STORY BY TOMMY LEE BYRD // PHOTOGRAPHY BY TOMMY LEE BYRD AND CYNTHIA DAVIS

SMOKIN' SS:

PART 4

Installing a Wilwood Brake System and Fabricating Custom Seats

In the last installment of Smokin' SS, Mark Davis and his students designed, fabricated and installed custom suspension components that will make this Monte Carlo handle like a racecar. Custom tubular control arms and hand-built spindles now ride under the car, along with AFCO coilovers on all four corners. Such an inspiring suspension is great, but to pull off this car, and to allow it to operate within its intended envelope, the Monte Carlo also needs a matching brake system.

For that, Davis knows the Wilwood brake component lineup—he used them for years—so the choice for this project was obvious: race-ready brake parts from Wilwood. In fact, he ordered the entire braking system, including the pedals and master cylinders, from Wilwood. When the parts arrived, the students went to work fabricating brackets for the calipers and welding them to the rearend housing and custom spindles.

After setting up the rotors and calipers, the crew mounted the pedals with a mock-up seat in place to make sure it would be comfortable for any person willing to slide behind the wheel. First and foremost, Davis wants his students to drive the car, and he really wants John Dianna's opinion on how the car drives and handles, so a Buckaroo test drive will be forthcoming. But before any of this can happen, and to eliminate the problem areas going in, considerable work needs to be done, including seat fabrication, deciding just where those pedals will go and how that relates to the steering wheel, and the list goes on.

As progress continues on the Smokin' SS Monte Carlo, we see more and more function, as well as innovative details throughout the car, ensuring that this will not be your average street machine. Functional details such as a true cowl induction were not overlooked, but more than that, every part of this car has a function, and that reveals Davis' racing background.

If there was ever any doubt about this car being fast—and it will be fast—plans call for a small block that will make well over 500 hp at the flywheel, but we'll elaborate on that in a later installment. For now, take a look at the steps involved to set up the braking system, fabricate custom seats and build a custom air cleaner for the true cowl induction system. ***CR***

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805/388-1188
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1 When the Wilwood brake kit arrived at the Metalcraft Tools SkillCenter shop, the students began fabricating the brackets that mount the calipers. Here is the Winters rearend housing with its new brackets welded into place. **2** The lightweight hubs from Speedway Engineering are perfect for this car, as they are super strong and keep the rotating mass at a reasonable weight. With the Wilwood rotor bolted to the aluminum hub, they could slide the axle into place and check the caliper's fitment. **3** With the rotor and hub assembly in place, the lower caliper mount could be bolted to the custom brackets. The four-piston caliper simply slides over the two studs and bolts into place, making it easy to change brake pads or service the caliper. **4** The students bolted the caliper onto its lower mount and made sure everything was aligned correctly. After inspection by Davis and the students, it was time to move to the other side and repeat all these steps. **5** After completing the rear-brake setup, the students moved to the front-end setup. Here, the mock-up brake system supplies the caliper with fluid and allows the students to check clearances in real-world driving conditions. **6** Davis and the students simply clamp the assembled spindle and hub to a work table and connect a hose to the caliper's inlet. This is a great way to make sure everything is just right before installing it on the car.


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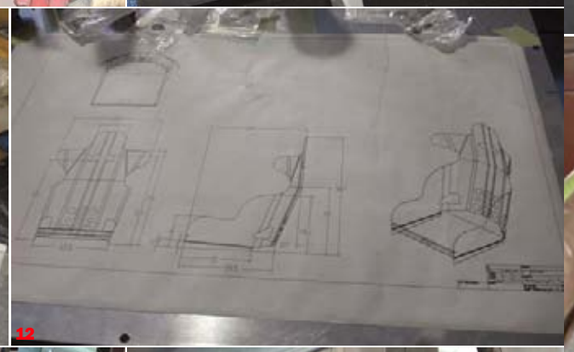
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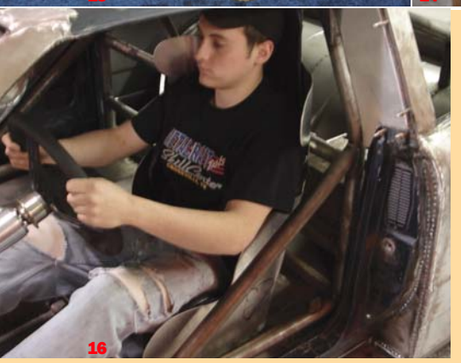
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7 With the calipers tested and clearances checked, the students could mount the calipers to their hand-built tubular spindles. Here, a paper template is made and will later be transferred to steel when it fits perfectly. **8** After transferring the shape to steel, they fit the first portion of the bracket to the spindle. The center of the bracket was cut out to save weight, but it will be strong thanks to its thick construction and additional support brackets. **9** The students fabricated additional brackets to keep the caliper mount steady and welded them all into place. Here is the finished product after welding is complete. The students matched the material thickness of the mounting brackets to the spindle to ensure a strong weld. **10** After allowing the steel to cool, the students installed the hub and brake rotor assembly and slid the caliper into place. The mounting setup is similar to the rear, as it uses a lower mount with studs to keep everything in line. **11** Now this is a good-looking brake assembly, with a big rotor bolted to a lightweight Speedway Engineering hub, topped by a four-piston Wilwood caliper. This should work well under the Smokin' SS Monte Carlo and look great, too! **12** With all four corners finished in the braking department, it was time to move on to the custom seats. The students need to build the driver's seat and mount it before they can locate and mount the pedal assembly. Check out these awesome computer-aided designs for the seats. **13** The students transferred the small designs to a full-size scale and made a paper template. Here, the template is transferred to the metal, which will be trimmed to specification later. **14** After cutting the basic shape, Wilson cleaned up the edges with an electric grinder. When it meets the desired dimensions, the flat metal will go through a series of bends that will create the back of the seat as well as the side supports. **15** Here is the finished product in the car. Wilson fabricated the lower portion of the seat and incorporated mounts to make for a clean installation. This is another aspect that could have been handled by ordering a pair of seats, but it gave the students more metalworking experience. **16** With the seat fully mounted, Wilson hops in to check fitment and see where the pedals need to be located. He can get an idea of the mounting location and make sure this car will be versatile enough for anyone to drive.

17 Here's a glimpse of the pedal assembly installed beneath the dash bar. It attaches with steel brackets, which keep it very strong, because you know a car like this will be abused on the track, and the last thing you want is a weak clutch and brake pedal assembly.

18 After mounting the pedal assembly, it was simply a matter of marking and cutting the holes for the master cylinders for the brakes and the slave cylinder for the hydraulic clutch. Wilwood's master cylinder and pedal assembly is easy to work with, and the students installed it in a matter of hours.

19 Wilson and Keys mounted the pedal assembly and master cylinders without too much effort and began fabricating the passenger seat. Using the same designs and techniques, Wilson quickly fabricated the seat.

20 With the seating arrangements complete and the braking system nearly finished, work could continue on the body to tie up the loose ends. For the cowl panel, the students will match it to the cowl induction hood, rather than making a flat panel, as with most production cars.


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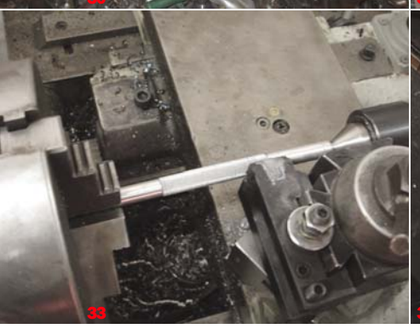
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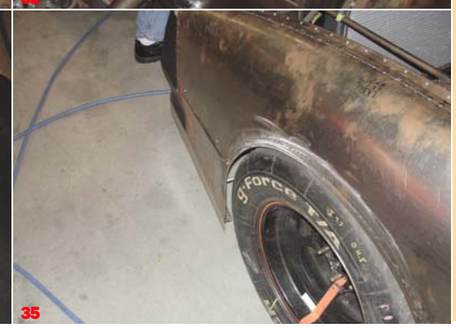
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21 Here's an in-progress shot of the passenger-side cowl panel before it was trimmed on the fender side. This contoured cowl panel will help the air flow from the hood to the windshield with little interruption. **22** Held in place with Cleco fasteners, the driver's-side cowl panel is coming along nicely as well. On the front portion of the cowl panel, a flange was made to match the hood, while the rear portion features a small, rolled edge to send air to the windshield. **23** With both sides clamped into place with Cleco fasteners, the students can figure out what it takes to mount these panels. They can now bolt the hood into place and check fitment on the cowl induction scoop. **24** We thought the work was complete on the hood, but Davis and the crew fabricated a true cowl induction system so the stroker small block can breathe in plenty of fresh air. Here, part of the enclosure is built and trimmed to fit the hood's inner structure. **25** Again, Cleco fasteners do the job to keep the air box in place so the hood can be installed on the Monte Carlo. Now they can shut the hood and check the gaps between the hood and cowl panels. **26** A few minor adjustments allowed the hood to fit nicely, so the students moved on to the custom air cleaner, which will be sealed off to the air box. The low-profile design is essential to making this cowl induction system work with the limited amount of available space. **27** With the hood nearly shut, you can see how this setup will work, and you can see where the carburetor will be positioned with a spacer in place. This setup will be sealed to prevent the hot air in the engine bay from entering the carburetor. **28** Flat aluminum was used to create the lower portion of the air box and welded to the air cleaner base. The lower box runs all the way to the firewall and features a rolled edge, which will easily accommodate a rubber seal. **29** Toward the rear of the lower air box, the students ran into a problem, as the aluminum structure interfered with the MSD distributor cap. To eliminate this problem, they simply marked the problem area, cut it out and welded in a domed piece of aluminum to provide additional clearance. **30-31** A conventional filter is used to keep the incoming air clean, and it fits nicely in the carefully measured hole. Now, rather than sucking hot air from the engine compartment, this small block will bring in fresh air from the true cowl induction scoop—functionality is the key with Smokin' SS. **32** With the induction system taken care of, the guys used basic struts to support the hood. Here, you can see that a small bracket is welded to the hood's inner framework and the other end attaches to the firewall. **33** In the second installment of this buildup, we saw the crew fabricate the entire body of this mid-'80s Monte Carlo, but that didn't mean they were finished with the body. Threaded body braces will strengthen the corners of the fenderwells and allow for adjustments according to racing styles. **34** Here are two of the adjustable body braces bolted into place using spherical rod ends from Aurora Bearing. The knurled section allows for easy adjustment when the jam nuts are loosened. **35** Before, the body panels tucked in at the bottom because of the lack of strength, but the new braces provide a sturdy panel with better aerodynamics. The braces help push the panel flush with the wheel and tire, which makes a big difference in high-speed stability.

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