HOW TO DRIVE A BUS

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HOW TO DRIVE A BUS

Driving a bus is a real job. It calls for good physical condition, a clear head, quick thinking, and coordinated use of eyes, ears, hands, and feet. Some pointers are given here for new drivers and—maybe some old timers, too. While some of the items covered in this booklet may seem rather simple, nevertheless, if the things to which it calls attention were carried out properly at all times there is no doubt that a better bus operation will result. At the same time you can carry out your patriotic duty of conserving rubber and scarce mechanical parts.

In driving a bus, it must be kept in mind that you are dealing with two machines—yourself, the human machine, and the bus, the mechanical machine. The definite limitations of the human machine cannot be ignored any more than you may overlook the limitations of the bus.

An example of what is meant by human limitations is eyesight. Expert investigators tell us about eye concentration, focal point of vision, foreground and peripheral vision, etc., but it all adds up to the fact that good eyesight is essential to good driving. Our eyes cannot possibly see everything in front of us every foot of the distance ahead on the road.

Because our judgment of speeds of vehicles ahead of us and coming toward us depends upon our vision, a driver cannot afford to take his eyes off the road ahead and its traffic, particularly when passing.

After entering a darkened theatre we are practically blind for some minutes.

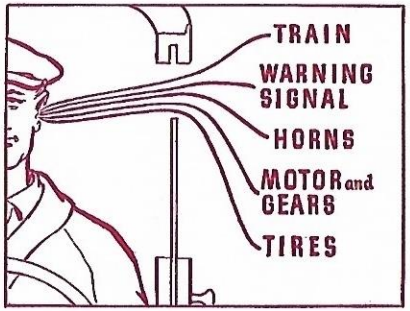
Night driving presents an additional problem. The mechanism of the human eye is such that its adjustment to bright illumination is more rapid than its adjustment to darkness. This is clearly demonstrated every time we visit the movies. After entering the darkened theatre we are practically blind for some minutes, but we can see quite clearly after our eyes become accustomed to the semi-darkness. When we leave the theatre, the bright light outdoors causes some blinking of the eyes, but they adjust

themselves almost immediately to the increased illumination. This explains the momentary blindness that occurs after passing the glare of oncoming headlights.

Drivers on regular night runs become familiar with the roads, the bumps, and the curves by use of certain landmarks as guides. This familiarity is used by drivers without their being fully aware of it. Dim-sightedness has no place in night driving.

Whether driving by night or day, eyesight must be normal. Eye glasses sometimes may be required to bring vision up to standard and assure safe driving.

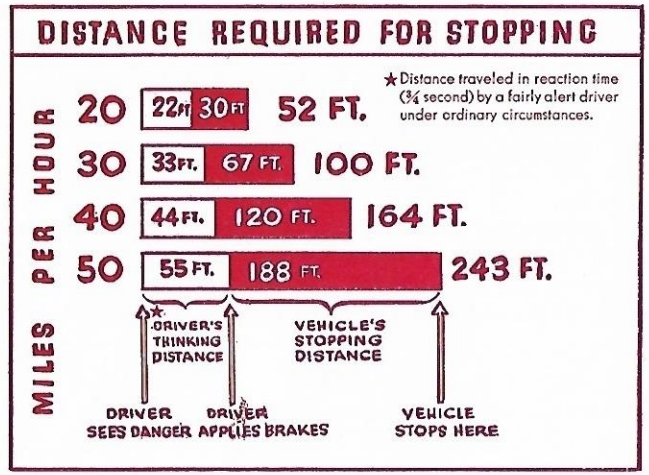
The human machine is also equipped with sound detectors, which we call ears. Good hearing is also essential to good driving. A train whistle may be hard to locate because sound does not travel in a straight line as light does. However, a train whistle, regardless of accurate knowledge of its direction, is an immediate warning for preparedness and calls our eyesight into concentrated action. A good driver always keeps his window open, even though only partially open in bad weather, in order to detect warning signals of trains, or other vehicles. Good hearing also will detect unusual sounds from the engine, tires or gears which generally indicate trouble.



A good driver keeps his window open to detect warning signals, also unusual sounds which may indicate trouble.

The typical human reaction to a loud noise is to be startled, with some persons actually jumping or dropping what is in their hands. Bus drivers should remember this and, when warning a driver directly ahead, should use no more than a few taps on the horn button. A long loud blast should be used only for long distance warning. The same applies to warning pedestrians. Scaring the daylights out of anyone may often result in momentary paralysis of his senses and entirely unpredictable reactions.

We have mentioned the need for quick thinking which is always coincident with quick action. The response to the situation reported by eyes and ears must be instantaneous. A delay of even a fraction of a second may mean traveling another 25 feet or so, depending upon the bus speed. (See chart next page.) Excitability and confusion are not exactly desirable characteristics in a bus driver's seat.



The machine called a motor bus also has definite limitations and should be thoroughly understood by all concerned. Manufacturers have built into their motor buses any number of provisions for economical operation, ease of control, good performance, safety, dependability and long life—all of which are dependent in the long run upon proper maintenance of the vehicle by the owner and the proper use of it by the driver. In the case of the human machine, discovery of symptoms of trouble is aided by the use of instruments which the doctor uses. For the motor bus, manufacturers have installed a number of instruments which are always in plain sight, and these are the telltale indicators of proper functioning of vital parts. If warning signals are ignored, trouble will invariably result.

When warning signals are ignored by the human machine, it generally ends up in bed for a period of days or weeks. When the motor bus quits, it is likely as not to be at some very inconvenient place.

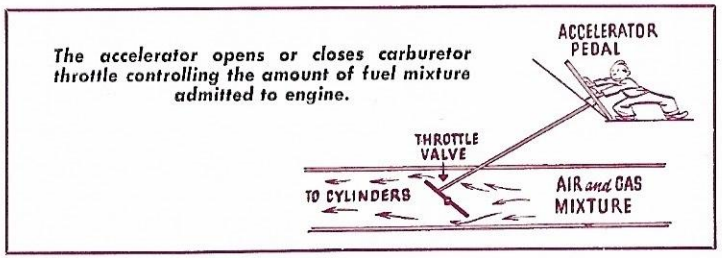
An experienced bus driver follows a routine before he leaves the garage. He looks at his tires to quick-check on inflation and the matching of dual rear tires. After getting into the seat, he also looks at the instruments on the panel and checks on the several controls. Because they differ between various makes and types of buses, these instruments and controls should be carefully checked before starting so that the driver is familiar with their location and operation. We read a lot about the number of instruments that an air pilot has to watch for proper control of the airplane, but the road pilot also has lots of instruments to watch and must watch them closely.

IGNITION SWITCH

The ignition switch is the circuit breaker for the electrical system. Turning the switch to the "on" position completes an electrical circuit which permits starting and running of the engine. Returning the ignition switch to the "off" position breaks the circuit and stops the engine.

THROTTLE CONTROL

The foot pedal located alongside the brake pedal is used most for opening or closing the carburetor throttle, thus controlling the amount of fuel mixture admitted to the engine. This pedal is often called the accelerator pedal.

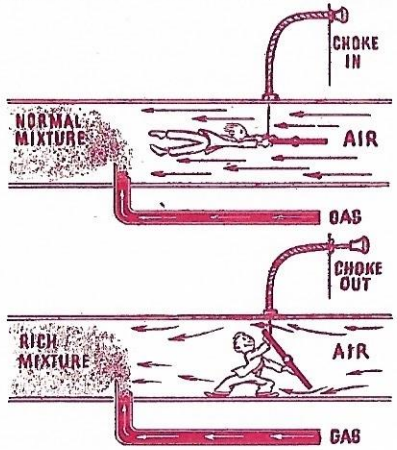


The accelerator opens or closes carburetor throttle controlling the amount of fuel mixture admitted to engine.

A hand control is usually furnished and is connected to the foot pedal control. The hand control is usually mounted on the instrument panel and pulling the button outward opens the throttle.

CHOKE CONTROL

The choke control is usually mounted on the instrument panel. Pulling out this control button reduces the amount of air pulled into the carburetor, resulting in a richer mixture. Always run the engine with the button pushed against the instrument panel. (See starting instructions.)



Pulling out choke control button reduces the amount of air pulled into carburetor, resulting in a richer mixture.

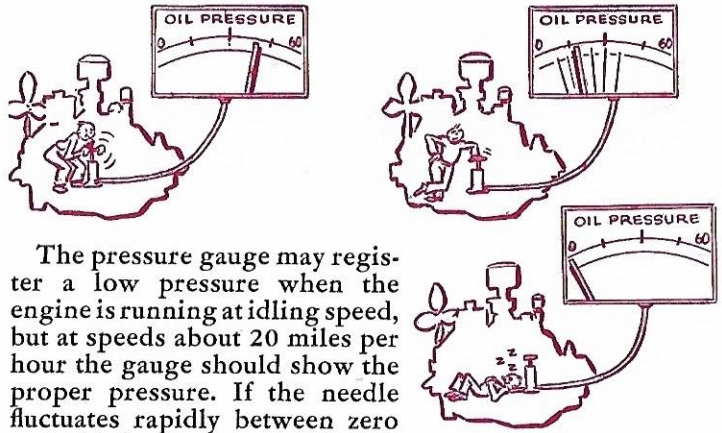
TEMPERATURE INDICATOR

There is a thermometer that shows the temperature of the liquid in the cooling system, usually above 100 degrees. You will notice that the pointer swings over to normal operating temperature in a very few minutes after starting

cold. This is because a thermostatic control prevents the cooling liquid circulating through the radiator until the liquid in the engine reaches a normal operating temperature. Never warm the engine quickly by running it fast just after starting. Speeding up the engine with the transmission in neutral is called "racing." While driving, glance at this temperature indicator occasionally to see that it does not register too hot. If the needle is in the danger zone, the engine is too hot and should be stopped. Continuing to operate an over-heated engine may cause permanent damage to its working parts.

OIL GAUGE

The pointer on this gauge indicates the pressure in the oil circulating system and the proper reading varies between makes of buses. The driver should watch this instrument rather closely and, if the indicator pointer drops to zero, the engine should be stopped immediately and the cause of oil pressure failure investigated and corrected before restarting the engine.



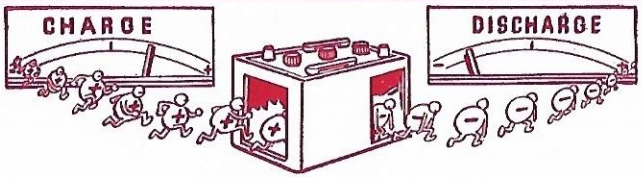
If oil pressure drops to zero or fluctuates rapidly, engine should be stopped until the trouble is corrected.

The pressure gauge may register a low pressure when the engine is running at idling speed, but at speeds about 20 miles per hour the gauge should show the proper pressure. If the needle fluctuates rapidly between zero and a higher reading, the engine should be stopped and the trouble investigated. Usually, fluctuation of the pointer is caused by insufficient oil in the engine.

AMMETER

This electrical instrument registers the amount of electricity flowing into or out of the battery. The generator makes the electricity and sends it to the battery and other electrical units, such as the lights, ignition coil, etc. When the electrical units are drawing more electricity than the

generator is charging, the pointer on the ammeter will be on the negative (−) side of zero and when charging more than is being consumed, the pointer will be on the positive (+) side of zero. Electricity consumed by the starting motor



The ammeter registers the amount of electricity going into or out of the battery.

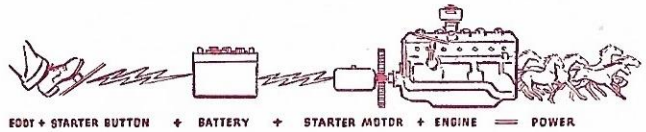
is not registered by the ammeter. If the ammeter pointer registers on the negative (−) side of zero when all electrical units are switched off, there is a leakage of electricity somewhere in the system. Unless you are able to locate and correct this condition, be sure to have it corrected in a shop quickly, because it will soon cause the battery to become exhausted and the engine will not run. The ammeter keeps you posted on the charging condition of the generator and the consumption of electricity by the system.

LIGHTING SWITCHES

The control of the lighting circuit is usually accomplished by pulling a control button to various positions. There is usually a foot operated switch to the left of the clutch pedal on the floor board for the deflection of light beams when passing. Very often there is a separate switch for instrument lighting.

STARTER SWITCH

A foot controlled switch, adjacent to the accelerator pedal, operates the starting motor switch; on some buses the



Pressing down on switch completes the electrical circuit between battery and starter motor, cranking the engine.

starter is controlled by a button on the dash. Pressing down on the switch or button completes the electrical circuit between battery and starter motor, and rotation of the starter armature through the gears cranks the engine. When using the starter, keep the clutch pedal depressed to reduce the load on the battery. When the engine starts the starter circuit should be opened immediately.

WINDSHIELD WIPERS

There are several types of windshield wiper control buttons. These should be checked before operation. A sudden need for the use of windshield wipers should not be followed by a lot of fumbling around with control buttons which may require the driver either stopping or taking his eyes off the road ahead.

BRAKE LINE GAUGE

With air or vacuum brake system, pressure gauges are often provided to indicate the amount of pressure being used in various brake applications.

GEAR SHIFT LEVER

Checking up on the gear shift lever is a wise precaution for good driving. The driver may have to shift in a hurry and that is no time to be fumbling with the gear shift trying to find out the right shift to make.

PARKING BRAKE LEVER

A check on the location of the parking brake lever should be made before starting and the required amount of travel of the lever should be checked.

WARNING SIGNAL

The operation of the horn should be checked, also the amount of pressure needed on the button to get the desired signal.

STARTING THE ENGINE

1. Transmission gear shift lever must be in neutral.
2. Pull out hand throttle partially. This is not necessary if engine is warm.
3. Pull out choke button to obtain richer fuel and air mixture for starting. If the engine is warm, choking is unnecessary.
4. Insert key in ignition switch and turn switch to "on" position.
5. Disengage clutch by pressing down on clutch pedal.
6. Press on starter pedal to crank the engine. Release pedal as soon as engine starts.
7. Push in choke button and adjust hand throttle to obtain even idling. When the engine is cold, it should be run several minutes before attempting to move the bus.

Remember the seven steps necessary for starting the engine.

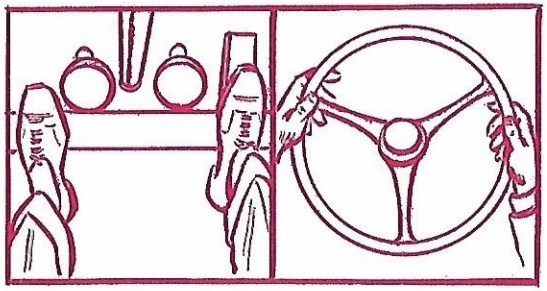
STARTING THE BUS

1. Depress clutch pedal to disengage the clutch.
2. Move transmission gear shift lever into the first gear position.
3. Release the hand brake lever.
4. Press on accelerator pedal to speed up the engine. Release clutch pedal slowly and press on accelerator pedal as necessary to pick up the load and prevent stalling the engine as the bus starts to move. Press the accelerator pedal slowly to pick up speed until the engine reaches its high governed speed.
5. Release accelerator pedal, depress clutch pedal, move the gear shift lever to neutral and then to the next higher speed. Press on accelerator and release clutch as above. Repeat this operation through the various steps until the transmission is in high gear. Remember that the clutch pedal and accelerator are to be moved simultaneously and in opposite directions—one down and the other up.

ROLLING THE BUS

Now that the bus is rolling, the driver should avoid slouching and lounging. He must be mentally alert. His hands should be diagonally opposite each other on the steering wheel, his right foot on the accelerator, and his left foot on the *floor* in a position to quickly reach the clutch pedal. Eyes should be kept straight ahead, although when necessary the driver must glance to either right or left, at the rear view mirror, and occasionally at the instrument panel.

It should be unnecessary to warn drivers to use care, courtesy, and common sense to avoid accidents and traffic jams. Too many drivers depend upon the size of their bus to scare the automobile driver or pedestrian out of his rightful place in traffic. The common rules of the road should be followed by all.



When bus is rolling the driver's hands and feet should be in the positions shown in the above sketch.

DRIVING DOWN GRADES

When driving down grades it is advisable to use the same transmission gear that would be required to climb the same grade. This is a safety rule followed by all good drivers in hilly territory. This causes the bus to drive the engine instead of the engine driving the bus and will reduce the brake application required. On very steep or long down grades it may be necessary to shift the gears to first speed to have the engine hold the bus speed low enough for safety.

Continuous or long-time application of the brakes is not good practice, because it causes excessive wear of the lining. If brake application is necessary on long down grades, it is best to apply and release the brakes alternately and perhaps more severely. This will give the brake drums a chance to cool a little and run at lower temperatures. Do not coast down grades with the transmission in neutral or with the clutch disengaged.

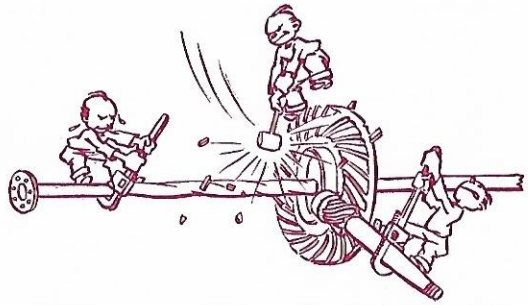
DRIVING UP GRADES

When driving up grades, some drivers try to reach the top without shifting gears. In fact, the most common fault in driving up grades is failing to shift to a lower gear soon enough. If the highest possible road speed is desired, the transmission should be shifted into the next lower gear at the very first indication that the engine and bus speed are beginning to decrease. This will permit driving the bus at the maximum possible speed upgrade.

SHIFTING TO LOWER TRANSMISSION GEAR

When shifting from one transmission gear to another, use of a method known as "double clutching" is desirable. This is accomplished as follows:

1. Depress clutch pedal quickly, maintaining the same pressure on the accelerator. Move gear shift lever to neutral and at the same instant release the clutch.



Careless gear shifting causes breakage of axle shafts and of teeth in the driving gears.

2. Again depress clutch pedal and move the gear shift lever to next speed. Release clutch slowly and at the same time accelerate the engine to synchronize its speed with the speed of the vehicle.

OFF-THE-ROAD DRIVING

Drive slowly in loose dry sand or fresh thick gravel, even though the engine will drive the bus at a faster rate. Difficulty may be encountered in steering the bus because the wheels, when turned, may slide.

Soft or boggy ground and deep snow should be avoided wherever possible. The best thing to do when traveling this type of terrain is to shift into low gear. If a wheel starts to spin, the clutch should be disengaged immediately. The slightest delay in doing this will permit the wheels to dig in. Reverse gear should then be used in an attempt to get the vehicle out. If wheel spin continues on both forward and reverse gears, disengage the clutch and put the gear shift lever in neutral. Racing the engine with a spinning driving wheel is useless and merely bogs the vehicle. Mud and clay or snow that may have piled up in front of the wheels must be shoveled away. Piling brushwood, stone, cloth, etc. under the driving wheels rarely helps, as the spinning wheels quickly hurl them out of the way. If the vehicle fails to extricate itself after a few trials, it is advisable not to risk further strain. Another vehicle on firmer ground should be used to tow the stalled vehicle. While towing is in progress, the stalled vehicle should help with a steady pull in low gear. "Frogging" or rocking the vehicle back and forth by shifting from forward to reverse gear, will only result in damage to some of the running gear parts.

STOPPING THE BUS

1. Remove foot from the accelerator pedal and apply brake by pressing down on foot pedal.
2. When speed of bus has been reduced to idling speed of engine, disengage clutch and move transmission gear shift lever into neutral position.
3. When bus has come to a complete stop, release clutch pedal.
4. When making brake application at high speeds, it is recommended that the brake be applied and released alternately in order to give the brake drums a chance to cool.

SHIFTING INTO REVERSE

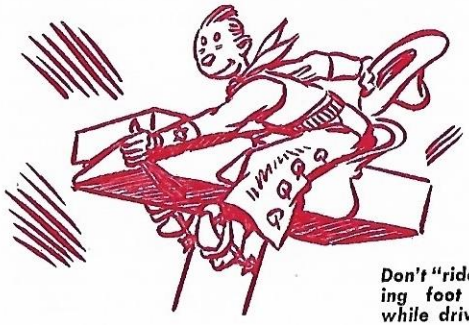
Before attempting to shift into reverse, the bus must be brought to a complete stop.

1. Push clutch pedal downward to disengage the clutch.
2. Raise latch on gear shift lever and move lever to the reverse position.
3. Release clutch and accelerate engine as necessary to pick up the load and prevent stalling the engine as the bus starts to move backward.

SOME DRIVER DON'TS

1. Don't race the engine to warm it up.
2. Don't roll the bus at high speed before the engine is fully warm.

   In both cases, the reduced circulation of oil due to its low temperature will cause frictional wear and may perhaps score or even freeze the pistons.
3. Don't use the choke longer than absolutely necessary. Excessive choking may result in a flooded carburetor and starting difficulty. It may also cause dilution of the oil in the crankcase by raw gasoline seeping past the pistons.



Don't "ride" the clutch. Keeping foot on clutch pedal while driving causes unnecessary wear of plates and early replacement.

4. Don't ride the clutch. Keeping the foot on the clutch pedal while the vehicle is in motion separates the clutch plates slightly. This makes them slip against each other and causes unnecessary wear and early replacement.
5. Don't ride the brake pedal. Resting the foot on the brake pedal may cause light brake applications which, in addition to causing unnecessary wear on brake liners and brake drums, creates objectionable heat and also acts as a drag.

6. Don't idle the engine while the vehicle is not in motion. Useless idling consumes fuel and may dilute the crankcase oil. (Of course, if the bus is to resume its run within 5 minutes, say, it is better to idle the engine for this period of time than it is to restart it.)
7. Don't turn the front wheels of a standing bus. Stationary tires in contact with the road offer resistance which imposes an unnecessary load on steering gear parts. Scuffing of tires will also result.

TIRE CONSERVATION

The conservation of rubber is absolutely essential and the observance of a few simple driving rules will be an important factor in accomplishing this objective.

Start and stop easily in order to avoid wheel slippage and scraping which grinds off tread rubber.

Steer clear of chuck holes, bumps and rough pavement—if impossible to avoid, then drive very slowly through the section.

Go around curves slowly and do your necessary braking to reduce speed before you enter the curve. High speed on curves can actually double the weight of the bus on its tires because of centrifugal force. It causes excessive stress and strain on side walls and unnecessarily wears off tread rubber due to scraping and slipping. In the interest of safety slow driving around curves is sensible.

Spinning wheels on slippery pavement is very disastrous to rubber tires—the heat generated seriously affects and causes rapid tread wear.

Driving in excess of 30 MPH—regardless of regulations permitting higher speed—results in decreased life of tires. At high speed the heat inside the tire increases and weakens the tire body and inner tube while at the same time the bus sways more, resulting in excess scraping and scuffing the rubber off the tread.

Rubbing the curb at any time grinds off the side wall and weakens the tire.

EQUIPMENT REPORT

It is to your interest and to the interest of the service to keep equipment in good running order. You drive the bus, you know how it acts, you know what to expect. It is a responsibility of yours to report to the proper persons any defect which you know or think exists in the equipment so that it may be checked and remedied before extensive repairs become necessary, perhaps resulting in the bus being taken out of service for an extended period of time.