



IN-CAR COACH GUIDELINES

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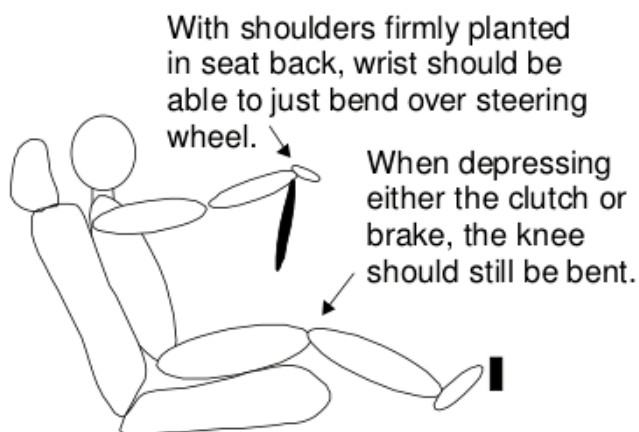


IN-CAR COACH GUIDELINES

If your chapter is running this program for the first time, or if this is your first time acting as an in-car coach, there are a few things that you need to know:

1. Many of the chapters hosting a Tire Rack Street Survival® event are accustomed to presenting this material in the context of performance driving. It is very important that we establish, from the very beginning and emphasize throughout the program, that the basic skills and concepts being taught at TRSS® are intended to make teen drivers safer on public roads. When expanding on various topics please use “real world” or highway examples and avoid references to racing or performance driving. This is not a speed event. Any similarities with terms relating to speed events should not be used. Words like ‘apex’, ‘turn-in’, ‘track-out’ are not appropriate. Similarly we do not increase tire pressures to over normal street levels. Everything should relate to an everyday drive on the street or highway, and the bad things that can happen while driving that bring us to the edge of control.
2. The student is not a track-junkie looking to get that last second off his lap time. They are probably not even “car people” or kids of “car people”. To add to the mix they are 16 years old!. Their attention span is much shorter than what you are used to. They might be very timid and you’ll wonder how they even drove to the event. They might be a bit cocky and think since they already have their license that they already know how to drive. The majority of the students do not want to be there. This school wasn’t their idea. You need to take into account this attitude and allow them to figure out that this program is not just a day full of talking. They will be doing things in their car that they normally get yelled at for doing. Squealing tires, sliding the car, slamming on the brakes. Let them have the little light come on and then celebrate that with them.
3. This is the instant gratification generation. With video/computer games they know “how they are doing” right away. You need to talk to them and tell them how well they are doing a lot more than what you are used to. Find anything to praise them about. Stay positive with them.
4. If parents are there, engage them. Tell them about their teen’s progress during the day. Talk with them at lunch and on the breaks. At the end of the event share with them what positive things you think their teens have learned and what things they can help improve as well as bad things to watch for.
5. If you are practice each driving exercise first thing in the morning *please* refrain from practicing these elements in front of the students. This is NOT the time to show them how good you are. It’s not about you.
6. Please keep in mind that safety is the focus of the program. Many existing advanced skills schools teach “*throttle steering*” or “*power slides*” aka “*drifting*”. We will ***not*** teach this to Tire Rack Street Survival® students, and we ask that coaches please refrain from practicing or demonstrating these techniques when students are present.
7. We want students to understand that tire limits determine what is too fast, not the confidence or even the skill of the driver.

8. The purpose and method of teaching *Basic Driving Skills* is outlined in the classroom material. Please emphasize that what we're teaching is *basic*, not advanced skills and unless a student is involved in an emergency situation the public roads are no place to practice driving skills of any sort. You might at this point let them know that at the end of the day they'll get a handout listing clubs that host High Performance Driving schools, autocrosses, etc., where the full spectrum of skills may be learned and practiced.
9. Every coach should check their student's seating position, hand placement and driver inputs at the start of the first exercises. There is ample time while staged and by having coaches handle this in-car we can be assured that students will make adjustments properly. The basic rules, which are covered in the classroom are:
 - a. The wrist should be able to bend on top of the steering wheel, without pulling the shoulder off the seat.
 - b. With the clutch (or brake) depressed fully the knee should still be bent and using the ball of the foot on the pedals, not the toes.
 - c. Contact with the steering and pedals should be through our small muscle groups, allowing for fine adjustments. They will hear about always pulling down on the steering wheel while turning not pushing up. A light grip on the wheel at 9 & 3 hand positions.
 - d. Seatbelt use: Belts positioned correctly, i.e. low on the hips and tight. Move the lap belt under any jackets and sweaters to allow the belt to work without the soft materials creating an additional layer.



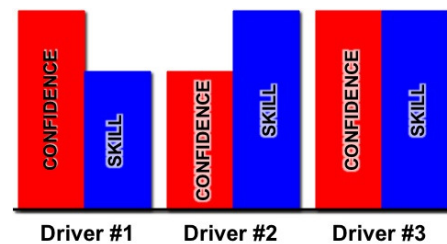
KEY MESSAGES

There are three aspects of driving that we all need to survive, be safe, and be what can be defined as a good driver. They are:

1. *Knowledge (Traffic Skills)*. These are the rules, regulations and laws that drivers need to know, such as what lane to make a turn from, what to do when a school bus or emergency vehicle is nearby, and when you can make a turn onto a one-way street. Typically, these are the things that new drivers are taught in order to get their license. But as we know, they don't guarantee that drivers will survive on today's roadways.
2. *Vehicle Control Skills*. This is a big part of what TRSS teaches, but for most drivers it's what they learn through years of trial and error - experience. Unfortunately, we know what the errors lead to, and it's why TRSS (and other programs like it) are so important.
3. *Mindset (Mental Skills)*. In this category are things like the ability to identify and adapt to changing levels of risk (such as worsening weather conditions, increased traffic congestion, distractions, etc.), along with decision-making, good judgment, having an appropriate level of confidence, attention/awareness, and a desire for continuous improvement as a driver. This is the Safe Driving Mindset.

Teaching vehicle control skills without a corresponding focus on mental skills has actually been shown in a Finnish study (<http://www.ncbi.nlm.nih.gov/pubmed/9006647>) to potentially result in an increase in incident rates amongst young drivers. That is why a great driver training curriculum addresses the issue with what we'll call "balanced training."

Balanced training is simply ensuring that a driver's confidence level does not exceed, or significantly lag behind their skill level. We all know what a driver with more confidence than driving skill will do (Driver #1 in the accompanying illustration) – the driver is an “accident waiting to happen.” And a driver with more skill than confidence (Driver #2) will likely



do nothing when faced with some type of emergency, as they don't believe they can do anything about it. That is why this theme of balanced training is baked into the overall TRSS program. It is critical, and leaving it to chance may even be irresponsible. If a student leaves TRSS with significantly more confidence than skill (something some instructors unknowingly do exceedingly well), the program may have caused more harm than good.

It can't be stressed enough that your goal is to ensure that students leave the TRSS program with relatively equal levels of skill and confidence (Driver #3). In your excitement for teaching skills, it's possible for you to inadvertently create a situation where a student becomes over-confident.

It's up to you to constantly “read” your students and adapt your instruction to suit their needs, either building skills or confidence (or in some cases, reducing confidence).

Risk assessment and adapting to varying levels of risk are things that drivers learn through experience, and it's one of the main reasons why you're a better driver today than you were at age 16. Sure, your vehicle controls skills have improved, but it's your ability to assess the ever-changing levels of risk (reading conditions, predicting incidents), and then adapt your driving to that level that is so important to surviving on the road (so that you're less likely to need your superior car control skills).

Relate the need for adapting to varying conditions to the exercises the students are experiencing.

Finally, one of the main things that track HPDE programs do is develop or create a mindset in drivers where they constantly want to improve. How many drivers do you know who realized after a track day or two that they had much more to learn, and therefore have made it almost a lifelong goal, constantly wanting to get better as a driver? Imagine if that same sense of constant improvement, that motivation for becoming an even better driver was instilled in each and every student that goes through the TRSS? We want the TRSS program to be ***aspirational*** – a goal is for drivers to want to aspire to be even better.

Share your passion for never-ending improvement of your own driving, and even challenge your students to constantly improve. Inspire them.

Sport Utility / High Center of Gravity Vehicle Policy

The Tire Rack Street Survival® program strives to be an all inclusive program, allowing any street legal vehicle that a teen driver can operate on the street to participate. With that being said, there are inherent issues with certain vehicles that need to be addressed when hosting a Tire Rack Street Survival School®. Sport Utility Vehicles (SUV), Pickup trucks and other High Center of Gravity vehicles (HCG) that are prone to tip or roll-over under extreme weight transfer maneuvers need special attention to prevent incidents from occurring during the driving exercises.

The TRSS program has always allowed host chapters/regions the option of not allowing some vehicles into the schools, and we will continue to do this. We feel it is proper to set some guidelines for those hosts that would like to allow any vehicle into their school.

SUV/HCG's without any Electronic Stability Control (ESC) are now not allowed in the program. These vehicles are screened during the registration process using the www.safercar.gov website run by the NHTSB and the National Dept. of Transportation. Most of the time the older vehicles (pre 2004) will not have any ESC capabilities but some newer vehicles at the lower end of the price scale may also lack any additional ESC features. We review every registration that comes in and check the HCG vehicles. If I see that their vehicle is not appropriate we notify the student and parent and give them the option to replace the vehicle with a more appropriate one or offer a full refund. If a vehicle still appears at your school without any ESC system this vehicle *cannot* be allowed to participate and will violate a liability insurance requirement that we have been asked to adhere to.

Electronic Stability Control uses automatic braking of individual wheels to prevent the heading from changing too quickly or not quickly enough. ESC cannot increase the available traction, but maximizes the possibility of keeping the vehicle under control and on the road during extreme maneuvers by using the driver's natural reaction of steering in the intended direction.

As opposed to many track school adventures that many of us instruct in, the ESC should *never* be turned off by the coach or student and it should be discussed both in the classroom and in the vehicle with the student. Making sure that this isn't presented as a forbidden fruit which will only have the opposite effect, this should be presented in the light of "this is here for your safety, and just like a seat belt or an airbag, it should be used all the time not just when you think you might need it."

Coaches

Your first control of this vehicle in many cases will be the coach you place in the right hand seat. Use a very experienced coach that has exposure in these types of vehicles and has the ability to maintain control and not let the student get in over their head. This means discussing the inherent negative issues with the vehicle before each exercise, getting the student to maintain a slightly slower speed if necessary, and to decrease severity of the steering inputs. If the coach cannot reach a comfort level with that student or their vehicle, they should have the student sit out a particular exercise. These conditions should always be discussed with the Lead Instructor on site, and the student's parent, if present. Caution should be given to insure that the instructor is not just prejudiced towards the vehicle. Consider this as an opportunity to educate the parent on the hazards of the vehicle and how it might not be the best choice for a teen to drive. It is recommended that you also have an observer monitor speeds through the potentially hazardous exercises, i.e. slalom, accident avoidance/lane change. The speeds inside the vehicle are not always perceived as high as they are standing and watching from the outside. The observer should notify the inside vehicle coach when they feel the speed is excessive. When multiple coaches are used on a single student vehicle, the vehicle should be marked as to allow the coach to not enter that vehicle if they are not comfortable with its unique handling character.

THE EXERCISES

The driving exercises will be the most memorable actions of the day for the student, sorry classroom instructors. The way the exercises are set up depends mostly on the size of the venue and the way the Chief Instructor wants to run the program.

There are two basic methods. The *Station* method in which each exercise is its own 'station' and the student repeats one exercise until the allotted time is expended. Or the *Circuit* method in which the student runs a combined circuit of as many of the exercise elements that can fit in the venue as possible.

Both have their merits and advantages.

The following descriptions will breakdown each element as if it were a station; a description towards the end will show elements that can be used for combining these into a circuit.

SLALOM

ABSTRACT

The slalom course at first blush appears to be a speed event. It is not. This exercise teaches both weight transfer and proper use of eyes/vision. This provides the proper control to change direction of the vehicle. The Slalom allows better understanding of the vehicle's capability during transitional maneuvers

Please remember the basic concepts we're teaching...

- 1) vision down the course
- 2) smoothness in weight transfer

EXERCISE SETUP

If using the slalom in both morning and afternoon, have the morning set-up as a simple regulated course. Cones paced off at 35-45 paces in one line straight. Then alternating cone on the side of these cones creating an 'easy' and a 'hard' side. In the afternoon have the course look the same at a glance but have the cones not set at a regular spacing tightening at the end and offset out of line. Within reason, the general rule for this exercise is the faster the better. The exercise can be effective at as little as 15-20mph, but 25-30mph works best. Second gear in manual cars.

STUDENT PREP

Provide a brief explanation of the physical makeup of the exercise, the staging area and procedure, and give them a conservative initial entry speed. Also, remind them to accelerate out of the staging area aggressively so that they can level their speed before getting to the first cone. While waiting in line watch the other cars and discuss what they are doing.

STAGING

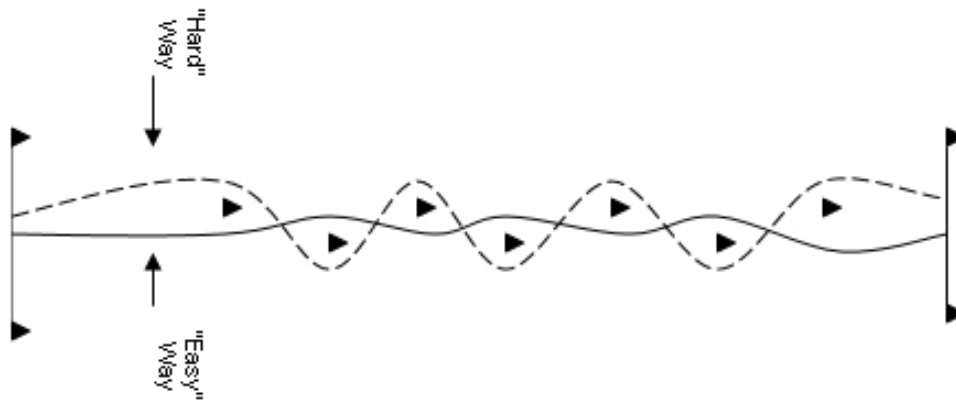
Please remember, however, that repetition is crucial so conversations at the end staging area should not interrupt the flow of the exercise. In-car coaches should direct their students out of the exercise path to give them feedback. When run properly, the flow of cars is nearly constant. The number of rotations through this exercise depends on the number of cars, size of the venue etc...

BENCHMARK

With the speed established, the coach should then tell the student to smooth out transitions from one side to the other. Often this is a case of the eyes not looking far enough down the course. Try and have them look at least 3 cones ahead, or, if a short course is used, less than 6 cones, find a tree, fence pole or water tower off in the distance and have them focus on that while driving.

TEACHING TIPS

- Have them look further down the course, not just the cone that's in front of them.
- Remind students to use their small muscles to pull down on the steering wheel not push up. Changing side to side should be a series of pull on one side of the wheel and then the other.
- Remind them that the accelerator pedal is NOT an on/off switch.
- If they appear to get bored with this exercise have them hold their cell phone up to their ear and drive the course. Or start a text back to their parents while keeping the speed up to what they did the last time.
- Pull the handbrake (if the car is equipped) to add a level of skill to the exercise, reminding them that you never know when a patch of ice or slick pavement comes into play.



Standard Slalom (Morning session)



Alternate Slalom (Afternoon session)

STRAIGHT LINE BRAKING

ABSTRACT

ABS has saved many lives but it has also likely cost a few – especially the early systems – because people felt the vibration in the pedal and heard the noise generated by the valves and got off the brakes thinking something was wrong. We want students to get accustomed to the feel of ABS. Furthermore, we want them to understand that ABS kicks in when too much is being asked of the tire. Crashes that occur at the end of long straight skids made by front wheels turned fully one way or the other are now, thankfully, rare. We don't feel that it is necessary to teach threshold braking if the car has ABS. They should, hear and understand the concept but it is unlikely that if they are driving a car with ABS now that they will revert back to a non ABS car in the future. Trying to get them to outwit the ABS isn't the best use of the limited time we have them. We think it is much more important to emphasize that you can brake 100% and still steer around what you are trying to avoid. In the event they drive a car without ABS, or with a broken ABS system, we'd like them to understand tire limits and develop threshold-braking skills. This can take a lot of time so approach this in basic terms that a sliding tire cannot be steered and the goal is maximum braking without the tire locked up.

Please remember the basic concepts we're teaching...

- 1) Speed and Braking Consistency
- 2) Familiarity with ABS braking
- 2) Braking Skill – Modulating Braking Pressure

EXERCISE SETUP

Within reason, the general rule for this exercise is the faster the better as long as there is room to accelerate and stop safely. The faster the student travels the more time they spend actually on the brakes. The exercise can be effective at as little as 30mph, but 40mph to 45mph works best.

STUDENT PREP

The talk should be limited to exercise. Provide a brief explanation of the physical makeup of the exercise, the staging area and procedure of the skill, and give them a conservative initial entry speed. Also, remind them to accelerate out of the staging area aggressively so that they can level their speed before getting to the pointer cones. The coach should glance at their speedometer just prior to the student hitting the brakes, reporting the speed to the student... this will help insure speed consistency.

STAGING

Remind them to accelerate out of the staging area aggressively however you don't want a 'smoky burn out'. Please remember, we do NOT teach threshold braking if the car has ABS. Hard application of the pedal to engage the ABS and still give them the ability to turn is more important. Pick a point you would like for them to stop, the double cones at the end for example and ask them to stop as close to that as possible without going past it. This give the student the task of understanding how much distance it takes to stop the car. As the speed increases that distance also increases.

FIRST PASSES

On the first pass the student should arrive at the assigned speed, begin braking at the pointer cones, and bring the car to a COMPLETE STOP. They will then exit the exercise and receive feedback off to the side (if running a 'Stations' arrangement) while the next student makes his or her run. The coach giving feedback should tell the student's speed, raise it incrementally when prudent, and grade the accuracy of their braking point. That coach will then return to the exercise to send the next student, or return to the staging area if remaining in-car. If deemed helpful, an coach may have their student wait at the exercise long enough to watch the next student's pass. After two or three runs a good speed and good level of consistency should be achieved. From inside the car, the student should be able to feel the tire slightly "judder" (Carroll Smith's favored expression for the pulsing or vibrating of a tire or brake) when the ABS is active, and may also hear the pulsing of the ABS valves. If possible, have the student run with windows down and listen for a slight chirping or scuffing sound from the tires.

BENCHMARK PASS

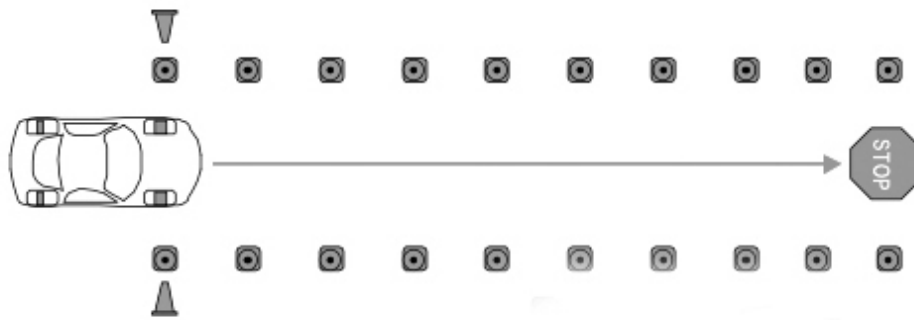
With speed and braking points established, the coach should then tell the student to slam on the brakes and be sure to use ABS for the entire stop. Note the stopping point. Increase speed 5 mph.

THRESHOLD BRAKING

Every year brings fewer and fewer cars to the program without ABS. But they still are out there. One of the most frequent first accidents are new drivers rear ending vehicles because they do not understand how much distance it takes to stop a car and without ABS they just slide into them because of the panic stop. If you have students with ABS cars be sure that the coach in the car can teach the proper method of threshold breaking. The student should be told to feel the point just prior to the wheels locking up. This might take a couple of tries to get the student to feel this. Be patient. Once they can feel that then the process of teaching modulation begins. First tell them to curl their toes back in the shoes and if it's still locked up to pull the foot off the pedal very slightly, emphasizing slightly.

TEACHING TIPS

- Remind students to use their small muscles (curl their toes, not move their thighs) to modulate brake pressure on the non ABS equipped car.
- Have them put their hand up with palm facing toward you, then you press your fist into their hand to demonstrate how subtle the changes in braking pressure can be.
- Remind them that the brake pedal is NOT an on/off switch.
- If a student regularly fails to come to a complete stop, have a cone set in the path of their car at the end of the pass.
- Give the student positive feedback.
-



Straight Line Braking Exercise

BRAKING AND TURNING

ABSTRACT

Just as in straight line braking, this exercise is to understand the limits of tires in breaking and turning. Cars with ABS will likely feel the system engage. For those without ABS this *Threshold Braking* is a critical skill to learn.

EXCERISE SETUP

This exercise, in particular, works better at higher speeds. At lower speeds the car rarely has time to get settled into threshold braking before the driver needs to turn. The pointer cones may need to be adjusted, and a third pointer cone, or other object, can be placed on the last cone on the inside of the corner. This gives the students, especially those sliding to the outside, something to find with their eyes.

STUDENT PREP

Again, brief instructions. Staging will be the same, but again give them a conservative starting speed. Point out the visual aid (third pointer cone or?) and remind them of the “string analogy”. A string tied from the bottom of the steering wheel to the big toe of the right foot will lift that foot off the brakes when the steering wheel is turned. Furthermore, if the steering wheel is turned the string will prevent the right foot from depressing the accelerator.

STAGING

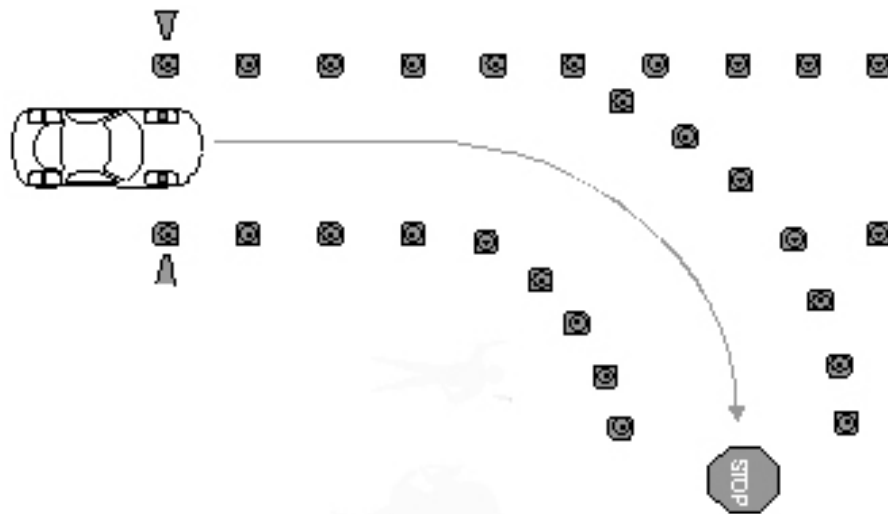
Same as in the straight line exercise.

FIRST PASSES

As with Straight Line Braking, increase speed incrementally until students are entering the corner cones fast enough to induce some understeer or, rarely, oversteer. Establish an baseline stopping point.

SUBSEQUENT PASSES

While the students are working on matching their baselines, look closely at their response to understeer... be sure that they aren't adding steering. Also, eyes will tend to move to the outside of the corner, as opposed to the inside (visual aid). This portion of the exercise is less about stopping distance and more about balancing steering and braking inputs showing them you can still push the brake pedal at 100% and still steer the car, This exercise also teaches dealing with understeer, and training the eyes to stay focused on the escape rather than the collision. We want them to look at where they *want* the car to go, NOT where it's going (called Driving Principle #1 in the classroom). We want to see the cars at or briefly above the limit, with drivers that are calm, patient and focused on the way out of the corner.



Braking and Turning Exercise

SKID PAD

ABSTRACT

This exercise can be the biggest educational tool in your driving exercises of the day. It can also be one of the biggest disappointments. If you have pavement that will allow a slippery surface it can be a fun day. If not then you are facing an uphill battle. It is very important in all skid pad exercises that each is begun on a constant radius with hands held still, throttle held still, and the speed putting the vehicle at the limit. If the student is moving the steering wheel, or is on and off the throttle, the resulting weight transfer, no matter how subtle, will make the limit very difficult to detect. This portion of the exercise is a good time to remind them that any movement of the car's controls will result in weight transfer. The limit is very subtle and requires a calm driver to detect.

Also, emphasize the importance of keeping the eyes focused ahead and where they want the car to go. This is especially difficult during the oversteer exercise. The coach in the car may need only call out "EYES" and the student will understand what they're doing wrong.

Note: All traction control, stability control and all other electronic aids are to be left on. At NO time are any of these devices to be turned off to "show the student what the car is doing for them". These are life saving instruments just like seat belts and air bags. The maturity of the teenager mind (or lack of maturity) might see that when these devices are turned off it makes the car 'more fun to drive'. This can do more future damage than you realize in the heat of the moment of instructing. Please leave them on.

EXERCISE PROCESS

Instructor demos need to be short and crisp.

Lap 1 – Establish Constant Radius

Lap 2 – Exceed limit with acceleration, regain limit with deceleration (radius grows, radius shrinks)

Laps 3-4 – Understeer – full lock with a lift off the gas; sustained; demonstrate restored grip as understeer is eliminated.

Laps 5-6 – Oversteer – HANDS-ONLY (no throttle) correction, remind students about eyes

STAGING

Set aside an area outside the skid pad where students can park and watch, and another area closer to the skid pad where a couple of cars can wait for a spot to open (Instructor and student belted and ready). Depending on the size of the pad and its adhesion, note the physical effects on the students, many cannot sustain going in circles for long sessions (coaches also!). Let every student have minimum of two turns of approximately 6 - 8 rotations min. each; more turns if class size allows. Don't sit too long here waiting. Time is much better served doing another rotation of the other driving exercises than sitting and waiting too long. A suggestion would be having one or two cars at the most waiting 'on deck' while a car is on the skid pad.

CONSTANT RADIUS

As stated in the classroom outline, this exercise is crucial to a student's understanding of the limit. They must absolutely lock their hands and have a constant throttle setting. Reach over and put a finger on the steering wheel to be sure their hands are still. Once they've achieved this on a constant radius, have them very gently increase speed until the radius begins to grow. then have them gently ease off the gas until the radius begins to shrink. This exercise accomplishes three things... it teaches them where the limit is, it teaches them how subtle the limit is, and it teaches them how calm they have to be to detect the limit.

Understeer

Have the students set up again on a constant radius at the limit, then all at once add a little bit of power and a lot of steering. The little bit of power unweights the front wheels just as a lot of steering breaks them loose. Have them keep adding steering until they are at full lock. Many students tend to lift off the gas when the car starts to head toward the outside of the skid pad, which means you may have to try several times while reminding them to stay on the gas. When they reach full lock, let them sustain it for a moment and then tell them to lift off the gas. The car will dart toward the center of the circle. When good coaching will produce the effect tso that the car goes into the middle of the circle without hitting any cones...Go back to a constant radius at the limit and again induce understeer. This time, however, have the student try to sustain it for a lap by holding their hands still and modulating the throttle. Expect modest success. Lastly, have them again achieve sustained understeer, and then gently straighten the wheel until they feel the "tug" that results as the tires regain grip. Point out that steering less made the car turn more.

The vast majority of the cars will understeer due to the abundance of front wheel drive cars and the engineering of the rearwheel drive cars to undeersteer first since it is safer to hit something with the front of the car than with the back..

OVERSTEER

Rear Drive

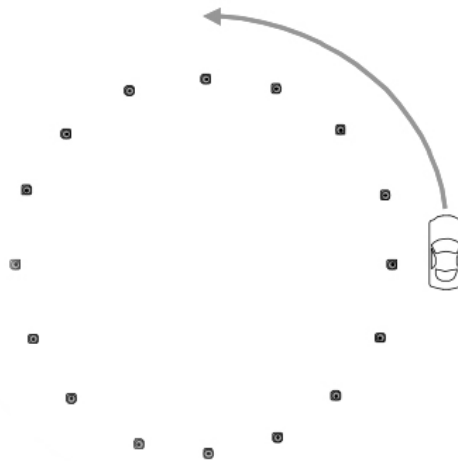
With the student once again at a constant radius and at the limit, have them abruptly lift off the gas and then blip, stab, kick, whatever, the throttle long enough to break the rear wheels loose. They then must get off the gas completely and correct, wait and steer back. Skip Barber calls this CPR (Correct, Pause, Recover). Corrections should be HANDS ONLY... no throttle involved

Front Drive

The same procedures are followed as for RWD, except that when the RWD student would blip the throttle the instructor will gently pull on the parking brake. No need to yank it, just pull up with gradually increasing force until the rear end breaks loose. Keep the button pushed in so as not to have the lock engage. Again, hands-only correction. You should tell students with FWD cars that going to power with *any* corrective steering input will cause the car to lurch to the outside of the corner.

All Wheel Drive

Try both approaches. Often one or the other will work.



CONSTANT RADIUS SKIDPAD

(used both clockwise and counter-clockwise)

FIGURE 8 SKIDPAD

POWER-INDUCED OVERSTEER & UNDERSTEER

As students drive more aggressively they will begin to encounter understeer through the exit of each corner. Eyes are the key here. Having them find their reference point for the opposite skid pad as they begin exiting the near skid pad will help them to detect understeer sooner. In some cases they will get understeer on entry as well; this is a result of too much steering input or too much speed. No matter where it occurs, help the student to identify and correct it. Students with RWD may begin to get power-induced oversteer on the exits. Inform them that this practice is a good way to crash a car and that the summons they will get will be for "Misuse of Power, or Dangerous Driving." With this understood, allow them to continue power-induced oversteer for the sake of practicing recoveries.

BRAKE-INDUCED OVERSTEER

With smooth hands, gentle brakes and a little patience, most cars can be made to oversteer on corner entry. In racing we call this rotation, on the highway we call it stupid at best and an accident at its worst. Whether a driver has entered a corner too fast or has encountered an obstruction, accidents occur as result of inadvertent brake-induced or Trailing Throttle oversteer. We try to replicate this on the Figure 8. Encourage the student to do it themselves with the right combination of braking and turning, or you can induce it with the parking brake in all three formats (FWD, RWD & AWD). Again being careful not to allow the brake to lock. When using the e-brake with RWD cars, it's usually best to give it a brief pop instead of the gentle pull we use with FWD. We don't want to abuse any cars, so if modest use of the e-brake doesn't work you'll have to rely on balancing braking and turning.

THE LINE

Obviously, we're not referring to a "racing line." Instead, it's a path designed to give us longer, more gradual entry arcs with enough straight after the exit to allow for adequate acceleration. When drivers exit wide, they aren't able to generate both enough speed *and* set up properly for the subsequent corner. The line should be wide on entry (long gradual turn in) and tight on exit.

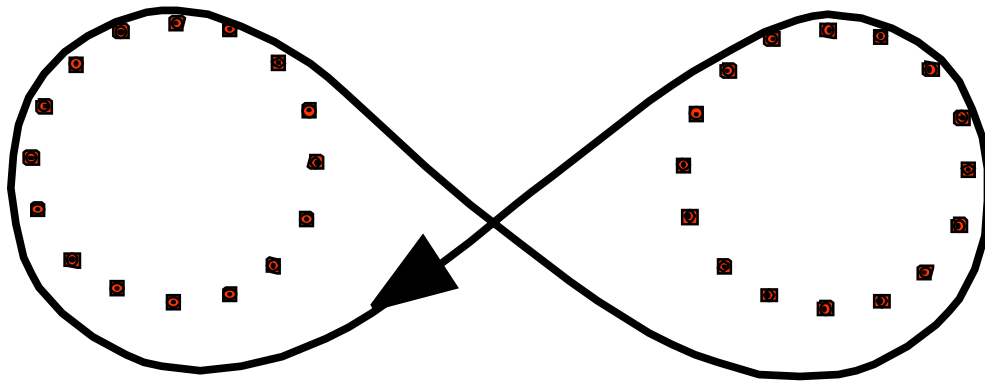


FIGURE 8 SKIDPAD

EMERGENCY AVOIDANCE

ABSTRACT

This exercise is a great “real world” example. Tell the student they are driving down the road following a pickup truck full of construction materials. Something falls off the truck and they have to react, by changing lanes and coming to a controlled stop.

EXERCISE SETUP

The speed at which this exercise is run will be determined by the spacing of the two sets of cones. Again, a faster execution works best, but will require greater distance between the two sets of lanes. The exercise can be facilitated by a flagger at the end of the exercise a safe distance away from the braking zone or by the in car coach giving the commands at the last second. The coach should explain the possibility of extreme secondary weight transfer. Every pass in this exercise should be concluded with a controlled braking to a complete stop. Be incessant in the need for the complete stop at the end of this exercise or it becomes a driving chicane which has a tendency to increase speeds, which is not the intent.

STAGING

Center lane for single lane change, alternating outside lanes for double lane change. If using this exercise in both the morning and afternoon, use the single lane in the morning and the double lane in the afternoon. HCG vehicles should not do a double lane change.

SINGLE LANE CHANGE

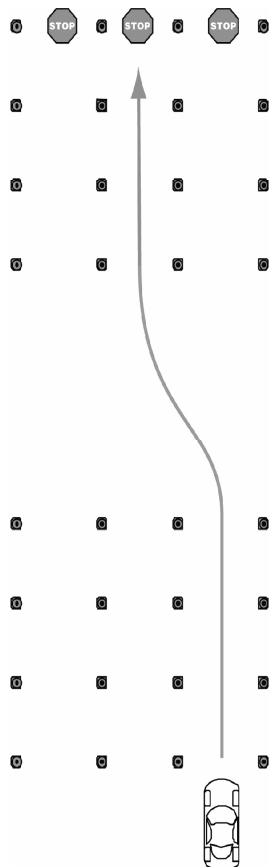
Students should make their first single lane changes at a conservative speed and keep a constant throttle setting until they are in the second set of cones, at which time they are to brake to a stop. Speed is increased until they are reaching the limit. When everybody has demonstrated that they have a handle on this (three or four passes), the group will change to double lane change and they will repeat the process.

DOUBLE LANE CHANGE –

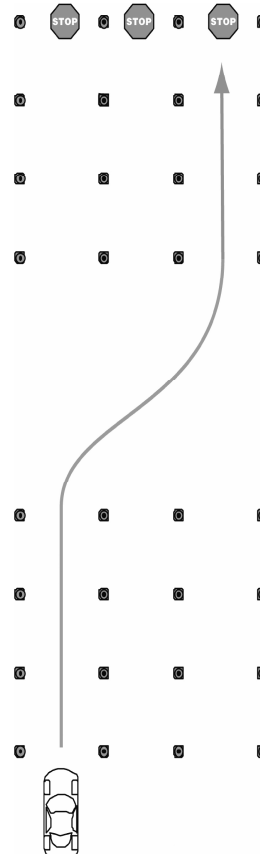
When the students begin reaching the limit at a constant throttle have them instead begin lifting off the gas just as they turn in. They will find that weight transfer helps to turn the car. With this approach, increase speed in small increments until they are again at the limit, and by this time experiencing significant weight transfer. If there are cars that persist in understeering during the initial turn in, students can achieve further weight transfer by very gently brushing the brakes just before their initial turn in. Keep in mind that in a real avoidance maneuver the driver will lift and generally go for the brakes, so the purpose of the exercise is two-fold. We want students to be prepared to make the most dramatic avoidance maneuver possible, and we also want them to be capable of dealing with the car control challenges that may result.

TEACHING TIPS

- Students are often timid with their first turn of the steering wheel. Tell them to make BIG initial turns.
- If they are unable to time their lift or braking with their first turn in, have them make a couple of runs straight through the center lane, doing nothing but feeling the weight transfer when they lift. Tell them to remember to stop in the second set of cones.
- In the afternoon have the braking section of the exercise wetted.
- If they appear to get proficient quickly with this exercise have them hold their cell phone up to their ear and drive the exercise. Or have them send a text back to their parents while keeping the speed up to what they did the last time.
- Pull the handbrake (if the car is equipped) to add a level of skill to the braking section of the exercise.
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SINGLE LANE CHANGE

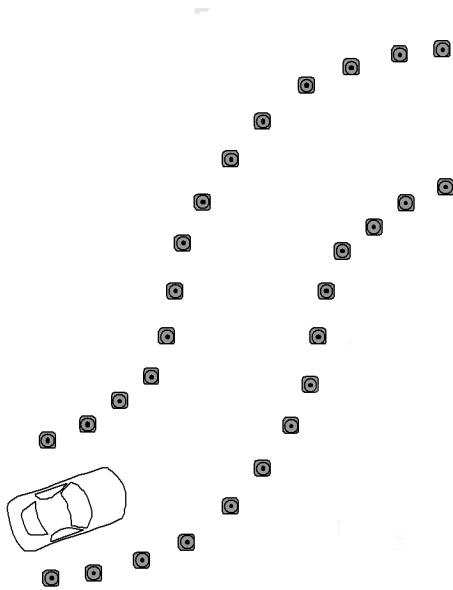


DOUBLE LANE CHANGE
SUV/HCG Alert

Combining Elements

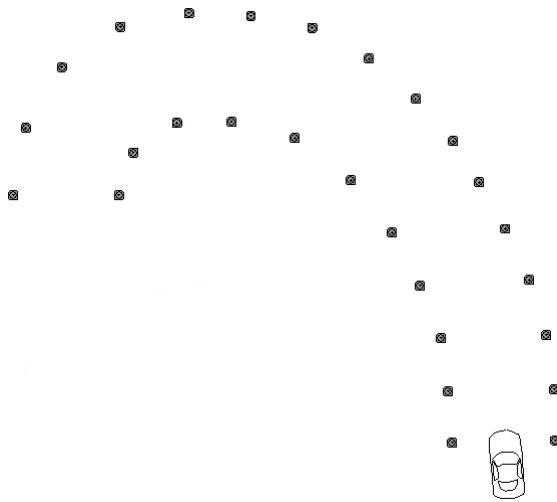
Using the following elements in combination with the 'station' elements, to create a course, is an alternate to the 'Station' concept.

This will also allow you to set up the final exercise runs of the day.



Consecutive Corners

Consecutive corners require good use of vision and proper management of secondary reaction of weight transfer. The angle can vary from mild to extreme depending on the venue and need to control speed. Obstacles can be added for additional avoidance skill training. Staging a course worker at this location and have them eliminate or add the obstacles to the course add complexity and assists in keeping the students attention with constant variables. Another advantage would be to have a course worker toss a cone, beach ball etc... into the path of the vehicle, without notice of the student, and having them avoid the obstacle.

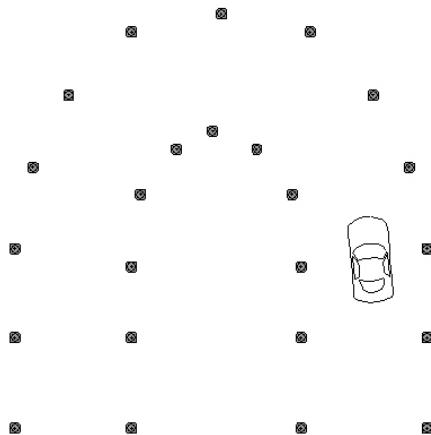


Decreasing / Increasing Radius Corners

Decreasing radius corners pose the same challenge as coming upon an obstacle in the middle of a corner. Either Oversteer or Understeer may result.

If using a circuit course, the morning exercise can have an increasing radius corner connecting 2 elements. Then in the afternoon, use a decreasing radius corner in the same location so it appears the same at entry. The student will assume it's the same corner and will get a surprise, again, giving them a real world experience.

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Hairpin Corners

Hairpins cause the eyes to drop and if taken too fast, the front wheels to slide, understeer. Eyes need to be up and corrections to understeer taken to correct the sliding front end.

Combined Exercise

ABSTRACT

The Combined Exercise is, obviously, an autocross without timing... please, however, refrain from referring to it as an autocross. Aside from the obvious insurance implications, we want to discourage the perception that this exercise is about speed or skill. Instead, emphasize that the course is designed to randomly and repeatedly produce the kinds of driving challenges that students might encounter during emergency situations.

LAYOUT

The examples provided in the lecture material provide a good basis for an exercise designed to replicate the kinds of vehicle dynamics challenges students will face in emergency situations. On a practical note, we want the entry and exits to be fairly far apart, yet we will also likely need to cycle coaches from the finish back to the start. Have them drive back to the start with the coaches so that they may exit the cars and get into the next car in line. This is at the end of the day and the coaches are tired... remember they aren't the young ones here today.

COMBINED EXERCISE RUNS

Coaches should keep students within their limits, but at the same time push them hard enough to get adequate benefit from each corner. Again, the goal is to produce all of the various vehicle dynamics challenges that might occur in an emergency situation. Coaches need to stay in the car at all times.

COMBINED EXERCISE RUNS w/ PARENTS

Allowing the students to take their parents out for a few runs at the end of the day gives them a chance to show the parents what they have learned.

At no time should a coach take a student or parent out for a 'Demo' run on what 'the car can do' or 'what the limit is like'. This has led to examples of incidents that are not in keeping with our goals of the program.

Thank you for your time!!