-5330
(201) 825-1400 (New Jersey)

AUTO METER PRODUCTS, INC.
413 W. Elm St.
Dept. CT-02
Sycamore, IL 60178
(815) 895-8141

BORGESON UNIVERSAL CO., INC.
1050 S. Main St.
Dept. CT-02
Torrington, CT 06790
(203) 482-8283

BUTLERBUILT MOTORSPORTS EQUIPMENT
3055 Pitts School Road,
P.O. Box 459
Dept. CT-02
Harrisburg, NC 28075
(800) 621-SEAT
(704) 784-1027 (North Carolina)

CJR PRODUCTS
210 Performance Way
Dept. CT-02
Mooreseville, NC 28115
(704) 664-2224

LAUGHLIN RACING PRODUCTS
114 Pride Drive
Dept. CT-02
Simpsonville, SC 29601
(803) 963-6022

MOTOR SPORTS TRAINING CENTER
Route 8, Box 5301
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Mooresville, NC 28115
(704) 664-6346

MSD IGNITIONS/AUTOTRONIC CONTROLS CORP.
1490 Henry Brennan Drive
Dept. CT-02
El Paso, TX 79936
915-857-5200

QUICKCAR RACING PRODUCTS
R.R. 3, Box 262
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Winder, GA 30680
(404) 867-9500

SAFETY SYSTEMS, INC./FIREBOTTLE
R.R. 1, Box 231
Dept. CT-02
Modoc, IN 47358
(317) 853-5437

SIMPSON RACE PRODUCTS
2415 Amsler St.
Dept. CT-02
Torrance, CA 90505
(310) 320-7231

STOCK CAR PRODUCTS, INC.
10 Thurman St.
Dept. CT-02
Richmond, VA 23224
(804) 232-3500

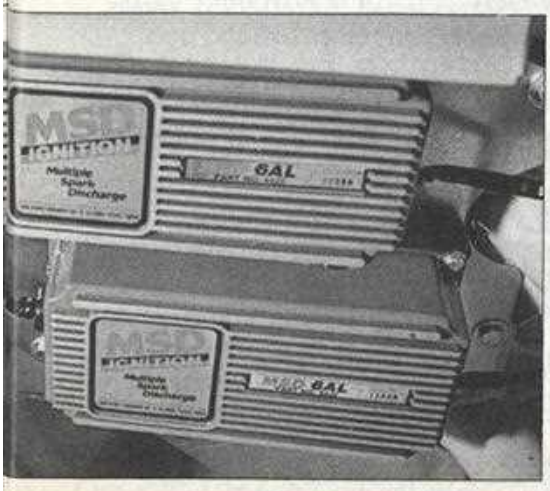
TILTON ENGINEERING
Dept. CT-02
Box 1787
Buellton, CA 93427
(805) 688-2353

WILWOOD RACING PRODUCTS
461 Calle San Pablo
Dept. CT-02
Camarillo, CA 93012
(805) 388-1188

Other small brackets, such as those for the ButlerBuilt window net, Tilton brake bias adjuster, and other pieces were installed next. Each is required because to get thattop-quality finish, once the paint is applied, all fabricating work must first be done.

■ NEXT MONTH

With the interior completed, the drivetrain needs to be located in the car, engine and trans mounts need to be built, and suspension mounts built. There is plenty of work yet to be done, and you'll be there to see it. O



An entire MSD ignition was installed by the Motor Sports students in the interior of the car to protect it from heat and track debris. Two 6AL control boxes were rubber-mounted on an aluminum panel off of the floor, and two MSD coils were rubber-mounted to a bracket that was mounted to the transmission tunnel. The two coils were routed through an MSD-supplied "coil selector" *(see arrow)* that allows the driver to just hit a toggle switch on the dashboard to change from the primary to the backup ignition system in case of a primary system failure.