



## **Class 2**

Understanding Vehicle Control:  
Starting, Steering and Stopping

**Starting the Engine and Moving the Vehicle Forward**

**Starting the engine**

Complete pre-drive procedures 1-6 (page 2-67)

1. Check to be sure parking brake is set
2. Place foot on brake
3. Make sure the shift lever is in park
4. Turn key clockwise to start engine
5. Turn ignition on and check gauges
6. As soon as the engine starts, release the key
7. Allow engine to idle no more than 15 to 20 seconds (observe gauges and dash lights to make sure all indicate normal functioning)
8. Set needed accessories and adjust ventilation (HVAC)
9. Turn on low beam headlights (use headlights at all times)

**Moving the vehicle forward**

1. With foot on brake, shift to drive “D”
2. Release parking brake
3. Check mirrors and over shoulder for traffic
4. Signal when clear
5. Position hands on steering wheel. Left between 7-9 and right hand between 3-5 o’clock
6. When safe, release brake pedal and press gently on the accelerator
7. Look well ahead along intended path of travel
8. Steer as needed to place vehicle in center of lane
9. Cancel signal

Accelerating

The ability to control speed depends upon good accelerator technique. However, no two vehicles accelerate exactly alike, so drivers must develop sensitivity for each vehicle they drive.

Three levels of acceleration:

1. **Engine acceleration** – releasing pressure from the brake pedal, allowing the low idle of the engine to move the vehicle forward.
2. **Light acceleration** – light accelerator pressure allows for a slow forward motion of the vehicle.
3. **Aggressive acceleration** – firm pressure on the accelerator to increase speed of the vehicle rapidly.

Steering Wheel Control and Techniques

**Hand position**

- The position of the driver's hands on the steering wheel will vary depending on the design of the steering wheel, the seat height and the length of the driver's arms and legs. However, the driver should be able to adjust the seat so the **left hand rests around 9 o'clock, and the right hand rests at about 3 o'clock**, as on the face of a clock, which allows for balanced shoulder strength to control the wheel.
- **Alternatively, some drivers may prefer a slightly lower hand position, placing the left hand closer to 8 o'clock and the right hand closer to 4 o'clock with the upper arms resting against the rib cage.** This also improves stability by lowering the body's center of gravity and reduces unintended steering wheel reversals. Because it is a more natural seating position, it also facilitates keeping both hands on the wheel and reduces upper and lower back pain often associated with long trip driving.
- The driver's grip of the steering wheel should be **firm but gentle**. Grip the steering wheel by the **outside rim**. For greater sensitivity to information communicated by the vehicle, **use fingers instead of palms of hands** and keep thumbs up along the face of the steering wheel. **Never turn the wheel while gripping it on the inside of the rim**, with the back of the hand facing outward.

**Steering techniques**

Turning the steering wheel clockwise (to the right) will cause the vehicle to change direction to the right. Turning the steering wheel counter-clockwise (to the left) will cause the vehicle to change direction to the left.

There are two steering techniques available to drivers:

1. Hand-to-hand steering or push/pull steering
2. Hand-over-hand steering

## Steering Wheel Control and Techniques

**Hand-to-hand or push/pull steering**

Sometimes referred to as push/pull steering this technique should not be confused with shuffle steering. Hand-to-hand steering is a steering technique in which the hands do not cross, even when turning. It permits the driver to make steering inputs ranging from very minor (one to two degrees) to gross adjustments (up to a half turn of the wheel), while keeping both hands on the wheel for precision adjustments.

Use hand-to-hand steering when turning the wheel during normal driving activity going forward above 10-15 mph.

1. When using hand-to-hand steering the **left hand grasps the wheel between 7 and 8 o'clock** and the **right hand grasps the wheel between 4 and 5 o'clock**.
2. Depending on the direction of the turn, the right or left hand pushes the wheel up and the opposite hand slides up, grasps the wheel and pulls down to continue the turn.
3. While the pulling hand moves down, the hand that initially pushed up slides back toward its original position to make adjustments as needed.
4. The driver should use the area on the wheel between 11 and 8 o'clock with the left hand and the area on the wheel between 1 and 4 o'clock with the right hand regardless of the direction of the turn.
5. Simply reverse the hand-to-hand process to bring the vehicle into the intended path.
6. If turning through a slight curve, both hands will typically retain their original grip on the wheel, making only slight finger or wrist adjustments as necessary to maintain path of travel.



Since the hands and arms never cross over the hub of the steering wheel, there is less chance of injury to the face, hands and arms in the event of a frontal crash when a vehicle is equipped with a driver side air bag. The 2 and 10 o'clock method is no longer recommended because it can be dangerous in vehicles equipped with air bags and cause excessive steering input.

Hand-to-hand steering is particularly well suited for precision maneuvers, steering through curves, intersection entry and exit, and front wheel traction loss control (vehicle under-steer).

## Steering Wheel Control and Techniques

**Hand-over-hand steering**

Hand-over-hand steering is a steering technique in which the driver's hands cross when turning the steering wheel. It is particularly well suited when speed of the steering movement is critical, such as skid recovery in a rear wheel traction loss (vehicle over-steer). When used to control or recover from a skid, it is important to hold the wheel in a pattern that allows the driver to use the upper left third of the wheel when steering to the left and the upper right third when steering right. This procedure allows for maximum movement of the wheel with knowledge of its neutral position.

Hand-over-hand steering is also useful when maneuvering in a space with limited sightlines, such as perpendicular parking in a congested shopping center. When using hand-over-hand steering, quick movements of the hands are recommended on entry to the parking maneuver, with smooth slow movements when returning the wheel upon completion of the parking maneuver.

Use hand-over-hand steering when turning the wheel at low speeds, such as when parking the vehicle or entering a tight driveway.

1. When using hand-over-hand steering, **the left hand grasps the steering wheel between 8 and 9 o'clock and the right hand grasps the wheel between 3 and 4 o'clock.**
2. Depending on the direction of the turn, use the right top third of the steering wheel to move the wheel to the right and use the left top third of the wheel to move the wheel to the left.
3. This process is repeated as necessary.
4. Simply reverse the hand-over-hand process to bring the vehicle into the intended path.

Drivers should be aware that employing hand-over-hand steering under all conditions does expose one to some additional risk of injury to arms, hands, and/or face in the event of a crash that results in air bag inflation. Use of hand-over-hand as the primary steering technique also raises the risk of off-road crash occurrences due to excessive steering input.



**Moving to Curb/Side of Road and Entering a Roadway from a Curb**

**Fact Sheet 3.3**  
Content Information

**Moving to Curb/Side of Road and Entering the Roadway from a Curb**

**Entering a roadway from a curb**

1. Signal and check traffic to front, side and rear
2. Identify a safe gap in traffic
3. Look well ahead along intended path of travel
4. Release brake and accelerate gently
5. Steer into intended path of travel
6. Cancel signal
7. Check for motor vehicles and other highway users to the sides of the path of travel
8. Check mirrors for traffic to the rear
9. Project visual search 20 to 30 seconds ahead

**Moving to curb/side of road**

1. Identify place to park
2. Check mirrors
3. Signal
4. Release accelerator
5. Tap brake pedal to alert following drivers
6. Press brake pedal to point of resistance
7. Steer gently toward curb
8. Use reference points to position vehicle legal distance from the curb
9. Apply firm, steady pressure for smooth stops. Do not pump brakes.
10. Check to assure vehicle is centered between front and rear lines

### Stopping the Vehicle

Braking a vehicle to a stop is a relatively simple task. However, like many actions, braking requires practice if it is to be performed smoothly and precisely. The most difficult task is learning when and how much pressure to apply to bring the vehicle to a smooth, controlled stop at the desired point.

There are three levels of braking:

1. **Coasting** – releasing the accelerator to stop the vehicle's forward propulsion. Although the vehicle will continue moving forward, it will be coasting forward rather than being propelled by the engine and will gradually slow.
2. **Controlled braking** – apply brake with sufficient pressure to slow the vehicle.
3. **Threshold braking** – the application of brake pressure to a point just short of locking up the brakes, resulting in maximum braking capability.

**To stop the vehicle:**

1. Check traffic in both mirrors before slowing down.
2. Ease off the accelerator.
3. Tap on the brake lightly.
4. Gradually press down on the brake pedal. Ease up on the brake just before stopping.
5. Leave the selector lever in DRIVE if planning to start moving again immediately, otherwise shift to PARK.



**Securing the Vehicle for Parking**

**How to secure the vehicle for parking**

1. Come to a complete stop with the wheels turned toward or away from the roadway as appropriate. Check state law for hill parking.
2. Keep foot on the brake pedal and set the parking brake\*.
3. Shift selector lever to park position.
4. Turn off all accessories and headlights if no daytime running lights (DRL's).
5. Turn ignition to lock and remove key.
6. Unfasten safety belt.
7. Check traffic to rear, exit vehicle carefully, and lock doors.

\* Setting the parking brake is required by law in some states. Setting of the parking brake is to hold the vehicle in place while parked and protect the transmission.

**Backing Procedures**

Because of very limited visibility to the rear of most vehicles, it is very important to ensure that there are no objects in the path of travel prior to backing. Checking the rear of the vehicle before entering is a good habit. Common mistakes committed by new drivers when backing are:

- Moving too fast
- Providing too much steering input
- Turning the steering wheel in the wrong direction
- Holding turn too long/rewinding steering wheel too late

**Backing straight:**

1. Prior to moving vehicle, check for objects to the rear
2. Place foot on brake pedal and shift to reverse
3. Grasp steering wheel at 12 o'clock with left hand
4. Turn body to right with right arm over back of passenger seat
5. Search through rear window and then glance forward
6. Move backward at idle speed, or use light accelerator pedal pressure if needed
7. Make minor steering corrections as needed
8. Release accelerator and apply pressure on brake pedal to stop
9. Look to rear until vehicle is stopped

**Backing and turning:**

1. Prior to moving vehicle, check for objects to the rear
2. Place foot on brake pedal and shift to reverse
3. Signal left or right as appropriate
4. Grasp steering wheel with both hands at 9 and 3 o'clock position
5. Turn body in direction of turn
6. Search through rear side window in direction of turn
7. Move backward at idle speed, or light accelerator pedal pressure if needed
8. Steer smoothly in direction vehicle is to move
9. Make quick checks to front corner, opposite of turn (front swing)
10. Continue backing and straighten/rewind steering wheel to straight
11. Release accelerator and apply pressure on brake pedal to stop
12. Look to rear until vehicle is stopped