

# UNIT I

## DRIVING SKILLS

### DRIVING FUNDAMENTALS:

School Bus Drivers have entrusted to them the lives and safety of students whose value cannot be measured. The driver must learn the basic skills and procedures to safely operate a school bus. Once learned, these skills and procedures should be practiced to develop proficiency. By developing proficiency in skills and procedures, the driver can devote more attention to the ever-changing traffic conditions enabling the driver to operate the bus with the highest degree of safety.

**Note: Before starting the engine refer to UNIT IV - VEHICLE MAINTENANCE of this manual**

### 1.1 SAFE START PROCEDURE

The starting procedure should become a routine matter; however, different engines (diesel, gasoline, propane) require different procedures. Be sure you have identified the engine type before attempting to start it. If equipped with hydraulic brakes depress the brake before starting the engine to check the electric assist motor.

#### A. STARTING PROCEDURE BASED ON ENGINE TYPE:

##### Diesel:

1. Check parking brake. It should be set to keep the bus from moving.
2. Depress clutch if vehicle is equipped with a manual transmission.
3. Shift to neutral/park position.
4. Turn ignition on – wait for glow plugs to go out, if so equipped.
5. Start engine.
6. Let engine idle for a short period, medium fast idle, throttle set at (1000 to 1200 rpm) for winter charging and warm ups, lights and heaters off. Monitor engine idle for 3 to 5 minutes for possible engine runaway. Wait for air pressure to build to appropriate levels (90 to 120 psi).

##### Gasoline:

1. Check parking brake. It should be set to keep the bus from moving.
2. Depress clutch if vehicle is equipped with a manual transmission.
3. Shift to neutral/park position.
4. Set choke.
5. Start engine.
6. If engine is fuel-injected, do not touch the accelerator.
7. Let engine idle for a short period, medium fast idle, throttle set at (1000 to 1200 rpm) for winter charging and warm ups, lights and heaters off. Monitor engine idle for 3 to 5 minutes for possible engine runaway.
8. Wait for air pressure to build to appropriate levels (90 to 120 psi).

Propane:

1. Check parking brake. It should be set to keep the bus from moving.
2. Depress the clutch if vehicle is so equipped with a manual transmission.
3. Shift to neutral/park position.
4. Start engine.
5. Use primer and a slightly depressed accelerator if the engine is cold.
6. Use nothing if the engine is warm.
7. Engage starter.
8. Let engine idle for a short period – 3 to 5 minutes.
9. Wait for air pressure to build to appropriate levels (90 to 120 psi).

**Note: Never race a cold engine during the initial start up or warming of the engine.**

## **1.2 SHIFTING - MANUAL TRANSMISSIONS**

A. Principles of Shifting:

Know the gear positions for your bus. Most buses have four or five forward speeds. Buses must have a gear position diagram on either the dash or gearshift knob. If you do not see a diagram, contact your maintenance person.

With some exceptions, second gear of manual transmissions is used for starting into motion under average terrain and load conditions. Ask your supervisor about your particular bus. Other conditions may dictate the use of a low gear.

**Note: Never start out in a gear higher than second as this places undue strain on the engine and clutch.**

B. Starting In Motion:

Depress clutch and shift into starting gear. Hold service (foot) brake firmly while releasing the parking brake. Release clutch gradually to the friction point and hold. Release service brake and depress accelerator. Release clutch smoothly while depressing accelerator. Remove foot completely from clutch. Continue to depress accelerator as bus gains speed.

## **1.3 SHIFTING - AUTOMATIC TRANSMISSIONS**

A. Up Shifting:

As speed increases, the transmission will shift automatically until the bus reaches cruising speed.

B. Downshifting:

Downshifting techniques vary a little from one brand of automatic transmission to another. It is best to check the manufacturer's recommendations for your particular vehicle.

C. Slowing for student stops:

1. Release accelerator and gradually apply brakes.
2. Increase brake pedal pressure slightly just before coming to a stop.
3. Shift into neutral once stopped.
4. Set parking brake as needed.

- D. Parking bus:
1. Shift into neutral.
  2. Turn wheels properly (left when facing uphill where there is a curb and right at all other times).
  3. Set parking brake.
  4. Turn off ignition and remove key.

## 1.4 **STEERING AND TURNING**

The School Bus Driver must be able to assume the correct steering position and make all turns correctly and smoothly. The driver must learn the procedures necessary to make the turn and re-enter the traffic pattern. The driver confronted with an unusual turn or a turnaround should do so with extreme caution. In case of a possible crash, the driver should remember that evasive turning action may be safer than trying to stop.

### A. Steering Position:

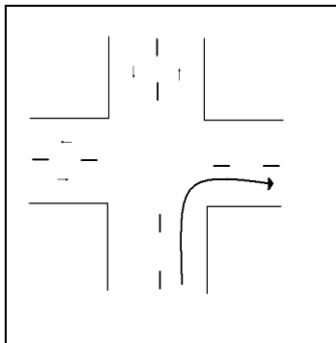
1. Hold the steering wheel firmly with both hands. If you hit a curb or pothole the wheel could pull away from your hands unless you have a good grip.
2. Assume a 10 – 2, 9 – 3 or 8 – 4 hand position.
3. Hands should be on the rim of the steering wheel and not on the cross bar.

### B. Push pull or hand over hand steering:

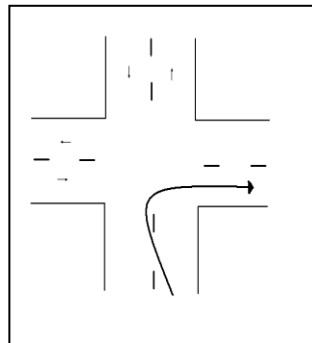
1. Whichever feels comfortable and is safe.
2. No palming.

### C. Right Turns: (See figures 2-11 and 2-12)

1. Signal your intention to make a turn.
2. Check traffic in all directions.
3. Move your head and body (rock and roll) to look around blind spots created by the body, mirrors or moldings of the bus.
4. Reduce speed (manual transmission, down shift to proper gear to turn).
5. Position bus in proper lane (2 to 3 feet from curb).
6. Check traffic again in all directions.
7. Initiate your turn.
8. Turn wheel smoothly.
9. Check left mirror for tail swing.
10. Check right mirror while turning.
11. Enter the right most lanes available and check turn signal for cancellation.
12. Steer wheels back into position, do not let steering wheel spin back.



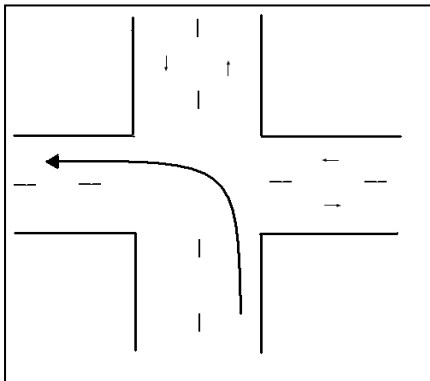
**Figure 2-11**  
**Proper turn**



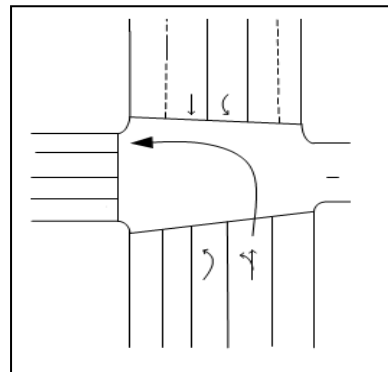
**Figure 2-12**  
**Improper turn**

D. Left Turns (See figures 2-13 and 2-14):

1. Check traffic in all directions.
2. Move your head and body (rock and roll) to look around blind spots created by the bus body, mirrors and/or moldings of the bus.
3. Give proper left turn signal.
4. Reduce speed (manual transmission, downshift to proper gear for turn).
5. Position bus in proper lane (move into the left most lane or to the right of center of the street unless there is more than one turn lane).
6. Keep front wheels straight if waiting to turn.
7. Do not enter intersection until safe to do so and only when you can complete your turn safely.
8. Check traffic again in all directions.
9. Execute turn.
10. Turn wheel smoothly.
11. Check right mirror for tail swing.
12. Check left mirror while turning.
13. Turn into appropriate lane (outside lane to most outside available lane).
14. Check signal for cancellation.
15. If on a multi-lane Street or highway, increase speed and move into proper lane as soon as possible.



**Figure 2-13**  
**Left Turn**

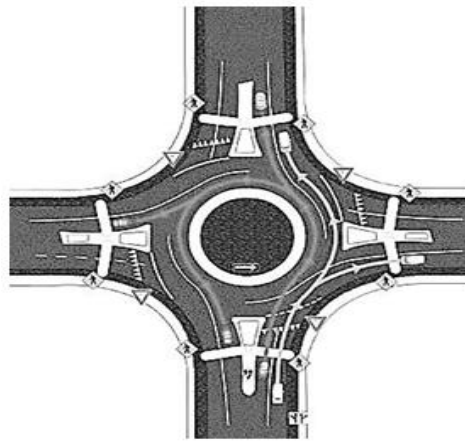


**Figure 2-14**  
**Double left turn lanes**

NOTE: If there are two left hand turn lanes available always use the outside left turn lane to lessen the chance of the buses tail swing striking another vehicle during the turn.

Roundabouts (see Figure 2-15)

1. Slow down as you approach the roundabout.
2. For multi-lane roundabouts, as with any intersection, get into the appropriate lane as you approach the roundabout.
3. Yield to pedestrians and bicyclists crossing the roadway.
4. Watch for signs or pavement markings that require or prohibit certain movements.
5. When entering a roundabout, yield to vehicles already in the roundabout. Do not cross into the roundabout until all traffic from the left has cleared.
6. After entering the roundabout, drive in a counter-clockwise direction until you reach your exit.
7. Do not stop, pass, or change lanes within a roundabout.
8. If an emergency vehicle approaches, exit the roundabout immediately and then pull over.



**Figure 2-15  
Roundabout**

**1.5 TURN AROUND AND BACKING – MN Rule 7470.1000 Subp. 3**

A turnaround is a procedure used to turn the bus around, by backing, so as to proceed in the opposite direction. If backing is necessary in a loading zone or near pedestrians, the driver should get assistance if possible. This adult would be able to see the area behind the bus and must be able to communicate with the driver. The school bus driver is the ultimate responsible party in all situations.

**ALL STUDENTS MUST ALWAYS BE ON THE BUS WHILE YOU ARE BACKING**

- A. Backing and turn around conditions:
1. NEVER back up if there are other options available.
  2. Whenever possible you should avoid this hazardous maneuver.
  3. Backing and turn around are necessary on some routes.

- B. Backing and turn around conditions:
  - 4. NEVER back up if there are other options available.
  - 5. Whenever possible you should avoid this hazardous maneuver.
  - 6. Backing and turn around are necessary on some routes.
  
- C. Backing and turn around procedures - MAKE ABSOLUTELY CERTAIN:
  - 1. Is it necessary to back up?
  - 2. Your students have boarded before you back up. Conversely, you must back up before allowing the students to disembark.
  - 3. It is quiet on the bus so you can devote your full attention to backing up safely. This will also allow you to hear sounds or warnings from other drivers, bystanders and students.
  - 4. You activate the 4-way flashers.
  - 5. Honk the horn twice, to alert those outside the bus, before beginning your back up maneuver.
  - 6. You have an unrestricted view to the rear. If you are not sure what is behind the bus, secure the bus, then get out and look.
  - 7. You have sufficient space. Remember the rear overhang of the bus.

## 1.6 **STOPPING and PARKING**

### Manual Transmissions:

- A. Stop in low gear at speeds below 10 mph:
  - 1. Release accelerator and gradually apply brakes.
  - 2. Depress the clutch and reduce brake pressure slightly just before coming to a stop.
  - 3. Shift into neutral, release clutch and remove foot from pedal.
  
- B. Stopping from cruising gear:
  - 1. Release accelerator and apply brakes.
  - 2. As proper speed is reached, downshift to lower gear.
  - 3. As bus reaches lower speeds, follow procedure outlined in "A" above.
  
- C. Parking bus:
  - 1. Shift into proper gear.
    - a. Low gear on level or upgrade.
    - b. Reverse gear on downgrade.
  - 2. Turn wheels in the proper direction for roadway conditions.
    - a. Left when facing uphill where there is a curb.
    - b. Right at all other times.
  - 3. Set parking brake.
  - 4. Turn off ignition and remove key.

### Automatic Transmissions:

- A. Stop when in drive at speeds below 10 mph:
  - 1. Release accelerator and gradually apply brakes.
  - 2. Increase brake pedal pressure slightly just before coming to a stop.
  - 3. Shift into neutral or park.
  - 4. Set the parking brake.

- B. Stopping from cruising gear:
  - 1. Release accelerator and apply brakes.
  - 2. As bus reaches lower speeds follow procedures outlined in “A” above.
- C. Parking bus:
  - 1. Shift into neutral or park.
  - 2. Turn wheels proper direction for the roadway conditions.
    - a. Left when facing uphill where there is no curb.
    - b. Right at all other times.
- D. Set parking brake.
  - 1. Turn off ignition and remove key.

## 1.7 **RIGHT OF WAY AND YIELDING**

Right-of-way and yielding laws help traffic flow smoothly and safely. They are based on courtesy and common sense. Violation of these laws is a leading cause of traffic crashes.

- A. When two vehicles reach an intersection at the same time, and there is no traffic light or signal, the driver of the vehicle on the left must yield to the vehicle on the right.
- B. When two vehicles reach an intersection at the same time, and all-way stop signs or flashing red traffic lights control the intersection, the driver on the left must yield right of way to the driver on the right.
- C. A driver who wishes to make a left turn must yield to vehicles approaching from the opposite direction when these vehicles are in the intersection or are near enough to pose the risk of a crash.
- D. Left turn yields on flashing yellow arrow. Drivers are allowed to turn left after yielding to all oncoming traffic and to any pedestrians in the crosswalk. Oncoming traffic has a green light. Drivers must wait for a safe gap in oncoming traffic before turning.
- E. When a green arrow signal indicates that a vehicle may enter an intersection to make a left turn, the driver must yield to other vehicles or pedestrians already within the intersection. After yielding, the driver may continue in the direction of the arrow.
- F. When two vehicles approach an uncontrolled “T” intersection, the driver of the vehicle that is turning must yield to all cross traffic.
- G. When approaching a public road from a private road or driveway, you must stop and yield to pedestrians and traffic.
- H. Drivers in the right lane of traffic must yield right of way to transit and metro mobility buses attempting to merge from a bus stop or shoulder.
- I. When a funeral procession identifies itself through use of headlights or hazard warning lights, you must yield to the entire procession.

### Yield To Emergency Vehicles:

When an emergency vehicle, such as an ambulance, fire truck, or police car, displaying flashing red lights and/or sounding a siren approaches your vehicle on a two-way road, you must pull to the right and stop. If you are traveling on a one-way road, you must pull to whichever side is nearest and stop. If you are within an intersection, proceed through it before stopping. Remain stopped until all emergency vehicles have passed. A law enforcement officer with probable cause to believe a driver has violated this law may arrest the driver within four hours of the violation.

You are not required to stop if the emergency vehicle that is approaching you is separated from your lane of traffic by a physical barrier such as a fence, wall, or median strip.

### Passing Parked Emergency / Service Vehicles.

When an emergency vehicle that has its emergency lights flashing is stopped, on or next to a road that has two lanes in the same direction, the “Move Over Law” requires you to reduce speed, move to the lane farthest away from the vehicle, if possible to do so safely and pass with caution. Emergency vehicles include; tow trucks, ambulances, fire trucks and police cars. If you are unable to move a lane away, reduce speed and pass with caution. The same procedure applies when approaching and passing parked vehicles such as freeway service patrol, road maintenance or construction vehicles that are stopped with warning lights activated.

## **1.8 PASSING**

If passing is absolutely necessary, think of the safety of the students on the bus first. If you need to exceed the speed limit in order to pass, you should not be passing. Improper passing causes many crashes. Use extra caution when passing at night, when visibility is poor, and when the road is slippery. In locations where passing is permitted on two-lane roads with traffic moving in both directions, you may pass on the left side of vehicles ahead of you. You should not exceed the speed limit to complete a pass.

However, the speed limit on two-lane highways with a posted speed limit of 55 mph or higher is increased by 10 mph when the driver is lawfully passing another vehicle in the same direction. When you are preparing to pass, you must make sure there is a safe distance between your vehicle and oncoming traffic. You must also look behind you to determine whether other drivers are preparing to pass you. When another driver is trying to pass you, stay in your own lane and do not increase speed.

Use your left turn signal before moving into the left lane to pass. Use your right turn signal after passing and before returning to the right lane. Return to the right lane when you can see the entire vehicle you have just passed in your rearview mirror. When passing another vehicle, you must return to the right side of the road before coming within 100 feet of an oncoming vehicle.

Do not attempt to pass another vehicle in locations where a “No Passing Zone” sign is posted or where there is a solid yellow line on your side of the center line. Double solid yellow lines mean passing is not allowed by vehicles traveling in either direction. Do not pass:

- On a curve or hill where you cannot clearly see the road ahead for at least 700 feet.
- Within 100 feet of an intersection, underpass, tunnel, or railroad crossing.
- When you are about to meet a vehicle coming toward you from the opposite direction.

## **1.9 DEFENSIVE DRIVING**

A defensive driver is one who makes allowances for the lack of skill and lack of knowledge on the part of the other driver. Defensive drivers recognize that they have no control over the unpredictable actions of other drivers and pedestrians, nor over conditions of weather and road. Defensive drivers develop a defense against all these hazards. They concede their right of way and make other concessions to avoid a collision. They are careful to avoid the crash traps caused by weather, roads, pedestrians and other drivers.



## 1.10 THE SMITH SYSTEM OF DEFENSIVE DRIVING

- A. The Smith System of Defensive Driving is a series of driving techniques that reduce the likelihood of being involved in a crash. Five keys to space cushion driving:
1. Aim high is steering.
  2. Get the big picture.
  3. Keep your eyes moving.
  4. Leave yourself an out.
  5. Make sure they see you.

- B. Points to safe driving.

The following checklist contains 35 points that should be explained and then demonstrated by an instructor. These are the major points that the Smith System stresses.

1. Describe best hand position due to airbag (if applicable).
2. Checking over the shoulder before entering traffic.
3. Demonstrate the fifteen second eye lead time.
4. Reasons for scanning intersections before entering.
5. From a stopped position, allowing the vehicle in front to move out for 4 seconds before accelerating.
6. Scanning the steering wheels parked cars (dirty wheels vs. clean wheels).
7. Reasons for braking early.
8. Demonstrate the 4 second (or greater) following distance.
9. One car length between vehicles at a stopped position.
10. How to avoid holding up traffic when pacing lights.
11. Point out poor driving habits of other drivers.
12. Identify packs or clusters of traffic.
13. Demonstrate obtaining eye contact.
14. Demonstrate and define the point of no return.
15. Identify space around the vehicle.
16. Demonstrate and define the lane of least resistance.
17. Fresh and stale lights.
18. Point out and define tire to ground contact.
19. Apply the brake and check your mirror.
20. Explain that the light is not green until the brake lights go out and the vehicle ahead starts to roll.
21. Mirrors should be checked every 5 to 8 seconds.
22. Convenience vs. emergency lane changes.
23. Patterns established by other drivers.
24. When appropriate, use Key #1 by name.
25. When appropriate, use Key #2 by name.
26. When appropriate, use Key #3 by name.
27. When appropriate, use Key #4 by name.
28. When appropriate, use Key #5 by name.
29. Leaving one car length behind crosswalk when stopped.
30. Contrast your space, visibility and options with another driver lacking these.
31. Point out aggressive drivers who are not getting ahead.
32. Demonstrate and explain proper turn signal timing.
33. Demonstrate and explain the four-second lane change.
34. Comment on the benefits of seeking alternatives to backing.
35. Comment on parking choice.

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### **1.11 SUMMARY:**

The School Bus Driver should be well versed and skilled in driving fundamentals. However, this alone is not enough. School Bus Drivers must also be defensive drivers and operate their bus in such a manner that, regardless of the type of situation that develops, they will be able to protect their students and vehicle from harm. This skill, once acquired, should be maintained and improved with daily practice of defensive driving skills and timely “on street evaluations.”

### **TRAINING OPPORTUNITIES:**

Train the Trainer – hosted by MAPT and MSBOA (offered in July)

### **ADDITIONAL RESOURCES:**

MAPT – [www.mnapt.org](http://www.mnapt.org)

MSBOA – [www.msoba.com](http://www.msoba.com)

Minnesota Department of Public Safety –

<https://dps.mn.gov/divisions/msp/commercial-vehicles/Pages/school-bus-safety.aspx>