Learning How To Race Right

By Gary Witzenburg

Turn One at Sears Point is a fast left-hander that arcs off the drag strip and up a fairly steep hill. There's a tricky 4th-to-3rd downshift required partway up as you skim the pavement's edge with your left-side tires where the bend tightens in "1A." Then you pick up a little bush out of the corner of your left eye, back off the throttle just momentarily—enough to set the chassis by transferring some weight to the front tires—and bend the car toward the blind hilltop apex at Two. Easier to say than do.

There's a straight away coming out of Two that lets you get up some speed before dropping you into a hole at the entrance to the left-hand Turn Three, which makes braking difficult. But trail-braking on the downhill and hugging the left side through Three gives you a straight shot through the right-hand 3A. Coming out of 3A, the track drops off again—right into the tricky, downhill, right-hand Turn Four. Holding the apex here and trail-braking about halfway through, however, keeps the front tires sticking enough for a good exit; and then you're faced with a semi-fast right-hand bend (Turn Five) around the side of a hill, which brings you out just in time to dodge back to the right for the entrance to Sears' famous downhill, left-hand Turn Six. "The Carousel." The line here starts right-of-center and then closes on the track's left edge as you gain speed down the hill.

At the bottom of six is a hard brake and downshift to a sharp right turn (to head back toward Turn One) if you're driving the Loop, but the full course requires a long, tight, left-hand apex followed by a wide and fast exit back onto the dragstrip surface. There's a slight jog in the straight leading up to the hairpin Turn Seven, but you're flat out in third and well into fourth before you have to lift, brake and downshift for this tight, slightly uphill right-hander. A left jog called 7A is next, which you straighten out as much as possible, and then you're into a pair of the trickiest esses anywhere. Eight goes left,

doing a terrific job of staying in line and concentrating. I kept climbing all over Bob exiting the corners. This did not sit well.

Stopping in the pits, he motioned the other advanced student, a nice guy named Dave Anderson, to follow, then told me to get in and ride. I could tell he was mad. He didn't say much at first as he

Bob Bondurant (right) explains the intricacies of Sears Point to Gary Witzenburg.

watched Anderson fall into line behind us; then he let me have it. Never raising his voice, he slowly and purposefully tore me to shreds. "You're fighting me," he said. "You're charging too hard and not learning a thing. You're way off line, and following so close you can't see where you are."

"I'm trying," I offered.

"You certainly are," he sighed, cresting Turn Two. Anderson was right behind, trailing obediently at the proper distance and right on line.

I felt an inch tall as Bondurant drove me around a few more laps, pointing out where I had screwed up and all the time watching Anderson in his mirror. We came up behind two of the five-day racing

trols, under- and oversteer, weight transfer, trail-braking, heel-and-toe downshifting, emergency maneuvers...mostly (but not all) stuff I had heard before, but never had I seen it presented so clearly and completely. I had even done some Handling Oval time with the five-day group between taking pictures and standing in the Northern California rain.

Bondurant teaches the advanced course himself, and insists that prospective students have a fair amount of racing experience. The curriculum includes everything taught in his five-day beginner's course (except that insidious Accident Simulator), but at a greatly accelerated pace and with numerous tips on passing, learning a new course, rain driving, etc. He's a master at pinpointing each student's strengths and weaknesses, and he skillfully builds on the strengths and eliminates the weaknesses...provided the student has the proper learning attitude and pays attention.

The teaching technique varies with each individual's level of experience, ego,

strengths and weaknesses were. Anderson said he was usually consistent and rarely spun or went off course, but needed to learn how to psych out the proper lines and to brake, downshift and corner more smoothly. I answered that I was strong on lines and smoothness but weak on concentration, and that I wanted to master that trick trail-braking technique.

A brief in-car "ground school" followed. "Most mistakes," Bondurant began, "are made with the hands and feet, and by not looking far enough ahead." He explained how you have to sit far back in the seat, bracing against the seatback, door panels and console, in order to feel and read the various vibrations and inputs from the car. Hands should be at the "three and nine" o'clock positions (not "ten and two"), with the thumbs lightly hooked over the spokes. This provides some extra leverage, he explained.

Brakes are squeezed on, not jammed, and with a slight "doublepump" action. This not only pre-tests the system so you're sure it's still there, it also gets all the friction surfaces tight up against the rotating parts and at similar temperatures so there's no surprise yank one way or the other when you get on them hard a moment later. Squeezing the brakes also settles the car's weight on all four wheels instead of causing the extreme heavy-front, light-rear bias that results from stomping hard on the pedal.

Bondurant teaches a fairly deep entrance into the average corner, with a late apex and a long, wide and straight-as-possible exit. This is not only the fastest way to navigate most turns, it's also the safest—"a too-early apex can put you off the road on the exit, or at best cause you to back off long enough to avoid a confrontation with the weeds, a tirewall or worse. Further, an apex (where you're on the inside edge of the curve) is normally an *area*, rather than a point. Holding the car right enough and long enough along this area is crucial to getting the quickest exit speed and therefore the fastest straightaway speed up to the next turn.

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Earlier I had been attempting to follow Bob Bondurant around as he showed me the proper lines through Sears' turns. He was in a Datsun sedan and I was driving one of the school's Z-cars. With more punch than the sedan, and feeling good to be on the road course at last after hours on that bleeping oval, I'm afraid I was not me to shreds. "You're fighting me," he said. "You're charging too hard and not learning a thing. You're way off line, and following so close you can't see where you are."

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I felt an inch tall as Bondurant drove me around a few more laps, pointing out where I had screwed up and all the time watching Anderson in his mirror. We came up behind two of the five-day racing course students and he offered comments on how each was doing. Amazingly, this man was simultaneously driving the course accurately and smoothly, relating my mistakes while making mental notes of Anderson's, and keeping track of which five-day student was in which car and how each was progressing.

ADVANCED COURSE

I had arrived two days earlier thinking I knew how to drive a race car. I was doing a story for another publication on the regular five-day road racing course, usually taught by Bill Cooper, Ron Southern, and Steve Cook, and had followed those students through their first two days. I had sat through Cooper's excellent ground school on seating position, proper use of the con-

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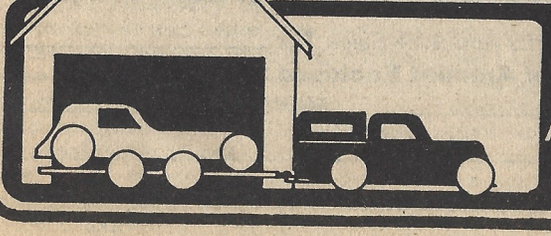

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students have a fair amount of racing experience. The curriculum includes everything taught in his five-day beginner's course (except that insidious Accident Simulator), but at a greatly accelerated pace and with numerous tips on passing, learning a new course, rain driving, etc. He's a master at pinpointing each student's strengths and weaknesses, and he skillfully builds on the strengths and eliminates the weaknesses...provided the student has the proper learning attitude and pays attention.

The teaching technique varies with each individual's level of experience, ego, attitude, learning speed and driving needs. This is why Bondurant has been so successful at teaching movie stars, entertainers and the likes, as well as experienced racers, most of whom are strong-minded, self-assured and egotistical enough to have succeeded in their very competitive lines of work. When I later apologized for the actions that had gotten him so upset, he replied, "I wasn't upset. I just knew that was what it would take to get through to you."

Anderson arrived Wednesday morning and suited up, complete with an open mind, a secure ego and a far better attitude than most advanced students. A self-employed systems analyst who manufacturers and sells small computer units to auto parts stores, he had moved to California a year earlier after six seasons of Midwest Council Sports Car Club racing experience at Blackhawk Farms, Wis., and other tracks near the Chicago area.

My own experience includes eight years of low-budget regional, national and professional SCCA competition, plus a lot of local (Michigan) events and the occasional IMSA drive thrown in here and there. This has been done in a variety of cars from a Datsun 510 to Camel GT Corvette. Most recently, I had raced three just-for-fun seasons in an old Winkelmann Formula Ford.

Usually I had done fairly well, sometimes very well...hence my feeling of knowing what I was doing going into this experience. I had just purchased Scott Hoerr's very competitive Datsun 710 for a serious go at the IMSA Radial Challenge series, and I thought it was time to learn trail-braking (something I had heard of but never tried) and generally polish up my technique.

Bondurant asked what we felt our apex and a long, wide and straight-as-possible exit. This is not only the fastest way to navigate most turns, it's also the safest—"a too-early apex can put you off the road on the exit, or at best cause you to back off long enough to avoid a confrontation with the weeds, a tirewall or worse. Further, an apex (where you're on the inside edge of the curve) is normally an *area*, rather than a point. Holding the car right enough and long enough along this area is crucial to getting the quickest exit speed and therefore the fastest straightaway speed up to the next turn.

I always thought I had learned to "heel-and-toe" back in 1966, but the Bondurant method is far different, and better, than mine. It's also the most difficult piece of his technique to learn, particularly when you have to break such an old habit and dial in a completely new one. I had always "blipped" the throttle with the right edge of my size 12 while braking with the left side and moving the shifter into the desired lower gear. I had never bothered to double-clutch, but had still been able to get the new gear fairly smoothly and had never scrambled any transmission pieces in the process. But believe me, the Bondurant style, once mastered, works much more smoothly and with less stress and strain on the car's vital members.

First you do the brake-squeezing bit with the ball of your right foot. Then you get your left foot in position over the clutch. When you're ready for the downshift, 1) depress the clutch, 2)adding even braking pressure, pivot the heel over to pick up the throttle (or roll your foot to get the throttle with the side of it, if that works better for you), 3) pick up the rpms and hold them, 4) gently move the shifter to neutral, 5) let up the clutch, not all the way but just enough to get the gears all spinning at the same speed, 6) depress the clutch, 7) ease the shifter into the gear you want, 8) back out of the clutch, taking care to let it up gently the last few degrees so you don't upset the chassis, finally, 9) ease your right foot back off the throttle. This may sound elementary to someone who's always done it that way, but it's terribly hard to master for a new student and particularly for a hard-headed clown like myself who's stubbornly done it wrong for 11 years.

The next step is trail-braking, and for me it was easier to learn than I had

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Bondurant

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expected. The point is to leave all that braking weight on the front wheels as you turn the car into the corner. If you use what Bondurant calls the old SCCA "stab and steer" method, you do all your braking in a straight line, then get off the brakes, initiate the turn and get back on the gas. Done smoothly, this works OK—except that you can't get into the corner as fast, and you have to start your braking earilier. Done unsmoothly, it yanks the front of the car up when the brakes are released, then jams the back end down when you jump on the gas. In other words, you've just unloaded the front tires when you need their traction most, and the result can range from mild to terminal understeer. When I think of how many times I've complained about unmanageable understeer (a particular Corvette comes vividly to mind) when merely trail-braking could have solved most or all of the problem...I wish like hell I had learned it a long time ago.

TRAIL BRAKING

"Trail-braking," incidentally, is a term Bondurant invented to explain a *slow* release of the brakes as you turn more and more into a corner. Going in, you squeeze them on gently at your braking point, then harder and harder as you get downshifting done and look for the turning point. Continuing the hard braking, and thus with a lot of weight—and traction—still on the front tires, you initiate the turn, then slowly ease off the brakes as the tires get a bite and the car proceeds toward the apex. How far you extend the trail-braking depends on the corner and how far your input from the steering tells you it's needed—(sometimes halfway or more to the apex). Once completely off the brake, you squeeze on the throttle and drive on through. "The first third of a corner, any corner," says Bondurant, "is the most important part, because you have to get the car set up so you can haul ass out of it."

Following this verbal instruction, we proceeded onto the two-turn Handling Qual to practice what we had been told.

As the sun went down we were working on the very greasy skid pad, which is a most valuable part of every Bondurant curriculum from the one-day street driving school to the anti-terrorist corporate Chauffeurs Course.

That was it for Dave Anderson, since he had signed for only two days of training, and we finished with a critique, a look at our grades and a discussion of what we had gained from the course. "I've learned an awful lot," he commented. "I didn't have the faintest idea how to trail-brake, for instance."

One of the most valuable parts of any of Bondurant course is the skid school. Here a student tries to deal with a low traction situation.

I was also through for a few days since I had to drive to Los Angeles and back, and Bob scheduled me for a third day on the following Wedensday—when actor Gene Hackman would be my fellow student. All the way south and back again, I practiced heel-and-toe downshifting in a borrowed Plymouth Horizon.

RAIN DRIVING

Wednesday dawned cold and miserable, with a steady rain, which by noon had turned into a cloudburst. I was pleased that California was recovering from a two-year drought—but wishing it could have happened some other time. Nevertheless, Hackman and I arrived more-or-less on schedule, suited up and joined Bob for an extended lesson in wet-weather driving.

"You really have to be accurate in the wet," he explained, "which will give you the basic lines, but not too accurately. Look how wide that line of rubber is, look how wide your car is, and remember that most of that rubber is from the outside tires. It could be off the apex by two feet, and if you're off two feet going in you'll be off six feet coming out."

By critique time it was dark again, and all three of us were wet and tired. But all three were pleased with our progress. Hackman commented that the biggest thing he had gained that day (his second day of extended training after having taken the basic five-day racing course a few weeks earlier) was learning not to try to go too fast too quickly.

"You had a rough day yesterday," Bondurant told him. "You kept charging and then you couldn't put it together because you weren't giving yourself time. You were braking too hard because you were going into the corners too fast, and you weren't trail-braking. But today the wet weather slowed you down, and when you slowed down you were more relaxed and could put things together a lot better."

To me, he added: "The heavy rain really dialed you in too. You were fighting me the first day. The second day you started to relax a little and you got better; but today you really dialed things in."

Bondurant is a tough teacher and certainly one of the world's best, and his compliments and high grades sent me off happy, satisfied and, I confess a bit swellheaded. Also a far better driver than I had arrived the week before and ready (I think) to run competitively in IMSA's Radial Challenge series for small sedans.

The Bondurant Advanced Road Racing course is not cheap ($300 a day for two or three days), but it seems to be a smart investment for almost anyone, no matter how experienced. It can be run in the school's Formula Fords or your own race car if desired, and there are some who retake it regularly to brush up for each new season.

But don't just take my word for it. Ask Jim Busby, George Dyer, Terry Visger, Ed Abate, Herm Johnson, Steve Anderson, "Fuzz" Fazekas, J.D. Briggs, P.L. Newman, G.H. Sharp, Scott Hoerr or one of the many, many other well-satisified customers.

FINDING THE LINE

One of the highlights was taking Hackman's Rent-a-Racer Ford LTD around Sears Point in the wrong direction (the other students were in ground school), with Bondurant at the wheel and Gene and I getting an excellent lesson in learning a new course. Bob recommends arriving early at an unfamiliar course and trying to talk the track people into letting you take a few slow laps in a street car to figure out the best lines. He demonstrated how to find apexes, exit and entry points by thinking back through a turn from the exit...if you run out of road and have to make a correction coming out, for instance, you probably turned in and apexed too early, or didn't hold the apex long enough. After a few such laps, he says, sit down and draw the lines and think about them, then go out and try again.

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Following this verbal instruction, we proceeded onto the two-turn Handling Oval to practice in the school's Datsun sedans, Bondurant first demonstrating and then observing from various spots on the oval. Most frustrating was when he called one of us in and jumped into the car for a first-hand look at our progress.

Anderson and I were both having some difficulty with trail-braking and the heel-and-toe downshifts, but after countless laps around the oval, Bondurant decided we were ready for The Loop, an eight-turn portion of the Sears Point road course. Again he drove us around first, then led, followed, observed and rode with us. In spite of several deadly-slippery spots caused by changes in the pavement surface (the exit of Turn Two, all the way through Three and 3A and the exit of Five, for those who may be driving Sears in the wet), we were able to put to use the new things we had been learning and work at breaking our old bad habits.

GRADES

Bondurant grades each student in eight categories plus overall performance, at the end of each day's training and records written comments on strengths, weaknesses and progress made. By the close of the first day, Anderson and I were both a bit weak in downshifting and trail-braking, but both strong in concentration and "car feel" (quickness of reaction to inputs from the chassis, correcting for skids and overall control).

On Thursday, fortunately, we managed to improve in every category. We spent all day in the Datsun Z-cars, warming up on the handling oval and then graduating to the full 12-turn circuit. The weather even cooperated by drying up a bit, and except for getting myself chewed out for charging too hard, it was a pretty fair day.

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"You really have to be accurate in the rain," Bondurant began. "You come into a corner a little bit earlier, because you're going to slide more, and you hold the apex a bit longer to buy some extra space on the exit. The downshifting is especially important because if you blow it you can lock up the rear wheels and skid right off the track. Coming into 11, for instance, I run about two feet off the guardrail, so if I do screw up I've left myself some room. Remember to concentrate on the trail-brake, because if you don't use it in the wet the front end can really float."

We reviewed understeer and oversteer in terms of tire deflection and weight transfer in the chassis. Oversteer (rear-wheel slide), of course, is controlled by modulation of the brakes or throttle (whichever caused it) combined with countersteer to keep the front end going the same direction as the back. But understeer (front-wheel skid) can be a bit more tricky, and more dangerous in a racing situation. You still back off the brakes or throttle, depending on which you were overdoing to cause the front tires to lose traction. Then you have to add more steering...or maybe dial some out if the tires are really pushing, use light braking to load the front tires and regain traction, and continue to trail-brake into the turn.

We spend the better part of that day doing the whole course in the worst of conditions: hard rain, deep puddles, some very greasy spots (watch out for Eight and 8A and the exit of 10 in the wet, Sears Point drivers, as well as the places mentioned earlier) and slow traffic on the Loop. But it was an extremely valuable day for both of us as a learning experience, because the conditions forced us to slow down, smooth out, dial things in and really concentrate. By the end of the day I

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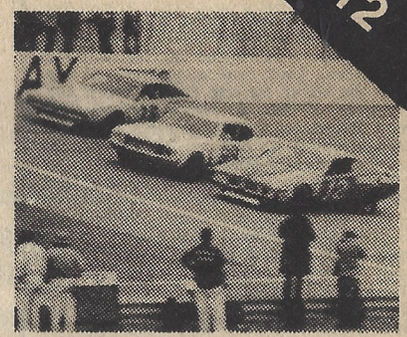

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