



BUS DRIVER'S COURSE

SECTION II. INTRODUCTION

BUS DRIVING COURSE.

MOTIVATOR: Getting your bus driver's license is one of the most exciting events in your life. The 44-60 passenger bus will be one of the largest vehicles you operate here at Fort Leonard Wood. The Bus provides an exquisite means of transportation with the highest safety standards and designed with the ultimate low floor/low mass.

Type: C

Time: .1

Media: TV, COMPUTER

TERMINAL LEARNING OBJECTIVE:

NOTE: Show slide No. 1, Title TLO

NOTE: Inform the students of the following terminal learning objective.

At the completion of this lesson you (the Student) will: At the completion of this lesson you will become a qualified driver on a 44-60 passenger bus.

ACTION: Conduct Bus Driving Operations

CONDITIONS: Given a 44-60 passenger bus, operate the vehicle on a prescribed course, with no more than two instructor assists. Proper certification and training must take place before you will be allowed to operate this vehicle alone.

STANDARD: Drivers must complete a 40 hours to attain his or her Bus Driver's License route IAW AR 600-55, AR 385-55, and TC 21-305. Drivers will become familiar with all the safety operations of a 44-60 passenger bus, and drive a bus without accident on a prescribed route. The driving certification process will take place after he or she has passed a knowledge test on rules and regulations and then demonstrates in a skills test that they can operate a bus safely.

SAFETY REQUIREMENTS: Seatbelts will be worn each time the Bus is operated. The bus has a 15 foot over hang that swings around when it makes a left or right turn.

RISK ASSESSMENT LEVEL: Low

ENVIRONMENTAL CONSIDERATIONS: None

**REFERENCES: AR 600-55
AR 385-55
TC 21-305
Owner's Manual, 2001
Accuride Rim/Wheel Safety & Service Manual**

EVALUATION: The students will be given two in-class written examinations, and also a final graded road test at the end of the course.

INSTRUCTIONAL LEAD IN: The 44-60 passenger bus is the conventional bus style that the U.S. Army Transportation Motor Pool, Department of Logistics' (TMP/DOL) uses to transport soldiers to and from their training areas. In this class you will have an opportunity to inspect and safely operate a 44- passenger bus.

SECTION III - PRESENTATION

NOTE: Show slide No. 2, Title ELO

A. ENABLING LEARNING OBJECTIVE 1

ACTION: Understanding the Safety Rules and Precautions

CONDITIONS: Given instruction in a classroom environment.

STANDARD: You will become familiar with all the rules and precautions. You will follow all the safety rules and precautions yourself, and your passengers and everyone else on the road.

1. Learning Step/Activity 1(Safety Rules And Precautions)

Method of Instruction: C Instructor to student ratio is 1 :

Time of Instruction: 00: 30 hours.

Media: , **OVERHEAD PROJECTOR, COMPUTER**

NOTE: Show slide No. 3-5, Title Safety Rules and Precautions

A. Safety Rules And Precautions

1. You must follow all safety warnings yourself, your passengers and everyone else on the road.

2. When approaching a right turn, you need to stay to the left side of the lane. While making the turn, keep glancing at the right-side mirror to ensure the right rear of the bus isn't hitting curbs, signs, pedestrians, etc.
3. When approaching a left turn, you need to stay to the right side of the lane. While making the turn, keep glancing at the left-side mirror to ensure the left rear of the bus stays in the appropriate lane to avoid hitting oncoming vehicles.
4. Right turn: Stay to the left side of the lane. Pull forward **SLOWLY**, then start making your turn gradually. Keep glancing at both mirrors to ensure the bus isn't hitting objects on the right side or the left rear of the bus isn't swinging into the left lane (rear of bus swing) hitting a vehicle. Refer to figure 4-1.
5. Left turn: Stay to the right side of the lane. Pull forward **SLOWLY**, then start making your turn gradually. Keep glancing at both mirrors to ensure the bus isn't hitting objects on the left side or the right rear of the bus isn't swinging into the right lane (rear of bus swing) hitting a vehicle. Refer to figure 4-1.
6. When turning from a stopped position be aware of the "rear of bus swing," (also known as "tail swing"). The following applies: (see figure 4-1)
7. Some busses are designed and constructed with an apparatus that allows passengers to stand (standees) while the bus is in operation. Regardless of whether or not the apparatus is installed, a "standee line" must be present and clearly marked. The line will be of contrasting color and located on the aisle floor just behind the drivers seat. At no time should there be a passenger standing in front of the standee line.
8. No bus shall be equipped with aisle seats unless these seats are designed and installed to automatically fold and leave a clear aisle when unoccupied. No bus shall be operated if any of the seats are not securely fastened to the vehicle.
9. Any bus equipped with an emergency door will have the door clearly marked. Emergency doors will also be identified by a red electric lamp readily visible to passengers. This lamp will be illuminated whenever the bus is in operation.

NOTE: Conduct a check on learning and summarize the learning activity.

2. Learning Step/Activity 2(Preventive Maintenance)

Method of Instruction: C Instructor to student ratio is 1 :

Time of Instruction: 00:30 hours.

Media , OVERHEAD PROJECTOR, COMPUTER

NOTE: Show slide No. 6-7, Title Inspecting the Tires, Rims, and Wheels.

A. Inspecting the Tires, Rims, Wheels.

WARNING: Improper parts and incorrect installation procedures could cause a wheel to fail in service. A serious, even fatal, accident could result.

1. Wheels must be mounted with the required studs. Studs types are not interchangeable.
2. Always use hub piloted wheels and flange nuts on hub piloted hubs and studs piloted wheels and chamfered nuts on stud's piloted huds. (**NOTE:** Mixing designs causes premature wheel failure.)
3. Nuts must be retorqued routinely. Use the proper nut torque and tightening sequence.
4. Each tire, wheel, and axle has its own maximum rating. (Do not load and inflate the tire/wheel/axle system beyond the rating of the lowest rated compound.

NOTE: Show slide No. 8-9, Title Vehicle Maintenance Checks.

B. Periodic Vehicle Maintenance Checks

5. Check all metal surfaces thoroughly including both sides of the wheels and areas between the duals. Watch for excessive corrosion buildup; cracks in metal; bent, broken flanges; loose, missing, or damaged nuts; bent or stripped studs.
6. Replace an assembly that is damaged. Remember; Excessively corroded or cracked rims are dangerous, especially during the removal

of the assembly. Deflates tire (both tire of a dual assembly) before removing the wheel.

7. Look for corrosion streaks which are an indication of loose nuts or improper nut fit. After tightening the nuts to the recommended torque level or replacing them, remove the rust streaks.
8. Replace broken studs and each unbroken stud next to the broken stud.
9. Determine the cause of the damage before installing another wheel.
10. Inflate tires to only the recommended air pressure. Be sure not to exceed the wheel's maximum inflation rating.

NOTE: Show slide No. 10-12, Title Before Driving the Bus.

C. Before Driving the Bus

NOTE: Inspect your bus at the end of each shift. The report must specify each bus and list any defect that would affect safety or result in a breakdown. If there are no defects, the Inspection Worksheet should say so.

NOTE: Riders sometimes damage safety-related parts such as hand-holds, seats, emergency exits, and windows. If you report this damage at the end of a shift, mechanics can make repairs before the bus goes out again. Mass transit drivers should also make sure passenger signaling devices and brake-door interlocks work properly.

NOTE: As you check the outside of the bus, close any open emergency exits. Also, close any open access panels (for baggage, restroom service, engine, etc) before driving. People sometimes damage unattended buses. Always check the interior of the bus before driving to ensure rider safety. Aisles and stairwells should always be clear.

NOTE: You must be sure it is safe. You must review the inspection report made by the previous driver. Only if the defects reported earlier have been certified as repaired or not needed to be repaired, should you sign the previous driver's report. This is your certification that the defects reported earlier have been fixed. Make sure these things are in good working order before driving:

1. Service brakes.
2. Parking brake.
3. Steering mechanism.
4. Lights and reflectors.

5. Tires (front wheels must not have recapped or regrooved tires).
6. Horn.
7. Windshield wiper or wipers.
8. Rear-vision mirror or mirrors.
9. Coupling devices (if present).
10. Wheels and rims.
11. Emergency equipment.

NOTE: Conduct a check on learning and summarize the learning activity.

3. Learning Step/Activity 3 (Air Brakes)

Method of Instruction: C **Instructor to student ratio is 1** **:**

Time of Instruction: 00 **:** 30 **hours.**

Media: - **OVERHEAD PROJECTOR, COMPUTER**

NOTE: Show slide No. 13-19, Title: Air Brakes

NOTE: Air brakes use compressed air to make the brakes work. Air brakes are a good and safe way of stopping large and heavy vehicles, but the brakes must be well maintained and used properly.

1. Air brakes are really three different braking systems: service brake, parking brake, and emergency brake.
 - **The service brake** system applies and releases the brakes when you use the brake pedal during normal driving.
 - **The parking brake** system applies and releases the parking brakes when you use the parking brake control.
 - **The emergency brake** system uses parts of the service and parking brake systems to stop the vehicle in the event of a brake system failure.
2. Stopping Distance ratio

Perception Distance +
Reaction Distance +
Brake Lag Distance +
Effective Braking Distance
Total Stopping Distance

3. The air brake lag distance at 55 mph on dry pavement adds about 32 feet. So at 55 mph for an average driver under good traction and brake conditions, the total stopping distance is over 300 feet. This is longer than a football field.
4. Brakes are designed so brake shoes or pads rub against the brake drum or disks to slow the vehicle. Braking creates heat, but brakes are designed to take a lot of heat. However, brakes can fade or fail from excessive heat caused by using them too much and not relying on the engine braking effect.

WARNING: Excessive use of the service brakes results in overheating and leads to brake fade. Brake fade results from excessive heat causing chemical changes in the brake lining which reduce friction and also causing expansion of the brake drums. As the overheated drums expand, the brake shoes and linings have to move farther to contact the drums, and the force of this contact is also reduced. Continued overuse may increase brake fade until the vehicle cannot be slowed down or stopped at all.

WARNING: Brake fade is also affected by adjustment. To safely control a vehicle, every brake must do its share of the work. Brakes out of adjustment will stop doing their share before those that are in adjustment. The other brakes can then overheat and fade and there will not be sufficient braking available to control the vehicle(s). Brakes can get out of adjustment quickly, especially when they are hot. Therefore, brake adjustment must be checked frequently.

NOTE: The use of brakes on a long and/or steep downgrade is only a supplement to the braking effect of the engine. Once the vehicle is in the proper low gear, the following is the proper braking technique:

- Apply the brakes just hard enough to feel a definite slowdown.
- When your speed has been reduced to approximately five mph below your "safe" speed, release the brakes.
[This brake application should last for about three seconds.]
- When your speed has increased to your "safe" speed, repeat steps 1 and 2.

5. Proper Braking Technique

EXAMPLE: #1 If your "safe" speed is 40 mph, you would not apply the brakes until your speed reaches 40 mph. You now apply the brakes hard enough to gradually reduce your speed to 35 mph and then release the brakes. Repeat this as often as necessary until you have reached the end of the downgrade.

EXAMPLE: #2 If the low air pressure warning comes on, stop and safely park your vehicle as soon as possible. There might be an air leak in the system. Controlled braking is possible only while enough air remains in the air tanks. The spring brakes will come on when the air pressure drops into the range of 20 to 45 psi. A heavily loaded vehicle will take a long distance to stop because the spring brakes do not work on all axles. Lightly loaded vehicles or vehicles on slippery roads may skid out of control when the spring brakes come on. It is much safer to stop while there is enough air in the tanks to use the foot brakes.

WARNING: Any time you park, use the parking brakes, except as noted below. Pull the parking brake control knob out to apply the parking brakes, push it in to release them. The control will be a yellow, diamond-shaped knob labeled "parking brakes" on newer vehicles. On older vehicles, it may be a round blue knob or some other shape (including a lever that swings from side to side or up and down).

WARNING: Don't use the parking brakes if the brakes are very hot (from just having come down a steep grade), or if the brakes are very wet in freezing temperatures. If they are used while they are very hot, they can be damaged by the heat. If they are used in freezing temperatures when the brakes are very wet, they can freeze so the vehicle cannot move. Use wheel chocks to hold the vehicle. Let hot brakes cool before using the parking brakes. If the brakes are wet, use the brakes lightly while driving in a low gear to heat and dry them.

WARNING: If your vehicle does not have automatic air tank drains, drain your air tanks at the end of each working day to remove moisture and oil. Otherwise, the brakes could fail.

WARNING: Never leave your vehicle unattended without applying the parking brakes or chocking the wheels. Your vehicle might roll away and cause injury and damage.

6. Stopping Distance

1. Push the brake pedal down. Control the pressure so the vehicle comes to a smooth, safe stop. If you have a manual transmission, don't push the clutch in until the engine rpm is down close to idle. When stopped, select a starting gear.

NOTE: If somebody suddenly pulls out in front of you, your natural response is to hit the brakes. This is a good response if there's enough distance to stop and you use the brakes correctly.

2. You should brake in a way that will keep your vehicle in a straight line and allow you to turn if it becomes necessary. You can use the "controlled braking" method or the "stab braking" method.

Note: If you drive a vehicle with anti-lock brakes, you should read and follow the directions found in the owner's manual for stopping quickly.

NOTE: Conduct a check on learning and summarize the learning activity.

NOTE: Show slide No. 20, Title: **Test Your Knowledge**

Test Your Knowledge

1. Why should you be in the proper gear before starting down a hill?
2. What factors can cause brakes to fade or fail?
3. The use of brakes on a long steep downgrade is only a supplement to the braking effect of the engine. True or False?
4. If you are away from your vehicle only a short time, you don't need to use the parking brake. True or False?
5. How often should you drain air tanks?

4. Learning Step/Activity 4 (Passenger Safety)

Method of Instruction: C **Instructor to student ratio is 1**____:_____

Time of Instruction: 00 : 30_ hours.

Media: **OVERHEAD PROJECTOR, COMPUTER**_

NOTE: Show slide No. 21-23, Title: **Passenger Safety**

A. Passenger Safety

Note: There is absolutely no smoking permitted while operating any of the buses.

WARNING: Do not tow or push a disabled bus with riders aboard the vehicle, unless getting off would be unsafe. Only tow or push the bus to the nearest safe spot to discharge passengers. Follow your employer's guidelines on towing or pushing disabled buses.

1. Inspect Emergency exit handles.

2. The seats must be safe for riders.
3. Never drive with an open emergency exit door or window.
4. The "Emergency Exit" sign on an emergency door must be clearly visible. If there is a red emergency door light, it must work. Turn it on at night or any other time you use your outside lights.
5. You may lock some emergency roof hatches in a partly open position for fresh air. Do not leave them open as a regular practice. Keep in mind the bus's higher clearance while driving with them open.
6. Make sure your bus has the fire extinguisher and emergency reflectors required by law. The bus must also have spare electrical fuses, unless equipped with circuit breakers.
7. All baggage or freight on the bus will be stowed and secured in a manner which assures:
8. Unrestricted freedom of movement to the driver and proper operation of the bus.
9. Unobstructed access to all exits by any occupant on the bus.
10. Protection of occupants on the bus against injury resulting from the falling or displacement of articles transported in the bus

WARNING: Avoid fueling your bus with riders on board unless absolutely necessary.

WARNING: Never refuel in a closed building with riders on board.

WARNING: Don't talk with riders, or engage in any other distracting activity, while driving.

NOTE: Conduct a check on learning and summarize the learning activity.

NOTE: Show slide No. 24-25 Title: Hazardous Materials

B. Hazardous Materials

CAUTION: Do not expose the engine to corrosive chemicals. Corrosive chemical can damage the engine.

WARNING: Do not operate a diesel engine where there are or can be combustible vapors. The vapors can be sucked through the air intake system and cause engine acceleration and over speeding that can result in a fire, an explosion, and extensive property damage.

WARNING: Do not allow riders to leave carry-on baggage in a doorway or aisle. There should be nothing in the aisle that might trip other riders. Secure baggage and freight in ways that avoid damage and:

1. Allow the driver to move freely and easily.
2. Allow riders to exit by any window or door in an emergency.
3. Protect riders from injury if carry on fall or shift.

NOTE: Watch for cargo or baggage containing hazardous materials. Most hazardous materials cannot be carried on a bus.

WARNING: Do not transport any hazardous material unless you are sure the rules allow it.

NOTE: Conduct a check on learning and summarize the learning activity.

NOTE: Show slide No. 26 Title: Test Your Knowledge

Test Your Knowledge

1. Does it matter where you make a disruptive passenger get off the bus?
2. How far from a railroad crossing should you stop?
3. When must you stop before crossing a drawbridge?
4. The rear door of a transit bus has to be open to put on the parking brake. True or False?

SUMMARY: We talked about stopping distance, "Speed and Stopping Distance." With air brakes there is an added delay: the time required for the brakes to work after the brake pedal is pushed. With hydraulic brakes (used on cars and light/medium trucks), the brakes work instantly. However, with air brakes, it takes a little time (one half second or more) for the air to flow through the lines to the brakes. Thus, the total stopping distance for vehicles with air brake systems is made up of four different factors.

5. Learning Step/Activity 5 (Bus Crashes)

Method of Instruction: C **Instructor to student ratio is 1** **:**

Time of Instruction: _00_: 30_ hours.

Media: OVERHEAD PROJECTOR, COMPUTER_

NOTE: Show slide No. 27-30 Title: Bus Crashes

NOTE: Show crash pictures.

A. The Most Common Bus Crashes.

1. Bus crashes often happen at intersections.

WARNING: Use caution, even if a signal or stop sign controls other traffic.

2. School and mass transit buses sometimes scrape off mirrors or hit passing vehicles when pulling out from a bus stop.

Caution: Remember the clearance your bus needs, and watch for poles and tree limbs at stops. Know the size of the gap your bus needs to accelerate and merge with traffic. Wait for the gap to open before leaving the stop. Never assume other drivers will brake to give you room when you signal or start to pull out.

WARNING: Crashes on curves that kill people and destroy buses result from excessive speed, often when rain or snow has made the road slippery. Every banked curve has a safe "design speed." In good weather, the posted speed is safe for cars but it may be too high for many buses. With good traction, the bus may roll over; with poor traction, it might slide off the curve. Reduce speed for curves! If your bus leans toward the outside on a banked curve, you are driving too fast.

NOTE: Show slide No. 31-33 Title: RR Crossings

3. Stop at RR Crossings.

- Stop your bus between 15 and 50 feet before railroad crossings.
- Listen and look in both directions for trains.
- You should open your forward door if it improves your ability to see or hear an approaching train.
- Before crossing after a train has passed, make sure there isn't another train coming in the other direction on other tracks.
- If your bus has a manual transmission, never change gears while crossing the tracks.

- You do not have to stop, but must slow down and carefully check for other vehicles:

1. At street car crossings.
2. At railroad tracks used only for industrial switching within a business district.
3. Where a policeman or flagman is directing traffic.
4. If a traffic signal shows green.
5. At crossings marked as "exempt" or "abandoned."

NOTE: Show slide No. 34 Title: **RR Crossings**

4. Stop at Drawbridges.

- Stop at drawbridges that do not have a signal light or traffic control attendant.
- Stop at least 50 feet before the draw of the bridge. Look to make sure the draw is completely closed before crossing. You do not need to stop, but must slow down and make sure it's safe, when:

1. There is a traffic light showing green.
2. The bridge has an attendant or traffic officer that controls traffic whenever the bridge opens.

NOTE: Conduct a check on learning and summarize the learning activity.

SUMMARY: Now that you are familiar with the 44-60 passenger bus and know the rules and precautions associated with driving the vehicle, you are ready for some hands on training. Of course, before operating the vehicle, it must be inspected so that's where you will begin. Once that is complete, you will then be ready to operate the bus under the direction of a qualified instructor.

6. Learning Step/Activity 6 (Normal Operating Procedures)

Method of Instruction: C Instructor to student ratio is 1 :

Time of Instruction: 00 : 30 hours.

Media: **OVERHEAD PROJECTOR, COMPUTER**

NOTE: Show slide No. 35-37 Title: Normal Starting Procedures

A. Normal Starting Procedures:

WARNING: Do not depress the accelerator pedal or move the accelerator lever from the idle position while cranking the engine.

CAUTION: To prevent damage to the starting motor, do not engage the starting motor for more than 30 seconds. Wait 2 minutes between each attempt to start.

1. Disengage the driven unit, or if equipped, put the transmission in neutral.
2. With the accelerator pedal or lever in the idle position, turn the key switch to the ON position, and wait for the WAIT-TO-Start lamp to go out; then, turn the key to the start position.
3. If the engine does not start after three attempts, check the fuel supply system. Absence of blue or white exhaust smoke during cranking indicates no fuel is being delivered.

CAUTION: The engine must have adequate oil pressure within 15 seconds after starting. If the **WARNING** lamp indicating low oil pressure has not gone out or there is a no oil pressure indicated on a gauge within 15 seconds, shut off the engine immediately to avoid engine damage.

4. Idle the engine 3 to 5 minutes before operating with a load.
5. After starting a cold engine, increase the engine speed (RPM) slowly to provide adequate lubrication to the bearings and to allow the oil pressure to stabilize.

CAUTION: Do not operate engine at low idle for long periods of time with the engine coolant temperature below the minimum specification.

B. Start up Failures:

1. Look and listen for changes in performance, sound, or engine appearance that can indicate service or engine repair is needed.
 - a. Engine misfires
 - b. Vibration
 - c. Unusual engine noises
 - d. Sudden changes in engine operating temperatures
 - e. Excessive smoke

- f. Loss of power
- g. An increase in oil consumption
- h. An increase in fuel consumption
- i. Fuel, oil, or coolant leaks.

WARNING: Batteries can emit explosive gases. To avoid personal injury, always ventilate the compartment before servicing the batteries. To avoid arcing, remove the negative battery cable first and attach the negative battery cable last.

WARNING: When using jumper cables to start the engine, make sure to connect the cables in parallel: Positive (+) to positive (+) and negative (-) to negative (-).

NOTE: Show slide No. 38 Title: Engine Shutdown

C. Engine Shutdown

1. Allow the engine to idle 3 to 5 minutes before shutting it off after a full load operation.

NOTE: This allows adequate cool down of pistons, cylinders, bearings, and turbocharger components.

2. Turn the ignition key switch to the OFF position.

NOTE: Conduct a check on learning and summarize the learning activity.

7. Learning Step/Activity 7 (Operate a Bus)

Method of Instruction: C **Instructor to student ratio is 1** **:**

Time of Instruction: 00 **:** 30 **hours.**

Media: Hands-On

NOTE: Show slide No. 38 Title: On-road driving

A. On-road driving.

B. Off road driving.

NOTE: Conduct a check on learning and summarize the learning activity.

Given: Final Written Examinations, and Road Test.