

Instructor Guidelines



Safety is the focus of this program.

We will NOT be teaching “throttle steering” or “power slides” Please refrain from practicing or demonstrating these techniques when the students are present. There will be time for instructor play when they are gone.

Please emphasise that we are teaching basic skills, not advance skills and unless a student is involved in an emergency the public roads are no place to practice driving skills of any sort. At the end of the day we will be presenting material on venues where to continue practicing the skills they have learned toady.

Basic skills and concepts being taught at Street Survival are intended to make teen drivers safer on public roads. Please use “real world” or highway examples and avoid references to racing or performance driving.

We want students to understand that tire limits determine what is too fast, not the confidence or even the skill of the driver.

A tire cannot both accelerate and brake at the same time, so one or the other is always 0. Presenting this way simply allows us to use one “formula” to describe the theory. This is also a good time to mention 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, steering wheel is turned the string will prevent the right foot from depressing the accelerator.

Driver's Environment



• Connection with your vehicle

Seating

- Setting Seat position
 - Rear-end back
 - Position to pedals
 - Hand position

Seat Belt

- Keeps you in the seat
- Always use them

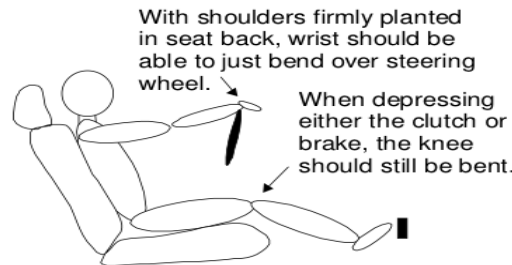
Steering

- Both hands on the steering wheel at all times.

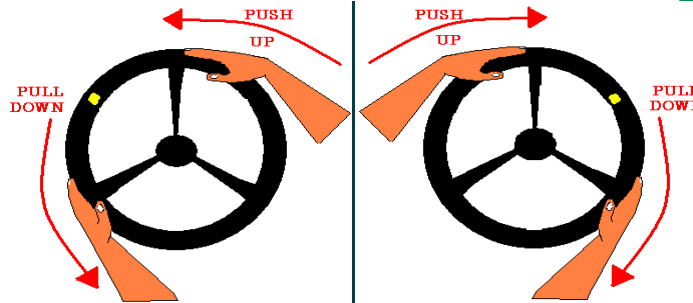
Pull down to turn

A FEW LAST THINGS

- When your instructor says "STOP"... **STOP IMMEDIATELY!**
- If you have a question... **ASK IT!**
- Hands at 9:00 and 3:00 on the wheel... **shuffle steer when busy.**
- Drive in the proper seating position...



- HAVE FUN!



Check students seating position, hand placement and driver inputs before the start of the first exercise.

a) The student's wrist should be able to bend on top of the steering wheel,

b) with the clutch (or brake) depressed fully the knee should still be bent and

c) contact with the steering and pedals should be through our small muscle groups, allowing for fine adjustments.

Exercise Station Teaching Guide

• Straight Line Aggressive/Threshold/ Braking



What we're teaching

- Braking pedal modulation (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. 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 braking skill.)

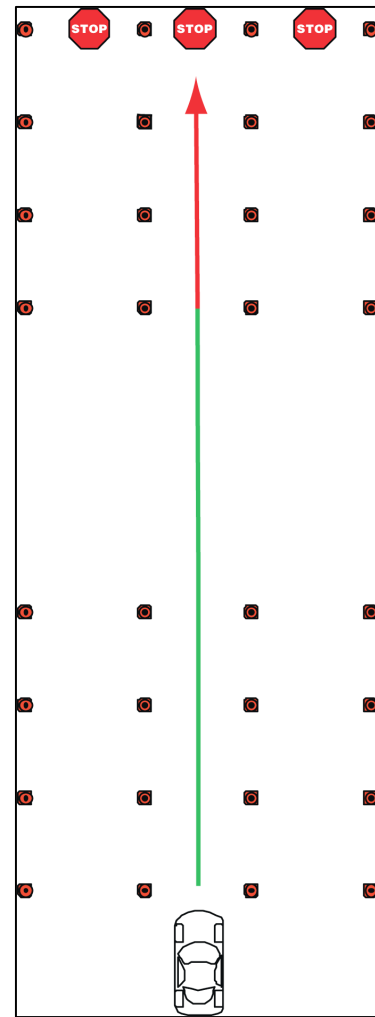
Why we're teaching it

- Vehicles without ABS may exceed the tires' traction limits and lock the tires, take longer to stop and surrendering steering control. Driver has to "pump" the brakes when this happens.
- Vehicles with ABS will automatically pump the brakes when the tires' traction limits are exceeded. While this will prevent locking the tires and maintains steering control, it will take longer to stop

ABS = Ability to Brake & Steer

How we teach it

- You drive at a constant speed and apply brakes at a consistent point.
- You will use ABS to panic stop.
- You will then attempt to match it in a shorter distance without using ABS.



Provide Guidance for:

- Speed & Braking Consistency
- Obtaining Familiarity with ABS
- Braking Skill- Modulating Braking Pressure

FIRST PASSES
Encourage Student to Accelerate out of Staging Area aggressively. Level speed before first set of cones.

Have Student come to a COMPLETE STOP before proceeding.

Ask the Student to raise their speed incrementally when prudent and grade the accuracy of their stops (up to 45 mph dependent on vehicle).

BENCHMARK PASS
With speed and braking points established, have the student slam on the brakes and engage the ABS for the entire stop. Note the stopping point. This is the mark for them to match without relying on ABS.

TEACHING TIPS
Remind students to use their small muscles (curl their toes, not their thighs) to modulate brake pressure.

Remind them that the brake is NOT an on/off switch.

If the student has a hard time, jump in and demonstrate.



Exercise Station Teaching Guide



• Handling

What We're Teaching

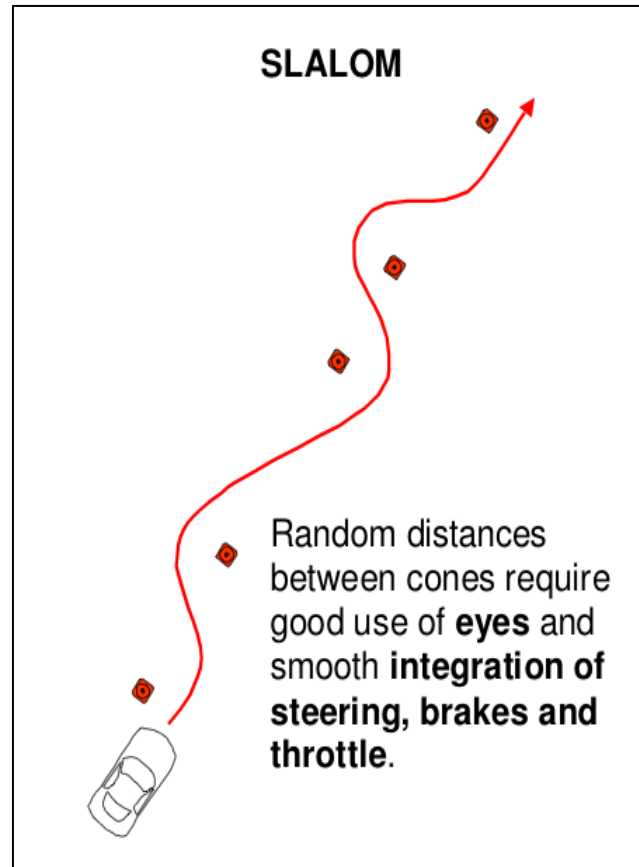
- How to smoothly change vehicle direction

Why We're Teaching It

- Better understand vehicle's capability during transitional maneuvers

How we teach it

- Driving between slalom cones requires good use of eyes and smooth integration of steering, brakes and throttle



TEACHING TIPS

- ❖ We're teaching:
 - ❖ 1) smoothness in weight transfer
 - ❖ 2) vision down the course
- ❖ Have Student look ahead of where they are on the course, further down the course, not just the cone in front of them.
- ❖ Ask them to feel the weight of the car shift as they provide steering inputs.
- ❖ Point out that the car will not change directions until the suspension travel has been taken up.
- ❖ Remind students to use their small muscles to pull down on the steering wheel not push up.
- ❖ Remind them that the accelerator is NOT an on/off switch.

Exercise Station Teaching Guide



• Cornering/Skidpad Exercise Station

GATHERING @ 2 Sets of 2 Skidpads

Demonstrations can be done with 3 student passengers per car. Get all the demonstrations done before running the students.

INSTRUCTOR DEMONSTRATIONS

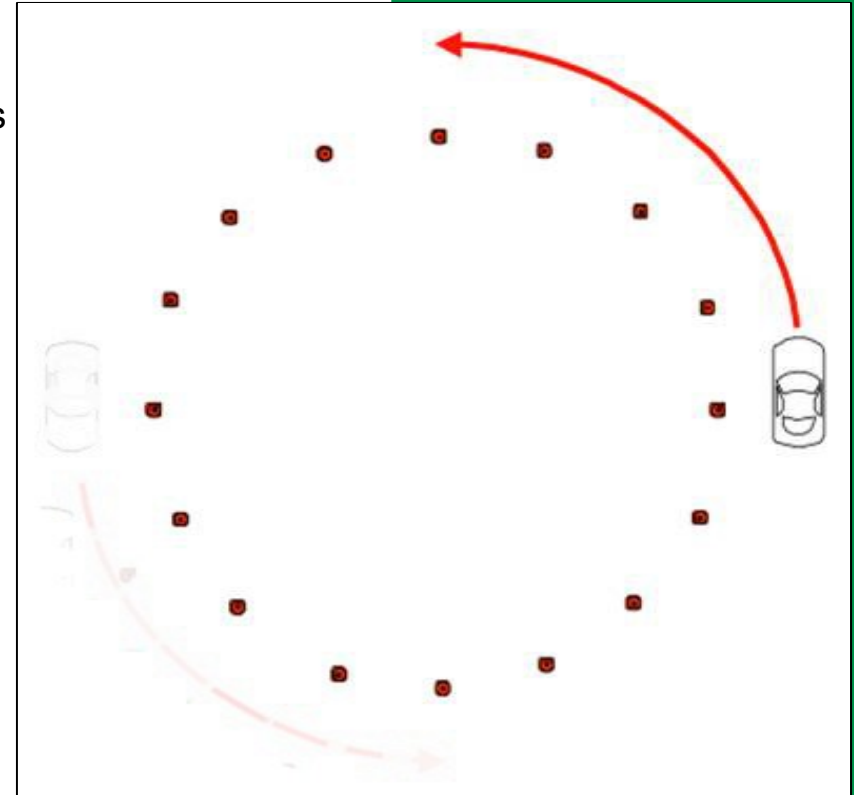
Instructor demos need to be short and crisp.

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 lift off gas; sustained; demonstrate restored grip as understeer is eliminated.

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



Exercise Station Teaching Guide

• Cornering Skidpad

CONSTANT RADIUS

Remind students that In-Car Instructors will be watching for the other car, and if the instructor calls out “STOP”, they are to stop immediately.

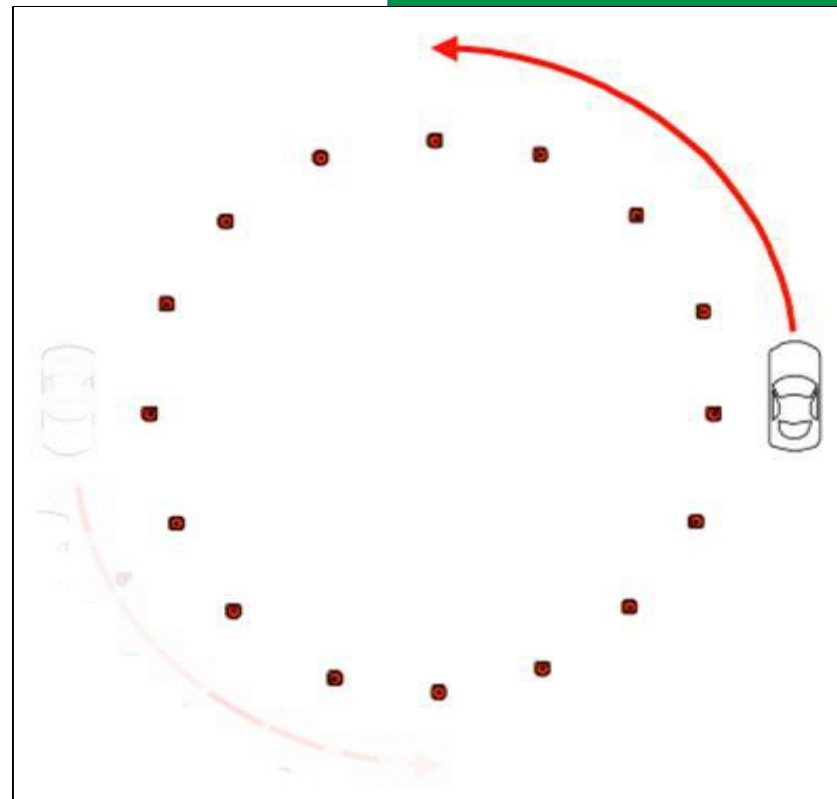
This exercise is crucial to a student’s understanding of the limit of the tires' grip.

They must absolutely lock their hands and have constant throttle setting. If you must, reach over and put a finger on the steering wheel to be sure their hands are still.

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.

Also, emphasize the importance of keeping the eyes focused ahead and where they want the car to go.

Once they have achieved this in a constant radius, have them gently increase speed until the radius begins to grow, then have them gently ease off the gas until the radius begins to shrink.



Exercise Station Teaching Guide

• Cornering Skidpad

What We're Teaching

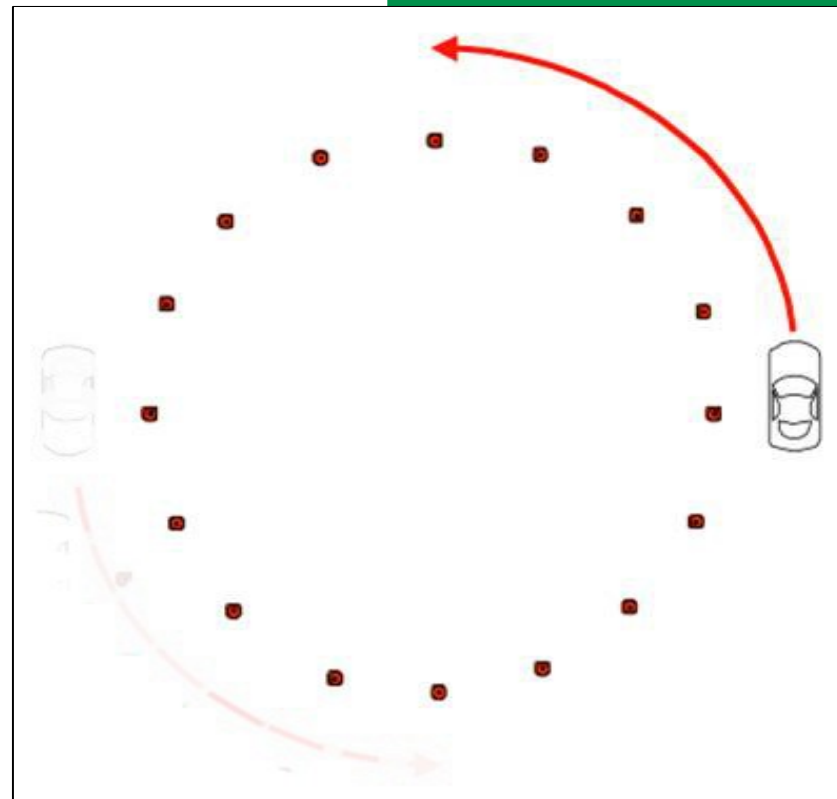
- The ability to recognize traction limits and react to skids

Why We're Teaching It

- A vehicle requires specific inputs from the driver as it reaches and exceeds its traction limits

How We Teach It

- You will drive a constant radius corner, and gradually increase speed until the vehicle approaches its limit.
- **LOCK YOUR HANDS**
- Allowing your coach to initiate some of the following...
- Front wheel skid or Rear wheel skid
(understeer) (oversteer)
- Changes in steering and throttle result in weight transfer, and alter the limits of each tire and change the vehicle's handling

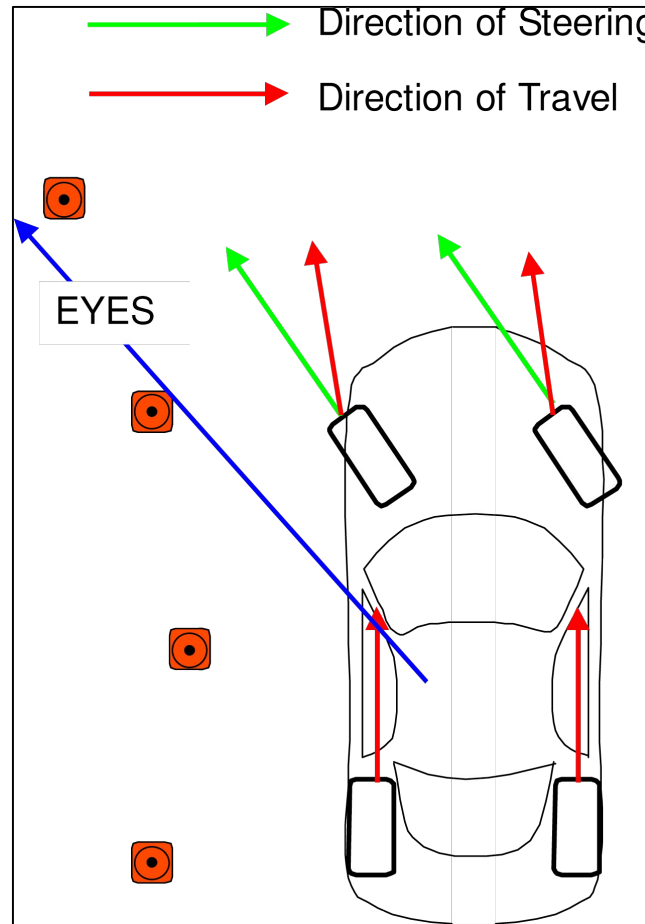


Exercise Station Teaching Guide



• Cornering – 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.
- Many students tend to lift off the gas when the car starts to head toward the outside of the skidpad, which means you 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.
- 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 the steering made the car turn more.



FRONT WHEEL SKID (Understeer)

How It Happens

- Too much speed for a given corner radius
- Too much speed for a given steering input

What To Do

- Remember Driving Principal #1
- “Look where you want the vehicle to go”
- Gently lift off gas to reduce speed slowly
- Reduce steering input slightly
- Wait... Be patient

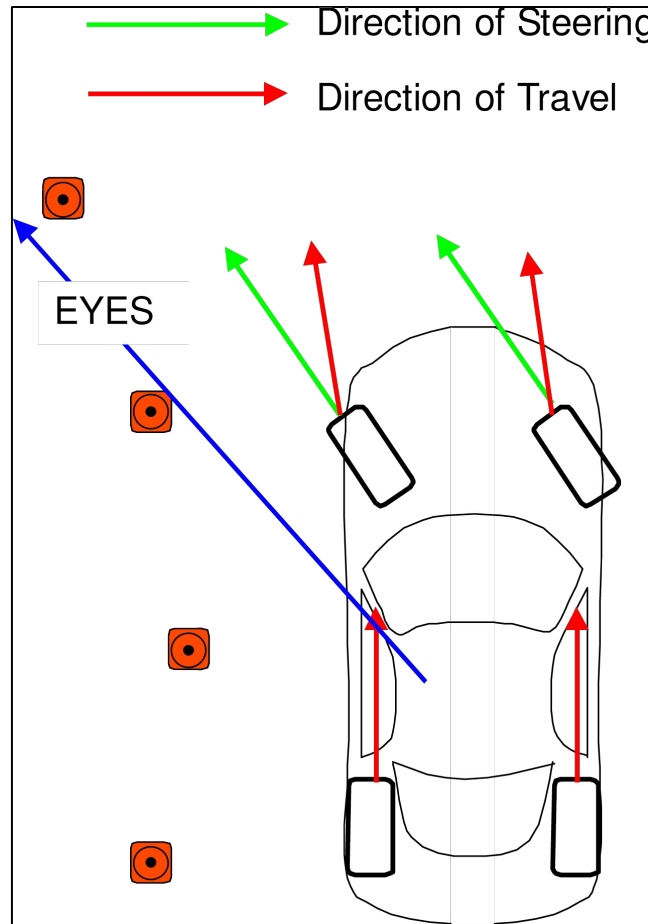
Exercise Station Teaching Guide



• Cornering

Front Wheel Skid

- Most vehicles will understeer as speeds gradually increase, requiring steering and throttle adjustments to control weight transfer, and balance the limits of each tire to control the front wheel skid



FRONT WHEEL SKID
(Understeer)

Skids

- Production cars are designed to understeer.
- A person's natural reaction, aside from adding more steering, is to get off the gas, which transfers weight to the front and helps to solve the problem. Oversteering cars would undoubtedly result in more accidents.

Exercise Station Teaching Guide



• Cornering Skidpad

• Rear Wheel Skid – Oversteer

• Rear Drive

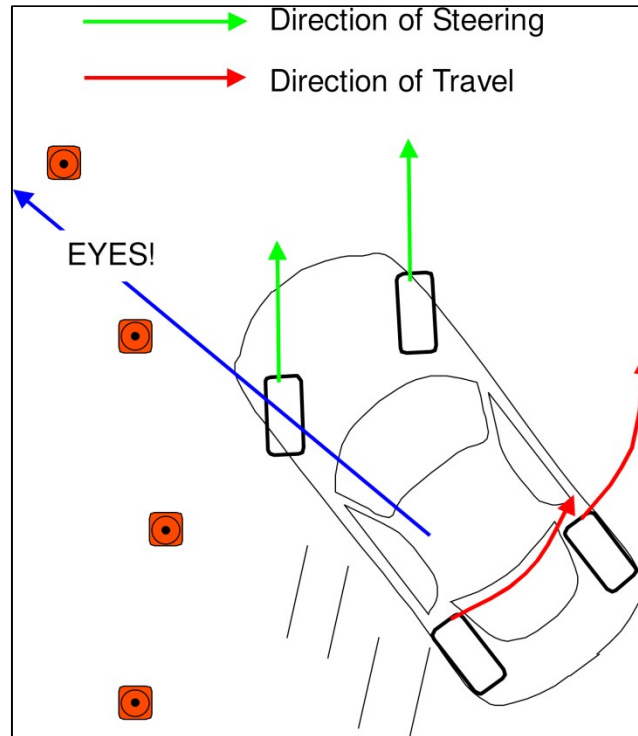
- With the student once again at a constant radius and at the limit, have them abruptly lift off the gas and then blip, stab, kick, whatever, the throttle long enough to break the rear wheels loose. They then must get off the gas completely and correct, wait and steer back. Skip Barber calls this CPR (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 FWD instructor will gently pull the e-brake. No need to yank it, just pull up with gradually increasing force until the rear end breaks loose. If it's a foot e-brake, have the student try themselves. Again, hands-only correction. You might 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.



- Oversteer (Rear wheel skid)

How it Happens

- Too much braking while cornering
- Too much acceleration while cornering (rear drive)
- Vehicle's reaction to weight transfer

What To Do

- Remember Driving Principle #1 (don't look at the tree!)
- Steer into the skid
- Reduce pressure on gas
- Wait for the rear wheels to grip
- Steer where you want the vehicle to go

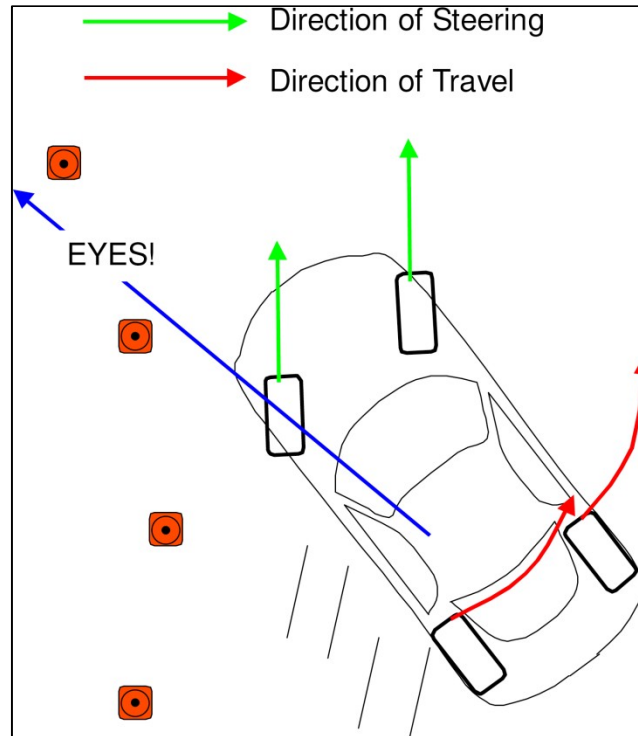
Exercise Station Teaching Guide



• Cornering Skidpad

Rear Wheel Skid

- When you detect oversteer, you must steer in the direction of the skid while looking in the desired direction of travel to maintain vehicle control



- Oversteer (Rear wheel skid)

How it Happens

- Too much braking while cornering
- Too much acceleration while cornering (rear drive)
- Vehicle's reaction to weight transfer

What To Do

- Remember Driving Principle #1 (don't look at the tree!)
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- Wait for the rear wheels to grip
- Steer where you want the vehicle to go

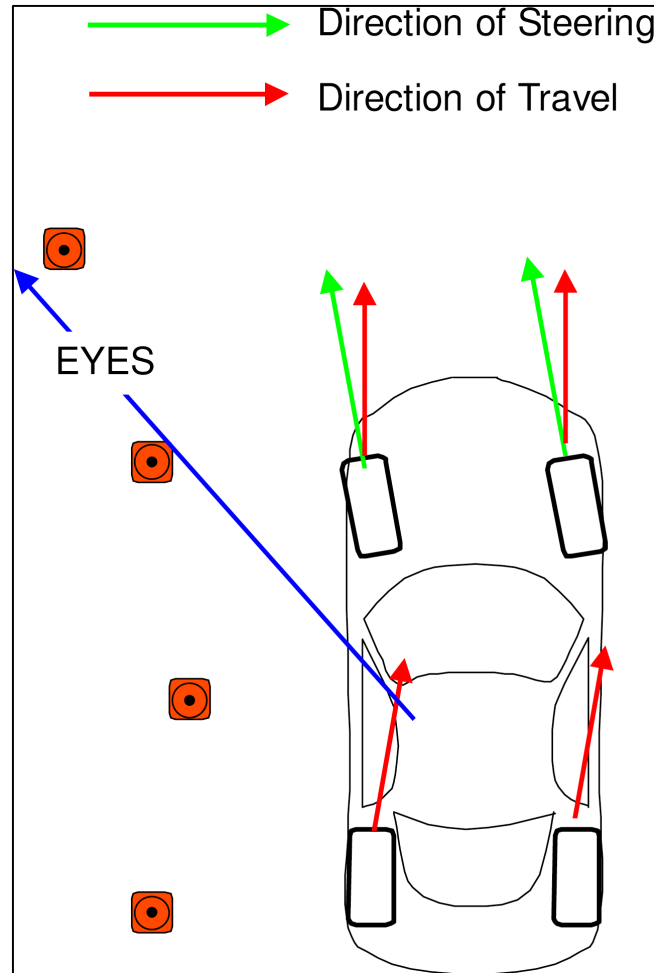
Exercise Station Teaching Guide



• Cornering Skidpad

Four Wheel Skid

- You place vehicle on constant radius and **LOCK YOUR HANDS**
- It is critical that the steering wheel is held steady
- Changes in steering and throttle result in weight transfer, and alter the limits of each tire and change the vehicle's handling



Exercise Station Teaching Guide



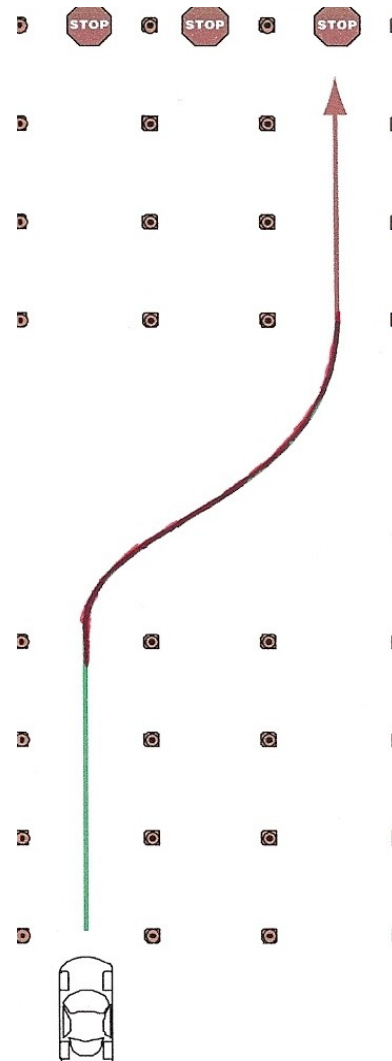
Braking and Turning

What We Are Teaching

- Balancing braking inputs.
- Dealing with understeer.
- Training the eyes to stay focused on the escape rather than the collision.

How We Teach It

- This exercise work better at higher speeds.
- We want to see the cars at of briefly above the tires' limits, with drivers that are calm, patient and focused on the way out of the corner.



While the students are working on matching their baseline, look closely to 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, and students will have a harder time staying out of ABS.

Exercise Station Teaching Guide



- **Emergency Avoidance**
 - Single Lane Change

What We Are Teaching

- Managing grip and weight transfer during avoidance

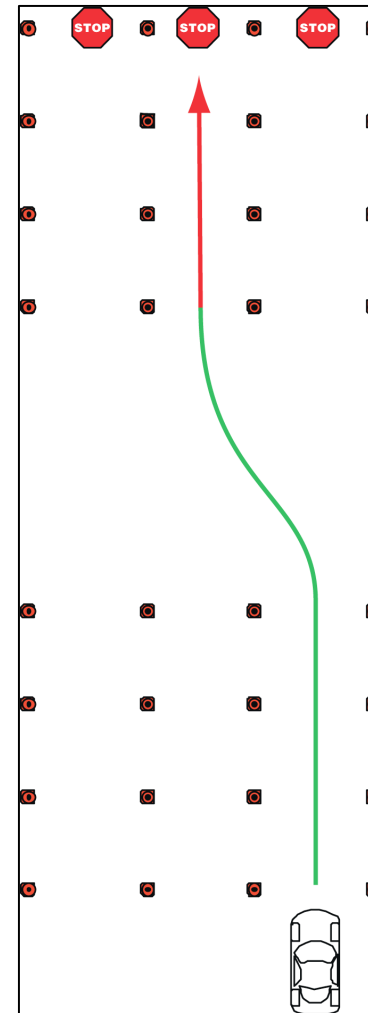
Why We Are Teaching It

- Emergency avoidance maneuvers often result in spins

How We Teach It

- You will drive at a constant speed into the first set of cones and may go straight, right or left in the second set of cones, then bring the vehicle to a complete stop

SUV ALERT



SINGLE LANE CHANGE

Students should make their first lane change at a conservative speed and keep the 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.

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 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.

Exercise Station Teaching Guide



• Emergency Avoidance

What We're Teaching

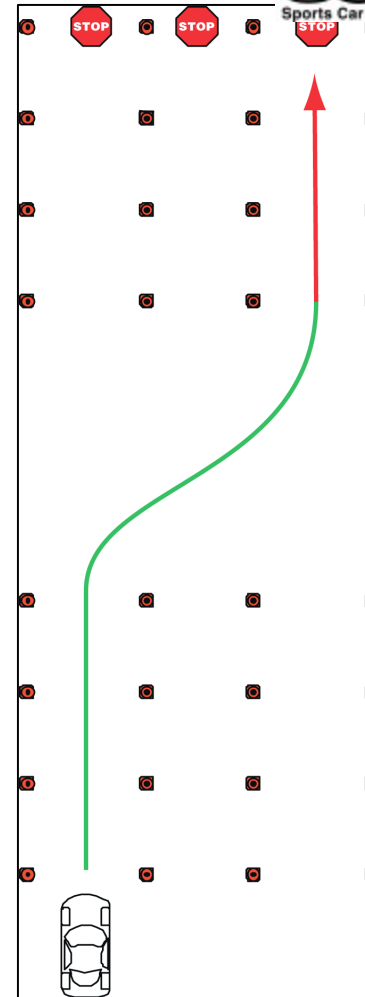
- How to abruptly change vehicle direction and recognize secondary weight transfer

Why We're Teaching It

- Understand vehicle's capabilities during emergency maneuvers

How We Teach It

- Lane change maneuvers that require good use of eyes and smooth integration of steering, brakes and throttle



SUV Alert!

- When the student s 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 the 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 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 car control challenges that may result.
- Emergency Accident Avoidance

Exercise Station Teaching Guide



• FIGURE 8

GATHERING @ one of two Figure 8 Exercise Stations

Demonstrations can be done with 3 student passengers per car. Get all the demonstrations done before running the students.

INSTRUCTOR DEMONSTRATIONS

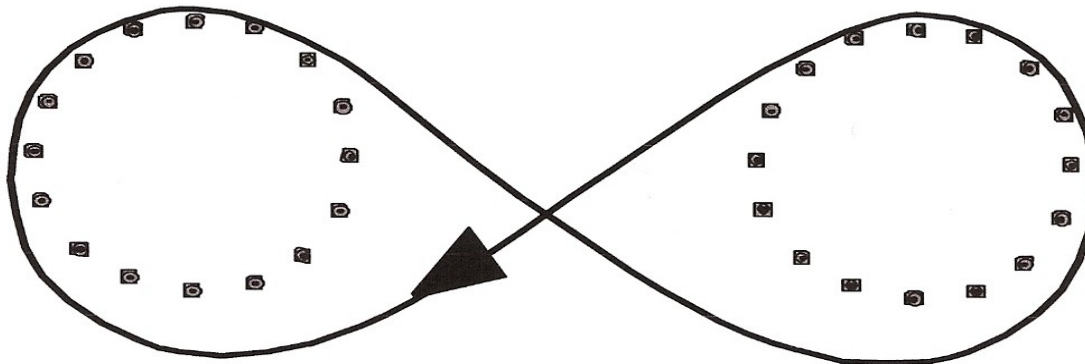
Instructor demos need to be short and crisp.

Lap 1 – Get on line and point out reference points.

Lap 2-3 – Get to the limit, remind students of reference points.

Laps 4-5 – Demonstrate power induced oversteer (RWC) or understeer (FWD & RWD) on exit.

Laps 6-7 – Demonstrate brake-induced oversteer on entry (may require e-brake).



- We want to encourage the students to drive a path to give more gradual entry arcs with enough straight after the exit to allow for adequate acceleration.
- When drivers exit wide, they aren't able to both generate 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.

Exercise Station Teaching Guide



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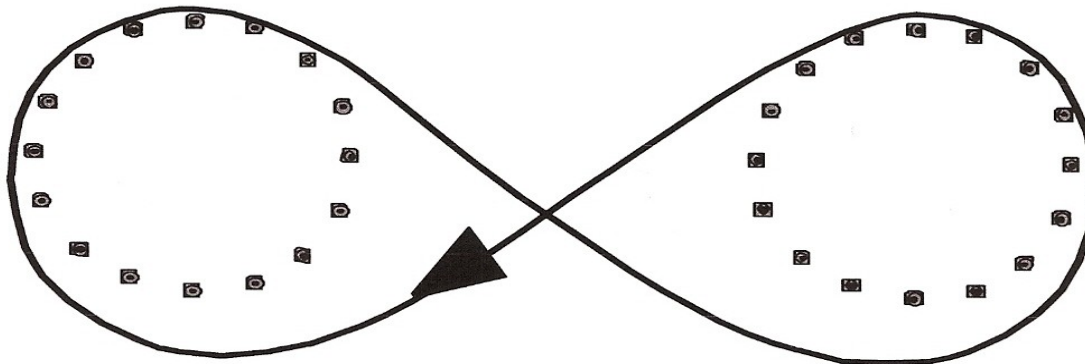
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- If a student manages the right combination of inputs during an emergency avoidance maneuver, they may find themselves in the beginning stages of a spin even before one is caused by secondary reaction weight transfer. We want to replicate this on this Figure 8.
- Also, be sure to emphasize smooth transitions from gas to braking to steering.
- Don't mention trail-braking, but demonstrate how your hands and feet work together as though they are attached by a string.

Exercise Station Teaching Guide

• FIGURE 8

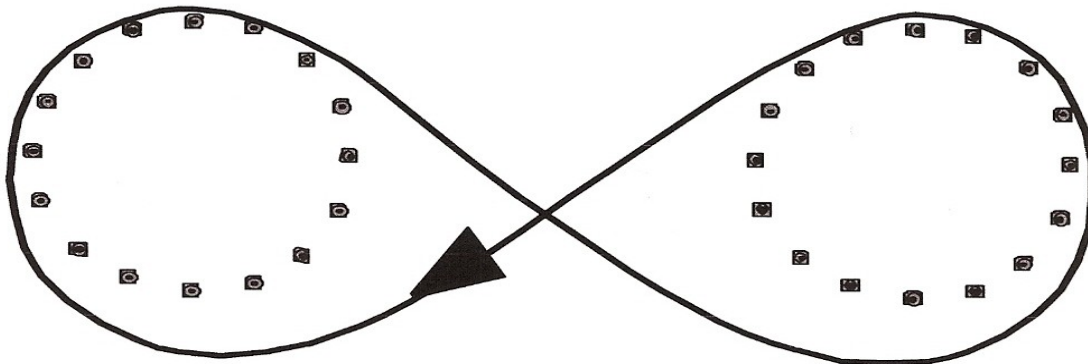
POWER-INDUCED OVERSTEER & UNDERSTEER

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 skidpad 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. 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 "Misuse of Power". With this understood, allow them to continue power-induced oversteer for the sake of recovery.



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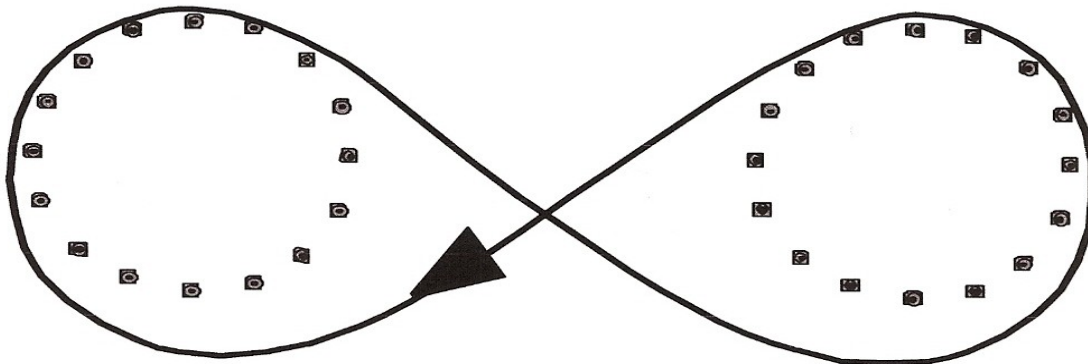
• FIGURE 8

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 an accident. Whether a driver has entered a corner too fast or has encountered an obstruction, accidents occur and result of inadvertent brake-induced or Training 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 e-brake in all three formats (FWD, RWD, AWD).

When using the e-brake with RWD cars, it's usually best to give 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.



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Exercise Station Teaching Guide

• Sudden Changes in Grip

What We're Teaching

- How to respond to changes in road conditions

Why We're Teaching It

- Help participants anticipate and experience sudden changes

How We Teach It

- Course goes from high grip to low grip and back while cornering on the skidpad



COMBINED EXERCISE

SUDDEN CHANGE IN GRIP

