

Keep the Car in Balance

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- Make smooth and effective starts, stops, and steering.
- Use transition pegs for effective transfer of braking, acceleration and steering forces.



What Causes the Car to Get Out Of Balance?

The car is constantly subjected to pitch and roll forces that cause it to be in, and out, of balance. When the car gets out of balance there is a change to the grip the tires have on the roadway. When the tires lose their grip, the monster breaks out of its cage, making for a challenging experience. The most common out-of-balance condition occurs while braking. Did you ever notice how the front of the car dips down when there is a hard braking action? When the front goes down, the rear comes up, causing the rear tires to lose some contact with the road.

Making Smooth Stops

As you step on the brake pedal and apply pressure, the front of the vehicle is pulled in a downward pitch. When the vehicle comes to a complete rest, the front is no longer held down, so it bounces up to its normal, non-braking position and gives a jerky sensation to occupants. To get a smooth braking result, release some of the braking pressure one or two seconds before the vehicle's motion stops. You only need to release about a half-inch of pressure from the brake pedal. With the ball of your

foot on the brake pedal, **curl your toes back** just before the vehicle comes to a complete rest. This will release a slight



amount of braking pressure to allow the pitch to come up smoothly.

Why a Smooth Braking Habit?

A smooth braking action will give comfort to passengers and give you a highly refined feedback system. If routine braking consistently results in jerky braking actions, you become accustomed to that feeling. It feels normal. Then when a surprise traffic situation requires a harsh, unplanned, jerky braking response, it doesn't seem extraordinary, so there is no feedback that something went wrong with your management of space!

However, when a driver who routinely makes smooth stops is surprised into a harsh braking action, it gives a gut-level feedback that something went wrong. The driver's awareness is peaked!

The skill of releasing slight braking pressure to make a smooth stop is the same action necessary to achieve a maximum threshold braking effort.

Threshold Braking Panic Stops

With the ten driving habits, surprise situations are minimized. But, if you get *behind the eight ball* and must make a critical maximum efficiency braking action, the brakes should be applied as hard as possible without causing the wheels to lock-up and slide. When you don't have an ABS (anti-lock braking system) equipped vehicle, you have to be your own computer. You can apply the brakes hard, and then as soon as you feel or hear the wheels sliding, slightly release braking pressure (similar to the technique used for making smooth stops). This is referred to as threshold braking. **Do not pump the brakes.** A constant pressure on the brake pedal should be used.

ABS Braking

If your vehicle is equipped with ABS, your wheels will be prevented from locking up by the ABS sensors. Hold the pedal fully down without fear of wheel lock-up. When the ABS system activates you may feel a pulsating movement from the brake pedal. This is normal. **Do not let up.** Keep applying a firm braking pressure. To make a smooth stop with ABS, use the same technique as you would without ABS; release a slight amount of pressure the last one or two seconds before coming to a stop.

Smooth Acceleration

When ready to move from a stopped position, take your foot off the brake and allow the car to move by its idle speed for a brief second before pressing the accelerator pedal. This will give a smooth movement by allowing a gradual transition of the pitch forces. When the car is accelerated there is a downward pitch on the rear tires. With rapid acceleration, occupants feel their body pushed against the back of the seat. The more rapid the acceleration from a stopped position, the greater the pitch forces are out of balance, resulting in less car control.

Steering Control Habits

Most of the time, any method of using the steering wheel will “work.” However, you need good steering habits when a critical situation develops. One critical situation may be caused by a tire blow-out. Another may occur during rainy conditions, when the car begins to hydroplane, or when a large truck or bus passes, creating a buffet of wind which could push your car into another lane. When these and other critical situations do occur, good steering habits are important in order to avoid losing control and to keep the monster caged.

Steering Techniques

Best hand position when traveling straight is to hold the steering wheel with two hands in a balanced position. If you look at the steering wheel as the face of a clock, a 9-3 position or an 8-4 position would be best. Avoid holding your hands higher. A lower position keeps them out of the way of a deploying air bag and eliminates serious injuries.

Avoid wrapping your thumbs around the wheel. Always keep your knuckles on the outside of the wheel.

When steering into curves and turns you can use a hand-to-hand method whereby each hand stays on its side of the steering wheel, one pulling down while the other pushes up. This method prevents your hands from getting into the path of the airbag.

Evasive Steering

An evasive maneuver requires three steering actions. To avoid the error of too much steering on the initial turn, keep both hands on the steering wheel at the 9-3 position. Focus on the path you want the vehicle to travel. On the second and third steering action turn as necessary to return to your intended path of travel. Look where you want the car to go, not at the object you are evading.

When Backing

Having the left hand at the 12 position allows you to turn the steering wheel from the top down in the direction you want the back of the vehicle to go. Then use the right hand to continue turning if more is needed.

When Backing a Trailer

Begin with the left hand at the bottom of the wheel, in the 6 position. Move the hand up in the direction you want the trailer to go.

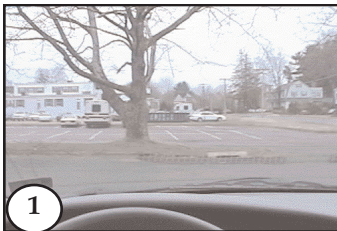
Transition Pegs

A transition peg gives you a visual reference to determine the precise moment at which to make a change (transition) in steering, acceleration, or braking that will best keep the car in balance.

- **The transition peg for making a right turn** is when your vision, and the rearview mirror, are aligned with the target area.
- **The transition peg for making a left turn** is when your vision, and the driver's side corner post, are aligned with the target area.

To use transition pegs, you must turn your head to look to the target area before turning the steering wheel, and keep your focus there. As the car is moving into the turn, your head is rotated in order for vision to stay focused on the target area. When your head rotates to the point where vision is blocked by the rearview mirror, or by the corner post, the car will be at the transition peg — 30 degrees away from being on target. That is the precise moment to take the following actions:

- **Transition Peg For Steering:** is the moment, while making a turn, that the steering wheel should begin to return to a straight (recovery) position.
- **Transition Peg For Braking into turns:** is the moment, while making a turn, when the foot can come off the brake and acceleration can take place.
- **Transition Peg For Acceleration:** is the moment, while making a turn, that an increase in acceleration will have a positive effect upon the vehicle's movement.



In photo 1, we are in a parking lot practicing the use of Transition Pegs. The tree is the target.

Photo 2 shows the transition peg for making a right turn recovery. The driver sees the center of the rearview mirror lined up with the target.

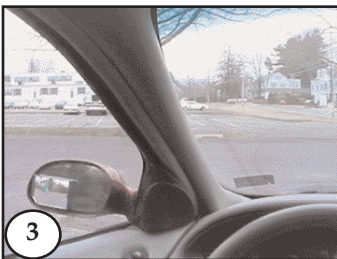
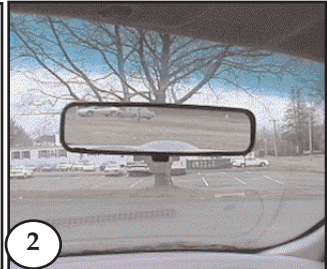
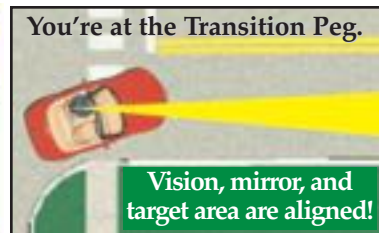
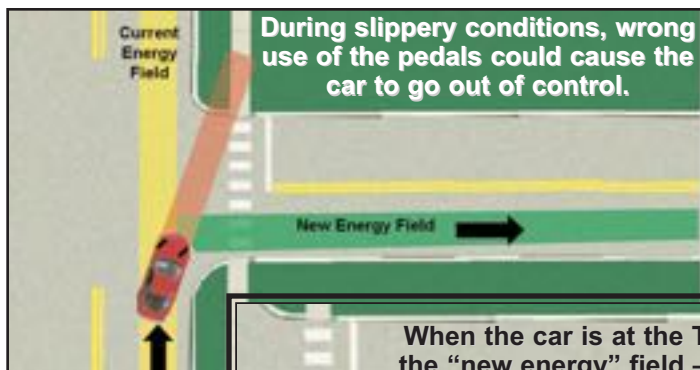
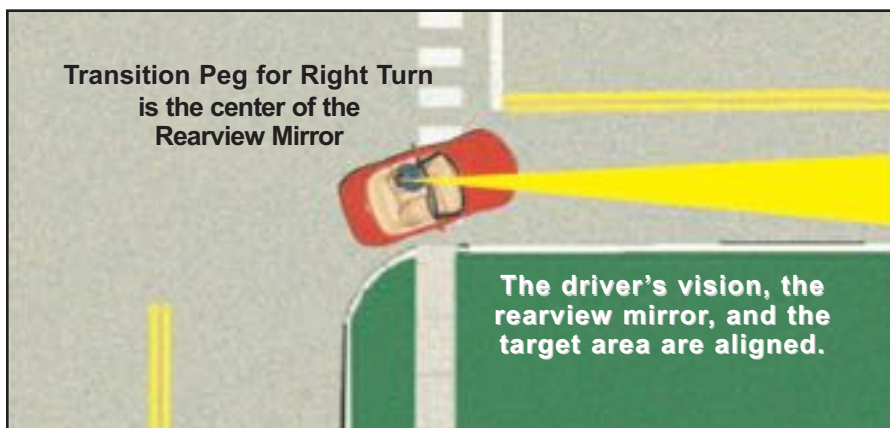
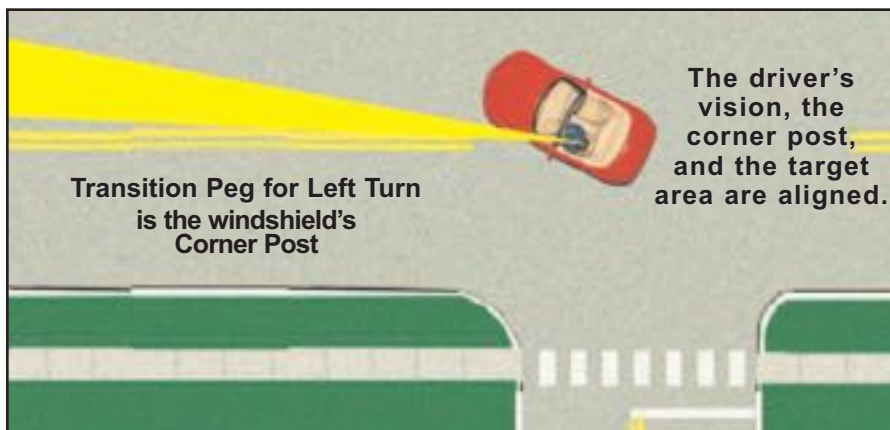


Photo 3 shows the transition peg for making a left turn recovery. The target (tree) is concealed by the corner post. The driver's vision, the corner post, and the target are in alignment.



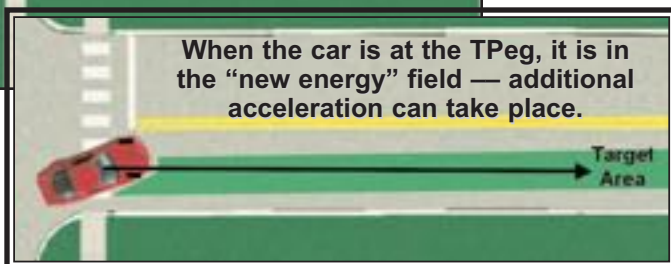
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Braking, Acceleration and Steering Control



Effective use of the Transition Peg (TPeg) lets your vision tell you when to use the gas or brake pedal.

Releasing the brake, or accelerating, before the TPeg puts more energy in the wrong field.



Three Stages of Car Control

Prevention Stage

There are three stages of car control. The easiest and best stage to have opportunity for successful car control is the prevention stage. This is the stage where the ten habits provide automatic protection. For example, while approaching a curve you: See it 30 seconds ahead in your target area, reduce your speed, select good lane positioning on your approach, look into the curve, use braking and acceleration controls effectively and all ten habits are working for you.



Detection Stage

The detection stage gives a warning that the driver is putting the car into harm's way. For example, while approaching a curve during rainy conditions, the driver gets distracted while putting the wipers on and speed is too fast. But the driver's good



four-second habit easily detects a violation in the danger zone. The driver has time to brake the car while still going straight, and while still within the traction capabilities of the tire's grip to the road.

Correction Stage

The driver goes too fast into the curve and fails to reduce speed until the car begins to slide to the outside of the curve. The monster is out of the cage. The driver now has less than one second to take corrective actions to get the car back in control.



What is easier, to keep the car from becoming a monster, or to get a raging monster back into its cage?

The control of the car is dependent upon four tire patches contacting the road. Each

patch is about the size of your hand. Whether they are managed or mis-managed depends upon your habits. Too much speed, too much braking, too much steering, all occurring at the same time, result in an out-of-control situation. The vehicle is in an out-of-balance condition.



The tire patches leave contact with the road, causing the monster to break out of its cage.

The Problem

A driver never knows of all of the risk factors that are likely to combine within a fraction of a second, calling for a demand of more traction. If only one or two risk factors are present they are not likely to result in a crash. It is when there are several risk factors occurring at the same time that the monster gets fed.

The Solution

We need to eliminate those risk factors contributed by our performance and acquire a system of Zone Control habits that can serve to automatically give low-risk behavioral patterns. This will provide protection against an over-accumulation of risk factors. **A driver needs the ten empowering habits, like an insurance policy, to prevent the monster from breaking out of its cage.**

When the **MONSTER** Breaks Out of the Cage!

Three Types of Skids:

1. Loss of Front-Wheel Traction

This commonly occurs when the brakes are applied to the point of wheel lock-up (ABS braking eliminates this type of skid). Also, excessive speed with a front-wheel drive car could cause loss of traction to the front tires when attempting to negotiate a turn or a curve.

The effects you will experience: You turn the steering wheel, with no response, as the car continues to travel straight ahead.

2. Loss of Rear-Wheel Traction

A forceful braking action pitches the front of the car downward, reducing the size of the rear tire patches. Speed, when driving a rear-powered vehicle into a curve, could cause the rear tires to lose road contact. And, in a front-wheel powered vehicle, a deceleration can cause the rear tires to lose contact with the road when traction is limited.

The effects you will experience: The rear of the vehicle will spin to the left or right, causing the front of the vehicle to move off-target from your intended travel path.



Your car is just beginning to skid off target. What actions should you take?

3. Loss of Traction to All Wheels

When a rear-wheel skid develops, and the driver is able to stop the spin (by rapidly steering to get the front tires pointing towards the target area), the rear-wheel skid may become a four-wheel slide.

The effects you will experience: The vehicle will slide sideways at an angle (yaw), with the front of the car pointing to the left or to the right of the target area.

Actions to Take to Correct Any of the Three Skids

- Take your foot off the pedals. No acceleration, no brake.
- Steer as rapidly as possible to get the front of the vehicle pointing towards the target area.
- Keep your head pointing to the target area.
- When the skid rotation is stopped, but the car is still sliding, look for the front of the car to begin moving towards the target area.
- When the front tires regain traction, you must immediately straighten the steering wheel.
- **Most important, keep your eyes focused on where you want the front of the car to travel.**



The skid continues to develop. The actions to take are no pedals and fully steer left to get back on target.

Rainy conditions cause more skids than ice and snow. Don't use cruise control during rainy or slippery road conditions. Cruise control can cause sudden changes in tire traction, resulting in tire spin and loss of control.