VEHICLE DYNAMICS and SKID RECOVERY

Georgia Public Safety Training Center
Driver Training Section

Terminal Performance Objective:

Given a skid control exercise, the participant will demonstrate the ability to recover from a skid following the three rules for rear wheel skid recovery, in accordance with Newton's first law of motion.

Enabling Objectives

- Identify how friction effects directional control.
- Identify weight transfer and its significance in vehicle dynamics.
- Compare the weight distribution of FWD to RWD vehicles.
- Identify the characteristics of vehicle dynamics common to FWD vehicles.

Enabling Objectives (contd)

- Describe the techniques for recovery from a skid in FWD vehicles.
- Describe and demonstrate proper techniques used to recover from a skid in a rear wheel drive vehicle.

Friction:

- Friction refers to two surfaces in contact, each resisting the motion of other.
- In an automobile, there are four points of contact between the tires and the road surface.

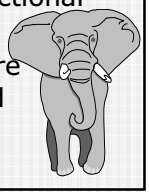
Friction:

- Rolling friction – needed to maintain steering control of the vehicle.
- Sliding friction – occurs when the tires are locked and not rotating.

The speed of the vehicle, tire condition and the road surface are critical.

Weight Transfer:

- Try to keep the weight of the vehicle as equally distributed as possible on all four wheels.
- **Smoothness** in making directional changes is important.
- Springs & shock absorbers are critical to weight balance and maximizing traction.



Weight Distribution (FWD):

- Transmission and differential are one unit called a trans-axle.
- Front wheels carry 63% of the weight while 37% is on the rear.
- The greater the imbalance between front and rear, the greater the "wobble" and potential for loss of control.

Vehicle Dynamics (FWD):

Have a tendency to under steer and "plow".

- Longitudinal weight transfer – occurs when you accelerate or slow the vehicle.
- Lateral weight transfer – occurs when you steer the vehicle and the weight shifts to the outside leading corner of the vehicle.

Steering (FWD):

- Smooth steering critical, especially now that the front tires turn and propel the vehicle.
- Shuffle steering into as well as out of turns may be needed to maintain the desired directional stability and control.

Acceleration (FWD):

- You must enter curves at slower speed so front tires can transition from braking to steering.
- You can apply acceleration slightly sooner as you steer out of the turn.
- Front wheel drive will **pull** you out of the turn.

Braking (FWD):

- Get the speed down before entering the curve because the car wants to continue in a straight line.
- Trail braking – **light** braking in the curve – can work if maximum braking before the curve.

Skid Recovery (**FWD**):

- Initially come off the accelerator.
- Steer straight if necessary to get the front wheels rolling (not plowing).
- Accelerate slightly and steer the direction you want to go.
- Stay away from the brakes.

Skid Recovery (**RWD**):

- Get off the accelerator or stay off if not accelerating.
- Counter steer – turn steering wheel the direction the rear end is sliding. Or, steer the direction you want to go. **Look down the road**.
- Stay away from the brakes.

In Summary:

A front wheel drive is heavier in the front, so:

- Anticipate possible under steering or plowing – front wheels steer & propel.
- At high speeds, critical to brake hard leading up to the curve.
- May accelerate earlier out of a curve since front wheels **pull** the car.
- In FWD skid recovery, may accelerate slightly as steer direction want to go.